

New Zealand Transport Agency
**Transport Agency Investment
Proposal Re-Evaluation | SH2
Melling Transport Improvements**
Findings Report

Final | 28 November 2018

This report takes into account the particular instructions and requirements of our client

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party

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Contents

	Page
Executive Summary	4
1 Background	6
1.1 The Investment Proposal	6
1.2 Summary of the Re-Evaluation Process	6
1.3 Further Inputs into the Re-Evaluation	7
2 Strategic Context	9
2.1 Government Priorities	9
2.2 Project Context	10
3 Review of the Investment Logic Map	18
3.1 Review of Problem Statements	18
3.2 Review of Benefit Statements	19
3.3 Review of Investment Objectives	20
3.4 Summary of the ILM review	21
4 Review of the Existing Uncertainty Log	23
5 Review of Options Development	24
5.1 IBC Options	24
5.2 Key Findings	25
6 Programme of Interventions	26
6.1 Consideration of GPS Themes	26
6.2 Proposed Programme	27
6.3 Alignment to Transport Outcomes Framework and IAF	27

List of Figures and Tables

Figure 1	Re-Evaluation Approach
Figure 2	Transport Agency Intervention Hierarchy
Figure 3	Government Policy Statement on Land Transport 2018-19 (Ministry of Transport, 2018)
Figure 4	Transport Outcomes Framework
Figure 5	Location of SH2/Melling Link Intersection
Figure 6	Interface between transport improvements and other initiatives
Figure 7	Investment Logic Map from the IBC
Figure 8	Arrangement of Melling Intersection
Figure 9	Peak period queuing (AM)
Figure 10	Peak period queuing (PM)
Figure 11	Crash history within project area (2011-2015)
Figure 12	Arrangement of proposed intersection options
Figure 13	Option development process

Table 1	Summary of unplanned events (TREIS 2011-2015; as outlined in IBC)
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Abbreviations

AADT	Annual Average Daily Traffic
BCA	Business Case Approach
CBD	Central Business District
CMP	Corridor Management Plan
DBC	Detailed Business Case
DSI	Deaths & Serious Injury
ESR	Environmental and Social Responsibility
GDP	Gross Domestic Product
GPS	Government Policy Statement (on Land Transport)
GWRC	Greater Wellington Regional Council
HCC	Hutt City Council
HCV	Heavy Commercial Vehicle
HOV	High Occupancy Vehicle
HPMV	High Productivity Motor Vehicle
IAF	Investment Assessment Framework
IBC	Indicative Business Case
ILM	Investment Logic Map
KPI / KPIs	Key Performance Indicator/s
LoS	Level of Service
MaaS	Mobility as a Service
MCA	Multi-Criteria Analysis
MoT	Ministry of Transport
NLTP	National Land Transport Programme
ONRC	One Network Road Classification
PBC	Programme Business Case
PT	Public Transport
RLTP	Regional Land Transport Plan
RPS	Road Protection Score
SAR	Scheme Assessment Report
SH (#)	State Highway (#)
SOV	Single Occupancy Vehicle
SSBC	Single Stage Business Case
TAIP	Transport Agency Investment Proposal
Transport Agency	New Zealand Transport Agency
TREIS	Traffic Road Event Information System
vpd	Vehicles Per Day

Definitions

Long term	10+ years
Medium term	3-10 years
Short term	0-3 years

Executive Summary

The Melling Transport Improvements project along the SH2 corridor in Lower Hutt forms part of an inter-governmental flood mitigation and urban regeneration project known as RiverLink, focusing on improvements along the Hutt River. The New Zealand Transport Agency is responsible for the SH2 Melling Intersection connecting to the Hutt City Council (HCC) owned Melling Link bridge crossing the Hutt River, which is currently susceptible to flooding.

The Transport Agency is re-evaluating selected state highway projects to assess whether they achieve transport outcomes aligned with current priorities, and if they represent value-for-money prior to inclusion in the National Land Transport Programme (NLTP). This report outlines the findings of a first principles review of the SH2 Melling Transport Improvements proposal, which considers improvements to address safety, efficiency and resilience along a section of the national strategic route within Lower Hutt.

This re-evaluation finds that there is sufficient evidence to support the investment and identifies opportunities for subsequent work to further align to the new strategic context.

Re-Evaluation Findings

Improvements to the intersection are intended to:

- Increase resilience to events such as flooding.
- Provide certainty of investment, enabling adjacent works by partners to proceed.
- Increase travel choices to public transport via walking and cycling improvements.
- Improve safety.
- Improve journey times.

Approximately \$1bn worth of infrastructure is at risk of flooding around the Lower Hutt area, with Melling Link bridge and parts of SH2 experiencing closure due to surface flooding on average every 10 weeks. The corridor also experiences closures for a variety of reasons on a weekly basis on average.

HCC and GWRC are seeking to deliver increased flood mitigation and support urban regeneration in Lower Hutt as part of the growth strategy for the Hutt Valley. The Melling Transport Improvements are integral to the overall urban regeneration objectives and enable the implementation of flood protection improvements to address the low Melling Link bridge clearance. The project also aims to reduce road severance for pedestrians and cyclists within central Melling and across the SH2 corridor by providing better access to services and to public transport. The redesign of the Melling Intersection will also provide enhanced safety and journey time performance on the network.

A review of the problems, benefits and investment outcomes as part of the re-evaluation processes was undertaken and concluded the case for increasing access and improving network resilience remains strong within the current strategic policy context, especially when the transport improvements are viewed as enablers to adjacent projects and investments. However, safety considerations are less of a driver for improvements as the safety record within the project area is not considered significant on a national basis.

Recommended Direction

In the short term, it is recommended that the Transport Agency complete the Detailed Business Case (DBC) for the Melling Transport Improvements and designation and regional consents be sought for the intersection improvements as part of the wider suite of RiverLink projects.

In the medium term, the Transport Agency should monitor partner and private sector investment in the Melling area to confirm the project is meeting wider urban regeneration objectives.

In the longer term, it is recommended that the Melling Transport Improvements be implemented to support improved resilience.

1 Background

The 2018-2027 TAIP sets out the 10-year programme of activities that the Transport Agency proposes for inclusion in the 2018-2027 NLTP, to give effect to the 2018-2027 GPS.

In the development of the TAIP, 16 state highway improvement proposals (subsequently consolidated into 10) were identified as needing re-evaluation including a more comprehensive assessment against the 2018 IAF. The SH2 Melling Transport Improvements project is the subject of this re-evaluation.

Arup reviewed the SH2 Melling Transport Improvements investment proposal to ensure that it remains aligned with government direction, is evidence based and achieves the intended transport outcomes at optimal value-for-money.

1.1 The Investment Proposal

The Melling Transport Improvements project is currently at the DBC stage. An IBC was published and the draft (version 1.1, July 2017) was provided to the re-evaluation team and formed the basis for this re-evaluation.

The Transport Improvements IBC aligns with the wider Melling Gateway PBC and the SH2 Ngauranga to Te Marua PBC. It was approved by the New Zealand Transport Agency's Value Assurance Committee and allowed to progress to the DBC stage in 2017.

The problems noted in the Melling Intersection IBC are as follows:

- *High and increasing traffic volumes, and intersections with insufficient capacity, result in delays and increasing variability in journey times in peak times and weekends.*
- *Configuration of intersections either side of Melling Bridge, some of which are in a high volume and high-speed environment, is causing a high number of crashes and deaths and serious injuries.*
- *The quality of infrastructure constrains access to alternative modes and leads to unnecessary car travel between SH2 and Lower Hutt at Melling.*
- *A high crash rate and flooding in storm events results in (key) journeys through the Melling intersections being impacted on a regular basis.*

1.2 Summary of the Re-Evaluation Process

This re-evaluation followed the methodology in the (draft) TAIP Re-Evaluation Guidance (July 2018) which was founded on the Transport Agency's business case principle. The core elements of the re-evaluation process are shown in Figure 1.

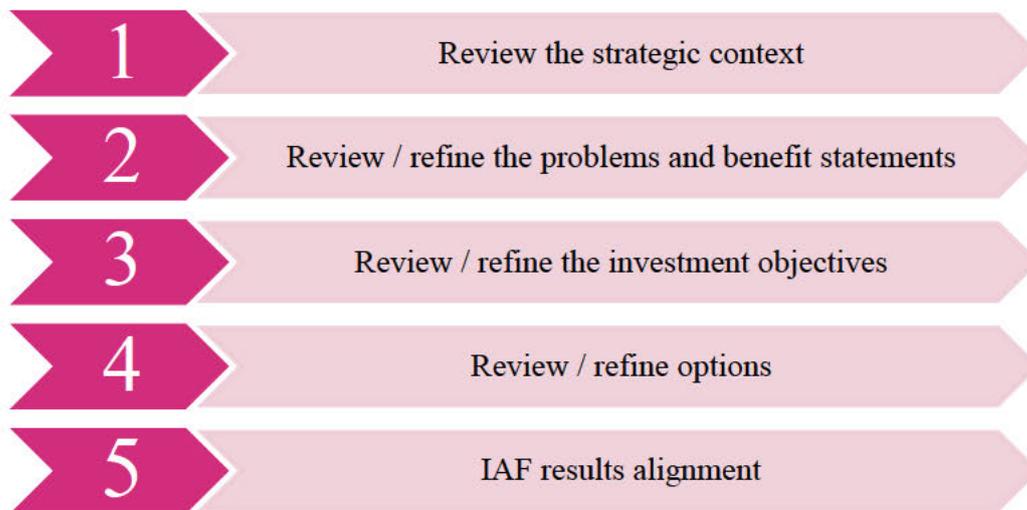


Figure 1 - Re-evaluation approach

The IBC was used as the primary source of information on the existing proposal. The Melling Transport Improvements DBC is currently under development and was not used during this re-evaluation.

1.3 Further Inputs into the Re-Evaluation

There are several inputs that are referred to throughout the re-evaluation process that are used when planning Transport Agency investments. These are introduced and outlined in sections 1.3.1 and 1.3.2.

1.3.1 Transport Agency System Approach

The Transport Agency applies a system approach to planning and investing in its transport system. The system approach involves:

- Providing for the different modes of walking, cycling, public transport, Mobility as a service (MaaS), rapid transit, road and rail in each place to extract the best from the overall network for customers and deliver on priority outcomes.
- Considering the full range of possible responses to an issue - land use planning, regulation, policy, pricing, investment in physical and digital infrastructure, behaviour change and use of technology.
- Using the Transport Agency's Intervention Hierarchy to guide planning and investment efforts:

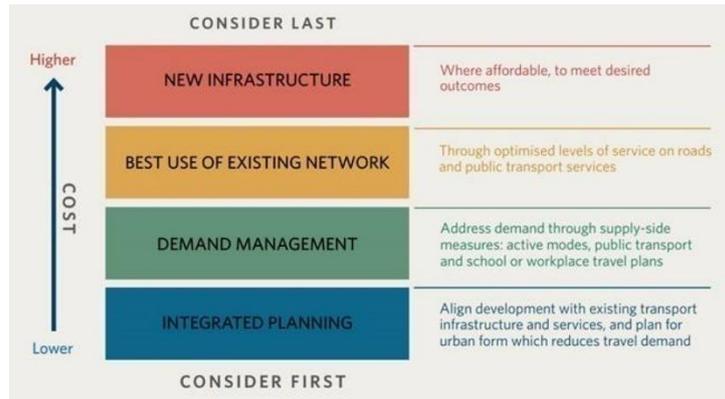


Figure 2 – Transport Agency Intervention Hierarchy

1.3.2 One Network Road Classification (ONRC)

The ONRC identifies different categories of road within the network as well as the customer levels of service appropriate for each classification. Generally, higher road classifications mean a higher level of service, including safety and a greater expectation that the corridor will be available to customers more often.

2 Strategic Context

2.1 Government Priorities

The Government Policy Statement on Land Transport (GPS) and the Transport Outcomes Framework provide direction on the outcomes and objectives sought from the transport system. The investment narrative of the existing proposal was reviewed against this direction to assess whether the investment is likely to deliver on the Government objectives.

2.1.1 Government Policy Statement on Land Transport

The GPS outlines the Government’s strategy to guide land transport investment over the next 10 years. It influences how the Transport Agency allocates resources from the National Land Transport Fund (NLTF) across New Zealand’s transport system.

As shown in Figure 3, the key strategic priorities include:

- Creating a transport system that is free of death and injuries
- Ensuring there is better access to social and economic opportunities, better access to a range of transport choices and that our transport system is resilient.

These priorities are supported by a strong focus on environment and delivering value for money services and infrastructure.

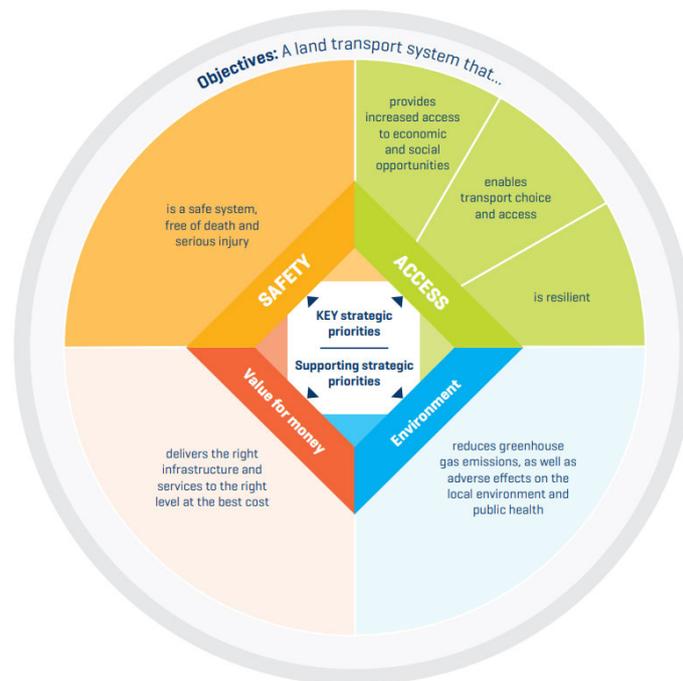


Figure 3 – Government Policy Statement on Land Transport 2018-19 (Ministry of Transport, 2018)

Section 2.6 of the GPS also introduces three core themes to provide guidance on *how to effectively deliver on the priorities* and provide *the best transport solutions*. These themes are used in Section 6 of this report where the options and solutions proposed are reviewed.

2.1.2 Transport Outcomes Framework

The Ministry of Transport (MoT) Transport Outcomes Framework has five core outcomes, illustrated in Figure 4, that the Government is seeking from the transport system, to shape *highly liveable places in thriving regions*. The Transport Outcomes Framework aligns with the Treasury Living Standards Framework as well as the Transport Agency's IAF.

The Transport Outcomes Framework has been adopted for this re-evaluation to help assess whether the proposed outcomes for the project align with Government priorities.

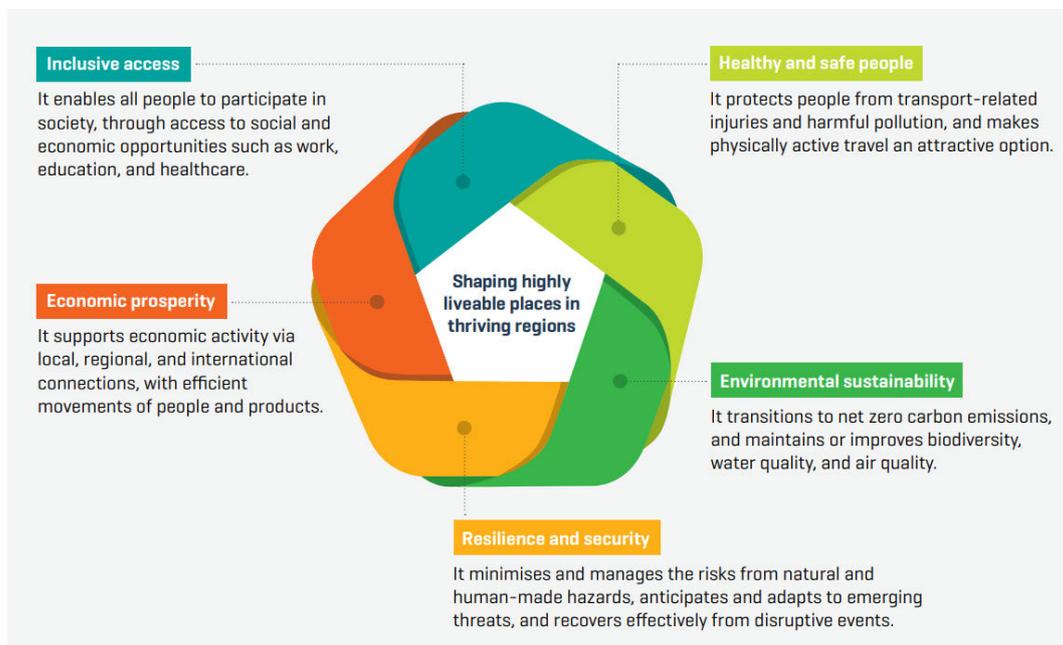


Figure 4 - Transport Outcomes Framework

2.2 Project Context

Lower Hutt is the Wellington region's second largest city and employment centre – home to a population of 104,000 people with a target of 110,000 by 2032 as per the 2012 Urban Growth Strategy. Local commercial and retail growth is understood to be tracking with wider growth metrics, but Lower Hutt CBD has suffered from poor occupancy of its commercial and retail buildings and a lag in development of apartments within the CBD.

Much of the existing population is situated on floodplains next to Te Awa Kairangi (Hutt River), and insufficient flood management poses a significant risk to the people of Lower Hutt. An estimated \$1bn in assets are likely to be inundated during a 1 in 65-year flood event.

The Melling intersection is located along SH2 (Figure 5) in Lower Hutt – part of the important intra-regional route linking Wellington with the Wairarapa sub-region to the north via the Hutt Valley. The Melling Link bridge connects the SH2 corridor to the Hutt City Centre and to important facilities such as Hutt Hospital via the Melling Link road. It also provides the only direct access to the Hutt CBD from the SH2 corridor.

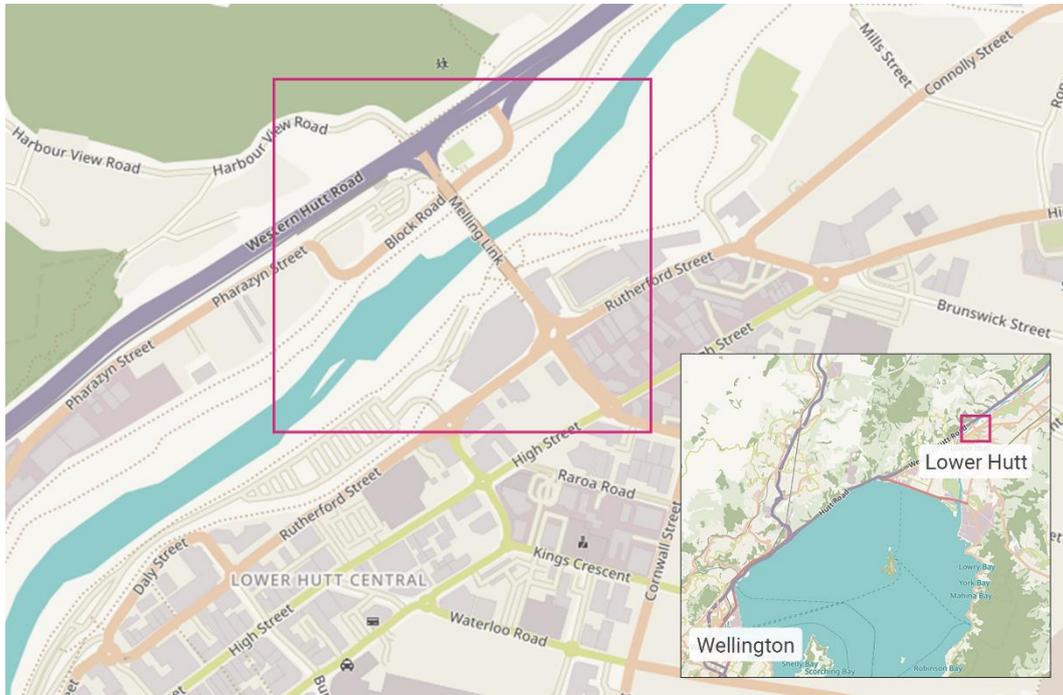


Figure 5 - Location of SH2/Melling Link Intersection

HCC and GWRC have both identified Melling as an area for investment and improvement. Through the RiverLink project and supporting PBC, investment to mitigate the risk of flooding and deliver public realm improvements has been outlined by both parties, along with the Transport Agency, to stimulate private sector investment in the area. Both HCC and GWRC have committed funding to their portion of works in their respective long-term plans.

The RiverLink project seeks to invest over \$300m into the flood mitigation, transport and public realm upgrades. The RiverLink plan is the cornerstone project of the ‘Making Places’ programme – HCC’s long-term development strategy to transform the CBD through an increased connection to the Hutt River.

The Transport Agency’s role as part of this multi-agency approach is to upgrade the Melling intersection to allow for the increase in clearance of the current Melling Link bridge (owned by HCC) to enable better flood protection and provide assurance of access to SH2. While the Transport Agency’s commitment is not critical to the progression of the RiverLink project, early engagement will significantly reduce the potential for rework and associated costs. Furthermore, opportunities exist to improve the Melling intersection’s transport elements through these improvements.

The interface between the Transport Agency’s objectives and the GWRC and HCC objectives highlight that while the transport improvements are not the end goal, they are a critical enabler for the other funded initiatives to occur (Figure 6).

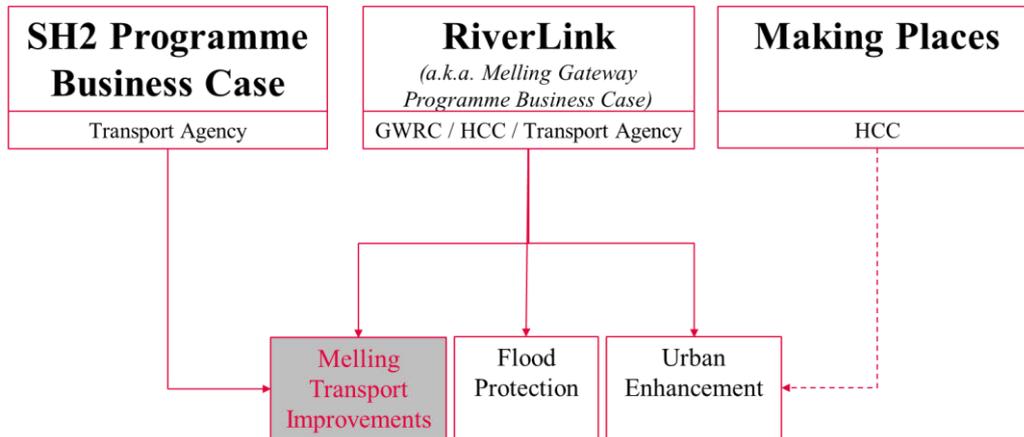


Figure 6 - Interface between transport improvements and other initiatives

The RiverLink project is funded and seeking confirmation of the Transport Agency’s involvement in the Melling intersection project. This will allow the intersection to achieve optimal outcomes through an integrated government agency approach, with the final design achieving targets for all parties involved.

The impact of Petone to Grenada Link Road and the Cross Valley Link – other major transport projects within the region – on the operation of the Melling intersection is anticipated by the project team to be negligible.

2.2.1 Pre-Evaluation Investment Logic Map

Figure 7 shows the Investment Logic Map (ILM) that was developed during the Melling Transport Improvements Indicative Business Case (IBC).

Additional contextual information relating to three of the five most relevant outcomes in the Transport Outcomes Framework are provided in sections 2.2.2 to 2.2.4. This approach has been taken to understand how the current transport system supports the delivery of these outcomes before assessing the specific problems that this investment proposal seeks to resolve. The information provided below is used when assessing the supporting evidence for the identified problems in Section 3.

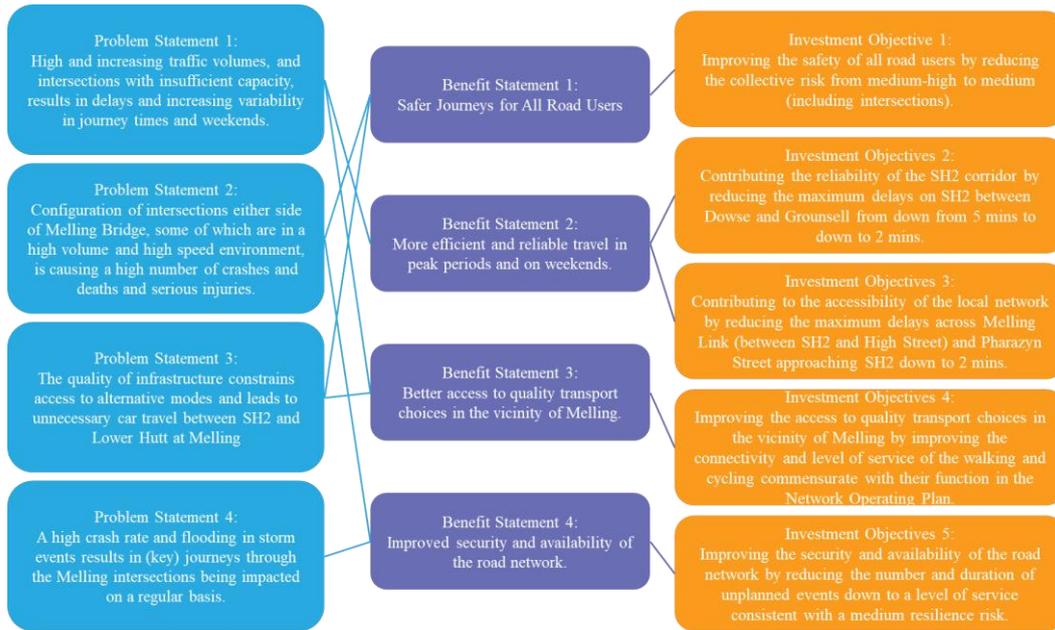


Figure 7 - Investment Logic Map from the IBC

2.2.2 Inclusive access

Within the study area, SH2 is a National (High Volume) route south of the Melling intersection carrying 35,000 vehicles per day, with 3-5% heavy vehicles. As Melling Link is the most direct connection between SH2 and the Lower Hutt CBD, the intersection provides an important access function within Lower Hutt. It accommodates approximately 23,000 vehicles per day – the highest AADT of the three available crossings of the Hutt River. The SH2 corridor is a 4-lane divided carriageway, with Melling Link bridge accommodating a 3-lane undivided carriageway.

Melling Link bridge is the only link connecting the Hutt CBD, Melling Station and the hillside communities to the west. Both SH2 and the Hutt River act as barriers between the city centre and east, and the western suburbs of Tirohanga and Harbour View. The Melling Link bridge itself also presents a barrier for walking and cycling owing to the lack of facilities.

The Melling intersection is complex (Figure 8), with two sets of traffic signals and four intersecting roads connecting the suburbs of Tirohanga and Harbour View to SH2, the Lower Hutt CBD and the mixed-use suburb of Melling via Block Road. The latter passes under the Melling Link bridge before connecting to SH2 at the northern end of the current SH2/Melling intersection and is susceptible to stormwater and river flooding.



Figure 8 - Arrangement of Melling Intersection

The capacity of the intersections within the project area was modelled in 2010 to forecast the 2026 volume capacities. It was shown that a high proportion of movements through the intersection are approaching or already exceeding capacity (the right turn bay length on the northbound SH2 lanes is regularly exceeded, impacting through traffic). More movements approach/exceed capacity during the PM peak than during the AM peak. This has resulted in queueing occurring during peak hours, which is reported as resulting in increased rat-running or users choosing to not travel at certain times.



Figure 9 - Peak period queuing (AM)

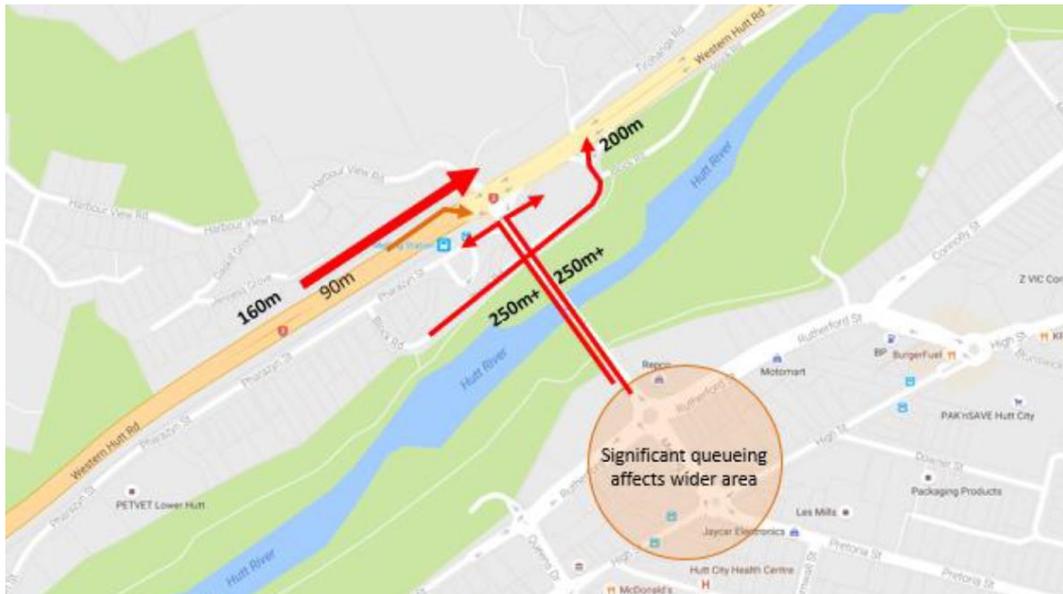


Figure 10 - Peak period queuing (PM)

Congestion is experienced during peak travel periods, with recorded data showing the average travel speeds through the intersection along SH2 dropping to approximately 15km/h northbound between 5pm and 6pm on weekdays, and not exceeding 40km/h southbound between 7am and 8am on weekdays.

The Melling Railway Station (at the end of the Melling line) is located close to the intersection and is served by up to three trains per hour in each direction during the AM peak. A 2010 passenger survey showed boarding numbers of between 170-240 across the three-hour AM peak. The station is supported by a 155-space Park 'n' Ride facility which is fully occupied before the last morning peak hour train has departed, meaning that a number of train services suffer from lower patronage than the available capacity.

While Melling Railway Station is well situated for access to/from the Hillside suburbs, it is not well connected to the Hutt CBD due to the distance and indirect route between the station and CBD which is non-intuitive and circuitous. 70% of patrons at the station choose to drive to the station and only half of patrons within the walk catchment of the station choose to walk.

Several GWRC MetLink bus services travel through the project area, but only one service stops at Melling Station. There are no services in the suburbs of Harbour View and Tirohanga, and it is noted that the steep topology of these suburbs may act as a hindrance to people walking or cycling to Melling Station or Lower Hutt CBD.

2.2.3 Healthy and Safe People

The presence of a signalised intersection within a 100km/h speed limit environment has led to multiple crashes at the SH2/Melling Link intersection. 211 crashes were recorded in the project area between 2011 and 2015 (averaging 40 per year), with six of those resulting in DSIs. Figure 11 indicates that the crashes

generally cluster around the intersections, with some occurring where traffic queues generated by the signalised intersections typically end.

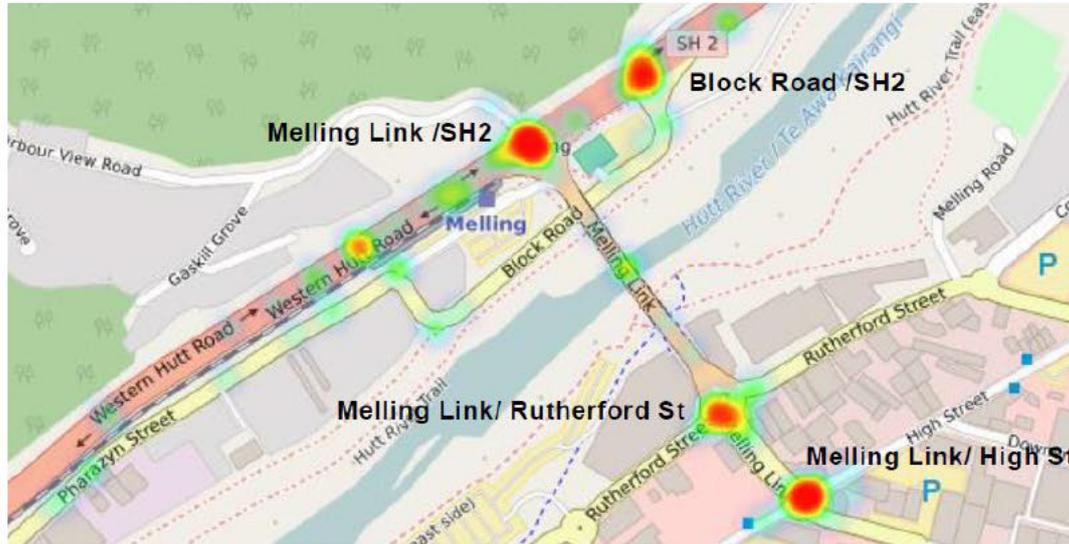


Figure 11 - Crash history within project area (2011-2015)

Rear-end crashes accounted for 42% of all crashes with crossing/turning movement crashes accounting for the most DSIs (2) between 2011 and 2015. The collective risk for the SH2 portion of the project area is recorded as ‘High’ or ‘Medium-High’ with a predominantly 2.0-star or 3.0-star KiwiRAP¹ rating – lower than the 4.0-star rating for a National (High Volume) route as specified by the ONRC. However, the Melling intersection does not appear in the Transport Agency’s High Risk Intersections Guide and therefore has a lower priority for safety interventions nationally.

2.2.4 Resilience and Security

Journeys through the Melling intersection are being impacted regularly by unplanned (non-natural) and natural (weather and natural hazard) events. The most common cause of closure on the network is heavy rainfall events, with the SH2 carriageway being particularly susceptible to surface flooding. Under these conditions, road crashes occur frequently and are the primary cause of unplanned events.

Table 1 - Summary of unplanned events (TREIS 2011-2015; as outlined in IBC)

Event Type	Frequency of Events (2011-2015)
Crashes	~75 events including 1 road closure (~1 per 4 weeks)
Obstruction	~50 events (~1 per 5 weeks)
Surface Flooding	27 events including 3 road closures (~1 per 10 weeks)
Slips or Fallen Trees	11 events (~1 per 5-6 months)
Traffic Signal Fault	~55 events (~1 per 5 weeks)
Total Events (if all in isolation)	~216 events over a 5-year period (~1 per week)

¹ http://www.kiwirap.org.nz/about_kiwirap.html

These unplanned events reduce the capacity of the surrounding transport network by a significant degree, as the SH2 corridor is the key intra-regional route linking the Hutt Valley to Wellington. Furthermore, the primary alternative route is via SH58 and SH1; the former passing through challenging topography that adds an additional 30km of travel between Lower Hutt and Wellington.

Surface flooding events recorded in the project area have generally been attributed to excess surface water runoff which is likely caused by the inability for the local stormwater network to cope. However, the project area is also vulnerable to more severe flooding during high intensity storm events, with GWRC estimating that the Melling Link bridge will be unable to sustain a 1 in 65-year flood event due to its lack of clearance height. This is significantly lower than the design year for the Hutt River stopbanks – designed to withstand a 1 in 440-year flood – and therefore places an estimated \$1bn worth of assets at risk during a 1 in 65-year flood event.

Re-evaluation finding: Evidence supporting the drivers for transport interventions are:

- The need for improved access for all modes, both along SH2 and into/out of the Lower Hutt CBD.
- Poor resilience of the intersection so that unforeseen events do not have a significant impact on its operation.

Safety considerations are not considered one of the major drivers for the implementation of transport improvements, as the number of DSIs mean that the Melling Intersection does not feature on the Transport Agency's High Risk Intersections Guide and therefore is less critical than many other intersections from a safety perspective nationally.

3 Review of the Investment Logic Map

A review of the Investment Logic Map (ILM) was carried out to assess whether there is clarity of intent, clear cause and effect between the problem and benefit statements and sufficient supporting evidence for the case for investment. Furthermore, Arup considered whether a change in the problem prioritisation or weighting was appropriate given the change in strategic policy context.

3.1 Review of Problem Statements

This section presents the reasoning for the problem statements provided in the IBC. Given the changes to the strategic context of the project, consideration is given to the fit of the original problem statements and their relative weightings.

Problem statement one: “High and increasing traffic volumes, and intersections with insufficient capacity, results in delays and increasing variability in journey times and weekends (35%).”

Evaluation points:

- Currently, delays of 4-5 minutes are experienced by commuters travelling to Wellington during the morning peak and by people leaving and returning to the Lower Hutt CBD during the evenings and weekends. Travel time delays of such magnitudes are unlikely to warrant the level of investment required to address them within the current strategic context.
- The Petone to Grenada Link Road, Cross Valley Link and SH2/58 Haywards Interchange projects were thought to possibly exacerbate capacity issues at Melling, but testing confirmed that this would not occur.
- Travel time variability is identified as an issue and demonstrated through changes in observed vehicle speed. More detail identifying the magnitude and/or scale of the variability would be beneficial as part of the DBC.
- The problem presently references traffic volumes and would better align to the theme of mode neutrality by including reference to people and to the observed underutilisation of public transport services and active modes.

Problem statement two: “Configuration of intersections either side of Melling Bridge, some of which are in a high volume and high speed environment, is causing a high number of crashes and deaths and serious injuries (40%).”

Evaluation points:

- Safety is identified as a priority within the present strategic policy context. However, while crashes in this project area are frequent (approximately 200 over five years), the number of DSIs that have occurred in the past five years is lower than other high-risk intersections nationally. This is confirmed by the Melling Intersection’s absence from the Transport Agency’s High Risk Intersections Guide.

- Therefore while the problem statement is valid and has supporting evidence, its associated weighting is considered too high.

Problem statement three: “The quality of infrastructure constrains access to alternative modes and leads to unnecessary car travel between SH2 and Lower Hutt at Melling (15%).”

Evaluation points:

- This problem is framed as a multi-modal access issue. Addressing the poor quality and lack of provision for alternative modes can also have positive implications on safety and environmental concerns, which are also valid drivers for investment. It is therefore recommended that the weighting of this problem statement be increased.

Problem statement four: “A high crash rate and flooding in storm events results in (key) journeys through the Melling intersection being impacted on a regular basis (15%).”

Evaluation points:

- There is sufficient evidence to show a strong link between cause and effect, with events occurring at frequency of approximately 1 per week.
- The weighting should be increased to reflect the fact that this is a key access issue for the transport improvements.

Re-evaluation finding: The intent of the problems is clear and appropriate. While the weightings assigned within the ILM could be revisited when developing the DBC to give greater emphasis to inclusive access and resilience considerations, there is unlikely to be any appreciable change in options to address the problems given their level of overlap.

3.2 Review of Benefit Statements

This section examines the benefit statements provided in the IBC and considers the impact of the revised strategic context on their validity and relative priority. Any potential impacts for the business case are then highlighted.

Benefit statement one: “Safer journeys for all road users (35%).”

Evaluation points:

- The benefit statement is clear and relates to the problems.
- The weighting should be reduced to reflect that safety issues at the Melling intersection are not critical when compared with the safety records of other intersections nationally.

Benefit statement two: “More efficient and reliable travel in peak periods and on weekends (30%).”

Evaluation points:

- The benefit statement could be reworded to place greater emphasis on a benefit of greater efficiency through the increased use of a variety of modes, noting this creates significant parallels with benefit statement three.

Benefit statement three: *“Better access to quality transport choices in the vicinity of Melling (15%).”*

Evaluation points:

- The statement acknowledges that increased transport choice will provide opportunities for wider transport outcomes to be realised.

Benefit statement four: *“Improved security and availability of the road network (20%).”*

Evaluation points:

- The benefit arises from addressing the resilience issues within the project area.
- The weighting could be increased, as resilience and access are principal drivers for the project.

Re-evaluation recommendation: The benefit statements generally align to the problems and are supported by the evidence.

3.3 Review of Investment Objectives

The investment objectives were reviewed to assess how they relate to the problem and benefit statements and to identify whether the change in the strategic context might impact the objectives of the investor.

Investment objective one: *“Improving the safety of all road users by reducing the collective risk from medium-high to medium (including intersections).”*

Evaluation points:

- The objective is consistent with the intended safety benefit.

Investment objective two: *“Contributing the reliability of the SH2 corridor by reducing the maximum delays on SH2 between Dowse and Grounsell from down from 5 mins to down to 2 mins.”*

Evaluation points:

- This objective should be reassessed for its achievability and importance given the evidence and the likely cost to achieve this level of reliability against other priorities. An objective aiming to limit increases in delays may be more appropriate and may not effectively pre-determine a solution as the existing objective could potentially do.

Investment objective three: “Contributing to the accessibility of the local network by reducing the maximum delays across Melling Link (between SH2 and High Street) and Pharazyn Street approaching SH2 down to 2 mins.”

Evaluation points:

- This objective should be reassessed for its achievability and importance. Its implications for the local road network would also need to be considered.

Investment objective four: “Improving the access to quality transport choices in the vicinity of Melling by improving the connectivity and level of service of the walking and cycling commensurate with their function in the Network Operating Plan.”

Evaluation points:

- This objective is appropriate as it references a range of modes, but the lack of a realistic and evidence-based target may lead to a high cost solution that is not commensurate with the magnitude of the problem. Hence, a quantifiable target should be included if the ILM is revised.

Investment objective five: “Improving the security and availability of the road network by reducing the number and duration of unplanned events down to a level of service consistent with a medium resilience risk.”

Evaluation points:

- The objective is valid, and no changes are recommended.

Re-evaluation finding: The investment objectives are aligned with the main drivers for investment. However, they should be reconsidered in the DBC as ambitious targets for two objectives may require a level of investment that could be difficult to prioritise within the current strategic environment.

3.4 Summary of the ILM review

The ILM for the Melling transport improvements logically follows the Melling Gateway PBC and the SH2 Ngauranga to Te Marua PBC.

The issues initially identified in both PBCs flow through to the problem and benefit statements and are generally well aligned with the new strategic environment. While there is no indication that the new context changes the relevancy of the existing ILM, the following findings are raised:

- While safety is a key consideration within the current policy context, Melling’s safety history does not warrant it as a key issue on a national basis and is therefore not as critical as initially stated. Instead, access and resilience constraints are the core drivers for the project.
- The investment objectives used in the IBC did not preclude a range of potential options from being considered, supporting their suitability within

the new strategic context as well as aligning with the Transport Agency's intervention hierarchy.

- An opportunity exists to apply the theme of mode-neutrality to a greater degree across the ILM and this should be undertaken if the ILM is revised under the DBC.
- The ILM is generally acceptable within the current strategic policy settings, although two investment objectives may be overly directive towards higher cost supply solutions.

4 Review of the Existing Uncertainty Log

The uncertainty log provided for review is supplied in Appendix A, and presented uncertainties with factors affecting demand, supply, cost and the programme of works.

The re-evaluation concluded that none of the factors listed require revision given the changes in strategic policy context, and that the log remains fit-for-purpose.

5 Review of Options Development

With a greater emphasis on value for money and evidence-based considerations, there is now an opportunity to review the timing and need for capital intensive infrastructure investment to achieve the investment objectives.

5.1 IBC Options

The IBC recommended a short-list with four potential long-term options – three of which were taken to public consultation. All four featured the following common design elements:

- Four lanes on a new Melling Link bridge.
- Pharazyn Street connects directly into Melling Link.
- Signalised intersections at High Street and Rutherford Street.
- Wider walking and cycling facilities on Melling Link bridge.
- Controlled walking and cycling facilities at the intersections and interchange.
- Increased Park ‘n’ Ride capacity.
- Melling Station relocated south of existing location.
- Grade separated interchange with SH2 remaining at-grade.
- New walking and cycling links over Hutt River and SH2 to provide more direct connectivity with the relocated Melling Station.

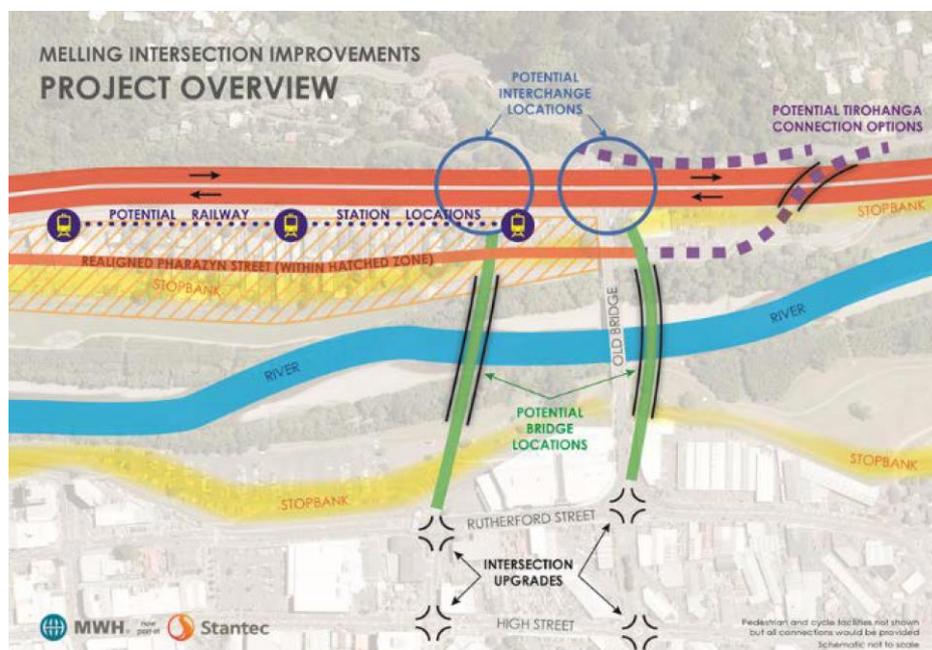


Figure 12 - Arrangement of proposed intersection options

5.2 Key Findings

Several schemes had been put forward for the Melling Transport Improvements prior to the commencement of the IBC. The project long-list was developed by collating the twelve most appropriate existing options from previous studies, to which further options were added by the project team.

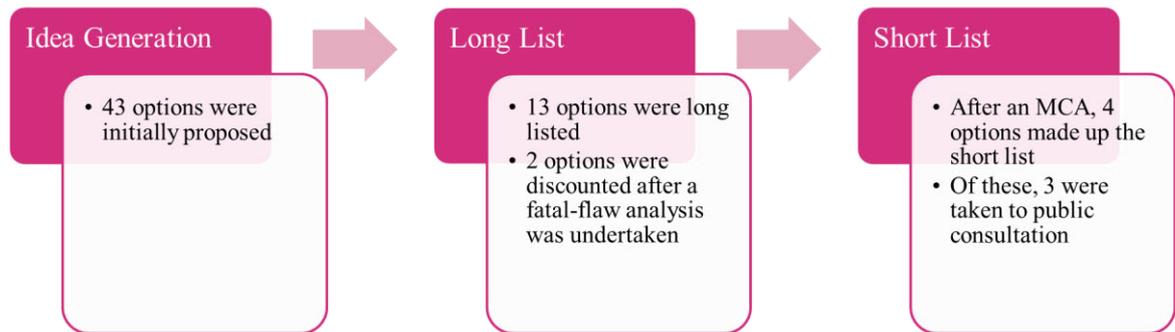


Figure 13 - Option development process

The option development process was reviewed according to the methodology in the re-evaluation guidance document, and it was found that:

- The idea generation process was inclusive of stakeholders and appears robust.
- The long list development was transparent and identified features which were critical to the desired outcomes (identified as “key principles”).
- The short list employed a transparent multi-criteria-analysis which appeared robust. While the options report displayed a clear process, it was unclear as to how the investment objectives stated in the IBC were reflected in the option development process.
- The revisions to the ILM suggested do not appear to be likely to significantly influence the outcome of the option development process.

Re-evaluation finding: While minor changes to the ILM are proposed, the relevancy of the existing ILM should not change. Therefore, the outcomes of the options development process remain valid within the current strategic context. However, the DBC should strengthen the links from the problem and benefit statements to the criteria used to develop the options and outcomes.

6 Programme of Interventions

Following the review of the business case, the Transport Agency and Arup developed a proposed direction for the Melling Transport Improvements investment to respond to the increased emphasis on value-for-money and to take account of the GPS 2018 themes.

6.1 Consideration of GPS Themes

The re-evaluation process offered the opportunity to review whether the investment proposal and proposed interventions adopts the current government direction on how to deliver the best transport solutions for New Zealanders. The GPS provides three key themes to assist with the understanding of how to deliver on the priorities:

- A mode-neutral approach to transport planning and investment decisions.
- Incorporating technology and innovation into the design and delivery of land transport investment.
- Integrating land-use, transport planning and delivery.

6.1.1 Mode Neutrality

There is a clear understanding that the layout of the intersection is constraining access and limiting connectivity between alternative modes of transport. The SH2 corridor contributes to severance between the residential western suburbs and the Lower Hutt CBD based on consumer insights. The DBC should therefore investigate enhancing accessibility and transport choice through all modes across the project area. This can include the provision of increased active mode facilities to reduce the dependence on SOVs, especially to and from Melling Station.

6.1.2 Integrated Land-Use and Transport

The project team indicated that the ILM from the IBC specifically focussed on transportation issues and interventions since the Melling Gateway PBC looked at more extensive factors such as land-use and access. The re-evaluation was therefore undertaken with the understanding that wider integrated land use objectives will be delivered through RiverLink's non-Transport Agency related project elements.

There should be little change to the nature of the existing integration between land-use and transport systems, but opportunities exist to increase access to current land-uses and enhance transport connectivity across modes to support the urban regeneration initiatives. These should be further explored in the DBC.

6.1.3 Technology

The DBC should examine whether technology interventions will assist in achieving the intended outcomes.

6.2 Proposed Programme

The Melling Transport Improvements project supports the wider suite of projects under RiverLink and is expected to support population growth, deliver infrastructure resilience for local and regional functions and drive regeneration into the Melling area. If successful in attracting investment as intended, the Melling improvements would prove to be a good example of cross government collaboration with urban regeneration outcomes.

Short-Term Interventions (0-3 years)

To enable partner projects and investment, it is recommended that the Transport Agency progress the Detailed Business Case (DBC) in the short-term and increase alignment to the current GPS as per the conclusions in sections 6.1.1 to 6.1.3. The Transport Agency should also seek all required designation and regional consents to accommodate the preferred design. Undertaking this step in the short-term will provide the Transport Agency with a greater stake in the designation process.

Medium-term Interventions (3-10 years)

It is recommended that the Transport Agency monitor partner and private sector investment in the Melling area to confirm the project will meet wider urban regeneration objectives and attract partner funding as intended.

Long-Term Interventions (10+ years)

As part of the wider suite of projects, the Melling intersection upgrade will allow significant investment by HCC and GWRC to occur, intended at safeguarding around \$1bn in assets in Lower Hutt while encouraging new developments to enable an additional 2700 new jobs in the CBD.

Therefore in the long-term, it is recommended that following the DBC, the preferred option for the Melling Transport Improvements is proceeded to the implementation phase.

6.3 Alignment to Transport Outcomes Framework and IAF

The programme of interventions described in Section 6.2 has been assessed in this section against the outcomes specified in the Transport Outcomes Framework to identify the degree of strategic alignment. The assessment is provided below. At a high level, the revised programme will enable the desired government outcomes to be achieved.

Activity	Timing			Key Benefits	Cost (\$m)	A transport system that improves wellbeing and liveability				
	Short (2018-2021)	Medium (2021-27)	Long (2028+)			Inclusive Access	Healthy & safe people	Economic prosperity	Resilience and security	Environmental sustainability
Allocate funding to allow the Detailed Business Case for the Melling Transport Improvements to finish	✓			<ul style="list-style-type: none"> Clarity on intended outcomes and quantity and return on investment Assurance that the long-term proposed option can be implemented 	TBC	H	H	H	H	L
Finalise the co-investment plan	✓				TBC	H	H	H	H	L
Carry out designation and consenting to confirm the Transport Agency’s role in the outcome of the Melling Transport Improvements, based on triggers for implementation identified in the DBC	✓				TBC	H	H	H	H	L
Re-evaluate market investment and monitor land acquisition to determine whether long term benefits are still valid		✓			TBC	H	H	H	H	L
Implement the transport improvements			✓	<ul style="list-style-type: none"> Increase resilience to events such as flooding Provide certainty of investment, enabling 	\$110m to \$215m (based on	H	M	H	H	M

				<p>adjacent works to proceed</p> <ul style="list-style-type: none"> • Increase travel choices to public transport via walking and cycling improvements • Improve safety • Improve journey times 	IBC estimations)					
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Appendix A

Factor	Time	Probability	Impact on Programme	Comments
Factors affecting demand				
Rate of population growth different to expected	Underway to beyond 10 years	Near certain	Low	Any change in growth will still be an increase in demand compared to current. The current intersection is operating at capacity so any increase in demand is not going to influence the need or timing of the project from a capacity point of view. There are also a lot of other reasons for the project including safety, resilience and the tie in with other RiverLink elements.
Rate of CBD development and population growth different to expected	Underway to beyond 10 years	Near certain	Low	As above
Factors affecting supply				
Transmission Gully impact different to expected	2020	Reasonably foreseeable	Low	Any increase in demand from upgrading Transmission Gully will still be an increase and therefore would not influence the need or timing of the project.
Petone to Grenada	Beyond five years	Reasonably foreseeable	Low	Project currently under re-evaluation. Impact of P2G is being modelled to determine impact but initial investigations show minimal impact.
Cross Valley Link	Beyond five years	Reasonably foreseeable	Low	Impact of CVL is being modelled to determine impact but initial investigations show minimal impact.
Passenger Rail Improvements e.g. RS1 and/or RSA	2020	Reasonably foreseeable	Low	Whilst a transition onto Rail is likely, the effect on reducing traffic volumes on the highway would be small compared to many of the other uncertainties in this log.
Future hours of operation of Melling Line not extended	2019	Reasonably foreseeable	Low	Currently expecting evening and weekend services. If these don't proceed, it is unlikely to affect peak demand to any significant extent

GWRC decide not to increase Park and Ride Capacity as part of rail station relocation	With rail station relocation	Reasonably foreseeable	Low	As above, effect of this is likely to be small compared to other uncertainties
LGWM outcomes including PT connections and road pricing	Beyond five years	More than likely	Medium	The LGWM programme could have a significant impact on how people travel to and from Wellington.
Managed Motorway	Beyond five years	More than likely	Low	Impact is unlikely to affect the need or timing of improvements
Factors affecting cost				
Integrated Ticketing	2020	Reasonably foreseeable	Low	Impact is unlikely to affect the need or timing of improvements
Changes in PT cost – fares	Annually	Reasonably foreseeable	Low	Impact is unlikely to affect the need or timing of improvements
Fuel prices	Anytime	Hypothetical	Medium	Fluctuation in global fuel costs had an impact on travel demand in the 2008/9; a similar change in markets will reduce private travel and slow growth for a period of time. Similarly a sustained decline in cost could have the converse effect. There is no real way of accurately forecasting this.
Factors affecting programme				
Timing and staging of flood protection delivery works delayed		Reasonably foreseeable	Low	The Melling interchange needs to be built after the flood protection works.
GWRC need to dispose surplus land that is needed for the interchange	After flood protection works completed	Near certain	High	Greater Wellington are buying land for the flood protection works which will also be needed for the interchange. If the interchange does not proceed in a timely manner, Greater Wellington are likely to onsell the land, it may be developed thereby making the implementation of the interchange at some point in the future very difficult and costly.
Co-funding contributions from partners aren't confirmed	Anytime	Reasonably foreseeable	Medium	Co-funding will bring down the cost to the Agency of implementing the transport components of RiverLink.

/ don't materialise				
Large Earthquake damages Melling bridge	Anytime	Hypothetical	Medium	The need for a new bridge would be brought forward in this scenario, bringing with it the interchange and other associated aspects.