
TAIP Re-evaluation: SH29 Piarere to Tauriko

NZ TRANSPORT AGENCY

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Executive summary

A PBC for SH29 Piarere to Tauriko was completed in October 2016 within the context of a Strategic Case for improvements to the Hamilton to Tauranga corridor (SH1 and SH29 and the East Coast Main Trunk railway between the two cities). The PBC identified three problems in the SH29 Piarere to Tauriko corridor:

- Disruption to freight movement to and from the Port of Tauranga results in an economic loss to New Zealand;
- Because of the steep and winding nature of the road over the Kaimai Range, people are exposed to an unacceptable risk of death and serious injury; and
- If the route does not support the efficient movement of freight, traffic will move to alternative local routes, increasing maintenance costs and risk to safety across the network.

Following consideration of options, a recommended programme comprising a \$330m to \$530m package of operational and capital improvements was proposed and supported by the NZ Transport Agency Board with implementation to be carried out over 20 years.

In broad terms the programme seeks to improve route continuity and consistency in treatment with key features of the programme including:

- Additional 2+1 passing lane opportunities;
- Key intersection upgrades;
- 'Kaimai Loop' dual-carriageway re-alignment over the Kaimai Summit section; and
- Customer service facilities (rest stops, wayfinding improvements).

A Detailed Business Case for the corridor commenced in August 2017 with some limited initial assessment being undertaken prior to re-evaluation.

Re-evaluation findings

Safety is a key concern within the corridor. Between 2012 and 2017, 328 crashes occurred on SH29 between Piarere and Tauriko, with 10 fatal and 32 serious injury crashes. These crashes resulted in 11 deaths and 54 serious injuries. The total cost to society resulting from the crashes along SH29 over the five-year period was \$88.5 million.

The evidence continues to support addressing safety particularly on the Te Poi to Tauriko section of the corridor. However, it is questionable whether substantial investment is required in the Piarere to Te Poi section of the corridor given the lower risk rating in this section of the corridor.

There is no evidence that route disruption is markedly undermining economic productivity. However, the evidence does show that crashes are the predominant cause of closures and delays on SH29. Improving safety will therefore improve freight reliability.

Whilst investigations to date have sought to include the provision of long-term capacity improvements in advance of when required as part of the safety works, investigation should now look to decouple (as far as reasonably practicable) capacity enhancements as a means of facilitating a safer journey. Further, the scale of issues between SH29 Piarere and Te Poi do not warrant investment in capacity enhancements or a significant safety spend given the scale of safety issues relative to other parts of the transport network.

The Detailed Business Case for SH29 Piarere to Tauriko should continue but with a focus on safety improvements with capacity enhancements only where necessary to contribute to an optimal safety outcome (which balances safety benefit with cost). Any consideration of long-term capacity enhancements as part of the business case should be deferred as there is no apparent land-use risk within the corridor and the requirement for additional capacity is long term. This could allow the DBC to be completed expediently and safety enhancements to be considered for delivery as part of the 2022-25 NLTP.

Re-evaluation purpose and approach

Through the development of the 2018 Transport Agency Investment Proposal, sixteen state highway improvement proposals were identified as needing to be re-evaluated and more comprehensively assessed against the 2018 Investment Assessment Framework. The re-evaluation is to help ensure that the 2018-21 National Land Transport Programme (NLTP) delivers on the 2018-28 Government Policy Statement on Land Transport Funding (GPS). The State Highway 29 Western Corridor is one of the sixteen projects.

The projects were identified because they have strong elements of efficiency, are of a significant cost, and were initially assessed, using the draft IAF, as having a low investment priority. The re-evaluation is an opportunity to review the projects and test whether the initial IAF assessment is accurate.

Re-evaluation purpose

Re-evaluation is a first principles review to ensure the nominated investment proposals give effect to the GPS and provide value for money, prior to inclusion in the NLTP. An outcome of the re-evaluation may be that some of the investment proposals being re-evaluated are rescope or potentially not included in the 2018-28 NLTP.

Re-evaluation approach

An eight-step re-evaluation process has been developed by the NZ Transport Agency as shown in the figure below. It is based on the business case principals of:



- Investing for benefits

Investments are made to obtain organisational benefits. An investment should: contribute to the organisation's strategic outcomes, represent value for money, and deliver benefits for customers.



- Clarity of intent

The intention driving an investment must be clear. Simple concepts and plain language will provide a clear understanding of the problems and benefits.



- Fit-for-purpose effort

The level of effort required must be proportionate to the complexity and risk of the problem and the proposed investment.

TAIP re-evaluation process



To achieve the Government's strategic priorities for the land transport system, the Transport Agency and therefore the re-evaluation has also been guided by the three themes in GPS 2018 which set out how the Government intends its priorities will be delivered. The re-evaluation has explored how the sixteen projects have, where appropriate:

- applied a mode neutral approach to transport system investment;
- used technology and innovation to achieve improved performance; and
- integrated land use and transport planning and delivery activities.

As the SH29 Piarere to Tauriko DBC is in its early stages of development the re-evaluation has focussed on an assessment of whether the DBC has a strategic context that is reflective of the current national and regional policy settings and that the problems, benefits and investment objectives are sufficiently robust. This includes a clear demonstration that the issues being explored are real and a priority for partner organisations to address. Also, the review has considered the degree to which problem statements or investment objectives have facilitated a mode neutral approach to options identification and development.

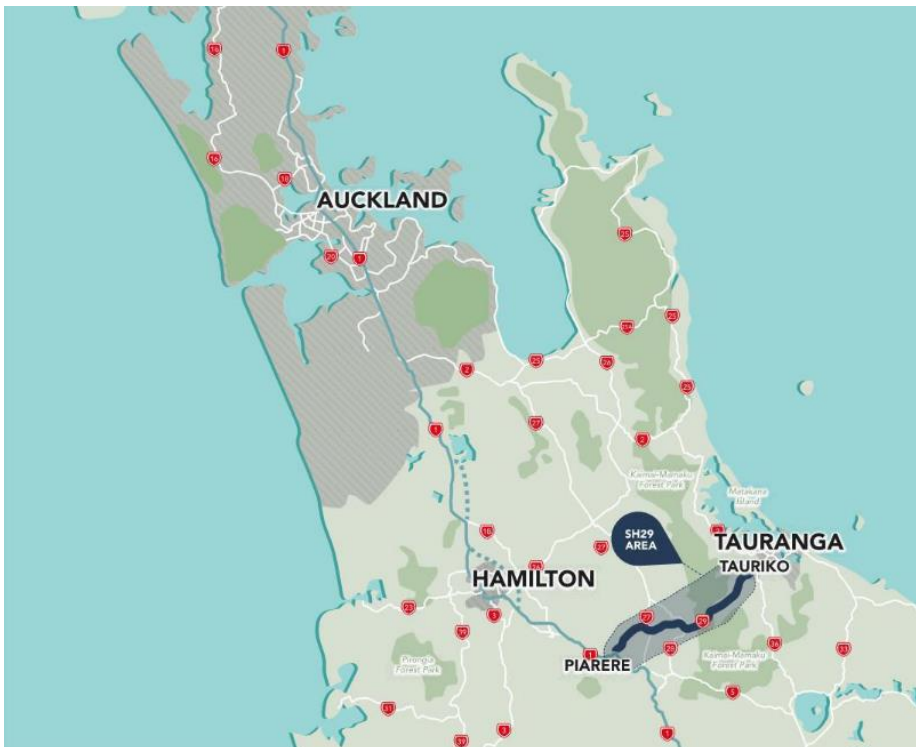
SH29, Piarere to Tauriko – Project context

Regional Context

SH1 between Cambridge and Piarere and SH29 Piarere to Tauriko are part of a key journey which links Auckland and Hamilton with Tauranga, specifically the Port of Tauranga via SH29, as well as the central and lower North island via SH1.

The corridor between Cambridge and Piarere presently carries approximately 18,000 vehicles per day (with 11% Heavy Commercial Vehicles). This is similar to the traffic volumes expected along much of the Waikato Expressway corridor. At the SH29 intersection, the vehicle flows split with approximately 60% travelling south on SH1 and 40% on SH29 to Tauranga. Completion of the expressway sees this split approach closer to 55/45. This section of SH1 is the linkage to the recently completed Cambridge Section of the Waikato Expressway where drivers travelling south will transition from the high standard expressway to a single lane rural road with passing lanes. Traffic demand is predicted to increase, not only because of growth in traffic volumes but also as a result of how customers are anticipated to use the state highway network following the opening of the Waikato Expressway. Following completion of the Waikato Expressway it is expected that there will be an increase in traffic volumes by up to 2000-3000 vehicles a day.

SH29 Piarere to Tauriko study area



The key problem currently experienced on this stretch of SH1/29 is related to road safety and the numbers of deaths and serious injuries which take place in this corridor. Closures of the road due to crashes is also negatively affecting the reliability of the route.

As a national high-volume route and an important artery for freight and general traffic, SH1 and SH29 caters for a mix of local and strategic long-distance traffic, which presently operates at a generally acceptable level of service.

Project History

A PBC for SH29 Piarere to Tauriko was completed in October 2016 within the context of a Strategic Case for improvements to the Hamilton to Tauranga corridor (SH1 and SH29 and the East Coast Main Trunk railway between the two cities). The strategic case identified that there are safety and efficiency problems worthy of further investigation, particularly given the national importance of the corridor (including the ECMT railway) for freight to and from the Port of Tauranga and as the primary transport link between Hamilton and Tauranga.

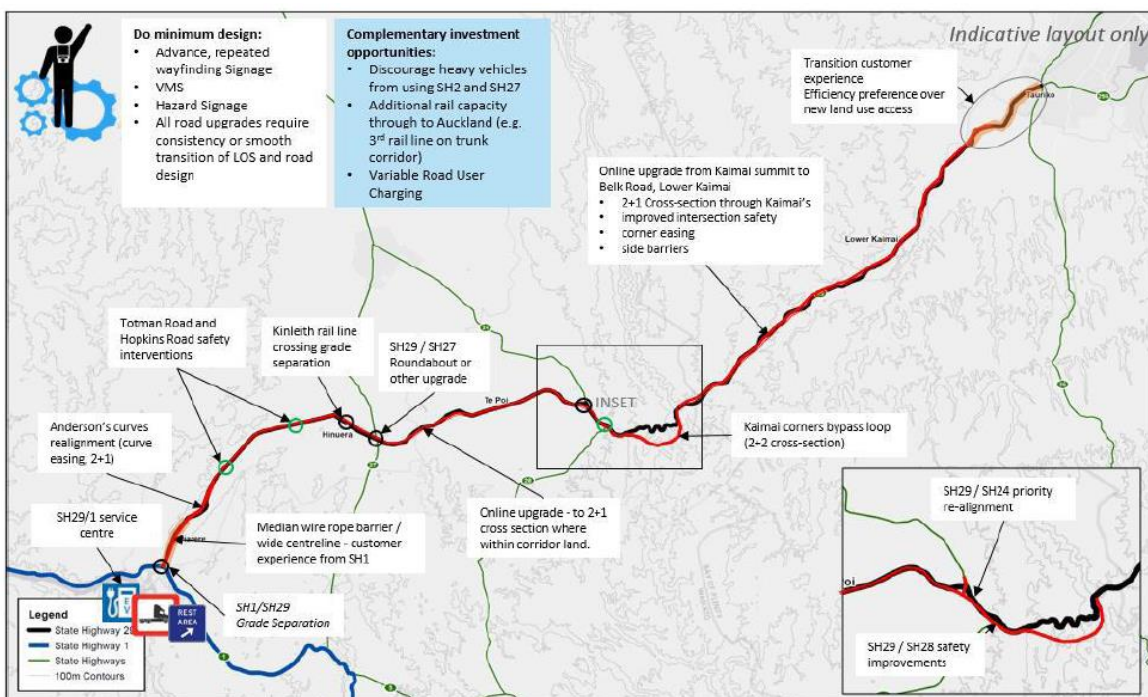
The PBC identified three problems in the 50km long SH29 Piarere to Tauriko corridor:

- Disruption to freight movement to and from the Port of Tauranga results in an economic loss to New Zealand;
- Because of the steep and winding nature of the road over the Kaimai Range, people are exposed to an unacceptable risk of death and serious injury; and
- If the route does not support the efficient movement of freight, traffic will move to alternative local routes, increasing maintenance costs and risk to safety across the network.

Following consideration of options, a recommended programme comprising a \$330m to \$530m package of operational and capital improvements was proposed and supported by the NZ Transport Agency Board with implementation to be carried out over 20 years. In broad terms the programme seeks to improve route continuity and consistency in treatment with key features of the programme including:

- Additional 2+1 passing lane opportunities;
- Key intersection upgrades;
- 'Kaimai Loop' dual-carriageway re-alignment over the Kaimai Summit section;
- Customer service facilities (rest stops, wayfinding improvements).

SH29 Piarere to Tauriko PBC recommended programme.



A Detailed Business Case for the corridor commenced in August 2017 with a stakeholder workshop to confirm the strategic context, problems, benefits and investment objectives. The project team then undertook some initial assessment including constraint mapping before the DBC was placed on hold at the end of 2017, pending the new GPS and TAIP re-evaluation, although some initial work has commenced on a long-list option exercise.

Review of problem and benefits statements

This section addresses the following key re-evaluation questions:

- To what extent has the priority given to the original problems changed as a result of the new strategic context?
- Has the magnitude of the originally identified problems changed due to external factors?
- Are there additional problems that have much greater significance as a result of the change in strategic context?
- Given any change to the identity of the problems, and their relative priority, what is the impact on the benefits of addressing the revised problems?
- Is the evidence sufficient to comprehensively support the cause and effect of the problem/opportunity statements?
- Is additional evidence needed to re-evaluate the problems?

Problem and benefits statements

The problem statements under-pinning the business case presently focus on three issues:

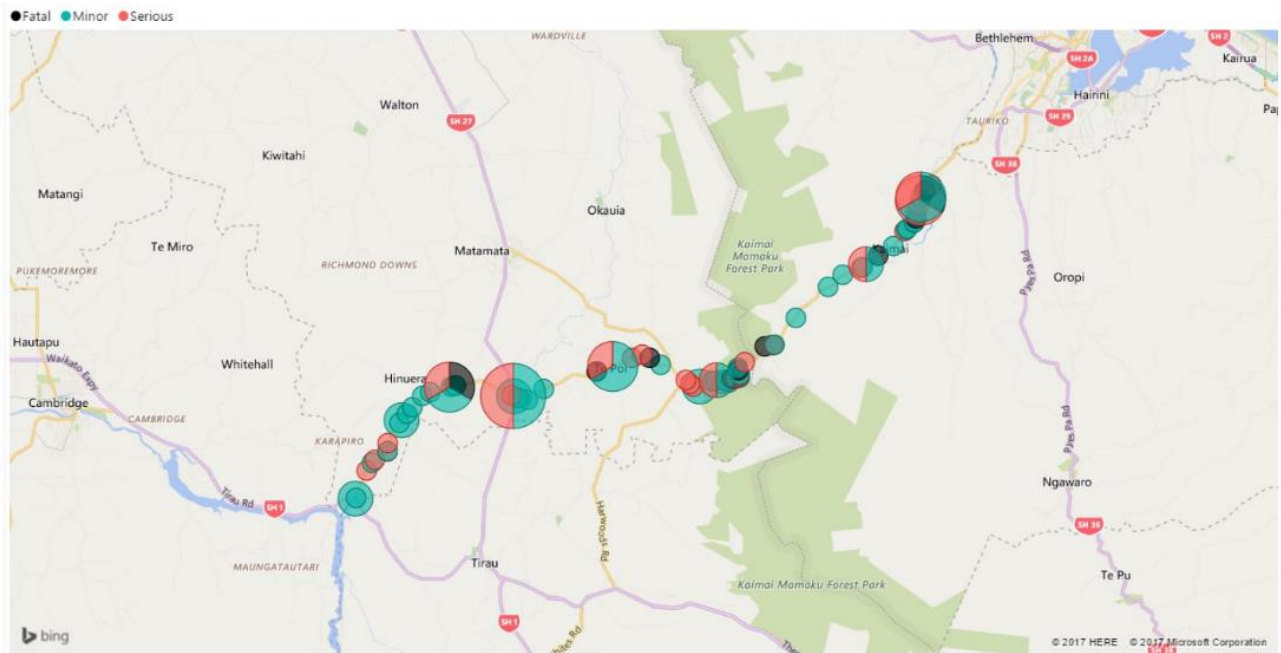
- As a consequence of the steep and winding nature of the road over the Kaimai Ranges, people are exposed to an unacceptable risk of death or serious injury (40%)
- Disruption to freight movement to and from the Port of Tauranga results in an economic loss to New Zealand (40%)
- If the route does not support the efficient movement of freight, traffic will move to alternative local routes, increasing maintenance costs and safety risks across the network (20%)

Safety

Safety is a key concern within the corridor. Between 2012 and 2017, 328 crashes occurred on SH29 between Piarere and Tauriko, with 10 fatal and 32 serious injury crashes. These crashes resulted in 11 deaths and 54 serious injuries. The total cost to society resulting from the crashes along SH29 over the five-year period was \$88.5 million.

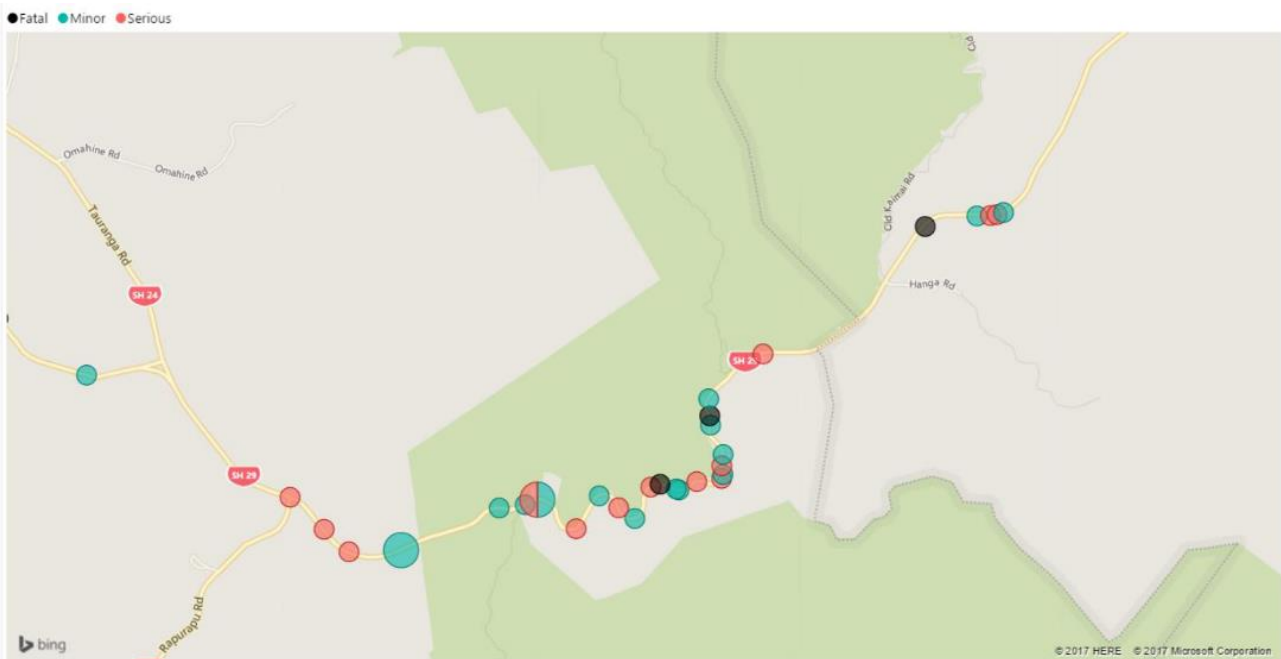
Most crashes occur within the section between the SH24 intersection and the summit of the Kaimai Range. The Kaimai Range section has tight horizontal and steep vertical alignments as a direct result of the geometric constraints of the road corridor. A review of the predominant crash causes along SH29 revealed that the largest crash type resulted from losing control or from a head-on crash on a bend, forming 52% of all crashes.

Injury crashes SH29 Piarere to Tauriko (2012-2017)



(source: SH29 Piarere to Tauriko DBC, Part A – Strategic Context, Revision 0, Aurecon)

Injury crashes SH29 Kaimai Ranges (2012-2017)

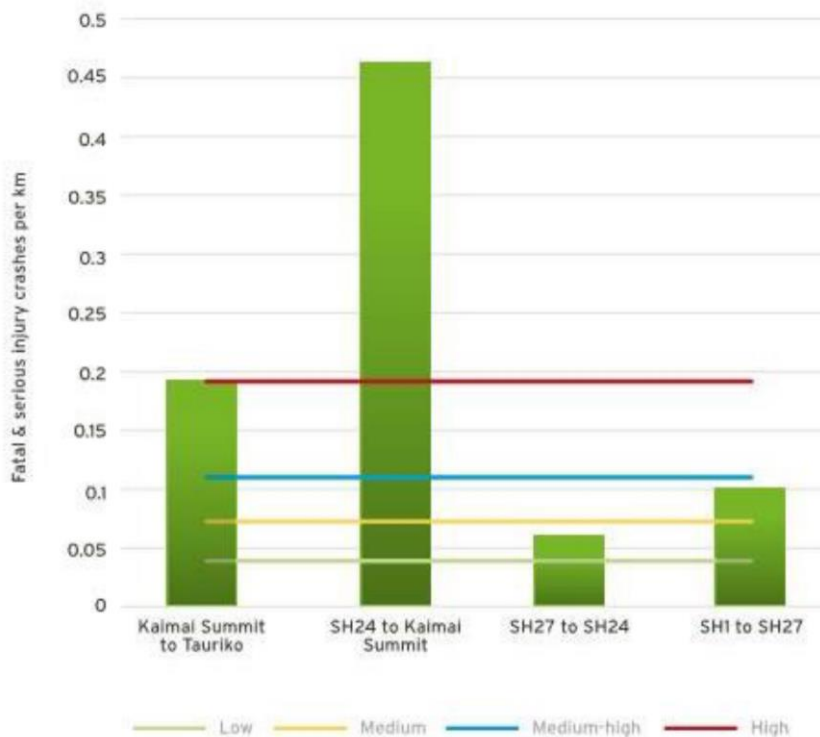


(source: SH29 Piarere to Tauriko DBC, Part A – Strategic Context, Revision 0, Aurecon)

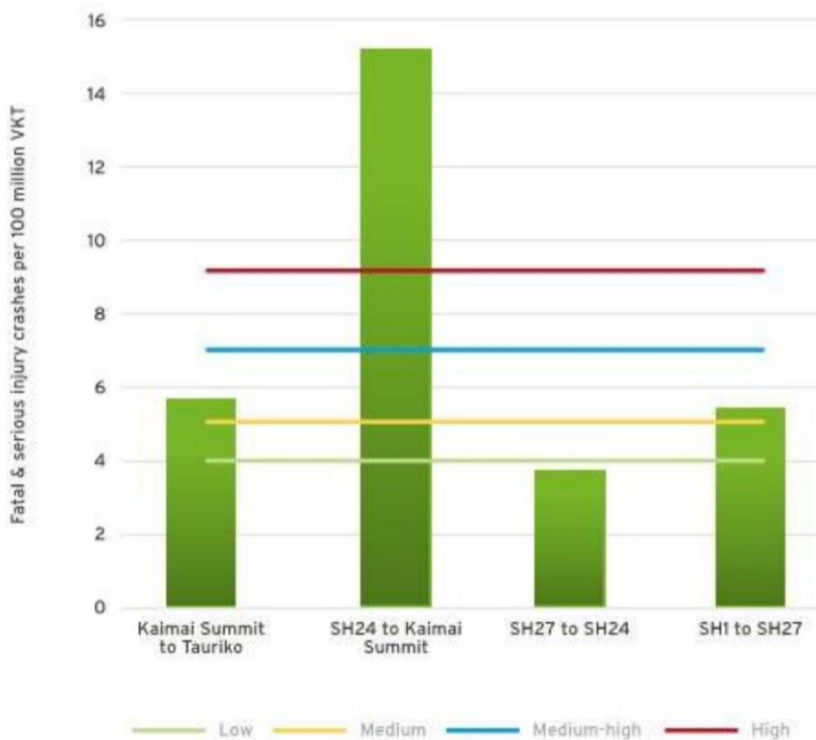
Of the total 328 crashes along SH29, 59 crashes involved heavy vehicles or 16% of the total crashes, resulting in four deaths. The proportion of crashes involving trucks is equivalent to the average daily flow of trucks on SH29 at 15%, therefore illustrating the safety issues for freight travelling on this corridor, as well as other customers who are in much smaller vehicles.

The Kiwi RAP collective and personal risk rating for SH29 has been defined by its crash history. The figures below show the risk ratings split for the different sections along the road corridor. It is evident that the section between SH24 to the Kaimai Summit has the highest crash rate and ratings for both collective and personal risks well over the "High" KiwiRAP rating threshold. This section of SH29 also has the seventh highest collective and personal risk rating in New Zealand.

KiwiRAP collective risk rating



KiwiRAP personal risk rating



The KiwiRap star rating in the corridor is predominantly 2- or 3-star standard with user hazards present and head on crash risk evident. The One Network Road Classification for this classification of route has a desirable level of service of 3 to 4 star.

The evidence continues to support addressing safety particularly on the Te Poi to Tauriko section of the corridor. However, it is questionable whether substantial investment is required in the Piarere to Te Poi section of the corridor given the low risk rating in this section of the corridor.

Disruption to Freight

The Hamilton to Tauranga corridor is recognised as a nationally important route, particularly its role as a primary freight corridor between the Bay of Plenty region and the wider upper North Island. The corridor consists of the SH1 to SH29 route and the ECMT railway, which both provide a primary link for the Port of Tauranga.

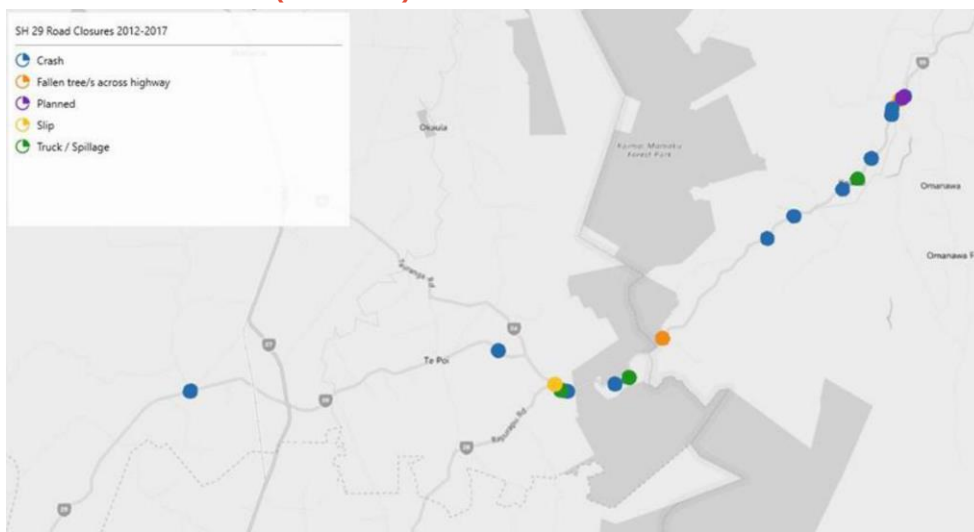
A leading benefit envisioned by the DBC is for the SH29 corridor to support economic growth and its economic significance, particularly in relation to the Port of Tauranga. The DBC suggests that the key to the Port of Tauranga's success is the need for the surrounding transport corridors to have a high degree of certainty in terms of being reliable and efficient.

Whilst the DBC has provided some evidence that disruption occurs on SH29 leading to resilience issues, no evidence has been presented that the scale of disruption is preventing the corridor from performing its key freight transport function to any degree which is resulting in a notable nationally/regional economic loss to New Zealand.

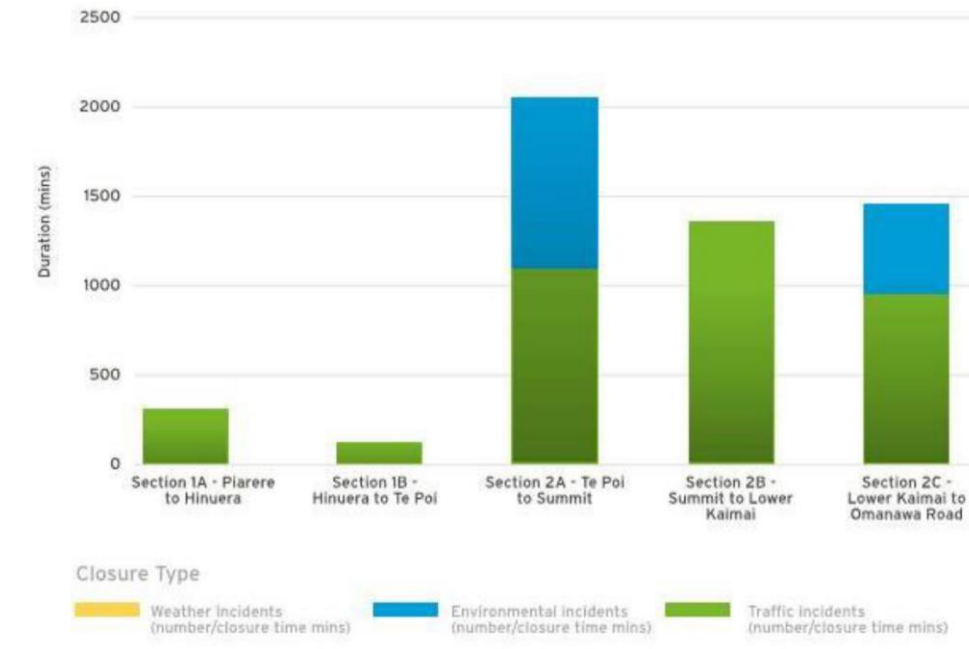
Resilience is defined as the ability to keep a road open for customers to go where and when they need to, despite any events or incidents occurring. These incidents can be planned or unplanned and can include weather conditions, natural events such as flooding, slips and earthquakes or not resulting from natural processes such as road works and crashes. Under the ONRC, a national (high volume) road has a desirable level of service whereby the route is available during major weather or emergency events and viable alternatives exist. Rapid clearance of incidents affecting road users is required and customers are advised in advance of issues and incidents so that they can make more informed journey decisions.

The figures below show the five-year history of closures and the duration of those closures. What can be concluded is that around 75% of closures are due to crashes and many closures are located on the Te Poi to Tauriko section of the corridor. Were the crashes sufficiently addressed it is likely that this would also provide an acceptable level of service for resilience without the need for explicit additional investment.

Road closures on SH29 (2012-2017)



Total duration of closures on each section of SH29 (2012-2017)



In considering the resilience of the corridor consideration must also be given to low probability, high impact events (LPHI) from natural hazards which can have a significant impact on the transport system. These LPHI events include earthquakes, storms, floods, tsunamis and volcanoes. The SH29 Resilience Prioritisation Score is classified as Low (Piarere to Kaimai) to High (Kaimai to Tauriko) for LPHI events with the risk primarily associated with earthquakes which may arise from the seismically active area around the Kerepehi Fault, and storms which may result in flooding and slips in the Te Poi to Summit and Lower Kaimai to Omanawa Road sections as shown in the table below.

SH29 resilience prioritisation score

	Section				
	SH1 – SH29 (Hinuera)	SH29 – SH24 (Te Poi)	SH24 - Summit	Summit – Lower Kaimai (McLaren Rd)	Lower Kaimai – Omanawa Rd
Risk priority score	Low	Low	Moderate to High	Low to Moderate	High

Strategic route choice

The final project objective is one of investing to support the NZ Transport Agency's strategy of promoting SH1/29 as the preferred route for travel between Auckland, Hamilton and Tauranga.

In August 2015, the Transport Agency Board agreed the strategic context for key upper North Island journeys. The direction was to focus primarily on delivering safety and then predictable journey outcomes from Pokeno to Tauranga via SH2 and efficiency and freight outcomes on the key journey from Auckland to Tauranga via

SH1/SH29. Travel time savings on SH2 and SH27 were not a priority, as this could undermine the preferred freight function on the SH1/SH29 corridor. This strategy is currently still in effect however, within the context of this review, the degree to which proactive investment is needed to reinforce the efficiency of the SH1/29 route to support the direction needs to be tested.

Most commercial trucks currently choose to travel along SH2 between Tauranga and Auckland, rather than SH29. The SH2 option is the shorter, quicker and lower cost option with more favourable road grades. One reason the SH1 to SH29 route is avoided by commercial drivers' is due to the number of roundabouts and the need to travel through Hamilton. Roundabouts and travelling through Hamilton via SH1 increase the cost of travel, reduce the travel time reliability and ease of drive with the need to regularly stop. However, these trends will be reduced when the WEX is completed in 2020 significantly upgrading the SH1 segment of the route.

In terms of the cost of travel, the current base vehicle operating costs (VOCB) are shown in the table below, based on road elevation gradients from 2012 (prior to completion of WEX which is discussed further below) and an assumed operating speed profile. It is evident the SH29 route option is more expensive in terms of operating costs. There is roughly 18% increase in operating cost when taking SH29 over SH2, which is mainly attributed to the difference in distance and gradient profile through the Kaimai Range.

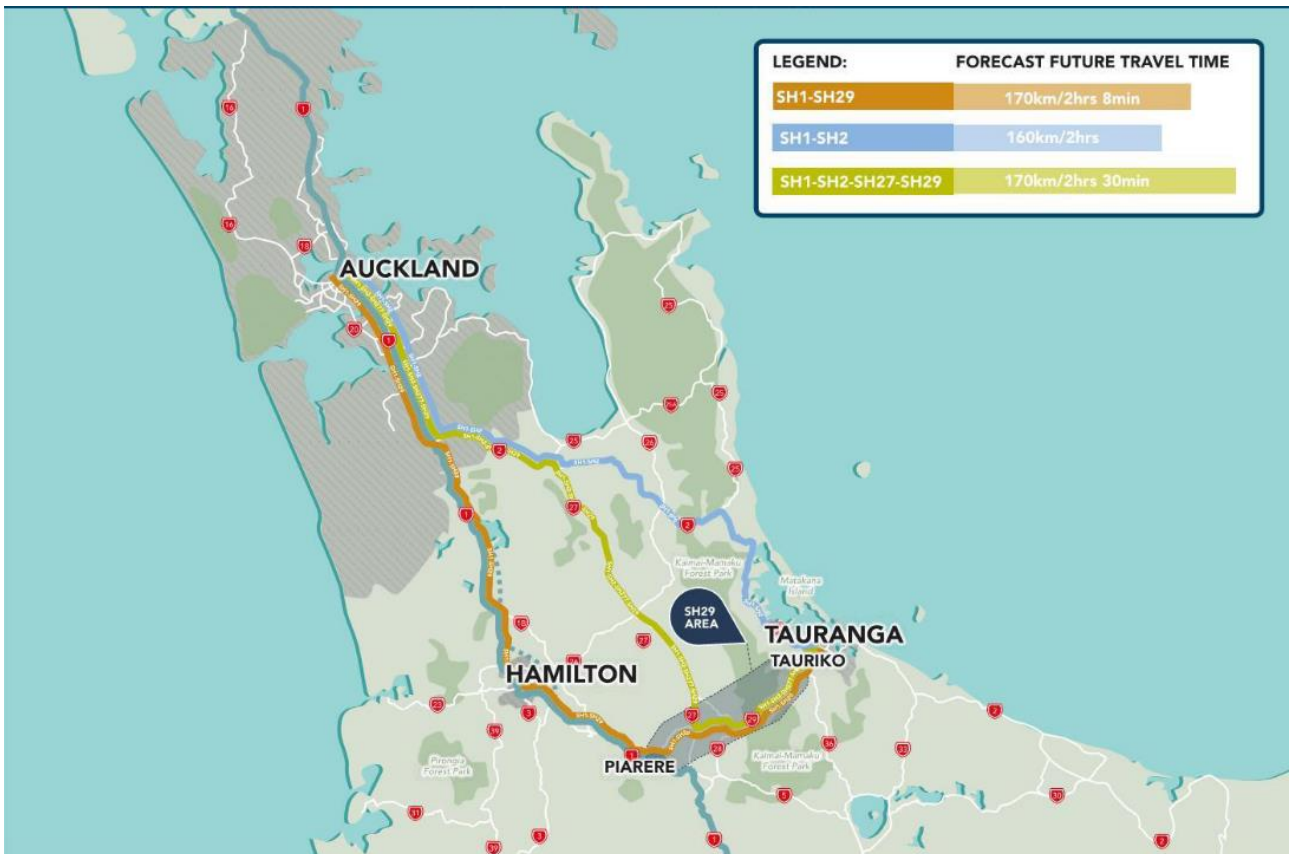
Base vehicle operating costs for key routes between Auckland (Pokeno) and Tauranga

Route	Length (km)	Vehicle Class					
		PC	LCV	MCV	HCV 1	HCV 2	Bus
SH1-SH2 VOCB \$	151.88	\$34.80	\$45.92	\$93.06	\$170.88	\$290.13	\$128.03
SH1-SH2- SH27 VOCB \$	157.85	\$36.05	\$47.52	\$97.01	\$178.34	\$301.47	\$133.13
SH1-SH29 VOCB \$	176.38	\$40.94	\$54.22	\$110.04	\$202.07	\$342.45	\$152.11

(source: SH29 Piarere to Tauriko DBC, Part A – Strategic Context, Revision 0, Aurecon)

When completed in 2020, the provision of the full WEX will provide comparable travel times (around 2 hours) between the two centres of Auckland and Tauranga, with only a slightly longer distance of 10km. Freight customers travelling between Auckland and Tauranga may avoid the currently favoured SH2 and SH27 routes.

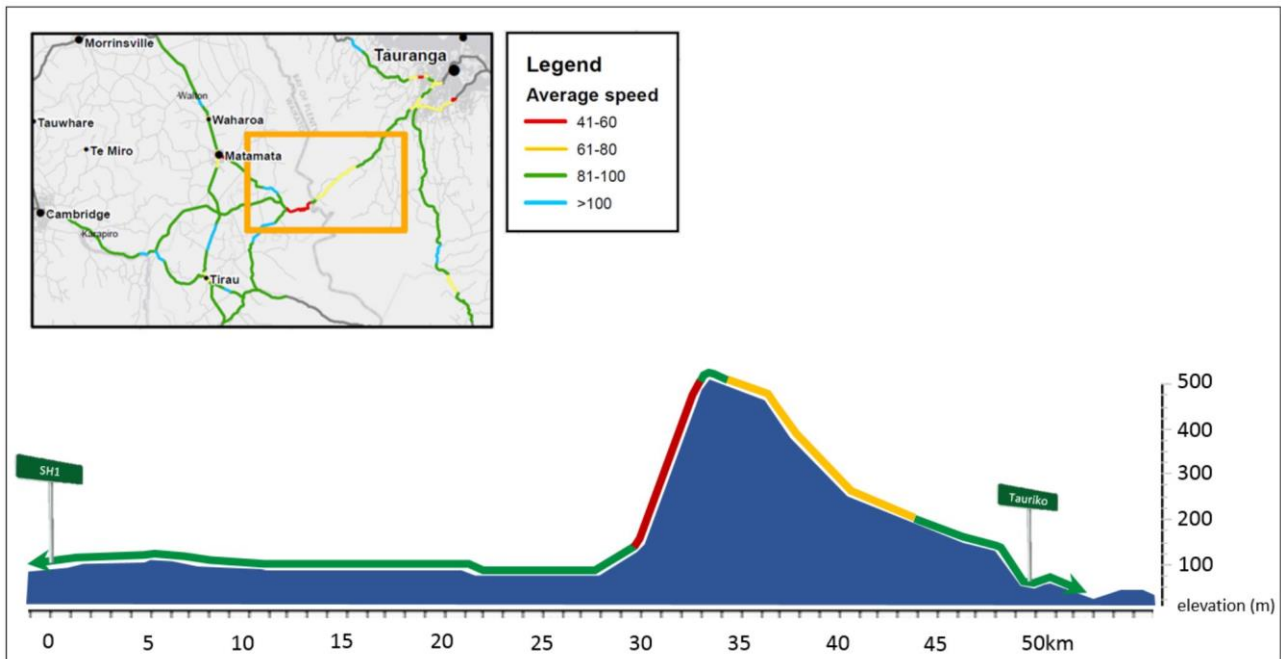
Forecast future travel time on key routes in 2020 (Auckland to Tauranga)



(source: SH29 Piarere to Tauriko DBC, Part A – Strategic Context, Revision 0, Aurecon)

Despite the future reduction in travel time, customer insights point to the ease of the drive and the quality of the road as key considerations of route choice. As shown below, the road elevation and speed profile over the Kaimai Ranges is a significant disincentive to use, particularly for freight. Freight customers have advised that, when given the option, they would travel along SH2 when laden and on SH29 when unladen. It is unlikely to ever be cost effective to address the trip cost disparity between the SH2 and the SH1/29 route through infrastructure investment in SH29 to further improve journey time efficiency. Rather, as identified in the Programme Business Case, pricing mechanisms, such as variable Road User Charges, should be explored by the NZ Transport Agency, as a national initiative, to support appropriate safe and efficient route choice.

SH29 speed and elevation profile



Conclusion from the review of problem statements

Safety remains a key concern within the corridor however the scale of issues between SH29 Piarere and Te Poi do not warrant investment in capacity enhancements or a significant safety spend given the scale of safety issues relative to other parts of the transport network.

There is little evidence that route disruption markedly disrupts freight efficiency in a way that is undermining the economic productivity of the freight task, further, by addressing the safety issue, freight reliability would also improve. On this basis it is considered that the significance of this issue for the corridor has been over represented in the analysis and could skew the types of investment towards significant infrastructure at levels disproportionate to the actual potential impacts.

Whilst investigations to date have sought to include the provision of long-term capacity improvements in advance of when required as part of the safety works, investigation should now look to decouple (as far as reasonably practicable) capacity enhancements as a means of facilitating a safer journey. Further, the scale of issues between SH29 Piarere and Te Poi do not warrant investment in capacity enhancements or a significant safety spend given the scale of safety issues relative to other parts of the transport network.

Investigations to date have also sought to include the provision of long-term capacity improvements in advance of when required as a means to deliver on the journey strategy of promoting SH1 and SH29 for strategic trips between Auckland and Tauranga. Whilst the strategy remains, there is no significant constraint which could further improve the attractiveness of the journey with respect to efficiency with the Kaimai Ranges and vehicle operating costs being the most notable barrier to uptake of this route. Therefore, the investigation should now look to decouple (as far as reasonably practicable) proactive physical road capacity enhancements to further the strategy from providing safer journeys.

It is therefore recommended that the problem and benefits statements be reshaped with a majority emphasis on safety, acknowledging the resilience benefits that come from safety investment and recognising that there is an overarching journey strategy which needs to guide the development of solutions but which, of itself, should not be a significant investment objective in its own right.

As noted in the programme business case, capacity utilisation enhancements and strategic route management can also be achieved through non road infrastructure improvements, e.g. differential Road User Charges, increased rail freight task and travel demand management to encourage off-peak travel.

Review of the strategic context

This section addresses the following key re-evaluation questions:

- What are the key strategic context documents that are most relevant to the investment proposal?
- How has the strategic context changed since the original Business Case?
- How will this strategic context change the assumptions made in the original Business Case?

Findings of the review of the strategic context

The Strategic Context (Part A) of the DBC was drafted in November 2017 ahead of the publication of the current Government Policy Statement on Land Transport (GPS).

The Part A addresses a range of key matters, including:

- identifying customer segments and their differing needs
- the economic context of the corridor and wider area, including:
 - the Port of Tauranga
 - regional tourism
 - freight movements (and the Upper North Island Strategic Alliance, Upper North Island freight story)
 - Ruakura inland port
- The wider transport context to the corridor including the East Coast Main Trunk for rail
- Current land use, albeit this is predominantly rural, with large land holdings farmed as rural productive units.
- Social, heritage and archaeological considerations
- Mana Whenua engagement

Upper North Island export industries and freight movements



It will be necessary to review and update the data supporting this part of the business case to reflect current data and trends.

The draft DBC has examined a wide range of policy and strategy documents both nationally and regionally which would guide the strategic importance of investment in the corridor. These have included:

- The draft GPS
- National Freight Demand Study (2014)
- NZ Transport Agency – Statement of Intent (2017-2021)
- Safer Journeys Road Safety Strategy (2010-2020)
- Road Efficiency Group – One Network Road Classification
- Upper North Island Strategic Alliance – Upper North Island Freight Story (2013)
- KiwiRail – KiwiRail Turnaround Plan (2010)
- Bay of Plenty Regional Council – Bay of Plenty Regional Land Transport Plan (2015 – 2045)
- Waikato Regional Council – Waikato Regional Land Transport Plan (2015 – 2045)

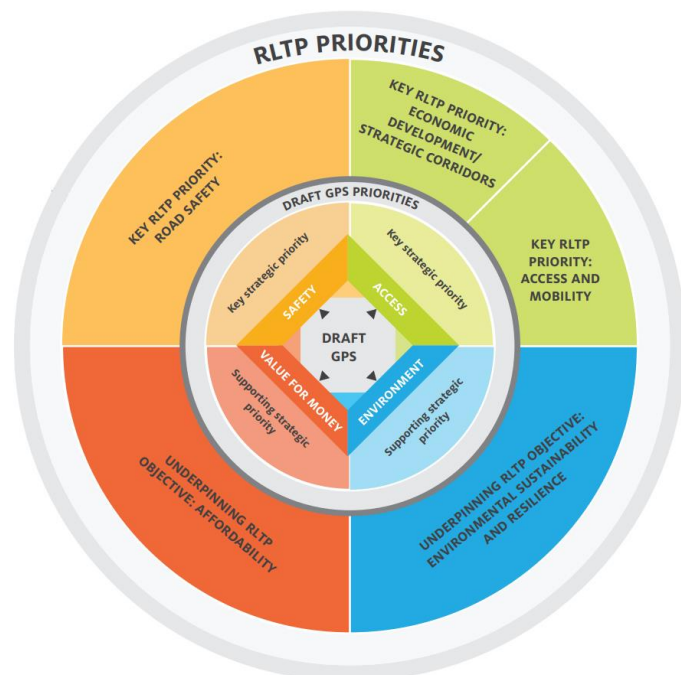
Implications for the DBC

It will be necessary to update the DBC with respect to a number of the key strategies listed above. In particular the GPS and Regional Land Transport Plans which have been updated since publication of the draft Part A. However, within the context of the problems and benefits established for the study it is considered that the project remains well aligned to these updated strategies. This is principally due to the significant focus on safety which is a key priority for the Government.

The Bay of Plenty Regional Land Transport Plan 2018¹ continues to support investment in the SH29 corridor to address safety and contribute to the Goal of the region of zero deaths and serious injuries on the regions transport system.

The 2018 update to the Waikato Regional Land Transport Plan 2015-2045² also elevates safety as a priority and identifies SH29 improvements as one of five priorities for regional investment.

2018 Update Waikato Regional Land Transport Plan 2015-2045 alignment of priorities



¹ <https://www.boprc.govt.nz/media/760427/bay-of-plenty-regional-land-transport-plan-2018-web.pdf>

² <https://www.waikatoregion.govt.nz/assets/WRC/Council/Policy-and-Plans/Transport/RLTP/2018-update/RLTP-WEB.pdf>

Key performance indicators

The DBC has developed a series of key performance indicators aligned to the investment objectives. This section considers the degree to which they are aligned to the NZ Transport Agency's prescribed performance measures³ which has been developed to provide a consistent framework by which investment proposals can be assessed against the requirements of the Investment Assessment Framework (IAF).

The table below presents the current key performance indicators and assesses the fit with the NZ Transport Agency framework and makes a recommendation on whether the key performance indicator should be updated.

³ <https://www.pikb.co.nz/assets/Uploads/Documents/KBlistofperformancemeasuresversion201771.pdf>

Review of KPI's & Investment Measures

Investment objective	KPI	Performance Measure	Equivalent NZTA Performance Measure	Recommendation
We will improve the safety along the corridor between Piarere and Tauriko by steadily reducing deaths and serious injuries by 30% by 2030.	KPI 1: Improve KiwiRAP Star Rating for the corridor	KiwiRAP assessment star rating (SH): -Baseline: 2-Star average -Target: At least a 3-Star KiwiRAP rating for the route	No star rating measure	The KPI/measure should be replaced or removed as this is an output measure of the scale and type of investment not an outcome measure.
	KPI 2: Reduce deaths and serious injuries	Number of deaths and serious injuries by mode -Baseline: 23 from Crash Analysis System (CAS) -Target: 25% reduction	Number of deaths and serious injuries	Measuring DSI's is appropriate and aligned to the NZTA framework. Performance measurement could be enhanced by including additional measures of personal risk & collective risk
We will reduce the number of unplanned road closures by 20% on SH29 between Piarere to Tauriko resulting in delays of more than 2 hours by 2030.	KPI 3: Increase the resilience of the corridor, including reducing the likelihood and impacts of closures	Travel time variability = 85 percentile – average time travelled. - Baseline: TomTom monitoring - Target: +/- 20%	N/A	Variability of travel times is not a good measure of resilience but rather reliability. The measure should be replaced with one which measures the number and scale of disruption.
	KPI 4: Decrease the frequency of crashes along the corridor, including reducing the likelihood and impacts of closures	No measure proposed	N/A	This is not an indicator but a tactic and should be removed
We will increase the attractiveness of the SH29 for road freight vehicles between	KPI 5: Decrease travel cost for freight	Additional vehicle travel time due to closure -Baseline: From Traffic Road Event Information System (TREIS) based on pre-earthquake	None	The performance measure does not reflect the KPI or objective of providing a consistently more attractive SH1/29 corridor. The measure would be more appropriate to KPI 3

Investment objective	KPI	Performance Measure	Equivalent NZTA Performance Measure	Recommendation
Tauranga and its key markets. *		baseline - Target: Reduced length of average closure by 30%		
	KPI 6: Attractiveness of route for customers, measured by increased freight use and facilities for a range of customers	Number and duration of road closure events in the region - Baseline: 277 number of road closure events every five years - Target: 159 number of road closure events every five years	The number of unplanned closures and the number of pedestrians, cyclists, and motor vehicles by vehicle class affected by the road closure annually The number of unplanned closures and the number of pedestrians, cyclists, and motor vehicles by vehicle class affected by the road closure where there was no viable detour	The performance measure does not reflect the KPI or objective of providing a consistently more attractive SH1/29 corridor. The measure would be more appropriate to KPI 3. IF the investment objective were to be retained a more appropriate performance measure would be: Change in percentage of inter-regional freight between Auckland and Tauranga on SH1/29 versus SH2 or SH27
		Number of hours accessible to the region - Baseline: From TREIS based on pre-earthquake baseline -Target: 30% reduction		The performance measure does not reflect the KPI or objective of providing a consistently more attractive SH1/29 corridor. The measure would be more appropriate to KPI 3

* - Comments on this investment objectives KPIs and performance measures however, note should be taken of the earlier recommendation with regard to this as a relevant / priority for Investment within the current context of the DBC.

Reviewing and updating the uncertainty log

It is important to review, and where necessary update, the uncertainty log. The uncertainty log holds important information particularly in regard to land use planning and other assumptions that will help ensure transport outcomes are connected with wider community and government outcomes.

The draft DBC Part A contains a brief section on issues and uncertainties as well as constraints and opportunities. The key issues and uncertainties recorded include:

- The future of the Port of Tauranga, and changes to the road/rail freight movements from changes in market share and predictions on freight volumes
- Significant reduction or expansion of the rail freight capability and upgrades ▪ Future predictions of freight volumes (including increase in HPMV uptake) on SH29 and mode share ▪ Future predictions of population and employment growth in the Waikato and Bay of Plenty regions, particularly in Hamilton and Tauranga
- Impacts of climate change and changes to weather patterns and intensity along the corridor and the effects this may have on inundation, flooding, rock falls and slips
- Changing land use activities and development along the corridor, particularly on western fringe of Tauranga.
- There are some lower impact and higher probability events which may have an impact on transport supply and demand. These have been considered but are not significant enough to warrant changes to the DBC's development. These include:
 - Increase in electric vehicle use and changes in fuel prices
 - Changes in the road maintenance regime
 - Technological advances in transport and construction.

Further work will be required on the uncertainty log to more clearly demonstrate that the degree of uncertainty, the significance of the issue to the DBC and any assumptions that have been made within the DBC to address these uncertainties. Without this fuller consideration of the issues it will be difficult to have confidence that the option identification and assessment process is sufficiently robust and adaptable to a range of possible futures.

Review of the investment objectives

This section addresses the following key re-evaluation questions:

- How has the new strategic context influenced the existing investment objectives?
- If there has been any change to a problem or benefit, how will this impact on the relevant investment objective?
- Should new investment objectives be considered?
- How do any revised investment objectives reflect the IAF priorities of safety, access, environment and value for money?
- How does the investment objective relate to the problem statements and benefits?
- How do the investment objectives encourage the widest consideration of alternatives?
- Is it clear that investment objectives are not "self-serving" - by being framed in a way that only leads to consideration and selection of certain types of option?

PBC investment objectives

Investment objectives were developed during the SH29 Piarere to Tauriko PBC to provide clarity for resolving the identified problems, while contributing towards achieving a range of identified benefits for customers. The PBC investment objectives were:

- Investment objective 1: We will steadily reduce the number of unplanned incidents so that SH29 between Piarere and Tauriko has no full closures resulting in a delay of more than 2 hours by 2030
- Investment objective 2: We will improve the cost of travel of SH29 such that SH1 and SH29 is the preferred route for road-based freight vehicles between Tauranga and Pokeno by 2030
- Investment objective 3: We will improve safety along the corridor between Piarere and Tauriko by steadily reducing deaths serious injuries to a medium Personal and Collective risk by 2030.

DBC investment objectives

Investment objectives for the DBC have been developed to align to the PBC investment objectives but updated to reflect the SH29 Piarere to Tauriko DBC corridor and the specific benefits and outcomes sought for this section. The DBC investment objectives are presently defined as follows:

- Activity objective 1: We will reduce the number of unplanned road closures by 20% on SH29 between Piarere to Tauriko resulting in delays of more than 2 hours by 2030
- Activity objective 2: We will increase the attractiveness of the SH29 route for road freight vehicles between Tauranga and its key markets
- Activity objective 3: We will improve the safety along the corridor between Piarere and Tauriko by steadily reducing deaths and serious injuries by 30% by 2030.

Commentary on the Investment Objectives

The investment objectives developed above are, in the main, SMART, that is Specific, Measurable, Attainable, Relevant and Timed. However, as noted in the review of the problems and opportunities, the inclusion of an objective which seeks to proactively invest to build on an overarching strategy could lead to perverse programme outputs.

There is confusion in translating the investment objectives into KPI's with Objective 2 having KPI's which would typically be used to assess performance against Objective 1: road closures.

The matters raised by the review of problems and opportunities, coupled with the weak linkage between investment objective 2 and its KPI's suggests there is scope to rationalise and possibly remove Objective 2. A safe and resilient SH29 (Objective 1 and 3) will itself make SH29 more attractive.

Commentary on options development, integrated land use & mode neutrality

The Detailed Business Case is at an early stage of development with only provisional option long-listing being undertaken prior to the re-evaluation process commencing. As such, there is scope through the re-evaluation to shape the consideration of options in advance.

By reconsidering the problems and objectives of the DBC there is scope to refine the direction of the option development process away from significant capacity improvements along the corridor in support of a route choice strategy to instead, focusing predominantly on safety interventions where required. This would provide a better value, affordable package of measures which provides for both the immediate safety issues and the medium to long term levels of demand in the corridor.

The strategic outcomes sought for the Auckland to Tauranga journey would be better served through the national / regional consideration of options for the use of pricing mechanisms and technology.

At the activity level, there is little evidence of a clear exploration of alternative modes, however, given the inter-regional, strategic nature of the corridor coupled with a very clear safety driver this is not considered a fatal flaw when considered in conjunction with other pieces of work being undertaken (or programmed to commence) by regional partners. Examples include the proposal by the Bay of Plenty Regional Council to commence an inter-regional rail study during the 2018-22 NLTP period.

Conclusion & recommendations

The current Detailed Business Case (DBC) is in the early stages of development with re-evaluation pausing the option development process.

The evidence continues to support addressing safety, particularly on the Te Poi to Tauriko section of the corridor. With safety being a key concern within the corridor the activity is considered to have a high level of results alignment with NZ Transport Agency's Investment Assessment Framework.

There is little evidence that route disruption markedly disrupts freight efficiency in a way that is undermining the economic productivity of the freight task, further, by addressing the safety issue, freight reliability would also improve.

Whilst investigations to date have sought to include the provision of long-term capacity improvements in advance of when required in support of a broader SH1/SH29 strategic route strategy the DBC should now look to decouple (as far as reasonably practicable) road capacity enhancements which are neither warranted or a strategic priority at this time. The risks of barriers to possible future capacity enhancements in the long term are considered low and other opportunities to manage demand and optimise existing capacity should be explored further in the short to medium term before looking to infrastructure solutions in the long term. The scale of issues between SH29 Piarere and Te Poi neither warrants investment in capacity enhancements or a significant safety spend given the scale of safety issues relative to other parts of the transport network.

The Detailed Business Case for SH29 Piarere to Tauriko should continue but with a focus on safety improvements with capacity enhancements only where necessary to contribute to an optimal safety outcome (which balances safety benefit with cost). Any consideration of long-term capacity enhancements as part of the business case should be deferred as there is no apparent land-use risk within the corridor and the requirement for additional capacity is long term. This could allow the DBC to be completed expediently and safety enhancements to be considered for delivery as part of the 2022-25 NLTP.