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Committee Regional Transport Committee
Author Mark Edwards, Senior Transport Planner

Regional Transport Network Resilience Programme Business Case

1. Purpose

To seek the Regional Transport Committee's (the Committee) support for a prioritised list of locations on the region's transport network that have been identified as a result of the Wellington Regional Land Transport Plan Transport Resilience Programme Business Case.

2. Background

The current Regional Land Transport Plan 2015 (RLTP) was prepared by the Committee, and subsequently approved by Greater Wellington Regional Council (GWRC) in April 2015.

The RLTP contains all the land transport activities proposed to be undertaken throughout the region over the next six financial years.

Within the programme was a programme business case that was jointly managed and funded by the New Zealand Transport Agency (NZTA) and GWRC.

The ultimate objective of this programme business case is to improve the resilience of the Wellington region's land transport network so that it is less susceptible to natural hazard events. To achieve this it is important for decision makers and practitioners have a good knowledge of the locations most at risk across the region, and how these risks rank against each other in criticality. In recent years there have been numerous investigations undertaken to inform the different land transport providers about the risks to land transport resilience. It is important to acknowledge this work but to recognise that this work to date has rarely taken a region-wide view of resilience and what might be important.

The key objectives for this programme business case are to:

- Produce a prioritised and prioritised regional list for resilience for the Wellington regional land transport network.

- Develop a gap analysis between the current suite of land transport network data sets and the risks identified in the regional prioritised list in order to understand what risks need further investigation.

3. Programme business case scope

The programme business case was jointly funded and managed by NZTA and GWRC. GWRC's liased closely with the other councils in the region within the project, relying heavily on their existing datasets and then presenting the results to this Committee following discussions with the councils.

The project was founded upon some basic principles:

- Utilise existing agreed data sets and resilency reports produced for councils and agencies in the region.
- Recognise the fit for puropose nature of the existing data and identify issues to resolve in the future.
- Recognise that there are dependacies with non-transport networks such as water, electricity and gas providers and that transport should include rail not just road.
- Take locally scaled resilience assessments and combine these in order to generate a regional scale perspective.
- Develop a simple, accurate and fit for purpose methodology by which to measure transport resiliency, the impacts of resilience and the relative criticality of parts of the transport network.

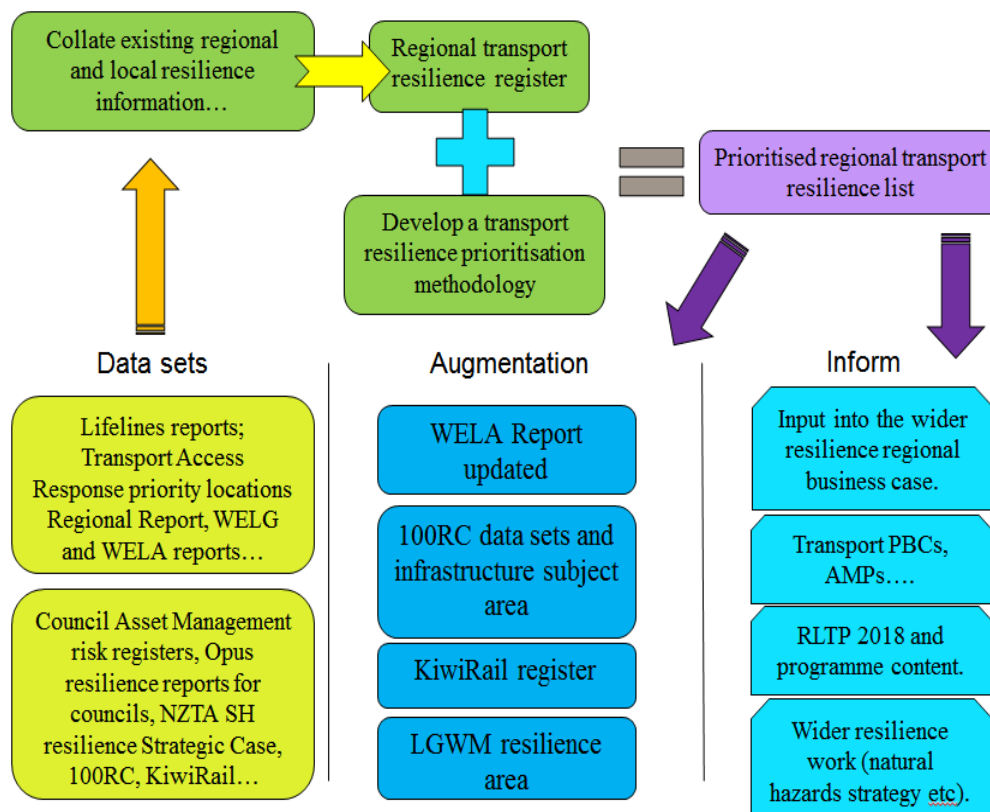The overall outline of the project is detailed in Figure 1.

Figure 1 Regional Transport Resilience project outline

3.1 Evidence base

The Committee has been very clear in its desire to utilise existing data and reports in relation to this project and this has been a key part of this project. Existing reports for NZTA, councils in the region and bodies such as Lifelines, 100 Resilient Cities etc have been used and no new data collection undertaken. These existing pieces of work often represent data sources commissioned by councils and agreed with councils meaning they have value as an agreed evidence base.

These data sets were sourced across the region and collated into a single "regional resilience risk register". This covered the state highway network, the local road network (defined by arterial and collector roads) and any significant local roads important for key lifelines. It also included the rail and utility networks plus aspects such as Lifelines 'response priority' locations.

NZTA and councils in the region were very supportive and helpful in providing both resiliency evidence, reports and thoughts on the data for this project.

3.2 Purpose of the list

The ultimate aim was to produce a list and a set of maps that set out for the region locations in the where the transport network was vulnerable, what it was vulnerable to and how critical that location was in relation to other parts of the region's transport network.

The list has significant value in being an agreed evidence base that enables resiliency projects to be developed and targeted.

The list has a number of uses:

- It identifies critical lengths and points on the transport network. Identifies the hazard or multiple hazards to which the transport network is exposed and interdependencies with utilities etc.
- It creates an agreed regional evidence base and priority list for future the RLTP and projects such as 100 resilient cities and the joint transport / utility regional resiliency business case.
- It enables transport network owners to start looking for resiliency issues and where there may be opportunities for collaborative working between neighbouring councils or utility providers.
- It raises the profile of resilience to enable resilience specific projects to be developed for the RLTP and ensures that resilience can be accounted for in wider transport projects in the RLTP 2018 review
- It allows resiliency to be better prioritised and represented in the RLTP programme in the future and
- It creates a defacto transport resilience monitoring sheet for the RLTP

3.3 Regular review of the list

The list was always intended to be a "live" document that would benefit from regular reviews. This reflects the pace at which resiliency knowledge and data sets are themselves updated.

It also recognises that some assessment areas are either lacking as much information as would be ideal or are in need of a refresh. This includes for

instance revisiting and updating the Wairarapa Emergency Lifelines Association resilience assessments, working more closely with KiwiRail on rail network resiliency and developing a better understanding of storm resiliency. It is intended to start to improve some of these types of data over the next few years.

The RLTP is reviewed every three years and renewed fully every six years. Thus it would seem appropriate to review the prioritised last at least every six years and probably every three years in the short term as some data sets are sharpened up.

4. Methodology

The aim was to keep the methodology simple using the most relevant assessment / prioritisation factors.

Much of this data existed in the form of geospatial mapping layers. This enables maps to be produced, not just a priority table.

The methodology is broadly as follows:

1. Pre-existing "importance" GIS layers from work done for each council and NZTA are combined. Some gaps are filled in KCDC, UHCC and Wairarapa. This establishes the transport network **"Importance".**

2. The resilience availability status for the transport network is also already known and agreed for various event types. Combine the "availability" with the "outage state" (time and degree of outage, all lanes closed or partially closed etc) to create a "**Disruption State**".

3. Combine these two GIS layers (**importance + disruption**). The combined result gives you basic "Criticality" for the transport network for event types.

4. Then factor in multi modal impacts on the transport network (alternative routes, multiple impacts on numerous modes etc) and shared vulnerability with utilities (water, electricity, gas).

5. When these factors are added the maximum hazard criticality locations can be seen from extreme, then severe through high to moderate etc

6. Each segment of the transport network or specific location is displayed by hazard types that location is vulnerable too.

7. The map base is then converted into a prioritised list with from extreme criticality at the top.

A more detailed summary of the prioriotisation methodology is given in **Attachment one**.

4.1 The prioritised regional transport resilience list

The final maps display criticality in two ways. In its coarsest form the network is presented as segments ("segmented") where the network is seen as discrete chunks but it is also mapped as specific points on the network. It is important that both maps are analysed because they display subtle differences of detail.
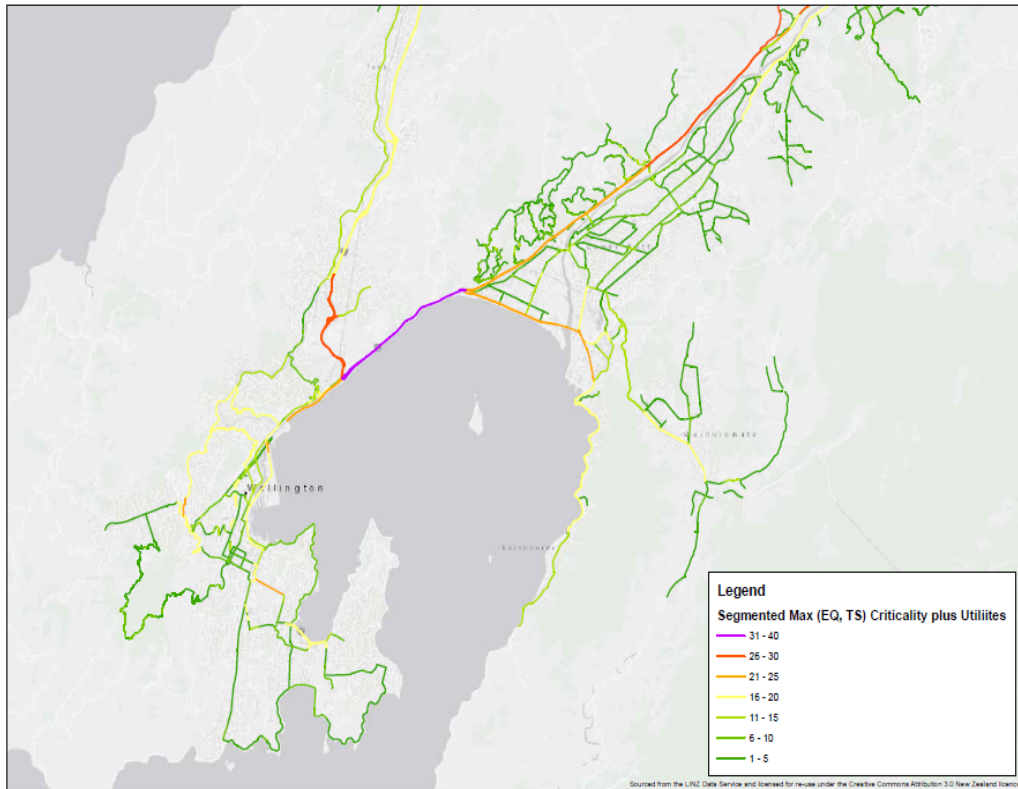
Figure 2 Regional Transport Resilience segmented network map

For example Figure 2 shows how the segments of the transport network (e.g SH1 Ngauranga Gorge) might be rated as critical (red). However in Figure 3 the more detailed map shows that the vulnerability in the Gorge is in only two isolated locations (red) near the north end as identified in the red circle.
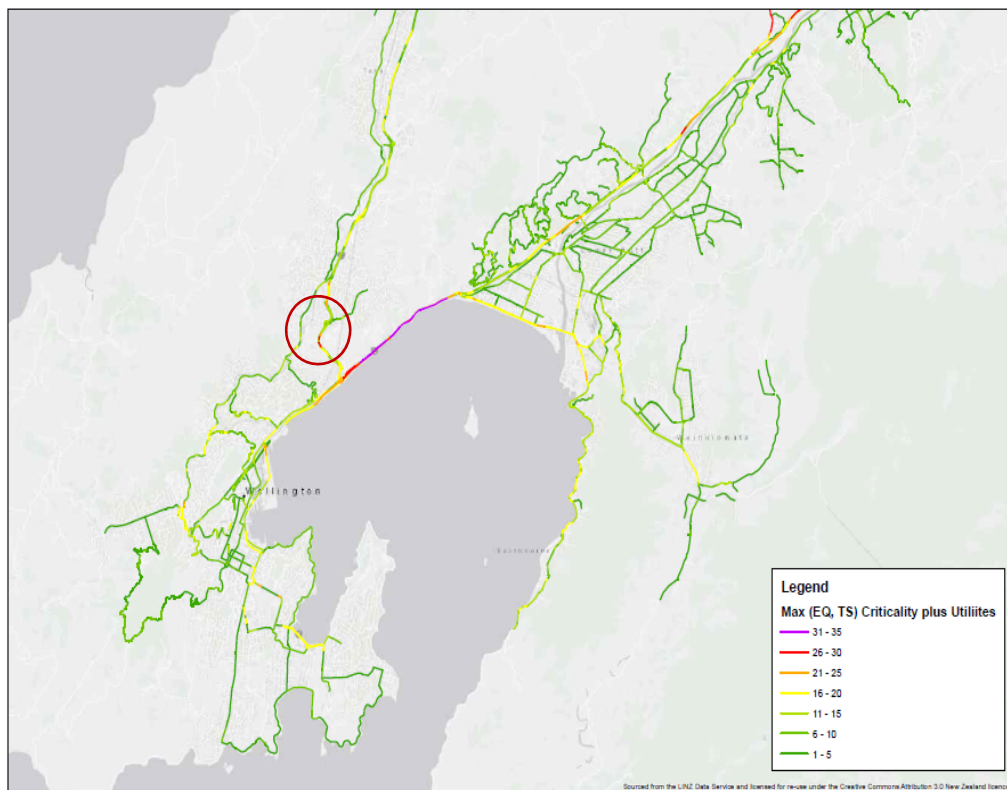

Figure 3 Regional Transport Resilience unsegmented map

It is important that the maps are used together with the priority list to be able to identify the correct intervention and to understand where the vulnerabilies are.

The resulting draft priorised regional transport resilience list is presented in **Attachment 2** and top of the list is shown in Figure 4.

Criticality Rating	Network Segment	Critical Section(s)	Vulnerable to			RCA owner
			E Quake	Tsunami	Storm	
Extreme	SH2 Petone to Ngauranga	Petone to Ngauranga	Yes	Yes	Yes	NZTA / Kiwirail
Very High	SH1 Ngauranga Gorge	Johnsonville Bypass	Yes	No	Yes	NZTA/ Kiwirail
Very High	SH1 Paremata to Plimmerton	Paremata & Goats Point	Yes	No	No	NZTA/ Kiwirail
Very High	SH1 Pukerua Bay to Paekakariki	Coastal Section	Yes	Yes	Yes	NZTA/ Kiwirail
Very High	SH58 Haywards to Moonshine	Haywards Hill	Yes	Yes	No	NZTA
Very High	SH2 Kennedy Good Br to Manor Park	Kelson Area	Yes	No	Yes	NZTA/ Kiwirail
Very High	SH2 Manor Park to Silverstream	Manor Park to Silverstream	Yes	No	Yes	NZTA/ Kiwirail
Very High	SH2 Brown Owl to Te Marua	Birchville to Mangaroa Rd	Yes	No	Yes	NZTA
Very High	SH2 Rimutaka Hill Road	Pakuratahi to Featherston	Yes	No	Yes	NZTA
Very High	SH1 Otaihanga Rd to Waikanae	Waikanae River/Rail Crossing	Yes	No	Yes	NZTA/ Kiwirail
Very High	SH1 Shell Gully Overbridge	Bridge	Yes	No	No	NZTA/ Kiwirail
Very High	SH1 Thorndon Overbridge	Bridge	Yes	Yes	No	NZTA/ Kiwirail
Very High	SH1 Southern Rail Overbridge	Bridge	Yes	Yes	No	NZTA/ Kiwirail
Very High	SH1 Paekakariki Overbridge	Bridge	Yes	No	No	NZTA/ Kiwirail
Very High	SH1 Otaki River Bridge	Bridge	Yes	No	Yes	NZTA/ Kiwirail
Very High	Churchill Drive	Otari to Blackbridge Road	Yes	No	Yes	WCC
High	SH1 Mt Victoria Tunnel	Portal / Approaches	Yes	No	Yes	NZTA
High	SH1 Thorndon to Ngauranga	Kaiwharawhara to Ngauranga	Yes	Yes	No	NZTA/ Kiwirail
High	Aotea Quay	Aotea Quay Off ramp	Yes	Yes	No	NZTA / WCC/ Kiwirail
High	SH1 Mungavin IC to Paremata	Ramp Bridge to Paremata Bridge	Yes	Yes	No	NZTA/ Kiwirail
High	SH1 Paekakariki to Plimmerton	Plimmerton to Airlie Road and Centennial HW	Yes	No	Yes	NZTA/ Kiwirail
High	SH1 Paekakariki - Paraparaumu	Paekakariki - Paraparaumu	Yes	No	Yes	NZTA/ Kiwirail
High	SH1 Waikanae to Peka Peka	Waikanae to Peka Peka	Yes	No	No	NZTA/ Kiwirail

Figure 4 Indicative layout of the draft Prioritised Regional Transport Resilience list

The prioritised list and maps identify segments of the transport network that are vulnerable to resiliency issues, which specific locations within the segments are critical risks and what events those locations are vulnerable to. The unsegmented maps provide the base data for the segmented maps where the information is gather together at a higher level.

The draft prioritised list was supplied to council partners and NZTA in October 2016 and feedback sought. The draft list can be seen in **Attachment 2**.

4.2 Feedback on the draft prioritised regional transport resilience list

Five sets of comments were received from councils and NZTA.

Comments were generally supportive of the methodology, the purpose and content of the draft prioritised list.

Comment from	Nature of the Comment	Response
HCC	General agreement with the draft list. Queries as to why The Esplanade and Seaview Road have been assessed as High while Eastern Hutt Road is Moderate and why Parkside Road is in the Moderate category.	Esplanade and Seaview Road have come up high because they also carry important utilities – bulk water main and access to petroleum facilities, conversely that doesn't apply to Easrtern Hutt Road. Parkside Road will have higher importance because of the fire station, and poor resilience because of its vulnerability to multiple hazards
KCDC	Support for the methodology. Query about whether the list assessed the situation now or post Expressway	The list represents the current state. Any planned works or those in progress can be recorded as the proposed mitigation.
MDC / CDC	Concern that SH2 Rimutaka Hill was only rated "high" in the draft table. Suggested that this be addressed by including "economic affects" in the methodology.	This was discussed with NZTA (who are responsible for the road). They confirmed the draft rating. Adding economics to the methodology was discussed with the consultants and NZTA. The view was that there was no agreed way to assess economics within the methodology and adding it to the methodology could actually result in SH2 Rimutaka Hill being less of a priority not more given locations nearer the CBD might be artificially prioritised higher.
NZTA	Positive feedback and support for the process and the draft list. There was a desire for more knowledge about the effect of storms on the regional network. And a request for	The intent is to fill in data gaps as we move forward, including the one identified. The graphics request is noted.

	more graphics on the maps for Lifelines response priority locations, population centres etc.		
WCC	Typographical errors.	Noted	

5. Next Steps

There seems support for the draft list, both in how it could be used and how it has been developed.

With this in mind the intent would be to use any list endorsed at this meeting to raise awareness of the identified critical transport locations with council and Agency roading staff in order that they might consider the most appropriate course of action in order to address these locations. It would be expected that this thinking would be reflected in the Activity Management Planning currently being undertaken and in the RLTP 2018-21 programme's planning which will commence in 2017.

It also enables councils to work with partners to develop joint programmes and liaise with local communites to determine the best course of action. There is a story to create from the maps and the list as these represent the implied relative priority of each location. For example Fergusson Drive in Upper Hutt is not high up the list in terms of vulnerability but it is currently a more resilient alternative than the neighbouring section of SH2, which raises the question of where best to invest - to upgrade SH2 or invest in ensuring Fergusson Drive stays open. Also the Petone to Grenada project seems to offer a significant resilience benefit in helping to address issues identified in the table and maps but if it is to fulfil this resilience function it must be designed to provide a high level of resiliency.

There is also a desire to start work on filling some of the data and knowledge gaps to improve the data sets and knowledge prior to the RLTP three year review that is also to commence in 2017.

6. The decision-making process and significance

The matter requiring decision in this report has been considered by officers against the requirements of Part 6 of the Local Government Act 2002. Part 6 sets out the obligations of local authorities in relation to the making of decisions.

6.1 Significance of the decision

The matters for decision in this report are subject to the legislative requirements of the Land Transport Management Act 2003. Section 18D(5) of the Land Transport Management Act 2003 requires the Committee to determine if a endorsement of the draft regional transport resilience prioritised list is significant, in accordance with its significance policy adopted under 106(2) of the Land Transport Management Act 2003 and included in the RLTP Appendix B.

An assessment has been undertaken of the prioritised list against the RLTP significance policy in order to determine the significance of the endorsement and whether that in itself might require a variation to the RLTP. The

assessment has concluded that the matter is not significant, does not require a variation to the RLTP and **does not** trigger the requirement to carry out consultation.

6.2 Engagement

No engagement is necessary in relation to the content of this report. However individual councils and NZTA may in due course utilise aspects of this list in their discussions with their partners and local communities in relation to transport projects and objectives.

7. Recommendations

That the Committee:

1. ***Receives*** *the report.*

2. ***Notes*** *the content of the report.*

3. ***Agrees*** *to endorse the draft Regional Transport Resilience Prioritised List as set out in **Attachment 2** in order that transport providers in the region can use the list to inform their project development in advance of the RLTP review.*

Report prepared by:	Report approved by:	Report approved by:
Mark Edwards	**Harriet Shelton**	**Luke Troy**
Senior Transport Planner	Manager, Regional Transport Planning	General Manager, Strategy

Attachment 1: Regional Transport Network Resilience Programme Business Case - summary methodology.

Attachment 2: Draft Wellington Regional Transport Resilience Prioritised List and Maps.