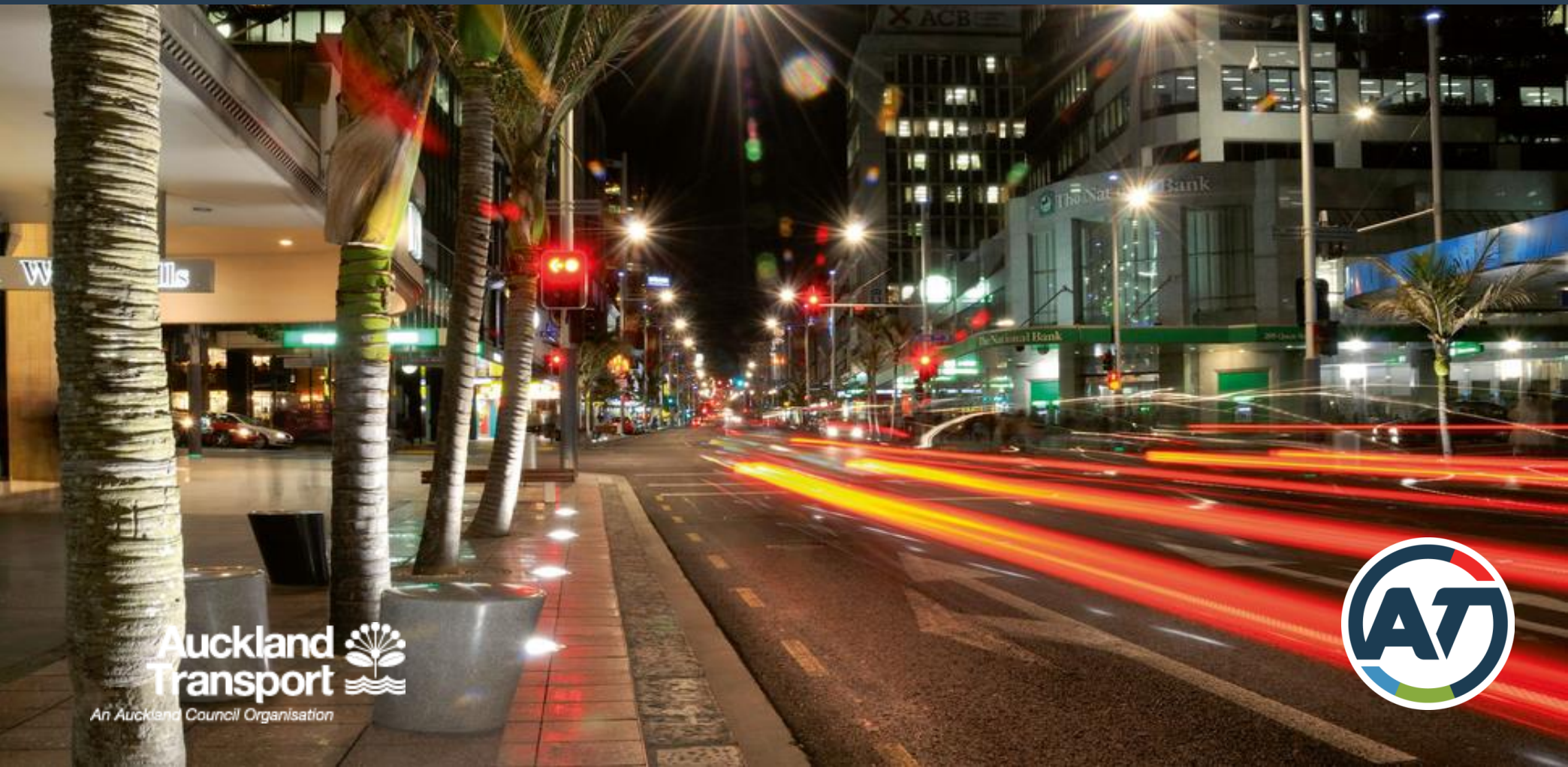


# Asset Condition Inspection Update Q3 2019/20

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**Date: 16 June Board Meeting**



# Purpose

This report is provided on a quarterly basis and provides an overview of the condition of Auckland Transport's structural assets and an update on the progress and outcomes of inspections undertaken.

The report also includes:

- an update on seismic assessments and strengthening works
- an update on active landslip monitoring and remedial work.

Structural Assets are categorised into:

- Roading Structures
- Metro Structures
- Carpark Buildings.

# Overview of Structural Asset Condition

Assets	Total No. of Assets	Asset Condition					
		Excellent	Good	Moderate	Poor	Very Poor	Unknown
All	7841	506 (6.45%)	3127 (39.88%)	2779 (35.44%)	658 (8.40%)	104 (1.33%)	667 (8.50%)

## Notes on Asset Condition and Unknown Assets:

- Assets found to be in 'Poor' and 'Very Poor' condition are prioritised for repair or renewal.
- Asset condition inspections are programmed for all assets with unknown condition ratings and will be completed by June 2021. These inspections could not be previously completed due to difficult access or over grown vegetation. Access and other means of inspections are currently being investigated.
- A large number of these unknowns are cycleway bridges where the management responsibility has not been confirmed i.e. whether it is Auckland Transport or Auckland Council. However, AT has now decided to include them in the inspection programme.

# Overview of All Structures - Asset Condition vs. Network Criticality

		All Structures						
		Condition (Likelihood)						
		Excellent	Good	Moderate	Poor	Very Poor	Unknown	Total
Network Criticality (Consequence)	Level 5 - Minor	165	1064	796	216	32	330	2603
	Level 4 - Local	73	506	457	127	17	91	1271
	Level 3 - Significant	111	639	566	139	30	92	1577
	Level 2 - Major	81	425	482	91	14	91	1184
	Level 1 - Vital	76	493	478	85	11	63	1206
Total (%)		506 (6.45%)	3127 (39.88%)	2779 (35.44%)	658 (8.40%)	104 (1.33%)	667 (8.50%)	7841 (100%)

## Notes:

- Assets found to be in 'Poor' and 'Very Poor' condition and of 'Vital' or 'Major' criticality are prioritised for repair or renewal.

# Breakdown per Asset Class

## Asset Condition vs. Network Criticality

Asset Class	Criticality	Condition Rating					
		Excellent	Good	Average	Poor	Very poor	Unknown
Bridges	Level 5 - Minor	27	56	98	38	2	94
	Level 4 - Local	13	55	58	24	1	30
	Level 3 - Significant	21	49	39	13	3	35
	Level 2 - Major	4	43	25	11		38
	Level 1 - Vital	13	42	24	3		17
Culverts	Level 5 - Minor	19	65	35	7	1	5
	Level 4 - Local	12	36	27	3		7
	Level 3 - Significant	11	35	24	4		2
	Level 2 - Major	9	21	14	2		2
	Level 1 - Vital	6	23	10	1	2	1
Retaining walls	Level 5 - Minor	105	829	540	121	24	224
	Level 4 - Local	35	317	255	61	13	53
	Level 3 - Significant	51	360	260	62	12	55
	Level 2 - Major	41	162	118	28	5	45
	Level 1 - Vital	33	213	129	23	3	40
Sea walls	Level 5 - Minor	4	37	27	14		2
	Level 4 - Local	1	23	31	15	1	
	Level 3 - Significant		14	3	2		
	Level 2 - Major		4	3	1		
	Level 1 - Vital		5	10	11		1
Gantries	Level 5 - Minor						
	Level 4 - Local						1
	Level 3 - Significant						
	Level 2 - Major			2	2		3
	Level 1 - Vital		8	2			2
Bus shelters	Level 5 - Minor	2	38	66	30	3	5
	Level 4 - Local		31	63	22	1	
	Level 3 - Significant	2	83	174	43	9	
	Level 2 - Major		53	140	26	1	3
	Level 1 - Vital		48	156	37	1	2

Asset Class	Criticality	Condition Rating					
		Excellent	Good	Average	Poor	Very poor	Unknown
ADS	Level 5 - Minor	8	20	16	5	1	
	Level 4 - Local	12	25	20		1	
	Level 3 - Significant	26	89	64	14	6	
	Level 2 - Major	27	138	179	19	8	
	Level 1 - Vital	24	151	145	10	5	
Rail stations & Depot	Level 5 - Minor		17	3	1		
	Level 4 - Local		14				
	Level 3 - Significant		8	1			
	Level 2 - Major						
	Level 1 - Vital		2				
Busway stations	Level 5 - Minor						
	Level 4 - Local		2				
	Level 3 - Significant						
	Level 2 - Major		3				
	Level 1 - Vital						
Wharves	Level 5 - Minor		1	9		1	
	Level 4 - Local		1	2	2		
	Level 3 - Significant			1	1		
	Level 2 - Major			1	2		
	Level 1 - Vital			1			
Carpark building	Level 5 - Minor		1	2			
	Level 4 - Local		2	1			
	Level 3 - Significant		1				
	Level 2 - Major		1				
	Level 1 - Vital		1	1			



# Roading Structures

- Roothing Structures include:
  - Bridges
  - Culverts
  - Retaining Walls
  - Seawalls
  - Advance Directional Signs (ADS)
  - Sign Gantries
  - Bus Shelters (within the Road Corridor).
- All Roothing Structures are inspected according to NZ Transport Agency Standards (NZTA S6 Highway Structures Inspection Policy) and international best practices (UK Standard – Inspection of Highway Structures (BD63/17), AS-VicRoads Road Structures Inspection Manual).
- The frequency of these inspections are normally every two years, depending on age, except for, Monitoring and Special Inspections.
- Monitoring and Special Inspections are scoped depending on the requirement of the structure and its conditions or any specific concerns.
- Findings from the inspections normally form inputs to maintenance and renewal forward works programmes.

# Roading Structures – Inspection Programme

- The list below provides the details for inspections completed last quarter, and those programmed for next quarter:

Type of Asset	Total No. of Assets	No of inspections planned for Year 2019-20	No of inspections completed to end FY Q3	No of inspections planned for FY Q4	No. of Assets reported "Very Poor " condition in last quarter
<b>Bridges</b>	876	327	242	85	0
<b>Culverts</b>	384	347	207	140	0
<b>Retaining Walls</b>	4217	1960	746	1214	0
<b>Seawalls</b>	209	154	8	146	0
<b>Bus Shelters</b>	1039	728	627	101	0
<b>ADS Signs</b>	1013	324	276	48	0
<b>Sign Gantries</b>	20	30	14	16	0

# Metro Structures

- Metro Structures and Carparks include:
  - Wharves
  - Rail Stations
  - Busway Stations.
- All Metro Structures are inspected according to International Infrastructure Management Manual (IIMM), National Asset Management Support (NAMS) guidelines and international best practices.
- The frequency of these inspections are normally every two years, depending on age, except for, Monitoring and Special Inspections.
- Monitoring and Special Inspections are scoped depending on the requirement of the structure and its conditions.
- Findings from the inspections normally form the background to maintenance and renewal forward works programmes.



# Metro Structures

- The list below provides the details for inspections completed last quarter, and those programmed for next quarter:

Type of Asset	Total No. of Assets	No. of inspections planned for Year 2019-20	No. of inspections completed to end of FY Q3	No. of inspections planned for FY Q4	No. of Assets reported "Very Poor" condition in last quarter
Wharves and Ferry Facilities	22	7	3	4	0
Railway Stations	46	25	14	11	0
Busway Stations	5	5	0	5	0

## Notes:

On 1 April 2020 AT took responsibility for the two airfields on Great Barrier Island. These include a number of structures which will be added to the inspection programme and recorded in the condition assessment reporting in future.

# Carpark Buildings

- All Carpark Buildings are inspected according to International Infrastructure Management Manual (IIMM), National Asset Management Support (NAMS) guidelines and international best practices.
- The frequency of these inspections are normally every two years, depending on age, except for, Monitoring and Special Inspections.
- Monitoring and Special Inspections are scoped depending on the requirement of the structure and its conditions.
- Findings from the inspections normally form the background to maintenance and renewal forward works programmes.

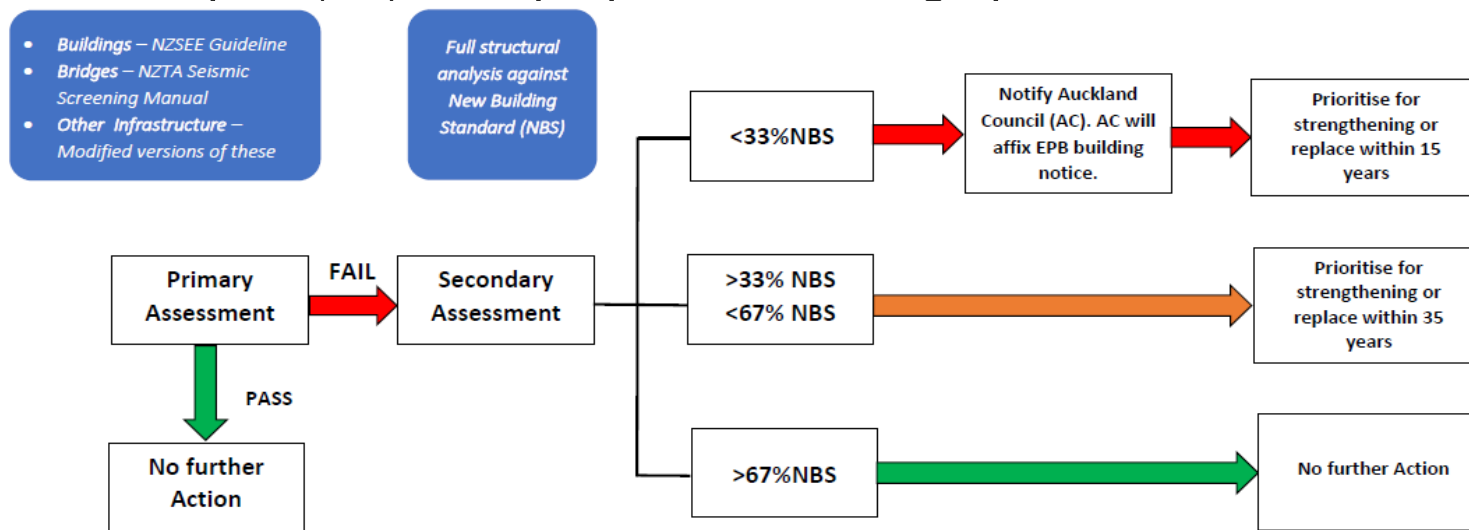
# Carpark Buildings

- The list below provides the details for inspections completed last quarter, and those programmed for next quarter:

Type of Asset	Total No. of Assets	No. of inspections planned for Year 2019-20	No. of inspections completed to end of FY Q3	No. of inspections planned for FY Q4	No. of Assets reported "Very Poor" condition in last quarter
Car Parks - Buildings	10	8	6	2	0

# Seismic Assessment and Strengthening

- The Building (Earthquake-prone Buildings) Amendment Act 2016 introduced major changes to the way earthquake-prone buildings are identified and managed under the Building Act (2004).
- Auckland is classified as a Low Seismic Risk zone where building owners are required to complete seismic assessments within 15 years and take action to remediate their buildings to achieve a minimum 34%NBS standard within 35 years.
- AT is drafting a policy for the management of risks associated with seismic events for all transport assets, and buildings owned, leased, occupied or managed by Auckland Transport (AT). The proposed two stage process is summarized below:



# Seismic Assessment Outcomes

The table below summarises the outcomes of the assessments to date:

Asset Type	Total Assets	Assessments Completed to Date	<33% NBS	34% to 67% NBS	Total requiring retrofit/strengthening
Bridge	876	653	0	2	<ul style="list-style-type: none"> <li>2 bridges require replacement</li> <li>13 bridges require minor retrofit</li> </ul>
Culvert (large)	384	374	0	0	0
Retaining Wall / Seawall (>2m)	4426	977	1	0	1 (Quay Street Seawall)
Train Station/ Depot	46	42	0	0	0
Bus Station	5	5	0	0	0
Carpark Building	10	7	1	2	3 (Downtown Carpark, Fanshawe Carpark, Victoria Street Carpark)
Wharves	22	22	4	9	13

# Seismic Strengthening/Renewal Progress<sup>14</sup>

Asset Name	% NBS	Remediation Required	Progress
Fanshawe Carpark	>33% and <67%	Further assessment to confirm scope	Detailed seismic assessment needs to be peer reviewed to confirm the NBS results. The peer review is planned to be completed by June 2021.
Downtown Carpark	Draft report indicates <33%	Further assessment to confirm scope	After finalisation of seismic assessment report, remedial works are planned within next 2 years by Year 2021/22.
Victoria Street Carpark	>33% and <67%	Strengthening	Strengthening works planned to be delivered within next 3 years by Year 2022/23.
Quay Street Seawall	<33%	Strengthening	Construction ongoing under Downtown programme. Works to be completed by end of 2020.
13 Bridges	Targeted assessment	Minor repairs/retrofits	Design completed. Works planned on site for Year 2020/21
Inga Road Bridge	<33%	Replacement	Bridge replacement planned within the next 3 years.
Panmure Bridge	>33% and <67%	Replacement	Bridge replacement planned within the next 23 years.

# Seismic Strengthening/Renewal Progress <sup>15</sup>

Asset Name	% NBS	Remediation Required	Progress
Downtown Ferry Terminal Pier 2	<33%	Replacement	Replacement to be scoped and programmed after the America's Cup.
Bayswater Wharf (old)	<33% (Based on IEP Screening)	Further assessment to confirm scope	Detailed seismic assessment needs to be completed to confirm the NBS. The assessment is planned to be completed by June 2021.
Beach Haven Wharf (old)	<33% (Based on IEP Screening)	Further assessment to confirm scope	Detailed seismic assessment needs to be completed to confirm the NBS. The assessment is planned to be completed by June 2021.
Okupu Wharf	<33% (Based on IEP Screening)	Further assessment to confirm scope	Detailed seismic assessment needs to be completed to confirm the NBS. The assessment is planned to be completed by June 2021.
Northcote Wharf	>33% and <67% (Based on IEP Screening)	Strengthening	Seismic remedial works to be part of other works related to asset deterioration currently planned to be completed by December 2020.
Sandy Bay Wharf	>33% and <67% (Based on IEP Screening)	Further assessment to confirm scope	Detailed seismic assessment needs to be completed to confirm the NBS. The assessment is planned to be completed by June 2021.

# Seismic Strengthening/Renewal Progress<sup>16</sup>

Asset Name	% NBS	Remediation Required	Progress
Matiatia Wharf	>33% and <67% (Based on IEP Screening)	Further assessment to confirm scope	Detailed seismic assessment needs to be completed to confirm the NBS. The assessment is planned to be completed by June 2021.
Schoolhouse Bay Wharf	>33% and <67% (Based on IEP Screening)	Further assessment to confirm scope	Detailed seismic assessment needs to be completed to confirm the NBS. The assessment is planned to be completed by June 2021.
Shoal Bay Wharf	>33% and <67% (Based on IEP Screening)	Further assessment to confirm scope	Detailed seismic assessment needs to be completed to confirm the NBS. The assessment is planned to be completed by June 2021.
South Cove Wharf	>33% and <67% (Based on IEP Screening)	Further assessment to confirm scope	Detailed seismic assessment needs to be completed to confirm the NBS. The assessment is planned to be completed by June 2021.
Whangaparapara Wharf	>33% and <67% (Based on IEP Screening)	Further assessment to confirm scope	Detailed seismic assessment needs to be completed to confirm the NBS. The assessment is planned to be completed by June 2021.
Devonport Wharf	>33% and <67% (subject to peer review)	Further assessment to confirm scope	Detailed seismic assessment needs to be peer reviewed to confirm the NBS results. The peer review is planned to be completed by June 2021.
Birkenhead Wharf	>33% and <67% (subject to peer review)	Further assessment to confirm scope	Detailed seismic assessment needs to be peer reviewed to confirm the NBS results. The peer review is planned to be completed by June 2021.





# Active Landslip Monitoring and Remediation

- Where landslip movement is observed along a transport corridor, AT initially takes interim measures by responding immediately to secure the site through isolating any areas of instability, providing safety barriers, appropriate warning signs, and initiating landslip movement monitoring.
- Permanent remedial works can include either building a new retaining structure, or reinforcing/reinstating the bank. The remedial works are prioritised, programmed and delivered based on:
  - Safety,
  - Risk of further damage, and
  - Network criticality.

# Active Landslip Monitoring and Remediation

- The list below provides a summary of the progress on delivery of the remediation works of prioritised slip sites:

Total number of Slip Sites	High Priority Sites				Medium Priority Sites	Low Priority Sites
	Total	Programmed for Remedial Works	Delivered to date	Delivery in progress during FY 2019/20	Remedial works programme during FY 2020/21 and FY 2021/22	Remedial works currently not programmed but being monitored
110	53	53	40	9	48	13

**Note:**

- All Slips sites where remedial works are yet to be delivered are currently being monitored on a regular basis or soon after a heavy rainfall event.

# Active Landslip Monitoring and Remediation

- The following Slip site(s) are new site(s) or are existing site(s) that have changed condition leading to reprioritisation:

Site Location	RP	Priority	Description of Defect/Issue	Action taken/planned
Great North Road (near Waterview)	ATP-TS-018	High	The slip has been showing accelerated movement during April 2020. Beca and Downer have been monitoring the slip and have noted new additional cracks on the footpath. Due to its currently observed movement, it is likely that the embankment may fail leading loss of the footpath and bus stop layby. Both the footpath and bus stop layby fall under the active slip zone.	<p>As an interim measure to protect the customers/users and to reduce the ongoing surcharge load on the active slip zone, AT has closed the section of the footpath affected and created a suitable diversion and moved the bus stop north of the site. A weekly monitoring inspections has also been put in place to monitor any movement.</p> <p>The permanent stabilisation works will require a significant structure to address what is a deep seated failure some 15-20m down from the level of Great North Road. An early indication of the rough order cost of a solution may cost between \$3M to \$4M.</p>

# Update on Key Structural Defects and Remediation

Asset Name	Description	Current Update	Status	Target Completion Date
<b>Britomart Centre</b>	There is water ingress through secant pile walls of Britomart Centre. Investigations carried out has confirmed that the water is saline in nature. There is evidence of early stages of corrosion which is likely to have an impact on its 100 year design life.	<ol style="list-style-type: none"> <li>1. After the successful trial methodology for repairs in December 2019, further areas of the northern secant piles were completed before Covid-19 Level 4 lock down.</li> <li>2. The repairs on the south secant piles will be programmed once construction restrictions related to Covid-19 is over.</li> <li>3. Corrosion protection for the reinforcements to maintain the design life is programmed for next financial year 2020/21.</li> </ol>	In progress	June 2021
<b>VMS Gantry failure at Whangaparaoa Road</b>	<p>The dynamic lane VMS Gantry No. 1 on Whangaparaoa Road failed on 5 August 2019 with the end of the mast-arm and VMS landing on the centre of the road. Based on investigations carried out for Gantry 1, the following were the key findings:</p> <ul style="list-style-type: none"> <li>• The gantry was built based on the wind loading standards and calculations.</li> <li>• Stresses from wind on Gantry no.1 were higher and different than the standards predicted.</li> <li>• A secondary factor was the lack of weld fusion.</li> <li>• The cause of failure of the pole cannot be blamed on one issue but was caused by several factors.</li> </ul>	<ol style="list-style-type: none"> <li>1. Replacement of the gantry design is programmed to be delivered by 31 May 2020.</li> <li>2. The construction works are currently programmed to be delivered first quarter of the next financial year (Year 2020/21). However, this depends on the Covid-19 construction restrictions.</li> </ol>	In progress	30 September 2020



# Update on Key Structural Defects and Remediation

Asset Name	Description	Current Update	Status	Target Completion Date
<b>Northcote Pt Wharf</b>	Key structural elements significantly deteriorated (piles and cross members).	<ol style="list-style-type: none"> <li>1. Wharf continues to be closed.</li> <li>2. Wharf to be inspected after severe weather events.</li> <li>3. Detailed design has been completed.</li> <li>4. The award of the construction contract is currently on hold due to Covid-19 construction restrictions.</li> </ol>	On hold	30 October 2020
<b>Asbestos Management Plans</b>	WorkSafe Asbestos Regulations require Asbestos Management Plans to be produced for all buildings owned or operated by a PCBU.	<p><b><i>PT Facilities and Carparks</i></b></p> <p>Asbestos surveys have been complete for 56 PT Facilities and Carparks to date. Asbestos Management Plans have been drafted for 16 facilities at which asbestos was identified or is presumed to be present. The plans are currently being reviewed internally by AT. The remaining surveys are scoped to be completed next financial year 2020/2021.</p> <p><b><i>Roading Structures</i></b></p> <p>The scope to undertake asbestos surveys and prepare an overarching asbestos management plan for selective AT Bridges and Major Culverts has been prepared. However, this work has currently been put on hold and will commence after Covid-19 related construction restrictions are over.</p>	In progress	December 2020

# Update on Key Structural Defects and Remediation

Asset Name	Description	Current Update	Status	Target Completion Date
<b>Investigations into Aluminium Composite Panels (ACP)</b>	The AT Board has requested that a register be compiled of all AT Structures which are known to (or presumed to) contain Aluminium Composite Panels.	<p>As part of developing the register a desktop review of all PT facilities to identify where ACP is likely has started. The initial review has confirmed 32 assets with confirmed ACP presence All of confirmed assets are Rail Stations, example locations include, Britomart Rail Station, Ellerslie Rail Station.</p> <p>The review has also highlighted around 50 locations where insufficient information was available and requires further investigation. A more comprehensive review of records will be carried out with a view to providing a register including an assessment of the risk posed by ACP where it is identified. The review will be followed by site visits if details are missing during this review. Any site visits will be planned when Covid-19 related construction restrictions are over.</p>	In progress	11 December 2020
<b>Half Moon Bay - Vehicular Wharf Refuelling Jetty</b>	<p>A Detailed Condition Assessment in December 2019 highlighted extensive corrosion of steel piles and severely corroded connections of steel beams supporting the gangways.</p> <p>These defects currently pose a low risk to public/passengers. However, it may have an affect on the ferry operations and overnight mooring of SeaLink vessels.</p>	<p>GHD have been engaged to undertake an urgent review of the loading on the platform and investigate remediation options.</p> <p>Once the recommended option is confirmed, detailed and the remedial works will be delivered.</p> <p>As an interim measure to monitor the defects, there has been monitoring inspections set-up on a monthly frequency and/or after a severe storm event.</p>	In progress	<p>12 June 2020</p> <p>2 October 2020</p>

# Update on Key Structural Defects and Remediation

Asset Name	Description	Current Update	Status	Target Completion Date
<b>Matiatia Wharf (New)</b>	The pontoon and gangways at Matiatia Wharf (New) were found to be in poor condition last year. Initial plans to repair the corroded elements were not considered cost-effective and it was agreed that these elements are replaced.	<p>Due to heightened concern for the structure and delays to procurement of the new pontoon an upgrade is being designed for the Old Matiatia wharf to provide a contingency plan should there be a failure to the current facility. In the meantime 'band aid' type repairs are continually being carried out at the current facility with the aim to keep it functional until the replacement can be constructed. This is now very likely to be after America's Cup.</p> <p>As an interim measure to monitor the defects, there has been monitoring inspections set-up at six weekly intervals.</p>	In progress	June 2021
<b>Wolverton Culverts 1 and 2 replacements</b>	Replacement of two culverts under Wolverton Road. The new larger culverts can contend with greater amounts of rainfall and more frequent storm events, reducing the risk of flooding.	<p>The culvert replacement works contract was awarded to Brian Perry Civil on 6 March 2020.</p> <p>The work construction had commenced on 9 March 2020. Enabling works stage 0, culvert 1 South side road widening was progressed, and site access lay down areas for stage 1 works were underway. Enabling Works stage 0 culvert 2 northside road widening underway with tree clearance and environmental controls in place. However, all works were suspended due to current Covid-19 lock-down from Thursday 26th March but contractor maintains site monitoring for the TMP and site security/safety as essential services only.</p>	In progress	December 2021



# Update on Key Structural Defects and Remediation

Asset Name	Description	Current Update	Status	Target Completion Date
<b>Meadowbank Rail Station</b>	North Access Ramp - some structural elements exhibit a loss of timber quality on the outer faces also extend to approximately 30mm within the timber at various locations. The steel frames which support the ramp landings exhibit advanced corrosion and section loss to supporting angle brackets and capping plates. There are significant number of fixings for the ramp structure showing surface and advanced corrosion.	Remedial works have been programmed for Year 2020-21.  As an interim measure to monitor the defects, there has been monitoring inspections set-up at three monthly intervals.	In progress.  No change in asset condition since the last update	June 2021
<b>Stanley Bay Wharf</b>	A number of timber piles supporting the wharf consisting of main, fender and raker piles are deteriorated due to marine organisms and reduced cross-sectional area. Additionally timber piles that have been jacketed for structural stability require the jackets to be extended to fully cover damaged piles and up to the adjacent timber pile.	Remedial works have been programmed for Year 2020-21.  As an interim measure to monitor the defects, there has been monitoring inspections set-up at three monthly intervals.	In progress.  No change in asset condition since the last update	June 2021