

Monday, 5 September 2022

Te Hui o Te Kaunihera ā-Rohe o Heretaunga

Hastings District Council

Hastings District Rural Community Board Meeting

Kaupapataka

Attachments Under Separate Cover

Te Rā Hui:
Meeting date: **Monday, 5 September 2022**

Te Wā:
Time: **2.00pm**


Te Wāhi:
Venue: **Council Chamber
Ground Floor
Civic Administration Building
Lyndon Road East
Hastings**

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HASTINGS DISTRICT COUNCIL
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TE KAUNIHERA Ā-ROHE O HERETAUNGA

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<p>Aropaoanui Rd: Slip Clearing</p> 	<p>Aropaoanui Rd: Slip Clearing</p> 
<p>Aropaoanui Rd: Sump Maintenance</p> 	<p>Aorangi Rd: Headwall Installation</p> 
<p>Aorangi Rd: Headwall Installation</p> 	<p>Aorangi Rd: Sign Installation</p> 

<p>Aorangi Rd: Sign Installation</p> 	<p>Aropaoanui Rd: Drop Out Repair</p> 
<p>Aropaoanui Rd: Drop Out Repair</p> 	<p>Beach Rd: Sump Repair</p> 

Beach Rd: Soak Pit Installation	Berry Rd: Watertabling
	
Brooks Rd: Sock Installation	Burma Rd: Cattle Stop (Slip Clearing)
	
Burma Rd: Cattle Stop (Slip Clearing)	Claymore Rd: Headwall Installation
	

Darkys Spur Rd: Fallen Trees



Darkys Spur Rd: Bridge Repairs



Darkys Spur Rd: Bridge Repairs



Dartmoor Rd: Sign Installation



Duff Rd: Bridge Maintenance



Duff Rd: Bridge Maintenance



Duff Rd: Bridge Maintenance



Duff Rd: Scour Repair



Duff Rd: Scour Repair



Ellis Wallace Rd: Bridge Maintenance



Ellis Wallace Rd: Bridge Maintenance



Ellis Wallace Rd: Watertabling



Ellis Wallace Rd: Headwall Installation



Gilpin Rd: Litter Removal



Glenbrook Rd: Culvert Maintenance



Glenbrook Rd: Culvert Maintenance



Harper Rd: Lime Application



Harper Rd: Lime Application



Heays Access Rd: Bridge Maintenance



Heays Access Rd: Bridge Maintenance



Hedgeley Rd: Flushing



Hendley Rd: Headwall Installation



Holt Rd: Headwall Installation



Huiarangi Rd: Culvert Extension



Kahuranaki Rd: Sign Installation



Kahuranaki Rd: Fallen Trees



Kahuranaki Rd: Watertabling & Verging



Kahuranaki Rd: Watertabling & Verging



Kahuranaki Rd: Rehabilitation



Kahuranaki Rd: Rehabilitation



<p>Kahuranaki Rd: Sign Installation</p> 	<p>Kaihika Rd: Watertabling</p> 
<p>Kaihika Rd: Dropout Repair</p> 	<p>Kaihika Rd: Dropout Repair</p> 
<p>Kaihika Rd: Drop Out Repair</p> 	<p>Kaihika Rd: Drop Out Repair</p> 

Kaiwaka Rd: Culvert Installation



Kaiwaka Rd: Headwall



Kaiwaka Rd: Slip Clearing



Kaiwaka Rd: Slip Clearing



Kaiwaka Rd: Sign Installation



Kawera Rd: Slip Clearing



<p>Kawera Rd: Slip Clearing</p> 	<p>Kawera Rd: Maintenance</p> 
<p>Kawera Rd: Maintenance</p> 	<p>Kereru Rd: Sign Installation</p> 
<p>Kereru Rd: Scour Repair</p> 	<p>Kereru Rd: Scour Repair</p> 

Kereru Rd: Slip Clearing	
	
Kereru Rd: Slip Clearing	
	
Longlands Rd West: Litter Collection	
	
Vicarage Rd: Litter Collection	
	
Makahu Rd: Culvert Replacement	
	
Makahu Rd: Headwall Installation	
	

<p>Makahu Rd: Culvert & Headwall Installation</p> 	<p>Mangaroa Rd: Sign Installation</p> 
<p>Mangatahi Rd: Bridge Maintenance</p> 	<p>Mangatahi Rd: Bridge Maintenance</p> 
<p>Mangatutu Rd: Fallen Trees</p> 	<p>Mangatutu Rd: Fallen Trees</p> 
<p>Mangatutu Rd: Fallen Trees</p> 	<p>Mangatutu Rd: Fallen Trees</p> 



Mangatutu Rd: Fallen Trees



Mangatutu Rd: Fallen Trees



Mangatahi Rd: Sight Rail & Maintenance



Mangleton Rd: Sump Repair



Mangleton Rd: Headwall Installation	Mangleton Rd: Culvert Extension
	
Maraekakaho Rd: Sump Installation	Maraekakaho Rd: Sump Installation
	
Maraekakaho Rd: Sump Installation	Maraetotara Rd: Trees
	

Maraetotara Rd: Slip Clearing		Maraetotara Rd: Slip Clearing	
			
Maraetotara Rd: Slip Clearing		Maraetotara Rd: Slip Clearing	
			
Maraetotara Rd: Fallen Tree		Matahorua Rd: Fallen Trees	
			

Matapiro Rd: Sign Installation



Middle Rd: Culvert Maintenance



Mokamoka Rd: Fallen Trees



Mokamoka Rd: Fallen Trees



Mokamoka Rd: Culvert Installation



Mokamoka Rd: Headwall Installation



<p>Mokamoka Rd: Culvert Installation</p> 	<p>Mokamoka Rd: Headwall Installation</p> 
<p>Mokamoka Rd: Culvert Installation</p> 	<p>Ngatarawa Rd: Litter Collection</p> 
<p>Ohurakura Rd: Sign Installation</p> 	<p>Ohurakura Rd: Flushing</p> 
<p>Ohurakura Rd: Scour Repair</p>	<p>Ohurakura Rd: Scour Repair</p>



Okaihau Rd: Maintenance



Old Coach Rd: Headwall Installation



Otamauri Rd: Tree Removal




Otamauri Rd: Tree Removal



<p>Omarunui Rd: Sign Installation</p> 	<p>Pirau Rd: Slip Clearing</p> 
<p>Pirau Rd: Slip Clearing</p> 	<p>Puketitiri Rd: Trees</p> 
<p>Puketitiri Rd: Fallen Trees</p> 	<p>Puketitiri Rd: Sign Installation</p> 

<p>Puketitiri Rd: Sign Installation</p> 	<p>Puketitiri Rd: Trees Down</p> 
<p>Puketitiri Rd: Sign Installation</p> 	<p>Putorino Station Rd: Sign Installation</p> 
<p>Raratu Rd: Watertabling</p> 	<p>Raratu Rd: Watertabling</p> 

<p>Red Hills Rd: Sign Installation</p> 	<p>Ridgemount Rd: Culvert Installation</p> 
<p>River Rd: Clear Slip</p> 	<p>River Rd: Clear Slip</p> 
<p>Salisbury Rd: Sign Installation</p> 	<p>Salisbury Rd: Scour Repair</p> 

<p>School Rd: Sign Installation</p> 	<p>School Rd: Litter Collection</p> 
<p>Seafield Rd: Sign Installation</p> 	<p>Seafield Rd: Watertabling</p> 
<p>Springfield Rd: Slip Clearing</p> 	<p>Springfield Rd: Slip Clearing</p> 

<p>Soldiers Settlement Rd: Sign Installation</p> 	<p>Stock Rd: Litter Removal</p> 
<p>Swamp Rd: Litter Collection</p> 	<p>Taihape Rd: Sign Installation</p> 
<p>Taihape Rd: Slip Clearing</p> 	<p>Taihape Rd: Slip Clearing</p> 

Taihape Rd: Slip Clearing



Taihape Rd: Slip Clearing



Taihape Rd: Sign Installation



Taihape Rd: Sign Installation



Taihape Rd: Guard Rail Installation



Taihape Rd: Guard Rail Installation



Taihape Rd: Guard Rail



Taihape Rd: Guard Rail



Taihape Rd: Tidying Slip Material



Taihape Rd: Tidying Slip Material



Taihape Rd: Bridge Maintenance



Taihape Rd: Bridge Maintenance



Taihape Rd: Culvert Inspection



Taihape Rd: Headwall Installation



Taihape Rd: Guard Rails



Taihape Rd: Guard Rails



Taihape Rd: Retaining Wall



Taihape Rd: Retaining Wall



Taihape Rd: Bridge Maintenance



Taihape Rd: Bridge Maintenance



Taihape Rd: Retaining Wall



Taihape Rd: Retaining Wall



Taihape Rd: Sight Rails



Taihape Rd: Sight Rails



<p>Tangoio Settlement Rd: Slip Clearing</p> 	<p>Tangoio Settlement Rd: Slip Clearing</p> 
<p>Tangoio Settlement Rd: Slip Clearing</p> 	<p>Tangoio Settlement Rd: Slip Clearing</p> 
<p>Tukituki Rd: Slip Clearing</p> 	<p>Tukituki Rd: Slip Clearing</p> 

Tuki Tuki Rd: Trees Down



Tuki Tuki Rd: Sign Installation



Turamoe Rd: Bridge Maintenance



Turamoe Rd: Bridge Maintenance



Vicarage Rd: Litter Collection



Vicarage Rd: Litter Collection



Vicarage Rd: Litter Collection



Waikare Rd: Sight Rail Repair



Waikare Rd: Sign Installation



Waikoau Rd: Fallen Trees



<p>Waikoau Rd: Culvert Maintenance</p> 	<p>Waimarama Rd: Fallen Trees</p> 
<p>Waimarama Rd: Litter Collection</p> 	<p>Waimarama Rd: Asphalt</p> 

Waimarama Rd: Asphalt



Waimarama Rd: Asphalt



Waimarama Rd: Asphalt



Waimarama Rd: Bridge Maintenance











Waimarama Rd: Bridge Maintenance





Waimarama Rd: Bridge Maintenance

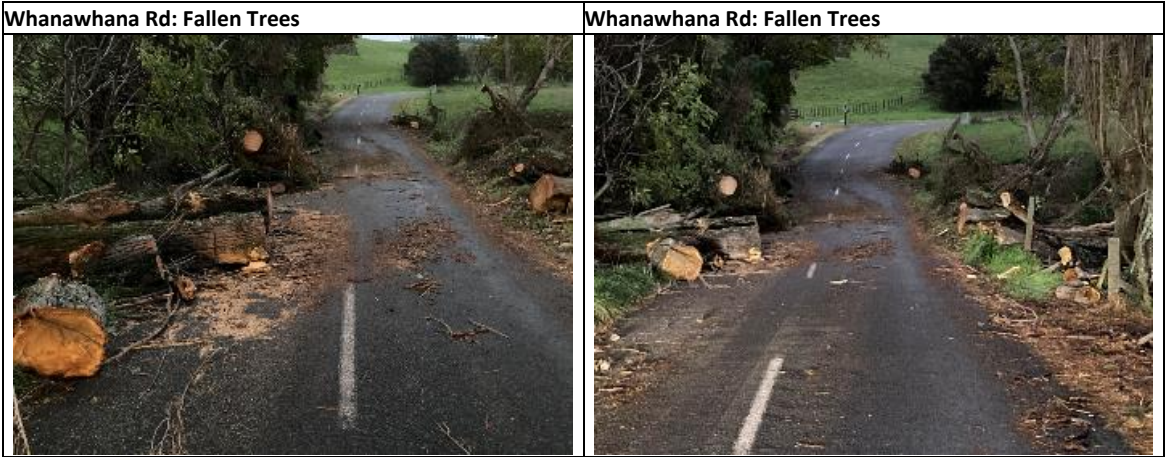


Waimarama Rd: Bridge Maintenance	Waimarama Rd: Bridge Maintenance
	
Waimarama Rd: Bridge Maintenance	Waimarama Rd: Slip Clearing
	
Waimarama Rd: Slip Clearing	Waimarama Rd: Bridge Maintenance
	

<p>Waimarama Rd: Bridge Maintenance</p> 	<p>Waimarama Rd: Bridge Maintenance</p> 
<p>Waimarama Rd: Bridge Maintenance</p> 	<p>Waimarama Rd: Bridge Maintenance</p> 
<p>Waimarama Rd: Bridge Maintenance</p> 	<p>Waimarama Rd: Bridge Maintenance</p> 

<p>Waimarama Rd: Bridge Maintenance</p> 	<p>Waimarama Rd: Bridge Maintenance</p> 
<p>Waimarama Rd: Bridge Maintenance</p> 	<p>Waipoapoa Rd: Slip Clearing</p> 
<p>Waipoapoa Rd: Slip Clearing</p> 	<p>Waitara Rd: Watertabling</p> 

<p>Waitara Rd: Fallen Tree Removal</p> 	<p>Waitara Rd: Watertabling</p> 
<p>Waitara Rd: Slip Clearing</p> 	<p>Waitara Rd: Slip Clearing</p> 
<p>Waitara Rd: Fallen Tree</p> 	<p>Waitara Rd: Watertabling</p> 



Item 6



Hastings Transport Network Resilience

Summary of Programme Business Case Development to Date

Prepared for Hastings District Council
Prepared by Beca Limited (Beca)

3 August 2022



1 Introduction and Purpose

Hastings District Council (HDC) maintains approximately 1,652 kms of local roads. The combined replacement value of these roads is estimated to be \$1.47b (2018 valuation). The road network is essential for the safe and efficient movement of people and goods through and around the District.

The road network is susceptible to weather and natural hazard events such as heavy rainstorms, high winds and extreme temperatures. The impact is broad and includes flooding, slips, fallen trees, damaged bridges and poor road condition. Climate change is increasing the frequency and severity of these events.

The increasing impact of natural hazard events on the roading network is leading to significant infrastructure damage, remedial cost increases, and loss of access for communities and businesses.

HDC and Beca are developing a Programme Business Case (PBC) with the aim of confirming the appropriate level of investment and actions that HDC can take to improve the Districts road network resilience and the transport system response to these events over the next 50 years, in conjunction with other services, such as power, that people rely on. Actions arising from the business case are yet to be defined but will include maintenance, renewals and more targeted studies to inform larger scale improvements and investment for particular corridors or locations.

The purpose of this summary report is to inform project partners and stakeholders about our findings to date (including new guidance on infrastructure resilience from Infrastructure Australia. Refer to Attachment), support planned discussions and request feedback that will inform completion of the business case (planned to be in draft by the end of 2022). This is a summary only and a full copy of the business case completed to date (up to short list option identification stage) can be provided upon request.

2 Focus of the PBC

The resilience of the road transport network can be affected by a range of hazards (events). Some of these are low frequency but high impact events, such as earthquakes, tsunamis, liquefaction, and volcanic eruptions that tend to trigger a civil defence emergency response. Other events are lower impact but occur more frequently, such as flooding, erosion, or landslips.

The PBC focuses on the high frequency low impact (HFLI) events such as flooding and slips that regularly impact on the resilience of the HDC transport network. These events can be addressed at a district level, whereas larger impact events which tend to trigger a civil defence response are considered in national level strategies and plans such as the National Disaster Resilience Strategy¹.

¹ Civil Defence, 2019



The type of events specifically considered by the PBC include:

- Storm/wind/lightening
- Flooding and inundation
- Fluvial erosion
- Coastal erosion
- Snow and ice
- Landslides and debris flows
- Drought and heat
- Wildfire events.

The geographic scope for the PBC is the Hastings District and the focus is predominantly on the rural inland and coastal areas that are particularly susceptible to resilience risks. Resilience has not been identified as a problem facing the urban community. The PBC also does not consider the resilience of the State Highway network that is addressed through the National Resilience PBC (Waka Kotahi), nor does it consider the resilience of rail, maritime or air transport as HDC has no control over these modes. The potential role of rail as an alternative transport service is considered at a high level.

The following map shows indicatively the nature and location of resilience events that have led to cost and access problems on the HDC road network in the last ten years.



Figure 1: Nature and General Location of Road Closures (recorded in RAMM database)

3 Problem Definition

Between 2011 and 2020, HDC spent roughly \$9m to address impacts caused by weather and natural hazard events. The range of expenditure per year is anywhere between \$300,000 and \$2M. There is no certainty of this annual cost to HDC.



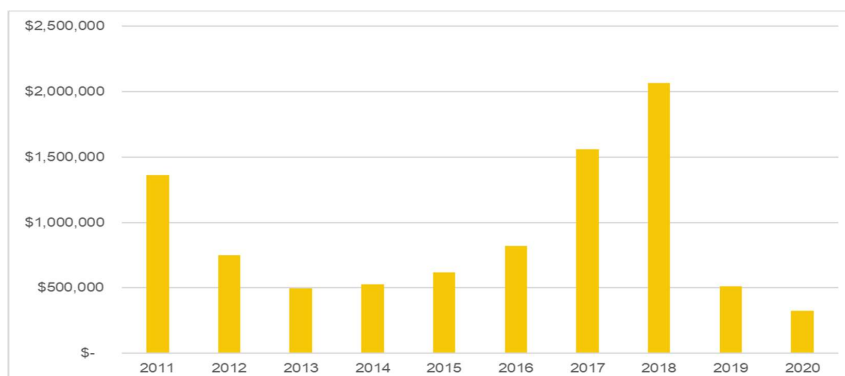


Figure 2: HDC Storm Event Response Spend (2010-2020)

Table 1 provides a summary of local road closures with an identified gap in customer levels of service, as defined by the Waka Kotahi One Network Road Classification. A gap in ONRC customer level of service gaps is defined using the following criteria:

- **Level of service exceeded:** the corridor performs better than all the ONRC criteria, and/or when it performs to a road category higher than its classification.
- **Level of service achieved:** the corridor achieves all the criteria described in its ONRC classification.
- **Level of service not achieved:** the corridor does not meet at least one aspect of the description for the ONRC road category.
- **Significant gap in level of service:** the corridor does not meet any of the ONRC level of service description and is performing at a road category lower than its classification.

Table 1: Summary of Road Closure Events (2011-2020)

Road	ONRC	AADT	% Freight ²	Road Closure Events	Level of Service (LoS) performance	Strategic Fit
Clifton Road	Primary Collector	3,600	3%	1	LoS not achieved	Medium
Joll Road	Primary Collector	2,500	0%	1	LoS not achieved	Medium
Taihapa Road	Secondary Collector	760	20.8%	3	LoS not achieved	Medium
Puketitiri Road	Secondary Collector	660	15.3%	2	LoS not achieved	Medium
Kereru Road	Secondary Collector	300	22.1%	1	LoS not achieved	Medium
Matahura Road	Secondary Collector	160	17%	1	LoS not achieved	Medium
Waitara Road	Secondary Collector	190	25.2%	1	LoS not achieved	Medium
Waipunga Road	Low Volume	<100vpd	34%	2	LoS achieved	Low
Darkys Spur Road	Low Volume	<100vpd	12%	3	LoS achieved	Low
Makahu Road	Low Volume	<100vpd	12%	3	LoS achieved	Low
Little Bush Road	Low Volume	<100vpd	12%	2	LoS achieved	Low
Ellis Wallace Road	Low Volume	<100vpd	30%	1	LoS achieved	Low
Holts Forest Road	Low Volume	<100vpd	12%	1	LoS achieved	Low
Mokamoka Road	Low Volume	<100vpd	30%	1	LoS achieved	Low

² Sourced from mobileroad.org

Road	ONRC	AADT	% Freight ²	Road Closure Events	Level of Service (LoS) performance	Strategic Fit
Richmond Road (Clive)	Low Volume	<100vpd	12%	1	LoS achieved	Low
Te Apiti Road North	Low Volume	<100vpd	8%	1	LoS achieved	Low
Whanawhana Road	Low Volume	<100vpd	12%	1	LoS achieved	Low
Glengarry Road	Access	<100vpd	12%	1	LoS achieved	Low

The gap assessment indicates that Primary and Secondary Collector local roads are failing to meet their defined ONRC customer levels of service, predominantly due to road closure incidents where there is a lack of alternative route options for communities. These roads are categorised as meeting a 'Medium' strategic fit under Waka Kotahi guidelines, representing a strong case for investment/intervention. The roads closed most frequently from 2011 to 2020 were Taihape Road, Makahu Road, and Darkys Spur Road. The most common causes of road closures were fallen trees (eight closures), slips (seven closures), flooding (seven closures), and snow (five closures).

Road closure incidents caused by natural hazard events reflects a much wider national trend. Figure 3 shows the number of extreme weather events identified by the Insurance Council of New Zealand. Data over the previous three decades shows a clear trend in increasing extreme weather events. This indicates that HDC will face higher costs, more frequent and possibly longer road closures in the future if the resilience of the road network is not addressed.

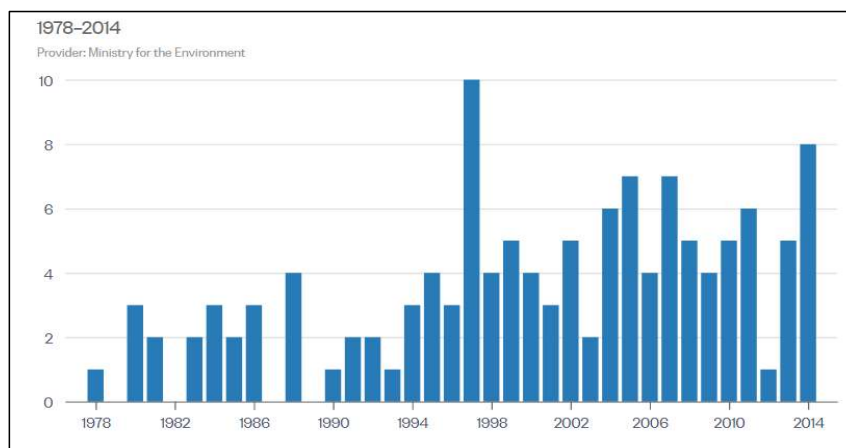
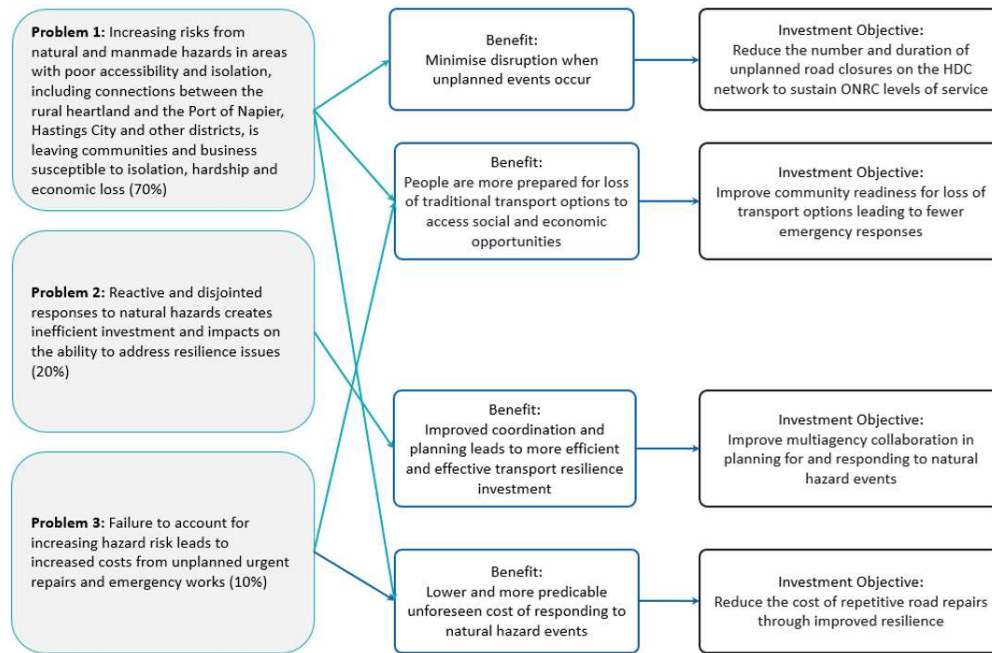


Figure 3: Number of Extreme Weather Events – 1978-2014 (identified by Insurance Council of New Zealand)

The following diagram shows the Problems, Benefits and Investment Objectives for the PBC.



Resilience is about preserving and quickly restoring access to the road network in the face of unplanned events, enabling customers to complete their journey (Waka Kotahi)

4 Programme Development and Short List Programmes

To address the problems and realise the desired benefits, a long list of potential transport improvement activities was developed during earlier stages of the PBC and 'packaged' to form a long list of programme alternatives and a do minimum programme. The long list of activities included a spectrum of low cost (i.e., planning/policy, district plan changes), optimisation of existing infrastructure and higher capital activities (i.e. new infrastructure), following Waka Kotahi's Intervention Hierarchy approach.

Each long list programme was then assessed with HDC and Waka Kotahi through a Multi-criteria Assessment (MCA) process, which ultimately resulted in three programmes being identified as the preferred short list based on a mix of criteria (i.e., investment objectives, fatal flaws, affordability, achievability, social/environmental impacts).

The following tables summarise the three shortlist programmes and provides an overview of their key activities, benefits, and risks. A key difference between the balanced and targeted approaches is the location and scale of investment. The balanced investment programme is a lower level of investment mainly improving areas that become damaged during events, so these areas are more resilient in future. Targeted investment adds improvements to important parts of the network such as arterial roads to make these more resilient. Comparing these two programmes will help us determine if the additional benefit of the targeted investment approach outweighs the additional costs.

Do Minimum - Maintenance of current assets with no additional investment.	
Key interventions	<p>Committed activities only (i.e., maintenance/renewals):</p> <ul style="list-style-type: none"> Pavement renewal programme. Programme to address ageing and deficient road pavement asphalt in both urban and rural areas. Road renewal.³ Escalated funding response to the needs of ageing and deteriorating transportation assets and increased demand on road assets.
Anticipated benefits	<ul style="list-style-type: none"> Affordable (easy to implement within existing budgets and funding constraints). There is sufficient competition and skills within the market to deliver this programme. The programme delivery is expected to have minimal environmental and social impacts, including property impacts. The programme is endorsed politically and by the community.
Investment level	Low
Risks	<ul style="list-style-type: none"> The programme does not provide sufficient resilience improvements over existing case (i.e., no improvements to ONRC levels of service). Programme does not mitigate against the impacts of future events. Anticipated growth in resident population is likely to drive a growth in travel demand (vkt), which will increase impacts to road and pavement surfacing and result in further future renewals costs. Without additional investment, there is no expected improvement in community readiness to unplanned road closures (i.e., alternative route access). Regional economy and future growth may be threatened without mitigation measures on high-volume freight corridors. Without additional investment, increased frequency and severity of weather hazard events presents increased risk to property and community safety.

Balanced Investment Programme - A mix of planning, operations and low-level network improvements focussed on mitigating the risk of damage in locations susceptible to natural hazards.

Key interventions	<p>Committed activities plus:</p> <p>Planning / policy</p> <ul style="list-style-type: none"> Improve data collection. For example, improve recording of location, duration, and detour routes available, when a road closure occurs. Improve post investment monitoring. For example, monitor closures and damage at locations that have been improved to determine the impact that has been avoided and the recovery cost that has been saved through investment. Implementation of better signage and communications. District plan and policy review to ensure that future land use/development does not increase infrastructure and community exposure to natural/weather hazards. Engagement with forestry industry to identify financial contributions for mitigation. Engage with neighbouring districts to enhance cross boundary benefits. Integrated spatial planning (in conjunction with HBRC) – used to better anticipate future impacts of climate change and identify mitigation strategies. <p>Infrastructure</p> <ul style="list-style-type: none"> Pakowhai Road corridor management plan. Includes upgrade of Richmond Rd / Pakowhai Rd intersection to a roundabout and also for the upgrade of signals at St Aubyn St/ Pakowhai Rd. Coastal protection - Waimarama and Clifton Seawalls.
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³ Reliant on Waka Kotahi funding approval.

	<ul style="list-style-type: none"> Improved network telecommunications (such as variable messaging system, gantry/vms messaging system, coordinated ITS). Drainage renewal activity targeted at high-risk areas affected by flooding events. High-risk flooding/sea level rise location investment. Investment in coastal erosion sites. Invest/protect alternative Port access corridor. <p>Business Cases / Monitoring</p> <ul style="list-style-type: none"> Havelock to Hastings SSBC. Develop a SSBC to investigate options to provide an alternative arterial link between Havelock North and Hastings to increase resilience between the two centres.
Anticipated benefits	<ul style="list-style-type: none"> Monetary savings generated from reduced road repair instances. Improved resilience capacity and response enabled by greater collaboration Greater understanding of risks, challenges and opportunities Greater value for money outcomes provided by low-cost activities (inclusion of policy/planning and district planning-level changes).
Investment level	Low – Medium
Risks	<ul style="list-style-type: none"> Programme does not achieve political support or endorsement. The assessment of estimated costs for this programme is indicative and has been made at a high-level. Further and more detailed cost analysis will be required in subsequent stages of the business case to understand the financial impact of this programme. Implementation of this programme will be dependent on other funding sources, such as the NLTP and LTP. It is not known if sufficient funding will be available from these sources in later stages of project implementation. Implementation will be dependent on other regional partners, such as HBRC and neighbouring districts.

Targeted Investment Programme - Targeted investment in parts of the network most susceptible to hazards and important to supporting community and economic wellbeing, e.g., collector roads and roads that provide access to important facilities.

Key interventions	<p>Committed activities plus:</p> <p>Planning / policy</p> <ul style="list-style-type: none"> Improve data collection. For example, improve recording of location, duration, and detour routes available when a road closure occurs. Improve post investment monitoring. For example, monitor closures and damage at locations that have been improved to determine the impact that has been avoided and the recovery cost that has been saved through investment. Coastal infrastructure review to identify assets that are critical and under threat. Integrated spatial planning (in conjunction with HBRC) – used to better anticipate future impacts of climate change and identify mitigation strategies. <p>Infrastructure</p> <ul style="list-style-type: none"> Stormwater drainage mitigation – identify flood prone areas and prioritise drainage improvements to reduce risk of roads flooding during storm events. Develop corridor management plans or single stage business cases to identify and programme resilience improvements on roads that have an important function (Collector Roads) and local roads at risk of natural hazard events. For example; <ul style="list-style-type: none"> Puketitiri Road (collector road) Taihape Road (collector road) Omahu Road (local road, medium risk landslips) Pakowhai Road (local road, high risk flooding, medium risk landslips).
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	<ul style="list-style-type: none"> Identify important / critical assets or facilities e.g., water treatment plants, for which a loss of access could result in high social, economic or environmental impacts. Identify and prioritise resilience improvements for access to these priority assets. Alternative routes – better identify known alternative routes and address major resilience issues on these routes to improve the likelihood of the alternative route being available when required (could be part of CMP / SSBC approach above). Tree felling programme for all Collector Roads. Bridge/culvert replacement and strengthening programme – A more exhaustive programme beyond the Do Minimum to target additional bridges/culverts. Slip mitigation - Target investment to improve levels of service of the road network in areas vulnerable to landslips. Flood mitigation - Investment to repair or mitigate impacts of fluvial flooding/ flooding inundation. Port access protection - Investment to protect essential lifeline service corridors servicing the Port. Havelock Road development - potential three laning. Northeastern connector - Karamu Road/Pakowhai Road link. <p>Business Cases / Monitoring</p> <ul style="list-style-type: none"> Develop an SSBC for all Primary/Secondary collector roads affected by road closures due natural/weather events. Havelock to Hastings SSBC. Develop a SSBC to investigate options to provide an alternative arterial link between Havelock North and Hastings to increase resilience between the two centres.
Anticipated benefits	<ul style="list-style-type: none"> Reduction in road maintenance/repair and emergency remedial expenditure due to investment in improved levels of service and targeting investment in high-risk locations. Reduced likelihood of road closures, specifically on higher volume corridors, through targeted investment at locations/areas that have a history of vulnerability to weather and natural hazard events Improved community access and increased access to alternative routes in the event of disruption enabled by delivery of corridor management plans Improved mitigation against sea level rise and flooding events through coastal protection projects. Greater freight protection provided by investment in port access corridor protection. Consolidates investment in areas/locations that would benefit the greatest.
Investment level	Low – Medium
Risks	<ul style="list-style-type: none"> The assessment of estimated costs for this programme is indicative and has been made at a high-level. Further and more detailed cost analysis will be required in subsequent stages of the business case to understand the financial impact of this programme. Implementation of this programme will be dependent on other funding sources, such as the NLTP and LTP. It is not known if sufficient funding will be available from these sources in later stages of project implementation. Implementation will be dependent on other regional partners, such as HBRC and neighbouring districts. Programme does not achieve political support or endorsement. Significant technical risks and challenges are apparent, particularly in relation to the implementation of coastal protection, corridor management, and other infrastructure focused activities.

5 Next Steps

The next steps to complete the PBC are summarised below.

Timing	Key Steps
August	Engagement on Short List Programmes with Partners and Stakeholders (including new guidance on resilience from Infrastructure Australia)
September	Short List MCA evaluation to identify Preferred Programme
October	Engagement with Partners and Stakeholders on Preferred Programme
November	Complete Economic, Financial, Commercial and Management Case sections of PBC
December	Complete Draft Business Case and Circulate to partners and stakeholders for feedback

We would appreciate your feedback on the information provided in this summary report, the following questions could be considered in your feedback.

- How has transport system resilience (or lack of it) impacted you, your business or your community in the past and how has this changed over time?

(this includes not only economic and environmental impacts but also social such as mental well being)
- Some locations have been identified as vulnerable to damage and closures in this summary report. In your experience, are these locations correct and are there any other locations where you find transport system resilience impacts you, your business or your community?
- Of the Infrastructure Australia guidance, what items should be considered critical success factors and added to the Do-minimum case.
- How much of a priority should HDC consider transport system resilience in regard to level of investment, where this may come at the expense of other Council priorities?

Attachment: Summary of Infrastructure Australia's "A Pathway to Infrastructure Resilience"

Infrastructure Australia's ten steps towards a systematic approach to managing risk are:

1. *Improve strategic alignment of resilience governance*: Governance that adopts a systemic view of risk and establishes the accountability and resourcing.
2. *Manage uncertainty through scenario planning*: A common set of future scenarios to streamline planning and support cross-sector coordination and shared responsibility.
3. *Improve data collection and sharing for informed planning, action and decision-making*: Coordinating, sharing and standardising critical disaster and climate data.
4. *Adopt place-based approaches for resilience*: Planning tools and data to consider multiple place-based issues and address resilience and community needs.
5. *Embed resilience into land use planning and development decisions*: Planning systems that value and set resilience as policy objectives, incorporate new and emerging data, capture local opportunities.
6. *Improve infrastructure investment decision-making*: Agreed mechanisms and guidance for quantifying the projected economic, social, environmental and governance implications of the impacts associated with managing uncertainty or resilience.
7. *Collect and share information on asset and network vulnerability*: A shared understanding of the impacts to interconnected systems.
8. *Value blue and green infrastructure*: Improving the understanding, valuation and governance of the green and blue infrastructure.
9. *Build trust through more inclusive decision-making*: Including communities and informing them about the risk, uncertainty and trade-offs related to infrastructure services and their livelihoods.
10. *Embed traditional ecological knowledge in decision-making*: Draw on traditional ecological knowledge to manage land and natural resources and mitigate-risk.

These opportunities to improve resilience in response to all hazards and across sectors are informed by the latest thinking from over 600 experts from across government, industry, peak bodies and academia.