

# An update on the seismic assessment of the transport network

## Recommendation

That the board

- i. Notes the report.

## Executive summary

In March 2013, the board agreed to a two-stage process for the seismic assessment of the transport structures and buildings. This work has progressed well and primary assessments for major structures and buildings will be complete by December 2014. This is six months ahead of schedule.

Seventy four structures, including bridges, parking buildings and wharves have been identified as requiring a secondary assessment (see Attachment 2). A programme for undertaking these assessments is being developed. The chief executive will be advised if these assets require significant strengthening or replacement.

The Integrated Transport Programme includes a budget of \$200m over three decades for seismic strengthening or replacement. An additional \$40m is included for strengthening the Quay Street sea wall.

On 8 May 2014, the Capital Review Committee noted the seismic screening update.

## Strategic context

The Auckland Plan has identified “A fair, safe and healthy Auckland” as one of its seven aspirational outcomes. This vision is reflected in the Integrated Transport Plan through the requirement to develop a resilient transport network.

Auckland Transport needs to ensure that the transport network is well prepared for the risk posed by natural hazards including seismic events. Seismic assessment of its significant structural and building assets contributes to this outcome.

## Background

In March 2013, the board approved a two-stage process of primary and secondary assessments to assess the performance of transport buildings and structures in a seismic event. These include bridges, culverts, retaining walls, wharfs, sea walls and parking buildings.

The two-year assessment programme started in July 2013.

## Issues and Options

### The assessment process

Auckland Transport is assessing its structures and buildings in the following order of priority:

1. Structures on arterial and collector roads and lifeline routes
2. All public transport structures including bus way stations, rail stations, wharfs and parking buildings
3. Selected bridges and culverts on local roads which are considered high risk (e.g. located on a single access route to a community)
4. All other major transport structures and buildings.

### Progress on assessments

The primary assessment on most major structures and buildings, excluding retaining and sea walls, will be done by the end of June 2014. The completed assessments are detailed in Attachment 1. The remaining assessments will be complete by December 2014, six months ahead of schedule.

The current programme of assessments does not include short span bridges, small retaining and sea walls, small culverts, overhead sign gantries and underpasses. These are either of low risk of failure in an earthquake, or the potential impact of failure on the safety and operation of the network will be minimal. The primary assessment of these structures will be completed over the next five years.

Attachment 2 details the seventy four structures that have so far been identified as requiring a secondary seismic assessment.

Secondary assessments will generally be undertaken within twelve months after the primary assessment. Where a structure is found to be of significant risk in a seismic event and requires strengthening or replacement, this will be reported to the chief executive. Advice will be provided as to whether the structure can continue to be used or alternatively what temporary measures need to be put in place.

At present only the Quay Street sea wall has been identified as requiring seismic strengthening. This was identified through the development of the Quay Street upgrade project.

### Building (Earthquake-prone Buildings) Amendment Bill

In December 2013, draft legislation was introduced to Parliament to amend the way the Building Act deals with seismic risk to structures and buildings. Consultation on this prospective legislation is currently underway.

The legislation will require the Chief Executive of the Ministry of Business, Innovation and Employment to set a methodology for seismic assessments. This may not fully align with the assessment process we are currently following. To mitigate this risk we have adopted current industry best practice on seismic assessments and are confident that any potential change in methodology will have minimal impact.

## Funding for assessments and strengthening

A budget of \$2m for primary assessments has been approved by the board. This will be sufficient to complete the task for all major structures and buildings. The primary assessment of the remaining minor structures will be funded through existing budgets.

A budget of \$1m annually for secondary assessments has been identified and included in the Long Term Plan. The cost of secondary assessments varies according to the nature of structure or building. As a guide the approximate cost of assessing a bridge is \$45k.

The ITP includes a budget of \$200m over three decades for seismic strengthening. In addition \$40m has been set aside for strengthening the sea wall to support the Quay Street upgrade project.

As further analysis is undertaken we will review budgets to ensure that they are sufficient. The timing of individual strengthening projects will be decided based on risk and criticality.

## Next steps




The programme of primary seismic assessments will continue through to December 2014. A full summary of findings will be provided early in 2015.

Secondary assessments will continue over a number years.

## Attachments

Number	Description
1	Schedule of Primary Assessments to June 2014
2	Schedule of Secondary Assessments

## Document ownership

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## Glossary

Acronym	Description	Business Unit
AC	Auckland Council	Corporate
AT	Auckland Transport	Corporate
ITP	Integrated Transport Programme	Strategy and Planning
LoS	Levels of Service	Strategy and Planning
LTP	Long Term Plan	Corporate
NZTA	New Zealand Transport Agency	Corporate
AC	Auckland Council	Corporate

**Attachment 1 - Schedule of Primary Assessments to June 2014.**

Asset Type	Road Hierarchy	Auckland Transport Inventory	Complete @ June 2013	Forecast Complete @ June 2014	Total	Forecast Complete @ June 2014
Bridges	Strategic Roads	365	242	107	349	96%
	Local Roads	287	45	93	138	48%
	<b>TOTAL</b>	<b>652</b>	<b>287</b>	<b>200</b>	<b>487</b>	<b>75%</b>
Major Culverts	Strategic Road	221	42	168	210	95%
	Local Roads	153	3	77	80	52%
	<b>TOTAL</b>	<b>374</b>	<b>45</b>	<b>245</b>	<b>290</b>	<b>78%</b>
Retaining Walls	Strategic Roads	1503	0	161	161	11%
	Local Roads	1799	0	0	0	0
	<b>TOTAL</b>	<b>3302</b>	<b>0</b>	<b>161</b>	<b>161</b>	<b>5%</b>
Sea Walls	Strategic Roads	51	0	1	1	2%
	Local Roads	136	0	0	0	0
	<b>TOTAL</b>	<b>187</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0.5%</b>
Wharfs		21	0	21	21	100%
Parking Buildings		13	4	8	12	92%
Train Stations		52	1	51	52	100%
Bus Stations		5	0	5	5	100%
	<b>TOTAL</b>	<b>91</b>	<b>5</b>	<b>85</b>	<b>90</b>	<b>99%</b>

## Attachment 2 – Schedule of Secondary Assessments

Asset Type	Road Hierarchy	Secondary Assessment Required	Comments
Bridges	Strategic Roads	64	Secondary assessments for 5 bridges – to be completed by the end of June: <ul style="list-style-type: none"> <li>• Mt Albert Road Over bridge</li> <li>• Dominion Road Bridge Access Ramp</li> <li>• Nelson Street Bridge</li> <li>• Purewa Bridge</li> <li>• Ngapipi Bridge</li> </ul>
Major Culverts	Strategic Roads	1	
Retaining Walls	Strategic Roads	0	
Sea Walls	Strategic Roads	1	Quay Street Sea Wall as already been identified as requiring seismic strengthening.
Wharfs		4	Secondary assessments for 4 wharves – to be completed by June 2014: <ul style="list-style-type: none"> <li>• Downtown Ferry Terminal</li> <li>• Devonport Ferry Terminal</li> <li>• Birkenhead Ferry Terminal</li> <li>• Matiatia Ferry Terminal</li> </ul>
Parking Buildings		4	Secondary assessment of four parking underway: <ul style="list-style-type: none"> <li>• Downtown Car Park</li> <li>• Clonbern Car Park</li> <li>• Victoria Street Car Park</li> <li>• Fanshawe Street Car Park</li> </ul>
Train Stations		0	
Bus Stations		0	