If calling, please ask for Democratic Services

Transport Committee

Thursday 16 May 2024, 09.30am

Taumata Kōrero, Council Chamber, Greater Wellington Regional Council, 100 Cuba St, Te Aro, Wellington

Quorum: Seven Members

Members

Councillors

Thomas Nash (Chair)

Simon Woolf (Deputy Chair)

David Bassett

Quentin Duthie

Chris Kirk-Burnnand

David Lee

Hikitia Ropata

Adrienne Staples

Ros Connelly

Penny Gaylor

Ken Laban

Daran Ponter

Yadana Saw

Appointee

Andrew Lensen

Recommendations in reports are not to be construed as Council policy until adopted by Council.

Transport Committee (A Committee of the Whole)

1 Purposes

1.1 Oversee the development, implementation and review of Council's strategic direction and policies for transport and mode-shift.

1.2 Set the operational direction to deliver public transport and mode-shift.

1.3 Provide input into joint transport-related projects and initiatives.

1.4 Ensure these matters promote the social, economic, and environmental well-being of the Wellington Region.

2 Specific responsibilities

2.1 Apply Council's Te Tiriti o Waitangi principles when conducting the Committee's business and making decisions.

2.2 Prepare the Wellington Regional Public Transport Plan (and variations) and recommend its adoption by Council.

2.3 Approve strategies, policies and guidelines to deliver public transport in accordance with the Wellington Regional Public Transport Plan.

2.4 Approve transport strategies, policies, plans, programmes, initiatives and indicators related to transport demand management and active mode promotion.

2.5 Review performance trends related to public transport and transport demand management activities.

2.6 Review periodically the performance and effectiveness of transport strategies, policies, plans, programmes, initiatives and indicators including:

- a Delivery of the Wellington Regional Public Transport Plan, including:
  - i Inter-regional transport initiatives
  - ii Fare strategies and methods
  - iii Increased mode share to public transport and active modes
  - iv Promoting transport equity, and increasing access to public transport, for groups that are more likely to be transport disadvantaged
  - v Alignment of Greater Wellington's accessibility work to the United Nations Convention on the Rights of Persons with Disabilities 2006 (UNCRPD)
- b Transport demand management, including Vehicle Kilometres Travelled (VKT) reduction, and active mode promotion initiatives.

2.7 Oversee Council's involvement in jointly-managed regional and national transport programmes and projects, including Let's Get Wellington Moving and the National Ticketing Solution.

2.8 Consider matters relating to public ownership of public transport and recommend on these to Council.

2.9 Consider regional, national and international developments; emerging issues and impacts; and changes in the legislative frameworks for their implications for transport strategies, policies, plans, programmes, initiatives and indicators.

2.10 Consider and endorse business cases for submission to Waka Kotahi NZ Transport Agency or other agencies on strategic transport projects with the potential for significant financial impact.

2.11 Inform Council's representatives on matters going forward to the Regional Transport Committee to assist that committee in developing the Wellington Regional Land Transport Plan.

2.12 Ensure that the Committee's decision-making:

a Considers climate change-related risks (mitigation and adaptation)

b Is consistent with Council's plans and initiatives to give effect to Council's declaration of a climate emergency on 21 August 2019, including agreed emissions reduction targets.

2.13 Advocate:

a For the alignment of initiatives across the Wellington Region with transport implications, including for spatial planning and land use planning

b To support the Wellington Region's territorial authorities in their traffic resolution processes that reallocate road space for public transport and active modes.

2.14 Review, after each Public Transport Advisory Group meeting, a written report of the business conducted at that meeting.

3 Delegations

3.1 Subject to sections 3.3 to 3.7, Council delegates to the Committee all the powers, functions and duties necessary to perform the Committee's responsibilities (except those that must not be delegated, have been retained by Council, have been delegated to another committee, or have been delegated to the Chief Executive).

3.2 The Committee has the authority to approve submissions to external organisations for matters pertaining directly to the Committee's purpose.

3.3 The Committee may make decisions on matters with a financial impact only where the related costs are:

a Budgeted for in the relevant business group's budget

b Not budgeted for in the relevant business group's budget, but can be met from savings within that budget.

3.4 Where the Committee considers a decision with a material financial impact is needed[1], the Committee must refer the matter to Council for its decision.

[1] That is, where savings are identified from other business groups' budgets to meet the related costs; or no savings are identified across Greater Wellington's overall budget to meet the related costs.

3.5 The Committee may not make a decision that is materially inconsistent with Council's Annual Plan or Long Term Plan.

3.6 Where a matter proposed for consideration by the Committee (including during the development of proposed Greater Wellington plans and policies) is of strategic importance to the Wairarapa Constituency, that matter shall first be referred to the Wairarapa Committee or its members for their consideration.

3.7 The Committee shall ensure that it acts under the guidance of the Memorandum of Partnership in working with Greater Wellington's mana whenua partners of the Wellington Region to ensure effective Māori participation in the Committee's deliberations and decision-making processes.

4 Members

4.1 All thirteen Councillors.

4.2 The Chair of the Public Transport Advisory Group.

5 Voting entitlement

The Chair of the Public Transport Advisory Group member sits at the table and has full speaking rights, but has no voting rights at any Committee meeting.

6 Quorum

Seven Committee members.

Transport Committee

Thursday 16 May 2024, 9.30am

Taumata Kōrero - Council Chamber, Greater Wellington Regional Council, 100 Cuba St, Te Aro, Wellington

Public Business

Please note these minutes remain unconfirmed until Transport Committee meeting on 16 May 2024.

Report 24.163

Public minutes of the Transport Committee meeting on Thursday 4 April 2024

Taumata Kōrero – Council Chamber, Greater Wellington Regional Council
100 Cuba Street, Te Aro, Wellington, at 9.31am.

Members Present

Councillor Nash (Chair)
Councillor Woolf (Deputy Chair)
Councillor Bassett
Councillor Connelly
Councillor Duthie
Councillor Kirk-Burnnand
Councillor Laban
Councillor Lee (until 9.58am)
Councillor Ponter (until 11.43am and from 11.47am)
Councillor Ropata (from 9.37am)
Councillor Saw
Councillor Staples

Councillors Duthie, Lee and Ropata attended the meeting remotely via Microsoft Teams, and counted for the purposes of quorum in accordance with clause 25B of Schedule 7 to the Local Government Act 2002.

Karakia timatanga

The Committee Chair opened the meeting with a karakia timatanga.

Public Business

1 Apologies

Moved: Cr Staples / Cr Laban

That the Committee accepts the apology for absence from Councillor Gaylor and the apology for early departure from Councillor Lee.

The motion was **carried.**

2 Declarations of conflicts of interest

There were no declarations of conflicts of interest.

3 Public participation

There was no public participation.

4 Confirmation of the Public minutes of the Transport Committee meeting on 22 February 2024 – Report 24.87

Moved: Cr Kirk-Burnnand / Cr Saw

That the Committee confirms the Public minutes of the Transport Committee meeting on 22 February 2024 – Report 24.87

The motion was **carried.**

5 Update on Progress of Action Items from previous Transport Committee meetings – April 2024 – Report 24.146 [For Information]

Samantha Gain, Group Manager Metlink, spoke to the report.

Councillor Ropata arrived at 9.37am during the above item.

6 Public Transport On-demand Trial proposed six month extension – Report 24.122

Tim Shackleton, Senior Manager Commercial, Strategy & Investments and Bonnie Parfitt, Senior Manager Network & Customer spoke to the report.

Moved: Cr Saw / Cr Connelly

That the Committee:

1 Notes that on 22 June 2023, the Committee agreed to extend the Tawa on-demand public transport trail into Porirua city centre for a 12-month period to 30 June 2024.

2 Notes that the Tawa on-demand public transport trial is not currently funded through the National Land Transport Fund.

3 Notes that on-demand public transport is now entitled to be funded through the National Land Transport Fund following legislative change to the Land Transport Management Act 2003 in September 2023.

4 Notes that receiving National Land Transport Fund funding is dependent on the service operating within a 'unit' established in the Wellington Regional Public Transport Plan.

5 Notes that there are funding uncertainties given the limited public transport funding signalled in the draft Government Policy Statement on Land Transport (GPS) and the need to prioritise existing services.

6 Notes that future National Land Transport Fund funding will be dependent on the outcome of the National Land Transport Plan processes.

7 Notes that the draft Long Term Plan 2024-2034 includes a funding allowance for the extended Tawa on Demand trial of $1.5 - $1.9 million per annum.

8 Agrees to extend the current extended Tawa on-demand trial for a 6-month period from 30 June 2024 at an estimated cost of approximately $750,000.

9 Agrees to include the establishment of a unit in the draft Wellington Regional Public Transport Plan to cover the Tawa on-demand service as a reserve measure to support future Council decision-making on the future of the service.

The motion was **carried.**

7 Wellington Metropolitan Rail Network Performance and Funding Challenges – update – Report 24.123 [For Information]

Fiona Abbott, Senior Manager Assets & Infrastructure and David Mawson, Manager Rail Network Delivery spoke to the report. Wellington Rail Programme Newsletter and Wellington Easter Block of Line (BOL) map were tabled.

Moved: Cr Ponter / Cr Connelly

That the Committee:

1 Requests officers:

a Work with KiwiRail to seek a detailed breakdown of critical rail assets for which funding has been sought and the impact of these assets on passenger rail services and to report to the Transport Committee on this at its next meeting.

b Provide a breakdown of potential service reductions that would be caused by failure of these assets and the implications for Metlink rail patronage and fare revenue projections of these service reductions.

c Provide a report on these matters to the Finance, Risk and Assurance Committee ahead of the committee's August workshop.

The motion was **carried.**

Councillor Lee departed the meeting at 9.58am during the above item and did not return.

8 Frontline Public Transport Workforce – Recruitment and Retention – Report 24.124 [For Information]

Matthew Chote, Senior Manager Operations & Partnerships and Susan Wilson, Principal Account Manager Bus, spoke to the report.

The meeting adjourned at 10.55am and resumed at 11.09am.

9 Public Transport Performance – update – Report 24.126 [For Information]

Matthew Chote, Senior Manager Operations & Partnerships and Susan Wilson, Principal Account Manager Bus, spoke to the report.

10 Transport Operator update – Kinetic – Report 24.125 [For Information]

Nigel Piper, Commercial Director, Kinetic spoke to the report. The Kinetic update presentation was tabled.

Councillor Ponter departed the meeting at 11.43am and returned at 11.47am during the above item.

Karakia whakamutunga

The Committee Chair closed the meeting with a karakia whakamutunga.

The public meeting closed at 11.53am.

Councillor T Nash

Chair

Date:

Attachment 1 to Report 24.196

Action items from previous Transport Committee meetings

Date	Action item	Status and comment
16 February 2023	**Transport Committee Update – Public Participation** **Noted**: The Committee requested a report on East/West connectivity of public transport.	**Status:** In progress **Comment:** This work will be undertaken as part of the Council's review of the Regional Public Transport Plan.
22 June 2023	**Public Transport On-Demand Review – Report 23.229** **Noted:** The Committee requested that a matrix be prepared with criteria for assessing future Public Transport On-Demand options, including population density, demographics, topography, value of money.	**Status:** Under consideration **Comment:** As part of the 2023 national operational policy development workstream to implement the Government's Sustainable Public Transport Framework, NZ Transport Agency Waka Kotahi is currently developing national guidance on criteria for assessing On-Demand PT opportunities. Draft guidance to date indicates a 'business case light' approach will be required from Public Transport Authorities and will require a range of criteria to be factored including those discussed at Committee. Officers note that the new Government's transport policy programme is a work-in-progress and policy positions regarding fare-box recovery and national PT funding and investment signalled in the draft Government Policy Statement on Land Transport, may impact the prioritisation and/or provision of On Demand PT.
22 June 2023	**Transport Officers – Report 23.230** **Noted:**	**Status:** Completed

Attachment 1 to Report 24.196

Action items from previous Transport Committee meetings

	The Committee requested that it receives regular reports on fare leakage, including total number of fines issued, number of fines issued by individual transport officers, and by route.	**Comment:** Report 24.183- Public Transport Performance – Update includes the number of: • Infringement notices issued. • The number of engagements regarding non-payment of fare This information is reported by bus route/train line.
17 August 2023	**Public Transport Advisory Group Meeting – 3 August 2023 – Report 23.311** **Noted:** The Committee requested a workshop to discuss policing versus educating approaches to prevent anti-social behaviour on public transport.	**Status:** In progress **Comment:** Committee members were provided with a briefing on presence of staff at railway stations; this briefing included work undertaken to respond to antisocial behaviour on the rail network. This topic will be covered further at a future workshop (scheduled for 20 June 2024).
14 September 2023	**Update on Progress of Action Items from previous Transport Committee meetings – September 2023 – Report 23.448** **Noted:** The Committee requested an update on the consideration of multi-modal options for the closure of the Melling Line	**Status:** In progress **Comment:** This work is on hold pending more information about RiverLink construction phasing.
30 November 2023	**Update on Progress of Action Items from Previous Transport Committee Meetings – November 2023 – Report 23.560** [For Information]	**Status:** Completed **Comment:**

Attachment 1 to Report 24.196

Action items from previous Transport Committee meetings

	Noted: The Committee requested that advice be sought from NZ Transport Agency Waka Kotahi on the issue of people standing on buses, and invited the Finance, Risk and Assurance Committee to consider the risk implications of this advice for Greater Wellington Regional Council.	NZ Transport Agency Waka Kotahi has recently issued its report on the safety of school bus journeys, which includes assessment of risks involved with children standing on school buses. The full report can be found here: https://www.nzta.govt.nz/assets/resources/research/reports/710/710-safety-of-school-bus-journeys.pdf A summary of the full report is available at: https://www.nzta.govt.nz/assets/resources/research/reports/710/710-safety-of-school-bus-journeys-summary.pdf This report will be highlighted to the Finance, Risk and Assurance Committee at its August meeting.
22 February 2024	**Review of Wellington Regional Public Transport Plan – update – Report 24.4** **Noted:** The Committee requested the Council Chair write to the Minister of Transport outlining Council's and Greater Wellington's public transport priorities for inclusion in the Government Policy Statement on Public Transport.	**Status:** Completed **Comment:** Council and Greater Wellington's public transport priorities were incorporated into Council's submission on the Draft Government Policy Statement on Land Transport.
22 February 2024	**Wellington Metropolitan Rail Network Performance and Funding Challenges – update – Report 24.2** **Noted:** The Committee requested: • That the action plan be shared with the Committee	**Status:** In progress **Comment:** High level rail network impact forecast information has been received and we are working with KiwiRail and Transdev to develop service impact scenarios. Following the completion of this piece of work, a joint

Attachment 1 to Report 24.196

Action items from previous Transport Committee meetings

	That staff provide the Committee with information on the effect of service reductions for the network and passengers and what the trade-offs are for short closures over a longer period of time versus longer closures in order to complete maintenance and upgrades.	scenario-based document will be produced; Councillors will be briefed on this.
22 February 2024	**Driver Toilet Facilities – update – Report 24.6** [For Information] **Noted:** The Committee requested that staff consider installing wayfinding signs to the nearest accessible public toilets at driver toilet facilities.	**Status:** Under consideration **Comment:** Staff are considering the implications of installing wayfinding signs to the nearest accessible public toilets at driver toilet facilities.

Transport Committee
16 May 2024
Report 24.192

For Information

RELEASE OF WAIRARAPA SW CARRIAGE ROUGH RIDE AND VIBRATION REVIEW

Te take mō te pūrongo
Purpose

1. To advise the Transport Committee (the Committee) on the recently released Wairarapa SW Carriage Rough Ride and Vibration Review.

Te tāhū kōrero
Background

2. There has been significant investment in the Wellington Metro Network since July 2020; with increased programmes funding allocated from NZ Transport Agency (NZTA) to complete catch up renewals and upgrade tracks, bridges, tunnels, and signalling.
3. Work started on the Wellington Metro Network in 2021, including upgrading the track north of Remutaka Tunnel. The investment in the Wairarapa Line in particular has focused on catch up renewals, after years of deferred renewals caused by historical funding limitations.
4. Rough rides and vibrations in SW carriages (SW-type), on certain sections of track, were first reported north of Remutaka Tunnel in November 2022. However, these vibrations were linked to degraded wooden sleepers.
5. In July 2023, it was reported that Wairarapa Line trains were experiencing vibration issues at 80km/hr, just north of Taita, and just north of Matarawa (near Carterton).
6. In late July 2023, KiwiRail suggested Temporary Speed Restrictions (TSRs) in the worst locations as vibrations were significantly less at lower speeds.
7. KiwiRail also sent additional engineers out to inspect via on board monitoring and found SW-type carriages were having increased vibrations at four locations.
8. Data loggers measuring the vibrations and rough rides were then installed and measurements taken on a SW-type test train, which confirmed that vibration was occurring.
9. KiwiRail also completed a track trial to test the SW-type carriage sensitivity to changes in track gauge. This trial confirmed that when the track gauge was widened, increasing the rail wheel interface gap, vibrations were reduced at speeds up to 80km/hour.

Wairarapa SW Carriage Rough Ride and Vibration Review.

10. In early March 2024, KiwiRail and Greater Wellington engaged Beca to undertake a review of the Wairarapa Line vibration issues. Greater Wellington staff contributed to the terms of reference of the review.

Te tātaritanga
Analysis

11. In May 2024 a final copy of the Beca Wairarapa SW Carriage Rough Ride and Vibration Review (Review) was received.

12. A copy of this Review is attached as **Attachment 1** to this report.

Summary findings of the Review

13. The scope of work and design for the Wairarapa line is compliant to KiwiRail Track Standards and tolerances. The work completed was identified from the existing KiwiRail maintenance work bank, which then went through internal KiwiRail reviews and approvals.

14. No wider consultation (regarding interoperability) occurred as all planned work was within existing KiwiRail standards and tolerances, hence no change or contract requirement to engage.

15. Works have been delivered predominantly by local KiwiRail teams utilising existing standards and task instructions.

16. Rail grinding post rerailing, as defined in the rail management standard, is an activity that is programmed and should take place after new track is installed.

17. Grinding alone will also not significantly reduce the likelihood of vibrations of SW-type carriages. Grinding will however help by creating a smoother wheel-rail interface, improving contact rail wheel, and reducing frictional forces that may contribute to the lateral instability of trains.

18. Re-profiling the wheels to a different profile, in addition to grinding the tracks will help reduce the likelihood of vibrations of SW-type carriages.

Programme of Works

Reducing service restrictions

19. In order to reduce service restrictions impacting SW-type carriages on the Wairarapa Line, the following Programme of Works has been developed:

Activity	**When***	**Comment/s**
Commence WRL rail track grinding	25 May 2024	Grinding is scheduled to take approximately 6 weeks. Testing to following grinding.
Commence re-profiling of wheels	Mid-July 2024	Re-profiling of affected carriages is expected to take 3 months

Activity	When*	Comment/s
		For testing purposes some carriages have already been re-profiled. Re-profiling will be progressed in stages, with testing undertaken to determine whether achieves outcome.
Remove Temporary Speed Restrictions (TSRs) related to vibration issues	October 2024	TSRs will be removed following the successful implementation of programmed work

*Note that timings are subject to change and will be accelerated if possible.

Wider Network review

20. Following the identification of issues with SW carriages on the Wairarapa Line, a wider network testing regime will take place to determine whether the vibrations are limited to the SW carriages.

Interoperability review

21. Further work will be undertaken (led by KiwiRail) to identify possible changes in KiwiRail standards and/or other interoperability documents.

22. All changes identified will need to be tested and updated in relevant documents in close consultation with all relevant parties (including Greater Wellington).

Te whakatūtakitaki
Engagement

23. Greater Wellington and KiwiRail have developed a stakeholder engagement and communications plan for this work.

Ngā tūāoma e whai ake nei
Next steps

24. Officers will continue to work closely and collaboratively with KiwiRail and Transdev on matters as set out above.

25. The Committee will be provided with updates on matters contained in this report as required.

Ngā āpitihanga
Attachment

Number	Title
1	Wairarapa SW Carriage Rough Ride and Vibration Review

Ngā kaiwaitohu
Signatories

Writer	David Mawson – Manager Rail Network Delivery, Assets & Infrastructure
Approvers	Fiona Abbott – Senior Manager, Assets & Infrastructure Samantha Gain – Kaiwhakahaere Matua Waka-ā-atea | Group Manager Metlink

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or with Committee's terms of reference. The Committee has responsibility to "consider regional, national … emerging issues and impacts …".
Contribution to Annual Plan / Long Term Plan / Other key strategies and policies The provision of public transport is a key activity in the Long-Term Plan.
Internal consultation No internal consultation was necessary.
Risks and impacts - legal / health and safety etc. There is some risk associated with the Report findings. Council/the Committee will be kept informed of any mitigations that are required.

Wairarapa SW Carriage Rough Ride and Vibration Review

Planning, Delivery and Tolerances

Prepared for KiwiRail and Greater Wellington Regional Council
Prepared by Beca Limited
Commercial in Confidence

1 May 2024

Creative people together transforming our world

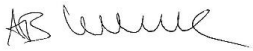
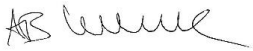
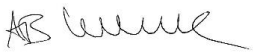
Contents

Appendices

Revision History

Revision Nº	Prepared By	Description	Date
1.0	Andrew Livermore	First Draft	02.04.24
2.0	Jonathan Sanders Lachlan Daniel	Interval Review - Draft	03.04.24
3.0	KiwiRail Greater Wellington Regional Council	Client Review – Draft	04.04.24
4.2	Andrew Livermore	Final	01.05.24

Document Acceptance

Action	Name	Signed	Date
Prepared by	Andrew Livermore		02.04.24
Reviewed by	Jonathan Sanders Lachlan Daniel		03.04.24
Draft Approved by	Andrew Livermore		03.04.24
Final Approved by	Andrew Livermore		01.05.24
on behalf of	Beca Limited		

Executive Summary

There has been significant investment in both the Auckland and Wellington Metro Networks since July 2020 with increased funding allocated to complete catch up renewals and upgrade tracks, bridges, tunnels, and signalling. Work started on the Wellington Metro Network in 2021, including upgrading the track north of Remutaka Tunnel. The investment in the Wairarapa Line in particular has focused on catch up renewals, after years of deferred renewals caused by historical funding limitations.

Rough rides and vibrations in South Wairarapa (SW) type carriages (SW-type), on certain sections of track, were first reported north of Remutaka Tunnel in November 2022, which following track and train inspections confirmed oscillatory or side to side movements (i.e. “hunting”). Seven speed restrictions are currently in place, as reductions in train speed reduce the severity of the vibrations in carriages. Locomotive Engineers have not reported hunting, nor has the EM80 Track Inspection Vehicle[1] (EM80) correlated track faults to hunting. Data loggers have been installed in some SW-type carriages to confirm hunting locations, and a trial of changing track insulations to amend the gauge has also been completed.

Railways are a system that are made up of multiple variables, hence to identify possible causes and solutions to reduce hunting in SW-type carriages, both above and below track aspects have been reviewed. As hunting propensity in carriages is increased by multiple factors, including:

- carriage design, including loading;
- the rail wheel interface gap (i.e. track gauge, rail head profile, wheel flange width, wheel condition including profile, and wheelset back-to-back measurements);
- carriage suspension characteristics (i.e. more modern bogies have improved capability to dampen out forces); and
- speed (i.e. it is more prevalent as trains accelerate and increase speed on tangent track).

KiwiRail engineering specifications confirm tolerances are 1068mm track gauge, including -4mm/1064mm or +2mm/1070mm on newly installed concrete sleepers. Track gauge is measured dynamically (i.e. underload) at a regularly frequency by the EM80, so faults can be identified and rectified, which confirms track gauge is predominantly 1066mm to 1070mm.

The condition of carriage wheelsets is defined by three profiles; C1 – new, C2 – alternative, and C3 – last turning profile (before wheels are condemned). The wheel flange width reduces by 2mm each time a wheel is reprofiled, which aids to maintain maximum life and ride quality. Currently, 17 of the 18 carriages have wheels at a C1 profile, with one at C2.

The back-to-back distance between wheels varies between the SW-type with 14 of the 18 carriages having 997 (+1 to -0mm) and four having 995mm (+1 to -1mm). An internal KiwiRail engineering change request was issued in September 2016, after Greater Wellington Regional Council (GWRC) took over responsibility of SW-carriages in July 2016, reducing the back-to-back distance between wheels to 995mm. Implications of this change to GWRC, Transdev and Hyundai Rotem needs further review and clarification, as some wheelsets pressed by KiwiRail have been

[1] The EM80 Track Inspection Vehicle is the network calibrated advanced monitoring vehicle designed to check the condition of the rails, detect any irregularities or faults (including gauge), and validate that the tracks remain within defined engineering tolerances.

updated to 995mm, whereas National Rail System Standard/6 – Engineering Interoperability Standards (2013) states 997mm.

Carriages and bogie suspension is inspected at regular intervals by distance and time intervals. Bogie rebuilds are planned in every 400,000kms, and currently 5 of the carriages are planned in for next year. Although specific records were not checked, it was commented that no change in inspections or maintenance has occur, except that wear liners replacement has increased from 2023, and brake blocks are also cracking and needing earlier replacement.

Based on the information provided and reviewed, the track and carriage factors causing increasing hunting propensity in SW-type carriages on the Wairarapa Line are:

- Track geometry, where track is straight and carriage speed exceeds 60km/hour, as hunting is less prevalent on curves and vibrations are reduced at speeds less than 60km/hour (i.e. hunting is likely to be still occurring, but the vibrations reduce).

- Track gauge, which also impacts the gap between the rail head and wheels. A gauge of less than 1068mm reduces the rail wheel interface gap and changes the contact points of the wheels on the rails, which then at higher speeds increases the likelihood for them to hunt for the optimal rail wheel contact point (i.e. increasing the likelihood for vibrations).

- SW-type carriage suspension has no lateral damping, as found in the SE and Martangi carriages, with increased sensitivity to changes in the rail wheel interface (i.e. it cannot dampen out certain vibrations past a certain speed, which are transferred into the carriage). During the interviews held, there were anecdotal reports of vibrations in SE-type and Martangi carriages, but this is yet to be formally verified by data loggers. Additionally, similar works in Auckland Metro has not seen any increased reporting of hunting or vibrations, which suggests SW-type carriages have increased sensitivity to rail wheel interface changes.

- Wheelset condition, the back-to-back distance, and wheel flange width also determine the rail wheel interface gap and the optimal contact point. A wider back-to-back and wider wheel flange narrow the gap and changes the contact points of the wheels on the rails, which then at higher speeds increases the likelihood for them to hunt for the optimal interface (i.e. causing vibrations as the wheels hunt the rail head and strike the rail face).

Based on the interviews held, and information provided and reviewed, the root causes of hunting occurring with SW-type carriages on the Wairarapa Line are:

- The history of deferred renewals on the Wairarapa Line due to historical funding limitations, following major renewals of sleepers in the 1960s and 1980s. Sleeper renewals between the 1960's and 1980's replaced the traditional hardwood sleepers to Treated Pinus Radiata (TPR). The 2017 Wellington Metro Upgrade Business Case identifies ~30km of these TPR sleepers were at end of life needing replacement and ~5km of rail close to wear limits. Had progressive renewals been occurring at regular intervals, the quantum of work needing to be completed from 2020 would have been significantly less.

- TPR sleepers have not been widely installed since the mid 1980's, when pre-stressed concrete sleepers became supplanted. The use of concrete sleepers is now current practice throughout the KiwiRail network due to their structural performance, lifespan, ease of inspection and replacement. However, due to historical deferred renewals, coupled with an update in sleeper type, there has been a significant improvement in track gauge variability

around the nominal 1068mm. The renewals work completed to date has now achieved a 32% improvement on nominal gauge variability (1066mm-1070mm), with EM80 track gauge data revealing:

  - 2023 track gauge data, 89% between 1066mm and 1070mm, with 96% between 1064mm and 1070mm (expected engineering tolerance for concrete sleepers)
  - 2020 track gauge data, 57% between 1066mm and 1070mm, with 96% between 1062mm and 1076mm.

- Due to the improvement in nominal gauge reducing overall variability, previously unknown hunting sensitivity in SW-type carriages has begun to appear on tangent track at speeds greater than 60km/hr. Hunting in SW-type carriages or other trains caused by track renewals was never known or documented prior to the renewals work being planned. As such, no consultation was undertaken between any of the parties when scoping the renewals, as there was no previous risk that the work might cause train interoperability issues. Existing KiwiRail specifications have also subsequently been used to select the materials, so no change management or stakeholder consultation was needed, as nothing had changed or might be deemed different to cause any interoperability issues.

- Hence, hunting in SW-type carriages is now occurring in some sections of renewed tangent track, where track gauge is compliant (within tolerance) but less than 1066mm, travelling in excess of 60km/hr, due to unknown possible limitations within the SW-type lateral dampening capability. In comparison, trains in the Auckland Metro network at greater speeds, on the same type of replaced track have not had any reports of hunting, increased maintenance on carriages, nor track components (i.e. insulators) failing at faster intervals.

Broader recommendations are provided at the back of this report, which identify a range of actions. However, to remove hunting a range of progressive targeted works will be needed. The works will need to be coordinated and continually tested with data loggers to confirm hunting is reducing. Testing with data loggers is important, as they provide independent verified data on the actual forces being transferred into carriages, and therefore provide confidence that changes are reducing hunting as trains start increasing speed. Possible works identified include:

- Rail Head Grinding – Grinding alone will not remove hunting, although it may reduce its severity in the short term. Grinding will however enable an optimum rail wheel interface and reduce the likelihood of other longer-term track and wheelset defects (e.g. rolling contact fatigue, guttering, etc).

- Wheel reprofiling – Changing C1 wheel profiles on SW-type carriages to a C2 wheel profile reduces wheel flange width, improving the rail wheel interface gap by ~4mm.

- Back-to-back distance – Depending on the improvements gained by grinding and wheel reprofiling, adopting the 995mm (+/- 1m) back-to-back should also reduce the likelihood of hunting. As reducing the distance between the wheel flanges also improves the rail wheel interface gap by a further ~2mm.

- If the above works do not reduce hunting in all SW-type carriages, then confirmed isolated track locations where hunting remains will need to be individually investigated. Site specific changes, such as changing insulator configurations (i.e. reclipping), will then need to be

further tested. However, widespread changes to increase the gauge beyond 1068mm should only be a last option, as this changes the contact points between the wheels and rail which has potential to create longer-term maintenance issues in both wheels and track.

1 Introduction

1.1 Chronological summary of key documents and events

Relevant information was reviewed before interviews, and requested during interviews, which is summarised in Appendix A, with more detailed relevant information provided in Appendix B. The following section chronologically summarises key time periods relevant to identifying root causes and the identification of hunting in SW-type carriages.

Pre 2017

In 2000 a Technical Report was written by Rail Services Australia on the Rail Wheel Interface Improvement for Tranz Rail. Tranz Rail were exploring what changes they could make above rails to extend the potential life of both wheels and rails, to reduce the longer-term costs of replacing rails and machining of the wheels to restore profiles. As one of the main reasons for the very severe wear in rails and wheels is the high proportion of sharp curves present in the National Rail System. The report focused on the rail wheel interface and provided recommendations to achieve improvements, in particular:

- reduced rail wear;
- reduced wheel wear;
- reduced development of defects;
- reduced cost of rail and wheel maintenance;
- reduced energy associated with wheel-rail interaction;
- improved network capacity; and
- any additional parameters.

The report provides reference to research that identifies the benefits that can be gained by designing suitable wheel and rail profiles, including:

- Improved steering characteristics of wheelsets in curves, and hence reduced flanging forces and wear, together with a reduced risk of wheel climb.
- Improved wheel/rail contact stress and creepage conditions, and hence reduced incidence and severity of contact fatigue defects.
- Improved dynamic characteristics of wheelsets, and hence reduced levels of vehicle hunting particularly in tangent track and shallow curves.
- Improved loading characteristics on the rails, and hence reduced section stresses providing an opportunity for increased rail head wear limits.

The report then confirms that with a 997mm back-to-back on 1068mm gauge:

- Modified wheel and rail profiles will satisfy the main wheel-rail contact requirements, including a definite two-point and relatively broad contact near the centre of the running

surface of the tangent rails, which reduce the sensitivity to vehicle hunting and adverse vehicle/track dynamics;

- The marked benefits associated with operating with either worn or modified wheel profiles, which lead to a reduction in the flange energy of about 90%.

The report then makes multiple recommendations, which KiwiRail state are still valid today, and have formed the basis for the current rail grinding profile, current work looking at rolling contact fatigue, and some wheel profile changes. This report also formed the basis of moving to a reduced back-to-back of 995mm in 2016. 995mm was arrived at as a lower limit due design of turnouts and certain track features, not the 5mm reduction (992mm) that was identified in the report.

This report also identifies and recommends that if hunting on tangent track at higher speeds becomes evident then the following three options should be considered;

- Reduce the wheelset back-to-back distance by 4-5 mm (995mm adopted in 2016); and/or
- Reduce the wheel flange thickness by up to 2 mm (i.e. C2 wheel profile); and/or
- Apply the tangent rail profile by rail grinding (currently planned in).

In 2013, National Rail System Standard 6 - Engineering Interoperability Standards - Issue 4 (NRSS /6) was updated. NRSS/6 outlines the minimum requirements for rail vehicle interoperability on the National Rail System. It includes an unchanged back-to-back at 997-988mm and flange widths unchanged, provided in wheel profile drawings provided in Appendix A (i.e. C1. C2, and C3).

Then in July 2016 Transdev Wellington took over the operation of commuter train services in the Greater Wellington region, including the Wairarapa Line from KiwiRail's subsidiary Tranz Metro. The change was part of a wider transition involving the management of the region's rail services. Since then, Transdev Wellington, under the brand name Metlink, has been responsible for running Wairarapa Line services.

In September 2016, an internal KiwiRail Engineering Change Request was issued, instructing the change in back-to-back to 995mm (+/- 1mm). The driver for this change was the analysis and recommendations from the Rail Services Australia Report from 2000, which identified benefits to the National Rail System by moving to a reduced back-to-back.

2017 – 2021

In November 2017 a jointly sponsored Single Stage Business Case by KiwiRail, as the network asset owner, and Greater Wellington Regional Council, as the predominant network asset funder and user, was prepared. It was written to obtain Crown funding for track and civil engineering infrastructure catch-up renewals throughout the Wellington Metro Railway Network.

The primary focus of the Business Case was the Wairarapa Line seeking investment to renew track assets which were approaching the end of their useful lives. A peak of future renewals work exceeding the capacity of the current funding models to address had been identified, which without additional funding, would cause significant impacts on service levels. At that time, the line already had significant speed restrictions in place due to deteriorating asset condition which were forecast to increase in quantity and severity without additional funding. Funding was therefore targeted at removing and preventing any additional speed restrictions, no benefits of increasing Wairarapa line speeds to 100km/hr were assessed.

The Business Case states that overall condition of the Wairarapa line is poor and deteriorating (see Figure 1). It is the worst condition route on the Wellington network. *"There are significant numbers of decayed sleepers, with poor fastenings, and over 5km of rail at or close to wear limits. Need for renewal primarily reflects the track and formation time in service. The line has had little major renewal activity since it was face-renewed with Treated Pinus Radiata (TPR) sleepers over a relatively short period between the 1960's and early 1980's. Deferred maintenance caused by funding limitations has further contributed to build a bow wave of renewals work. This concentration of similar aged assets falling due over a limited period is behind the scale of renewal required".*

Overall, the Business Case identifies the main deficiencies as:

- Approximately 30km of end-of-life TPR sleepers;
- Poor ballast and formation throughout, in places exacerbated by poor drainage;
- End of life and poor condition track in Tunnel 1 and (major) Tunnel 2;
- Bridges with end-of-life timber elements; and
- 1 high risk slope.

Figure 1. From Single Stage Business Case, "*deteriorated Treated Pinus Radiata (TPR) sleepers. These are endemic on the Wairarapa Line, with the sleepers replaced during significant volumes of renewals nearly 40 years ago now having run through their life cycle"*

The Business Case also provides a summary of the TPR sleeper legacy issues and changes to concrete. TPR sleepers have not been installed on the network since the mid 1980's, when pre-stressed concrete sleepers became supplanted. The use of pre-stressed concrete sleepers is now current practice throughout the KiwiRail network and other railways around the world due to their superior structural performance, lifespan, ease of inspection and replacement.

Risks to train and carriage interoperability was not covered nor mentioned. As the risk of hunting in SW-type carriages or other trains caused by track renewals was not known or had been previously identified prior to the quantum or type of renewal work being specified for the Wairarapa Line. No consultation was therefore undertaken between any of the parties, or engineering change management, as there were no risks in the scope of work that might impact train interoperability.

2022 - 2024

KiwiRail commences catch up renewals of the Wairarapa Line, which will be finished in 2028. GWRC's new hybrid trains are expected in 2029 which allows them to utilise the existing overhead power and then run on the non-electrified sections. Supported by KiwiRail's renewal works, they will allow for more peak and off-peak services.

To date ~38km of the 50km of track has been completed north of Remutaka Tunnel including re-railing and re-sleepering from life expired timber to concrete in many sections.

Completed works to date include:

- Renewed 58.8km of track to Masterton, including the 572m Maoribank Tunnel.
- Replaced the drainage in the Maoribank and Remutaka Tunnels.
- Replaced three aging bridges.

Remaining works:

- Replace the track in the 8.8km Remutaka Tunnel, so trains can go through it faster than 60 km/h. This work is scheduled for the Christmas 2024 network shutdown.

Reports of hunting first began in November 2022, KiwiRail received an emergency call that travelling in SW-type carriages "*the train shakes from side to side*" between 77km – 78.2km (Carterton – Clareville Waingawa) on the Wairarapa Line (WRL). The track was inspected by KiwiRail, and the geometry was found to be within engineering tolerances (i.e. Table 3 of T200 Track Handbook). The last EM80 report was also checked, which had no track geometry tolerance exceedances in the area. Hyundai Rotem (SW-type carriage maintainer) was also notified who inspected the carriages and subsequently found antiroll bars needed replacing.

In February 2023 KiwiRail received information that Hyundai Rotem was still reporting the vibration issue was occurring. Hyundai Rotem had inspected the carriages and found no issues with the antiroll bars, so requested the track north of Carterton be checked. KiwiRail confirmed the track had been re-laid in this area, but had been tamped, inspected, and was ok for linespeed (based on the track measurements and tolerances).

In July 2023 Hyundai Rotem again reported that they were having the vibration issues at 80km/hr, just north of Taita, and just north of Matarawa. They had upped inspections on carriages and maintenance but with very little improvements, so requested the track be checked. KiwiRail completed track inspections via trains, and confirmed the vibration sounds like the "*bogie slapping on the underneath of the carriage*" and referred it back to Hyundai Rotem, as the track geometry had no engineering tolerance exceedances, and the vibration issues were initially thought to be isolated to some SW-type carriages.

In late July 2023, multiple reports were raised increasing locations of rough rides by train crews. KiwiRail suggested Temporary Speed Restrictions (TSRs) in the worst locations as vibrations were significantly less at lower speeds. KiwiRail also sent additional engineers out to inspect via on board monitoring and found SW-type carriages were having increased vibrations at four locations.

As of 24th March 2024, there are 21 TSRs on the Wairarapa Line, seven are vibration, with six north of Featherston, and one Taita, with five at 60km/hour, one at 40km/hour, and one 25km/hour.

Data loggers measuring the vibrations and rough rides were then installed and measurements taken on a SW-type test train, which confirmed that hunting was occurring. Varying locations were identified within the carriages for data loggers to be installed, which also confirmed increased forces measured directly above the bogies versus loggers located in the centre of the carriage.

KiwiRail also completed a track trial to test the SW-type carriage sensitivity to changes in track gauge. They changed insulators (i.e. reclipping) between 68.3km - 68.8km which widened the track gauge to 1071mm (versus 1066mm either side of the trial). This trial confirmed that when the track gauge was widened, increasing the rail wheel interface gap, hunting was reduced at speeds up to 80km/hour.

1.2 Hunting

Hunting is a term used to describe the dynamic instability that can occur when a train is in motion. It describes an oscillatory or side-to-side movement of the wheelsets or bogies that can become increasingly pronounced at higher speeds. This lateral motion can cause the wheel flanges to repeatedly strike the rails, causing vibrations and leading to uneven wear on the wheels and rails, which over time can cause track and carriage defects. There are typically multiple factors that contribute to hunting, which include:

- carriage design and carriage suspension characteristics;
- the rail wheel interface gap (which involves the back-to-back measurements of wheelsets, the flange width of wheels, and track gauge); and
- speed on tangent track.

The repetitive lateral forces exerted by hunting over the longer-term impacts both the track and the carriages, including

- Increased fuel consumption;
- Increased and abnormal wear of the rail head;
- Increased track maintenance due to increased forces exerted on rail components (i.e. pads, insulators, and clips) and the supporting ballast;
- Faster wear on rollingstock wheelsets and bogies, causing increased faults and preventative maintenance; and
- Derailment risk also increases if speeds are not reduced, as a result of increased possibility of wheel climb.

1.3 Scope of the review

Railways are a system that are made up of multiple variables, hence to identify the causes and possible solutions to reduce hunting propensity in carriages, both above and below track aspects were investigated. The KiwiRail, below track scope included:

- Confirm the process that was undertaken to rerail the line, including timeline, planning decisions, approvals, and quality assurance/quality control mechanisms (e.g. design, specifications, pick up, installation, and code of compliance);

- Confirm roles and responsibilities, including which teams decided what, and who inspected/authorised/approved key decisions;
- Identify causal factors, and possible recommendations to prevent reoccurrence; and
- Produce a final report summarising the causal factors and recommendations.

The Greater Wellington Regional Council (GWRC), above track scope included:

- Confirm SW-type wheelset tolerances and current measurements;
- Confirm SW-type bogie maintenance intervals and current condition assessments (maintenance history);
- Identify relevant documents, including their revision history re changes/updates to measurements, tolerances or maintenance interventions;
- Identify likely root causes that are contributing to vibration and rough ride issues;
- Provide a table of possible solutions; and
- Reviews needed or changes to existing tolerances, standards, or maintenance practices.

Specific questions to be answered include:

- Has the rail been constructed within existing KiwiRail tolerances?
- Are the KiwiRail rail tolerances fit for purpose when there is a range of wheel profiles running on the line?
- What can be learnt from this incident about wheel profile tolerances? Reviewing selected incidents, from existing available reports and selected interviews with nominated KiwiRail Staff;
- Review current engineering change processes, including what is defined as an engineering change, current processes, standards, etc. Includes all standards relevant to new rolling stock or changes to track standards and tolerances, including timing of;
    - Comment on possible broader implications, including;
    - Current rolling stock maintenance intervals; and
    - 2029 future rolling stock (Lower North Island Rail Integrated Mobility[2]).

2 Methodology

2.1 Interviews

Interviews with 17 people were held on throughout March and April via Microsoft Teams and in person at KiwiRail Offices, GWRC Offices, and at the Hyundai Rotem workshop. Relevant documents and information were identified through the course of the interviews, and is listed in Appendix A.

[2] https://www.gw.govt.nz/document/19521/detailed-business-case-lower-north-island-rail-integrated-mobility-2021/

2.2 Document and Information Reviewed

Through the interview process, several documents and a variety of information was requested and provided. Those documents identified as most relevant to the scope of this review are listed in Appendix A. A quick turn-around for findings and recommendations was requested, hence this review summarises all provided information.

2.3 Scope Exclusions

Given the timeframes to complete, interviews were ~1-2 hours long each, and questions were focused predominantly on the scope and what supporting information was available. As such no detailed additional analysis or detailed investigations were possible.

2.4 Inherent Limitations

In carrying out our review, we have undertaken tests of selected controls as appropriate. Occasions may arise where the nature of the controls, the lack of controls or circumstances of the independent review require us to undertake alternative review procedures. The decision to test, or not to test controls, is made by us solely at our discretion. Because of the inherent limitations in any system of internal control, errors, fraud, or irregularities may occur and may not be detected.

Our independent review fieldwork was completed on 10th April 2024. Our findings are expressed as at that date. We have no responsibility to update this report for events or circumstances occurring after that date.

3 Findings

3.1 Planning and Delivery of Capital Works

The scope of work and design for the Wairarapa line is compliant to KiwiRail Track Standards and tolerances according to EM80 data, using standard concrete sleepers, 50kg/m rail, and ballast cleaning to increase asset condition and track quality. The works completed was identified from the existing KiwiRail maintenance work bank, which then went through internal KiwiRail reviews and approvals. No wider consultation occurred as all planned works was within existing KiwiRail standards and tolerances, hence no change or contract requirement to engage.

Works have been delivered predominantly by local KiwiRail teams utilising existing standards and task instructions. Track gauge is inspected, as per T-TI-WO-5926 – Face re-sleepering, with "*Documentation associated with the assessment for speed and clearing for passage of rail traffic must be compiled and cited by the Production Manager before handing back to traffic".*

Rail grinding post rerailing, as defined in the rail management standard, is an activity that is programmed based on track curve radii and route tonnage. Grinding tangent track will improve the rail wheel interface, but typically curved track with high tonnes has increased benefit by moving the contact band away from the stress zone on the rail head.

The Wairarapa Line is predominantly tangent track with low tonnage (e.g. 1.1 Million Gross Tonnes Per Annum MGTPA vs Wellington to Trentham which is 4.3 MGTPA), hence grinding post rerailing would have been proactively prioritised relative to other parts of the network. Passenger services also make up ~70% of Wairarapa Line tonnage, so predominately passenger services with minor freight.

Grinding alone will also not significantly reduce the likelihood of hunting of SW-type carriages. Grinding will however help by creating a smoother wheel-rail interface, improving contact rail wheel, and reducing frictional forces that may contribute to the lateral instability of trains.

Summary Findings

- Roles and responsibilities for review and approval of planned works, and completed works utilised existing internal KiwiRail standards and processes
- Design, the materials used, and installation methods are defined in KiwiRail standards (listed in Appendix A)
- Grinding is prioritised across the network to optimise the cost against longer-term preventative maintenance
- Grinding of tangent track will improve the rail wheel interface in the short-term but will not significantly reduce the likelihood of hunting of SW-type carriages

3.2 Track Tolerances

The track gauge on tangent (straight) track is 1068mm, with a construction installed tolerance on concrete sleepers as completed on the Wairarapa Line, of between +2 and -4mm (T-ST-DE-5200 Track Design). The greater lower tolerance of - 4mm is needed as over time rails will “settle in” and the gauge will widen over time towards a nominal 1068mm (see Note below in Figure 2). A gauge of 1068mm after 6 months is not a set target but indicates depending on multiple factors (e.g. train loading) that gauge will be within acceptable engineering tolerances (i.e. nominal gauge).

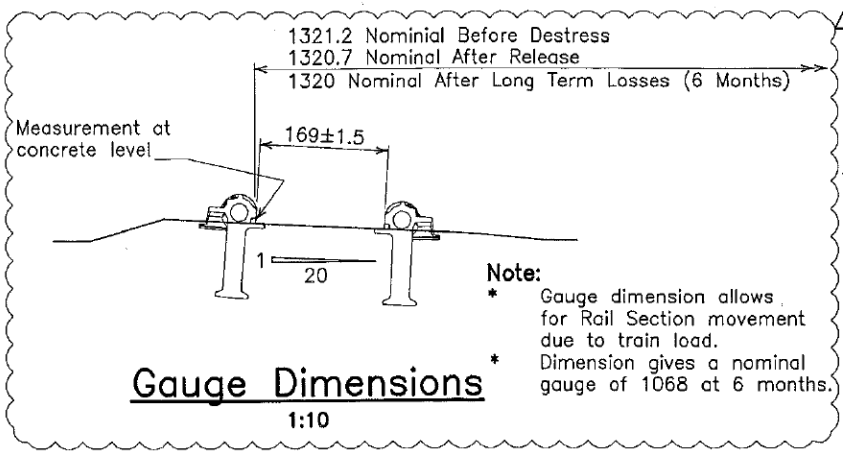


Figure 2. Standard Drawing (September 2011), identifying how a gauge narrower than 1068mm is designed, as it assumes movement will occur over time, depending on the frequency of train tonnage, but a nominal gauge of 1068mm could be expected after 6 months.

The EM80 measured the line on 7th December 2023, between 32.6km and 91.4km and gauge was found to be within engineering tolerance, with only two faults associated with track gauge identified at 32.8km (1052mm on a turnout) and 63.1km (1060mm on a bridge).It can be seen on the EM80 report where the gauge is less than and greater than 1068mm, but additionally it confirms no technical faults (i.e. track geometry including gauge is within allowable measured engineering tolerances) directly correlate to reported hunting.

The EM80 report also identifies where a trial was done by KiwiRail to widen the gauge, which confirms in the December 2023 EM80 data that between 68.3km - 68.8km track gauge was 1071mm (vs 1066mm either side of the trial). This trial also found that when the track gauge was widened by changing the insulator configuration (i.e. reclipping), increasing the gap between the rail head and wheels (rail wheel interface gap), measured hunting was reduced, although not fully tested with all SW-type carriages at speeds greater that 60km/hour.

A Ground Penetrating Radar report, published April 2019, between 19km and 91km was also reviewed, to see if current vibration locations correlated with possible poor track bed condition. This report showed that track bed is more or less consistent and there was no evident correlation of vibration issues to changes in track bed condition.

Rerailing has changed the rails from imperial 91lb/yard to metric 50kg/m rail, so CAD drawings were redrawn to double check the gauge using concrete sleepers. This drawing supported what is being seen on site, with track gauge measuring a minimum of ~1064mm, the EM80 measuring under dynamic testing ~1066mm, with movement over time expected to create a nominal 1068mm gauge (i.e. 1064mm-1070mm is the documented tolerance).

Summary Findings

- Track gauge is 1068mm
- Allowable engineering tolerances for the Wairarapa Line on concrete sleepers with 50kg/m rail is 1064mm to 1070mm (i.e. nominal gauge)
- Measurements and analysis show track geometry, according to KiwiRail track standards, are within defined engineering tolerances
- When track gauge was widened (68.3km - 68.8km) by changing insulators (i.e. reclipping) track gauge was 1071mm (EM80 measure), hunting was measured to be less prevalent between 60km/hr and 80km/hr, confirming the relevance of the rail wheel interface gap

3.3 Carriage Wheelset Tolerances and Bogie Maintenance

The maintenance records and inspections for bogies, together with profile tolerances for wheelsets and back-to-back measurements, are relevant factors that contribute to the rail wheel interface. Relevant documents relating to tolerances and inspections include:

- National Rail System Standard/6 – Engineering Interoperability Standards (NRSS/6) - April 2013, including SW-type wheelset profiles and back-to-back measurements.
- M9311 X28020 Maintenance Guide (September 2019) for SW-type carriages includes guidance on excess lateral movement and bogies reported as oscillating.
- M6000-100 Wheelset Manual – Wheelset Specifications (July 2021) for SW-type carriage wheelsets (X28020), including wheel diameter, rim thickness, tread diameter, and flange profile.

SW-type bogies have distance-based overhauls at “D1” 400,000km and “D2” 800,000km. Depending on carriage utilisation these overhauls typically occur every 4-5 years, with five carriages in the plan for next year. Wheelsets have on average four inspections per year, with:

- “A Inspection” at 12,000km (circa three-monthly) which checks the required dimensions against three types of pre-defined wheelset profiles (as defined in National Rail System Standard/6 – Engineering Interoperability Standards);

- "B Inspection" at 24,000km (circa three-monthly) which has broader checks, but also confirms the wheelset dimensions against the three types of pre-defined wheelset profiles;
- A further "A Inspection" at 36,000km, as above; and then
- An Annual Inspection, every 12 months, where carriages are taken out of service and given a more comprehensive inspection.

Currently, as per the defined wheelset profiles in NRSS/6, 17 carriages wheels are at C1, with one at C2 which was recently been reprofiled. A C1 profile has the same conicity as a C2 profile, however the flange thickness is reduced by 2mm on each wheel, increasing the rail wheel interface gap by 2mm. A C3 wheel profile also has the same conicity but reduces the rail flange by another 2mm.

Since hunting was first reported in SW-type carriages in 2022, there has been an increase, in their wear liners and brake block failures. The lateral movement of the wheelsets is also evident with increased "fretting" between metal-to-metal contact points (see Table 1 and Appendix C - SW-type increased maintenance photos). Table 1 also reveals that in 2024 those carriages with the majority of 995 back-to-back or a C2 profile have all had work done, possibly due to them operating within C1 or 997mm train consists and having increased vibrations transfer between carriage types. Overall, between 2020 and 2024, average work orders for the 995mm back-to-back are lower. There has also been no change in the suppliers or specifications of wear liners or brake blocks during this time.

Table 1. Work orders raised to replace brake blocks and wear liners across SW-type carriages.

Count of Work Order							2020-2024 997 Average Work Orders	2020-2025 995 Average Work Orders
Row Labels	2020	2021	2022	2023	2024	Grand Total		
SW3282	1	1		3		5	1.67	
SW3294	1	1		1		3	1.00	
SW3339	2	2				4	2.00	
SW3349			3	1	1	5		1.67
SW3355	1	1	2	1		5	1.25	
SW3376	1		2	1		4	1.33	
SW3394	1			2	2	5	1.67	
SW3404	2		3	3		8	2.67	
SW5646	1			1	2	4		1.33
SW5658	2	2	2			6	2.00	
SW5820			1	2		3	1.50	
SW5837	1			2		3	1.50	
SWG3365		1	1	2		4	1.33	
SWG3422				1		1		1.00
SWG5671	1	1	1	1	2	6		1.20
SWS3298	2		1			3	1.50	
SWS5660			1			1	1.00	
SWS5723		2		3		5	2.50	
Grand Total	16	11	17	24	7	75	1.64	1.30
994-996 Back-to-Back (2021)								
997 Back-to-Back with C2 wheel profile								

Back-to-back dimensions of wheels is defined in NRSS/6 as "*the dimensions between inside faces of wheels or tyres on a wheelset must be between 997 and 998mm*". However, in September 2016, KiwiRail amended their internal back-to-back wheel press measurement via an Engineering Change Request (ECR1016) to 994 – 996mm. NRSS/6 has not been updated to reflect this change, and Transdev and Hyundai Rotem reportedly only became aware of the change in March 2024.

KiwiRail has supplied wheelsets to Transdev and Hyundai Rotem since mid-2016 and has been progressively changing to KiwiRail's new standard of 994 - 996mm. Potentially, new wheelsets pressed to ECR1016 should have a concession from NRSS/6 provided by KiwiRail. As to date, Transdev states no formal notice has been received from KiwiRail to instruct them on this change.

From information provided during the review (see Appendix A), the reduction in back-to-back measurement is however also advantageous to reducing hunting, as the contact point moves 2mm toward the outside of the tread, and away from the higher conicity flange root area (i.e. improving the rail wheel interface) (Transdev Report 2024).

Data loggers placed in four carriages have been measuring the actual forces generated in the carriages (Figure 3). Varying locations were identified within the carriages for data loggers to be installed, which also confirmed increased forces measured directly above the bogies versus loggers located in the centre of the carriage.

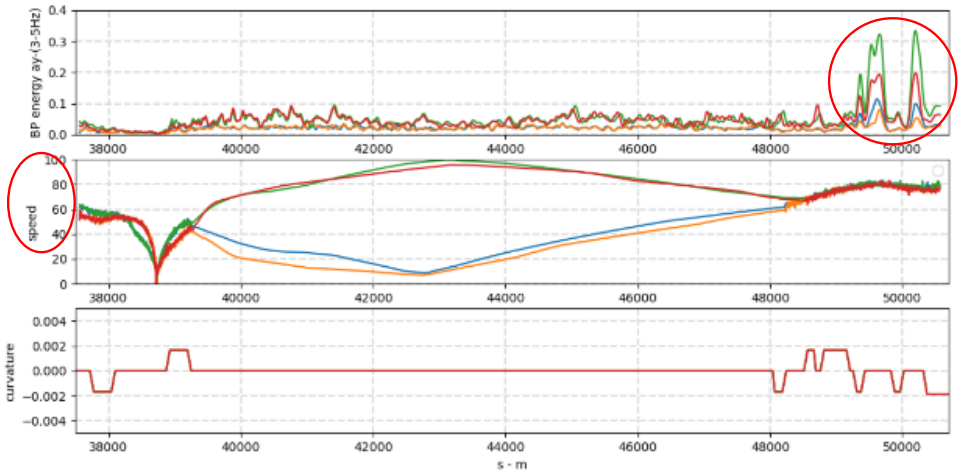


Figure 3. Data logger information recording hunting at ~49km at 80km/hour

Summary Findings

- Bogies and wheelsets are inspected and maintained at regular set time and distance-based intervals.
- Wheelset profiles are all within defined tolerances, with 17 of the 18 at C1, and one at C2
- There is variance between the carriages on back-to-back dimensions, with 14 between 997-998mm and 4 between 994-996mm
- Confirmation on the implications and history of ECR changing the back-to-back dimensions needs further investigating

4 Supporting Analysis – Identified Causal Factors

The following section reviews measurements relevant to the rail wheel interface, as it is likely changes in the rail wheel interface gap is the primary cause of hunting in SW-type carriages.

4.1 Track Gauge Changes

EM80 gauge data for from April 2020 was obtained, as this was effectively the baseline of track gauge before hunting was reported. EM80 gauge data is a standard measure of track gauge across the network in New Zealand, as the EM80 is regularly calibrated to enable consistent measurement. Since then, the only parameters in the track and train systems on the Wairarapa Line that have changed, are rerailing and re-sleepering renewals. So the 2020 EM80 data[3] was compared to the most recent December 2023 EM80 data, see Figures 4 – 7 below.

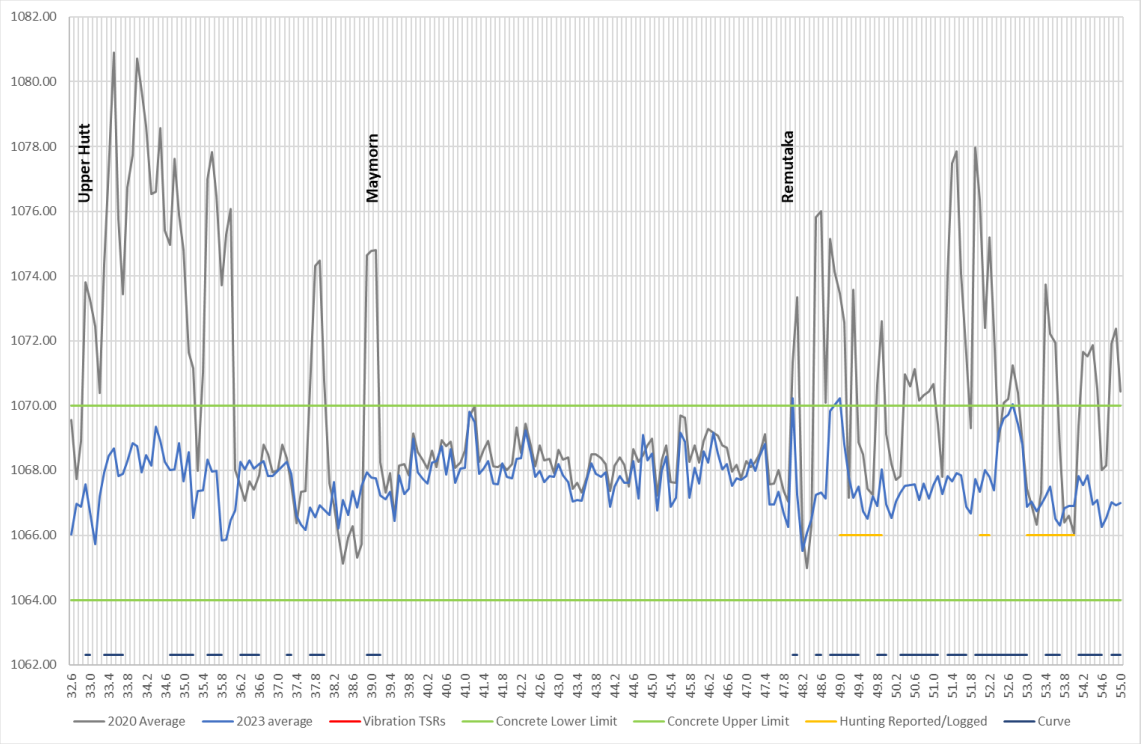


Figure 4. 2020 April EM80 data, 2023 December data, upper and lower tolerances for concrete sleepers (1068mm -4mm to +2mm), data logged/reported hunting between 32.6km to 55km. Current vibration TSRs and approximate curve locations also added at bottom of chart for context

[3] EM80 gauge data was averaged to every 100m to enable sufficient data points

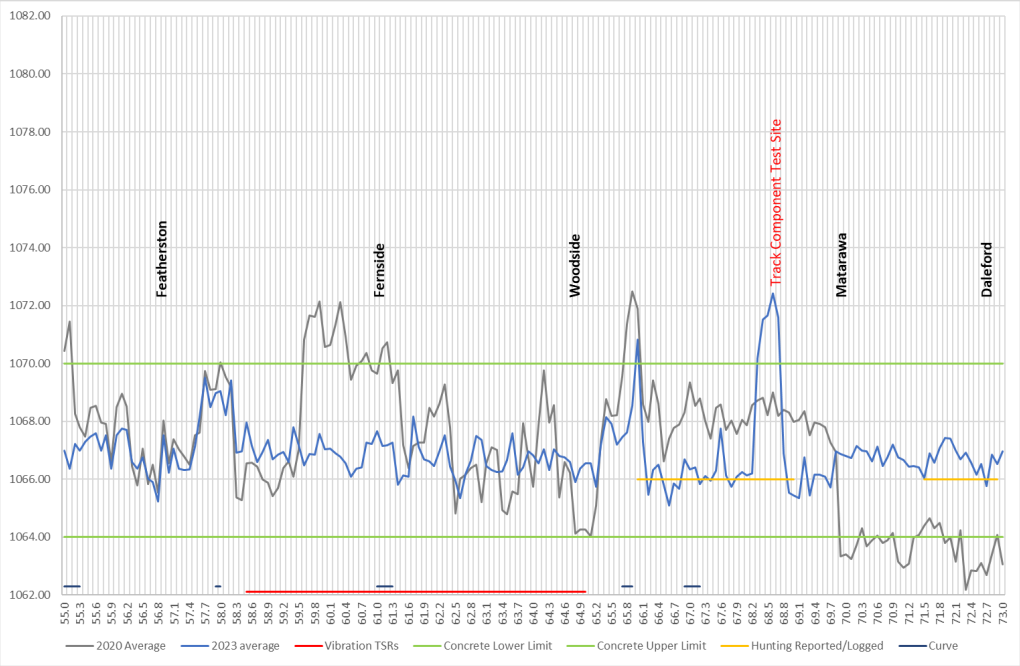


Figure 5. 2020 April EM80 data, 2023 December data, upper and lower tolerances for concrete sleepers (1068mm -4mm to +2mm), data logged/reported hunting between 55km to 73km. Current vibration TSRs and approximate curve locations also added at bottom of chart for context

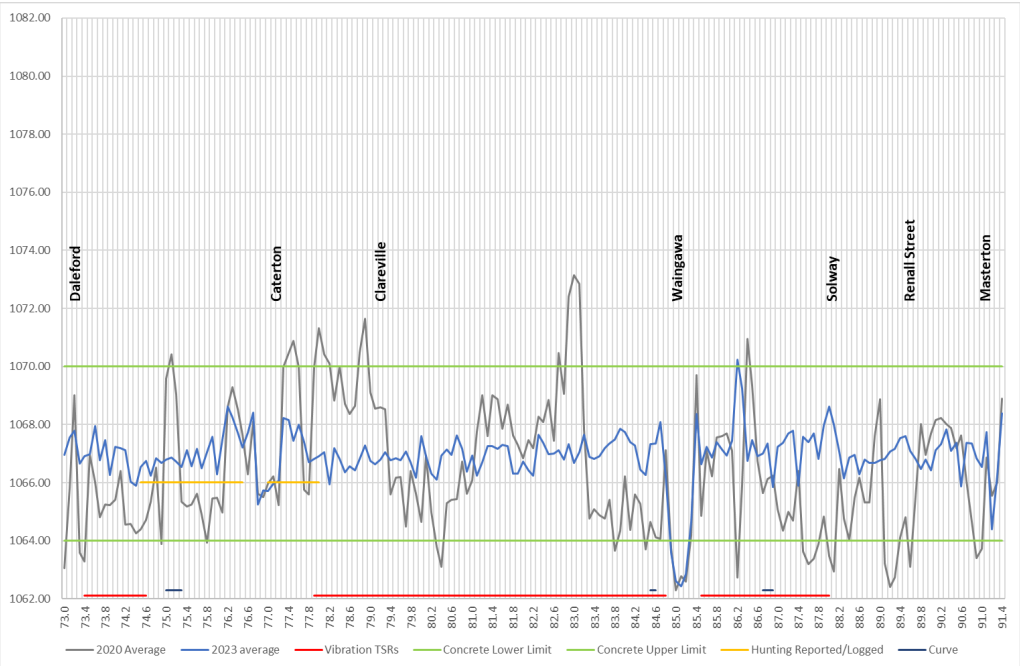


Figure 6. 2020 April EM80 data, 2023 December data, upper and lower tolerances for concrete sleepers (1068mm -4mm to +2mm), data logged/reported hunting between 73km to 91.4km. Current vibration TSRs and approximate curve locations also added at bottom of chart for context

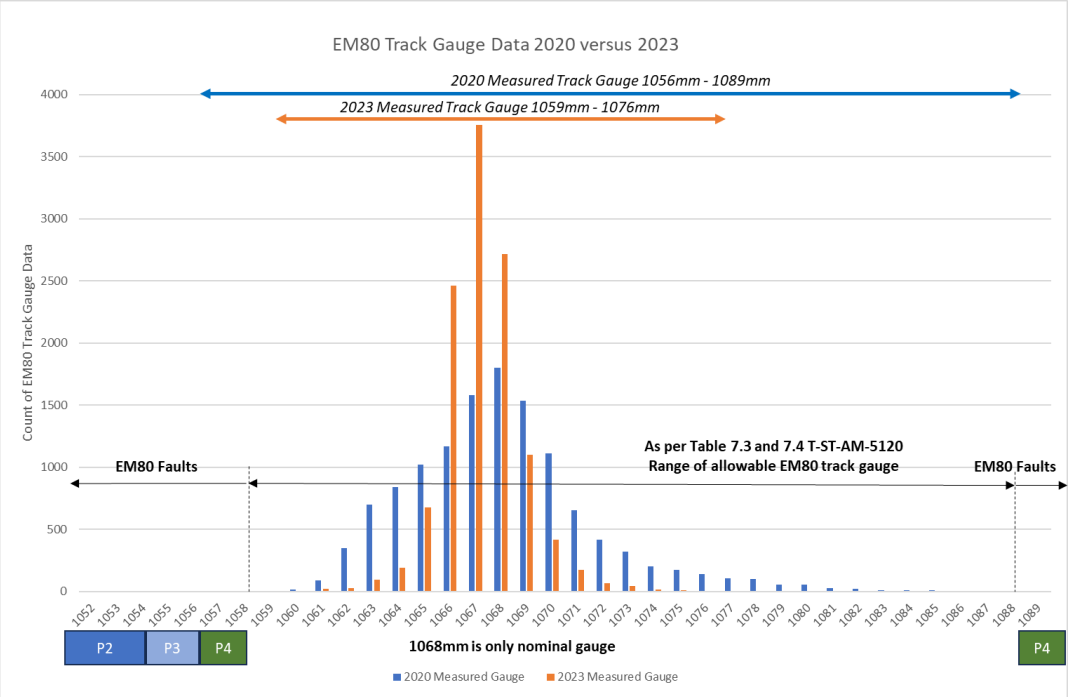


Figure 7. 2020 April EM80 versus 2023 December EM80 track gauge ranges, including EM80 defect notification tolerance and P ratings (as per T-ST-AM-5120 Track Standard: Track Geometry)

The quantum of catch-up renewals, shown in Figure 7, has achieved a 32% improvement on nominal gauge variability (1066mm-1070mm) from 2020 to 2023, with EM80 data revealing:

- 2023 track gauge data, 89% between 1066mm and 1070mm, with 96% between 1064mm and 1070mm
- 2020 track gauge data, 57% between 1066mm and 1070mm, with 96% between 1062mm and 1076mm.

Summary Findings

Reviewing the charts in Figures 4 – 7 reveals that overall:

- Track gauge variability between Upper Hutt (32.6km) and Masterton (91.4km) has improved from 2020 to 2023, because of the renewal works completed. The graphs show a 2023 track gauge is ~90% between 1066mm and 1070mm. So track gauge variability and tolerance has improved towards the nominal 1068mm
- 2020 track gauge had more variability, including more sections that are less than 1066mm, and some that are significantly greater than 1070mm. It was unexpected to find the gauge narrower back in 2020, however the rail head profile may have been more worn in these areas, on more flexible wooden sleepers, hence SW-type carriages were able to be more tolerant of this narrower gauge. The wider gauge would have been most likely due to wooden sleepers with more movement whilst be measured under load by the EM80
- Data loggers have recorded in some carriages hunting in isolated sections where track gauge is closer to 1066mm (e.g. ~66-69km and ~71.5-73km). Other areas reported and recorded for hunting are not as conclusive (e.g. ~49km-49.9, ~52-52.2km, ~53-54km,

~74.5-76.5km, and ~77-78km). Whilst other sections with gauge closer to 1066mm have also had no hunting recorded or reported to date.

4.2 Wheelset Profiles and Back-to-Back dimensions

The 2023 EM80 data identifies that the track gauge post completed works is predominantly between 1066mm and 1070mm. Wheelset dimensions also influence the ride quality of a carriage, so if track gauge now has less variability, wheel flange width and back-to-back measurements need to be examined. See Figure 8 for key measurements, and Table 2, for nominal rail wheel gap assessment.

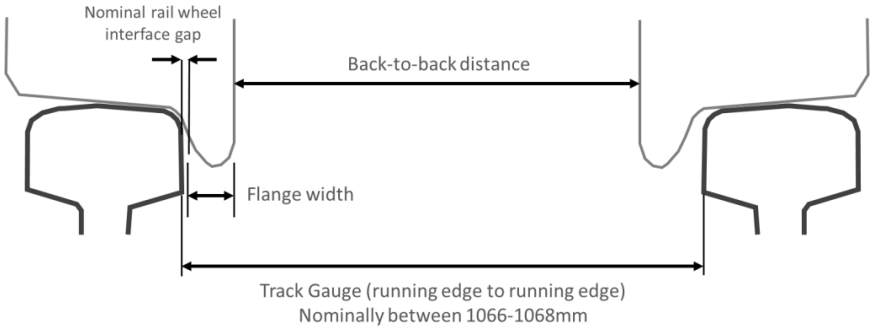


Figure 8. Nominal rail wheel interface gap, key dimensions that influence the gap.

Table 2. Nominal rail wheel interface gap analysis. Down the left side, identifies there are two different back-to-back dimensions in SW-type carriages, interfacing with a range of track gauges (1064mm-1070mm), that are then influenced by the wheel profiles C1 – C3 (with reducing wheel flange thicknesses 28mm-24mm).

		Back to Back	Track Gauge	*Remaining*	Flange Thickness Profiles - Rail Wheel Nominal Gap					
		998-997	1064-1070		C1 - Nominal Gap		C2 - Nominal Gap		C3 - Nominal Gap	
		996-994			28		26		24	
14 SW-type carriages		**998**	1070	72	16	8	20	10	24	12
		998	1068	70	14	7	18	9	22	11
		998	1066	68	12	6	16	8	20	10
		998	1064	66	10	5	14	7	18	9
		997	1070	73	17	8.5	21	10.5	25	12.5
		997	1068	71	15	7.5	19	9.5	23	11.5
		997	1066	69	13	6.5	17	8.5	21	10.5
		997	1064	67	11	5.5	15	7.5	19	9.5
4 SW-type carriages	SW3349, SWG3422,SWG5671, SW3349	**996**	1070	74	18	9	22	11	26	13
		996	1068	72	16	8	20	10	24	12
		996	1066	70	14	7	18	9	22	11
		996	1064	68	12	6	16	8	20	10
		995	1070	75	19	9.5	23	11.5	27	13.5
		995	1068	73	17	8.5	21	10.5	25	12.5
		995	1066	71	15	7.5	19	9.5	23	11.5
		995	1064	69	13	6.5	17	8.5	21	10.5
		994	1070	76	20	10	24	12	28	14
		994	1068	74	18	9	22	11	26	13
		994	1066	72	16	8	20	10	24	12
		994	1064	70	14	7	18	9	22	11

Note: Red indicates that at these rail wheel interface gaps, hunting is likely to be more prevalent. The Technical Report from October 2000 also suggested that the rail wheel interface gap for new wheels on new 50kg/m rails is approximately 9-11mm, which is more likely to be achieved on a C2 wheel profile.

Summary Findings

Reviewing the information in Table 2 it is likely that:

- The 14 SW-type carriages, with a back-to-back of 997 – 998mm, and a C1 wheel profile, will be most at risk of hunting on gauges less than 1068mm on tangent track. This is most likely due to the suspension design having a lower inherent ability to dampen forces out associated with hunting compared to more recent bogie designs (e.g. Martangi carriages)
- The 4 SW-type carriages, with a back-to-back of 994 – 996mm, and a C1 wheel profile, are also at risk of hunting on gauges of 1066 and below. This is most likely due to the suspension design having a lower inherent ability to dampen forces out associated with hunting. Additionally, as C1 wheel profiles become more worn, they will also change the contact point and rail wheel interface gap, increasing the likelihood of hunting
- Hunting in SW type carriages looks less likely to occur when wheel profiles are C2 or C3 (narrower flange widths), as the rail wheel interface gap is improved with no change in conicity (also see Appendix C - Differences between C1 and C2 asset condition).

4.3 Answers to specific questions

Specific questions to be answered were as follows.

Has the rail been constructed within existing KiwiRail tolerances?

Yes, based on KiwiRail standards provided and the current EM80 data, the renewals planned and delivered have been built and are compliant within documented KiwiRail tolerances.

Are the KiwiRail rail tolerances fit for purpose when there is a range of wheel profiles running on the line?

Further information from data loggers in other passenger carriages and trains in the Wellington Metro area is needed to validate if hunting is occurring elsewhere on the network, as:

- If hunting is confirmed as only occurring in SW-type carriages, and not extensively in other carriages and trains, then yes current documented tolerances in KiwiRail standards are fit for purpose. As hunting in SW-type carriages is isolated to an unknown sensitivity within their bogie suspension design, that increases the likelihood of hunting at line speeds greater than 60km/hr, on tangent (straight) track, when track gauge is less than 1066mm on concrete sleepers; **or**
- If hunting is confirmed by data loggers in other carriages and trains across the Wellington Metro network, then documented tolerances in KiwiRail standards may need further review. However, further work will be needed to identify possible changes in KiwiRail standards and/or other interoperability documents. All changes identified will need to be tested and updated in relevant documents in close consultation with all relevant parties.

What can be learnt from this incident about wheel profile tolerances? Reviewing selected incidents, from existing available reports and selected interviews with nominated KiwiRail Staff;

- The rail wheel interface gap is a critical area of the rail system. Wheel profiles together with track gauge and the rail head profile are key factors in train and carriage interoperability and longer-term track and wheelset maintenance implications. National Rail System Standard / 6 – Engineering Interoperability Standards needs to be updated, based on findings from data loggers and other known documented changes in KiwiRail standards since 2013 (e.g. changes in back-to-back dimensions).

Review current engineering change processes, including what is defined as an engineering change, current processes, standards, etc. Includes all standards relevant to new rolling stock or changes to track standards and tolerances, including timing of;

- *Comment on possible broader implications, including;*
- *Current rolling stock maintenance intervals; and*
- *2029 future rolling stock (Lower North Island Rail Integrated Mobility[4]).*

- Currently there is no documented requirement for KiwiRail to consult with Greater Wellington Regional Council on any changes to KiwiRail Standards. Additionally, the changes and updates that have occurred in the Track Standards listed in Appendix A, are mostly improvements and refinements within existing tolerances, not significant changes that would impact the rail system interoperability. However, the implications of 2016 Engineering Change Request updating the back-to-back needs to be further investigated, together with open consultation on the updates needed to NRRS/6 in light of the increased hunting in SW-type carriages and pending confirmation of changes that will reduce it.

[4] https://www.gw.govt.nz/document/19521/detailed-business-case-lower-north-island-rail-integrated-mobility-2021/

5 Possible options to reduce the likelihood of hunting

Options to reduce the likelihood of hunting from SW-type carriages are presented in Table 3. All options consider track and wheelset works, in the short-term and over the longer-term, to reduce the impact to passenger services. A longer-term view is important with new trains in 2029.

Table 3. Range of possible options to reduce the likelihood of hunting.

Options	Risks	Costs between now and 2029	Service Impact
A) SW-type Carriages are restricted on the network to <60km/hr. **No other works completed.**	Increasing risk of damage and defects to rails and carriages. Increasing risk over time that speed restrictions could reduce down further to 40km/hour	**MODERATE** - No cost to implement but likely increased maintenance costs longer term.	Significant impact to the travelling public, with speed restrictions increasing travelling time, and disrupting other services on the network.
B) Change track components (i.e. pads or insulators) to increase the track gauge to 1070mm. **No other works completed.**	Increasing risk of damage and rail defects due to suboptimal contact point and rail wheel interface (e.g. rolling contact fatigue). Not fully tested as a viable option	**MODERATE** – Time needed to change components to widen. Additional track and wheel costs over the longer-term as rail wheel interface remains suboptimal.	Potential increase in track and wheel maintenance over the longer-term, increasing disruptions to train services, due to suboptimal contact point and rail wheel interface.
C) SW-type carriages have wheels gradually reprofiled to C2 and back-to-back gradually changed to 995mm (ECR1016). **No other works completed.**	Time to complete, and potential changes to existing maintenance intervals and interventions. Risk of rail defects due to suboptimal contact point and rail wheel interface (e.g. rolling contact fatigue).	**MODERATE** – Costs associated with reprofiling and changes in back-to-back dimensions. Possible additional track maintenance costs as rail wheel interface remains suboptimal.	Wheelset changes may not be enough to improve rail wheel interface gap on new rails with low tonnage (i.e. rail head profile not optimal) so isolated speed restrictions may still be needed.
D) Rail grinding only, to improve the rail head profile. **No other works completed.**	Fire ban limiting access to complete. Access will need to be coordinated around other works. Time to complete, and possible changes to existing planned work.	**MODERATE** – Costs associated with grinding. Possible additional track and wheel maintenance costs if rail wheel interface remains suboptimal.	Works unlikely to improve rail wheel interface gap over the longer-term, and speed restrictions likely to still be needed.
E) Combination of rail grinding and wheelset reprofiling. Grinding improves rail head profile, and wheelset reprofiling to C2 and with possible gradual back-to-back changes to 995mm, improve the rail wheel interface	Fire ban limiting access to complete. Access will need to be coordinated around other works. Time to complete, and possible changes to existing planned work.	**HIGH** – Targeted works to improve the rail wheel interface gap and rail head profile (contact point)	Staged approach, to validate engineering tolerances and optimum wheel profile tolerances. Speed restrictions could be progressively removed if data loggers confirm reduction in hunting. Improved ride quality and least long term disruption.

6 Key Recommendations

From the information provided and analysis presented, we identify the following recommendations.

6.1 Reducing the likelihood of hunting in SW-type carriages

The completion of rerailing and re-sleepering works, reducing gauge variability from 2020 to 2023, has changed the rail wheel interface gap and increases the likelihood of hunting in SW-type carriages. SW-type carriages due to unforeseen suspension characteristics and possible lighter tonnage (when compared to Martangi and SE) have less ability to dampen the forces from hunting, hence transferring it through into the carriages as vibrations. The SW carriage bogie suspension configuration utilises spring primary and spring secondary suspension with no lateral damping between the bogie and carbody. The SE carriage and Matangi bogies (although different in design) utilise a suspension configuration with spring primary and airbag secondary suspension. In addition, the SE carriage and Matangi have a lateral damper between the bogie and carbody. Transdev believe that both the SW and SE carriage bogies are possibly exhibiting hunting, but the lateral damper found on the SE carriages is reducing the accelerations to the carriage. However, KiwiRail have found no increased damage to track components in Wellington, nor has Auckland Metro had reported increasing track damage from a similar renewal works, suggesting that if hunting is more prevalent it is not impacting the track.

Track work has improved and decreased the gauge variability across the Wairarapa line, so work to further modify the track gauge should only be considered as a last option. As widening track gauge beyond 1070mm would increase track gauge variability, effectively taking the network back towards a 2020 condition level, which could then increase the level of wheel and track maintenance needed over the longer-term. Hence, improving the rail wheel interface with staged targeted changes that improve the gap and rail head profile should be prioritised first. As improving the rail wheel interface is the best outcome for GWRC and KiwiRail, as it is likely to decrease the longer-term maintenance for both track and SW-type carriages.

Grinding is needed, which although it will not eliminate hunting over the longer-term, is an important factor to improve rail wheel interface. KiwiRail will need to confirm the rail head profile that needs to be achieved by grinding relative to the conicity of SW-type carriage wheelsets. Works will need to be planned in and progressively completed, so testing with data loggers can confirm what improvements have been achieved (i.e. unground baseline vs ground movements).

Progressive testing with data loggers of changes is essential to understand what improvements are being achieved. A complete train consist with all carriages on C2 wheel profiles on a 997mm back-to-back needs to be tested first, as the reduction in flange width is likely to improve the rail wheel gap. Works will need to be planned in and completed, so sufficient testing with data loggers can record a baseline (i.e. hunting) on a C1 wheel profile at 60km/hour, and what improvements have been achieved by changing to C2 wheel profile with a 997mm back-to-back at 60km/hour. If data recorded shows hunting is reduced or eliminated at 60km/hour, then test trains using a C2 wheel profiles on a 997mm back-to-back needs to be progressively tested at increasing speeds, possibly up to 100km/hr.

Depending on data logger results with a C2 wheel profile on 997mm back-to-back, a complete train consist with all carriages on C2 wheel profiles with 995mm back-to-back could then be tested. As the reduction in the back-to-back will also improve the rail wheel gap. Works will need to be progressively completed, so testing with data loggers can show a baseline (i.e. hunting) on a C1 wheel profile at 997mm, then at C2 wheel profile on 997mm, and what improvements have been achieved at 60km/hour, to possibly 100km/hr.

6.2 Wider implications to be investigated

There are anecdotal reports of other trains on other parts of the Wellington Metro having reports of vibrations and rough rides. To confirm or eliminate these reports additional data loggers are needed on other passenger carriages (e.g. Martangi and SE-type carriages). Data loggers will need to be in place for at least two weeks, across multiple carriages, to collect sufficient data at varying speeds to provide conclusive information that can be relied on.

6.3 Updating of documents

National Rail System Standard 6 – Engineering Interoperability Standards was last updated over ten years (April 2013). This document needs to be reviewed, in alignment with all other relevant standards, and updated, specifically around back-to-back dimensions and wheel profile flange widths. Once updated it then needs to go through the standard change control process, including consultation and feedback, before being adopted on an agreed date. The sharing of Auckland and Wellington Metro Interoperability lessons within existing joint forums or meetings, together with communicating planned changes that could impact the rail system, would also be beneficial for both metro rail systems.

6.4 Interoperability of new trains in 2029

With new trains planned for 2029, the rail wheel interface needs to be key component that is verified before their design is approved. Learnings from recent new trains on the Auckland Metro network, together with information from data loggers on the Wellington Metro network, needs to be factored in to confirm design has considered:

- Wheel profile, including conicity;
- Flange width and back-to-back measurements relative to defined and known track gauge tolerances; and
- Bogie suspension characteristics.

Appendix A: Documents Reviewed

Type	Document	Relevancy
Email	FW: MIS 346W Transdev 77km 78.2km Wrapa	First notification
Email	Re WRAPA - Vibration issue	Investigations
Website	https://www.kiwirail.co.nz/our-network/our-regions/wellington/wairarapa-line/	Scope of works
Brochure	Wairarapa Line Upgrade – February 2024	Scope of works
Document	KiwiRail T200 Track Handbook – Revised Issue 7 – Effective 30th September 2022	Engineering Tolerances
Document	Track Standard - T-ST-DE-5200 Track Design – December 2022	Engineering Tolerances
Document	Track Standard – T-ST-AM-5330 Rail Management – December 2022	Wairarapa Line tonnage (MGTPA)
Document	Track Standard – T-ST-AM-5320 Sleeper Fastenings – Sept 2021	Concrete Sleepers
Document	Track Standard – T-SP-MM-60156 Rail Grinding – June 2022	Grinding Frequency
Document	Track Standard – T-TI-WO-5926 Face Re-sleepering – Dec 2022	Gauge check post re-sleepering
Document	Track Standard - T-ST-AM-5120 Track Geometry	EM80 Gauge tolerances
Report	EM80 Upper Hutt ~ Masterton Data – April 2020	Track Gauge Measurements
Report	EM80 Upper Hutt ~ Masterton Data – December 2023	Track Gauge Measurements
Report	GPR Data WRAPA TSR Vibration mark up	Measurements
Drawing	NZR 50kg – 91lb Rail Sleeper Gauge Measurements V2	Measurements
Drawing	60kg 25 Tonne Concrete Sleeper	Measurements
Document	M9311 X28020 Maintenance Guide	Trouble shooting
Document	M6000-100 Wheelset Manual – Wheelset Specifications	Wheel tolerances
Document	M6000-101 Approved tread profiles	Wheel tolerances
Document	National Rail System Standard / 6 – Engineering Interoperability Standards	Wheel tolerances
Document	Wheel and Rail Profile Development – Rail Industry Safety and Standards Board	Wheel tolerances
Report	Technical Report TR.071 – Rail-Wheel Interface Improvement Investigation for Tranz Rail – Version 3.0 October 2000	Track and wheel tolerances
Document	Engineering Change Request (ECR) Wheelset Back-to-Back Dimension Change – September 2016	Back-to-back distance change
Report	Bogue Vibrations – SW Cars asset degradation solutions and remedies – Hyundai Rotem	Increased maintenance
Data	Brake block and wear liners Work Orders	Increased maintenance

Document	ECR no.1016 Wheelset Back-to-Back Dimensions Change	Internal change in back-to-back
Email	FW WMUP WL works – Impact of TSRs and Work	Works completed
Report	Wairarapa Carriage Hunting – Transdev	Increased maintenance
Report	Wairarapa Train Vibration - Notes	Vibration analysis and findings
Report	Wairarapa Line – CEMIT Presentation	Vibration analysis and findings
Business Case	Single-Stage Business Case Wellington Metro Railway Network Track Infrastructure Catch Up Renewals – November 2017	Asset condition and history, and renewals needed

Unless specifically stated otherwise in this report, Beca has relied on the accuracy, completeness, currency and sufficiency of all information provided to it by, or on behalf of, the Client, including the information listed above, and has not sought independently to verify the information provide

Appendix B: Relevant documents history

A large amount of supporting and historical documentation was provided throughout the review (Appendix A), with key documents summarised as follows.

October 2000 – Technical Report for Tranz Rail – Rail Wheel Interface Improvement Investigation

This report identifies:

- How improved wheel and rail profiles create benefits such as reduced level of vehicle hunting, particularly in tangent track.
- A major objective for tangent track is to avoid hunting, as this causes component deterioration and passenger discomfort, which is best obtained by maintaining contact near the centre of the running surface of the rail (i.e. widening the gauge moves the contact band to the inside edge of the rail).
- How a combination of worn wheel with new rail leads can caused a very localised contact in the gauge corner, increasing the risks of rolling contact fatigue.
- Track gauge is 1068 and all wheelsets have a 997mm back-to-back
- Depending on where you measure from, the expectant rail wheel interface gap for new wheels on new 50kg/m rails is approximately 9-11mm. This gap is similar to narrow gauge railways in Australia.
- An increase in the rail wheel clearance would generally be expected to reduce rail and wheel wear. The main reason is that the resultant larger wheelset lateral movements allow an increased rolling radius difference between the wheels to be established and hence higher steering forces, particularly in profiled rails and wheels.
- Grinding delivers significant benefits to prevent defect growth and can extend the rail life by about 50-100%. Grinding on tangent track can also improve the rail head profile and reduce possible vehicle hunting.
- Grinding also reduces rates of wheel deterioration (flange wear, tread hollowing and contact fatigue), due to improved wheel/rail contact and interaction characteristics. And reduce damage to various vehicle components, including wheels, bearings and sometimes bogies.
- Obtaining the optimal rail wheel profile, with a definite two-point and relatively broad contact near the centre of the running surface of tangent rails, reduces the effective conicity between rails and wheels, and hence reduces the sensitivity to vehicle hunting and adverse vehicle/track dynamics.
- Promotes the benefits of modified wheel profiles, including up to 90% reduction in flange energy on modified wheel profiles
- *In the short term, the modified wheel profiles should be introduced on both passenger and freight bogies, at least for trial purposes. During the trials, particular attention should be paid to the vehicle dynamics at the higher speeds in tangent track and shallow curves. This aspect is of importance considering that the modified wheel profile does have a fuller throat region, which could increase the vehicle dynamic response when the wheel throat approaches the rail gauge corner. If this is found to be a cause for concern, the following three options are available:*

- *reduce the wheelset back-to-back distance by 4-5 mm, as discussed in Section 5.9 of the report; and/or*
- *reduce the wheel flange thickness by up to 2 mm; and/or*
- *apply the tangent rail profile by rail grinding, as discussed in Section 6 of the report, in both tangent track and curves with radii above 1000 m, where rail gauge face/wheel flange wear will be negligible.*

September 2011 – Concrete Sleeper Design

This documented was:

- First published in September 2010, and last updated in September 2011
- States the gauge dimensions allows for Rail Section movement due to train load, and dimensions for nominal gauge of 1068mm after 6 months (i.e. close to 1068mm)

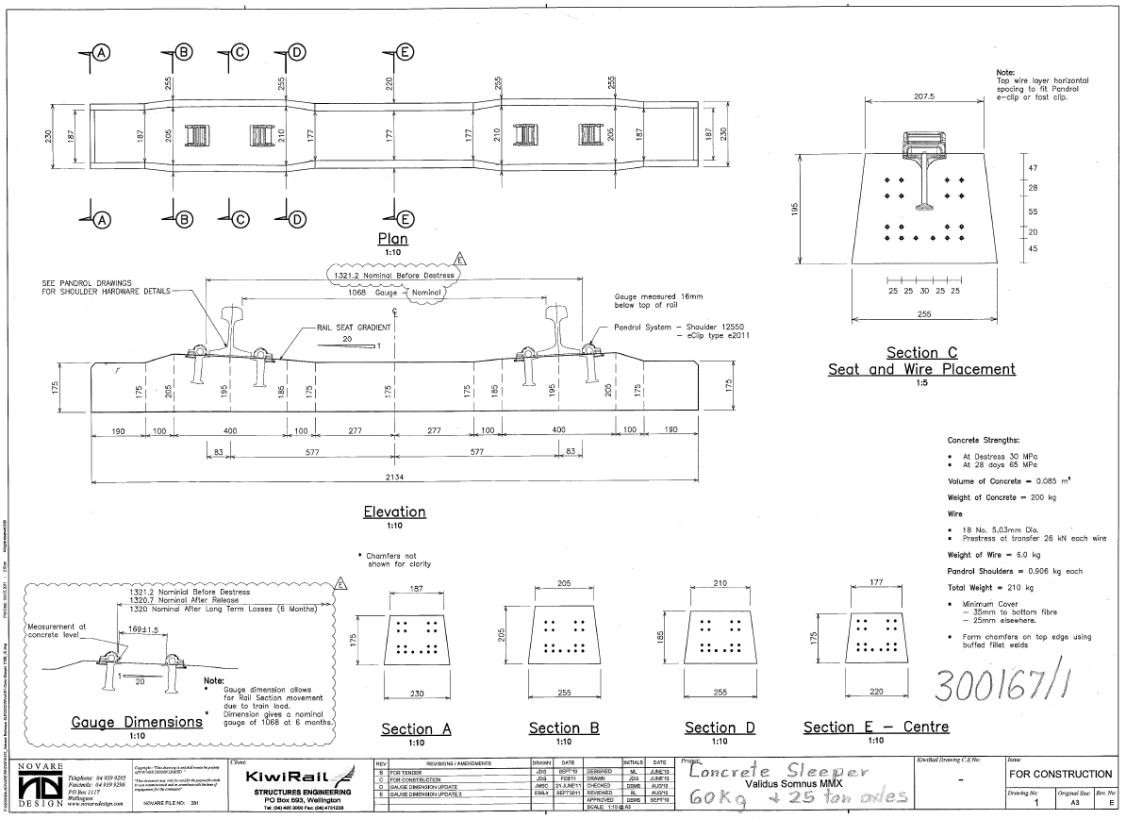


Figure 9. KiwiRail Standard Drawing for 60kg Sleeper – Approved September 2010, last updated September 2011

April 2013 National Rail System Standard / 6 – Engineering Interoperability Standards

This standard includes:

- The 50kg/m unworn rail profile (from 1987)

- *The back-to-back dimensions between inside faces of wheels or tyres on a wheelset must be between 997.0 mm and 998.0 mm, measured at three, equidistant positions around the circumference using gauge Y/X 4603/10.*
- *Wheel profiles must be to a National Rail System standard. Modified Heumann profile wheels with a fundamental tread conicity of 1 in 20 are used on the National Rail System. The current family of acceptable profiles is shown on drawings 7604/11 - 7604/13 in Appendix A* (see Figure 10)*.*

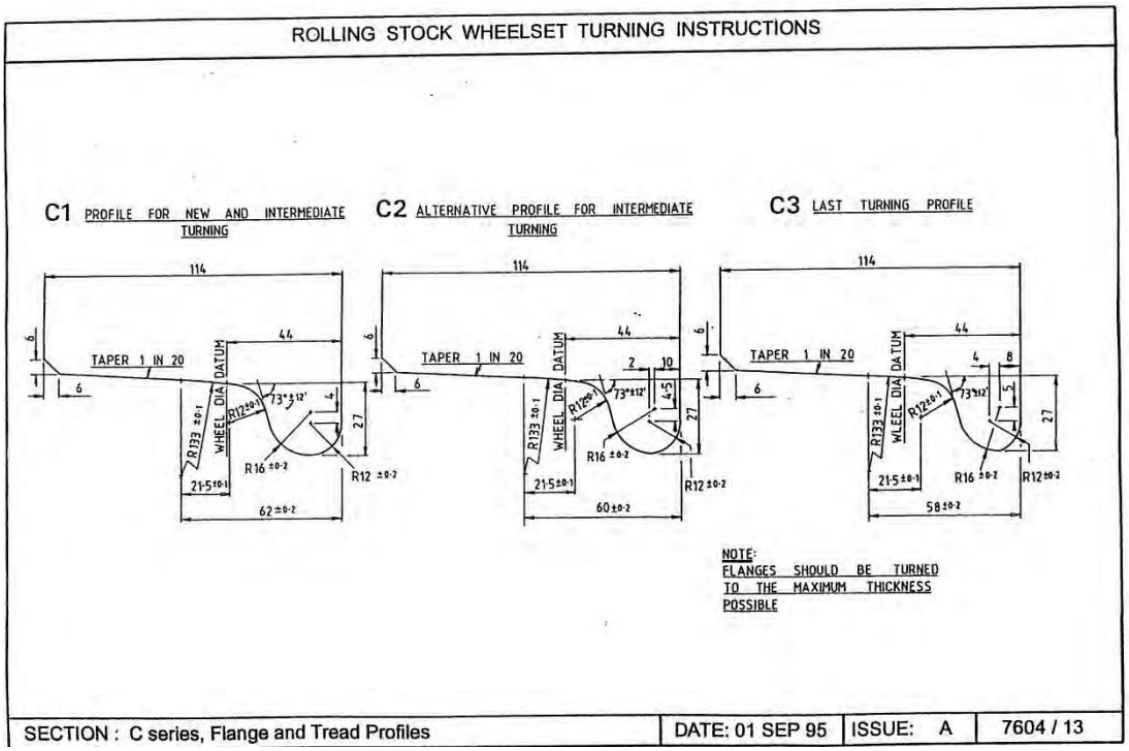


Figure 10. Rolling Stock Wheelset Turning Instructions, dated September 1995.

- *The relevant track standards affecting rail vehicle static and dynamic stability primarily reside in the following of the Access Provider documents (as updated from time to time):*
    - *T200 - Infrastructure Engineering Handbook*
    - *T003 - Track Code*
    - *T100 – Track Supplements*
- *These standards encompass the following:*
    - *Track gauge*
    - *Track construction and maintenance standards*

September 2016 Engineering Change Request – Wheelset Back-to-Back Dimension Change (NCR1016)

This internal KiwiRail change request provides the following:

- *Change Description - Reduce wheelset back-to-back dimension from current 997 (+1,-0) to 995 (+/-1). Agreement email from AME&I attached (note not attached on the version provided)*
- *Scope/ Assets involved - All rail wheelsets (loco's, wagon, carriages). May not affect hi-rail vehicles*
- *Means of Identifying Change - TBC*
- *Reason – It has long been recognised that our current arrangement has the wheel profile sitting too far out relative to the rail head. This change does not go as far as ideal, but at least moves in the right direction.*
- *Risk/ Management - Mixing wheelsets of different back-to-back dimensions on the same bogie is a potential problem, though it is debatable whether the outcome would be worse than having both wheelsets at the current back-to-back dimension. Requires further discussion.*
- *Effect on performance - It should yield wheelsets that track better and have less inclination to hunting. Over time this should see a reduction in sharp flanges, with perhaps an increase in guttering as the driver for wheel turning (skidding aside).*
- *Operational Impact - Theoretically there should be a fuel saving through less flange contact. May be difficult to measure.*
- *How will change be monitored and how often - Needs new back-to-back gauge.*
- *How will change be implemented - Issue change notification and amend codes, design drawings, specs. Can be immediate but does not preclude running existing wheelsets to end of useful life.*
- *Cost Benefit - Cost is minimal – just admin change of amending codes, drawings and specs. Savings accrue for less severe wheel turns and reduction of fuel consumption as new dimension starts to be dominant in fleet.*

Track Standards

Relevant track standards include:

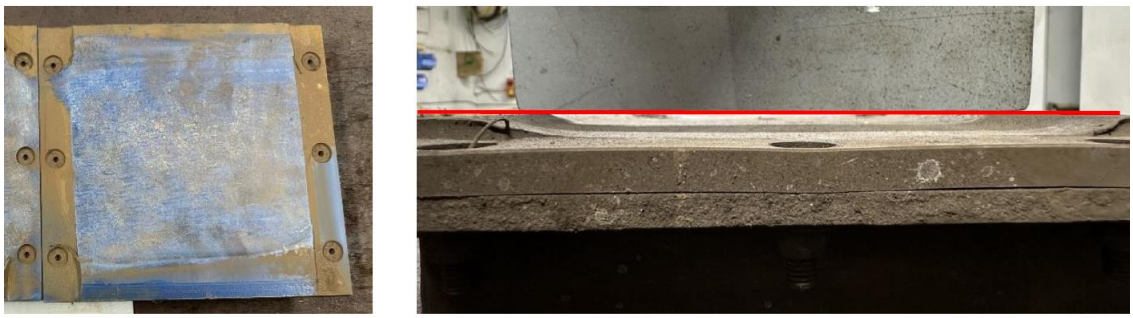
- Track Design, latest version 31/12/2022. Earlier revisions include 30/9/2021, 30/06/2019, 30/04/2017, and 3/03/2017;
- Rail Management, latest version 31/12/2022. Earlier revision includes 31/01/2018
- Rail Grinding, latest version 30/06/2022. Earlier revision includes 30/06/2019
- Sleeper fastenings, latest version 30/09/2021
- Face Re-sleepering, latest version 31/12/2022
- Track Geometry, latest version 3/03/2017

Appendix C: SW-type increased maintenance

Issues affecting carriages: Brake Blocks

Brake blocks from myriad carriages; the failure mode is new

Issues affecting carriages: Wear Liners



Worn wear liners with a very rough finish. Normally they are smooth and evenly worn

Issues affecting carriages: Side bearer

Red-coloured side bearers being found across the fleet.
The red is indicative of iron fretting

Appendix C: Differences between C1 and C2 asset condition

Issues affecting carriages – SWS3394 This car has a #2 profile

The bogies on SW3394 show much less evidence of fretting

Issues affecting carriages – SWS3394 Comparison with another car

SW3394

SW5671

Issues affecting carriages – SWS3394 Comparison with another car

SW3394

SW5671

Transport Committee
16 May 2024
Report 24.182

For Information

PUBLIC TRANSPORT ADVISORY GROUP MEETING – 6 MAY 2024

Te take mō te pūrongo
Purpose

1. To inform the Transport Committee (the Committee) of the deliberations of the Public Transport Advisory Group meeting held on 6 May 2024.

Te tāhū kōrero
Background

2. On 24 November 2022, Council re-established the Public Transport Advisory Group (the Advisory Group). The Advisory Group provides advice from a consumer perspective to inform the business of Metlink and the Transport Committee (as required).
3. The Advisory Group's Terms of Reference provides that:
    a The Council appoints the Chair of the Advisory Group.
    b After each meeting, a written report of the business conducted at that meeting shall be provided to the Transport Committee.
    c The Chair of the Public Transport Advisory Group shall speak to that written summary report at the relevant Transport Committee meeting.
4. The Transport Committee's Terms of Reference provides that Chair of the Advisory Group will be a non-voting member of the Transport Committee.
5. The Advisory Group's most recent meeting occurred on 6 May 2024.

Te tātaritanga
Analysis

Meeting agenda and matters considered by the Advisory Group

Workshop: Co-designing a better 'buses replacing trains' service

6. 'Buses replacing trains' (BRT) has become a frequent feature across the network as KiwiRail carries out critical upgrades and improvements to create a more resilient and efficient rail network for the Wellington Region over the next decade. We know from customer feedback that BRT, whether planned or unplanned, is less than ideal for the customer travel experience.

7. For this workshop, we asked members to draw on their personal experiences of BRT to help identify and prioritise potential avenues of improvement.

8. Members were divided into four groups to discuss six themes including information and communication, the BRT vehicle, finding and boarding, fares and paying, routes and bus stop facilities and the experience on bus. For each theme, members were encouraged to consider the 'pain points', positive experiences, and potential improvements. Key outtakes from each theme are summarised below.

    a Information and communication – groups were eager for information about BRT services to be "over communicated" given the potential for customers to miss information at every step of the journey. Rather than relying on the Metlink app or website, members advocated for standardised signage at every egress point at stops and stations as well as audio announcements and accurate real time information boards on bus and arrival and departure times that reflect traffic conditions. Support from staff was highly valued, but members agreed it would be even better if all operators had the same standardised processes and procedures for running BRT services.

    b BRT vehicle – members generally understood that the deployment of buses for BRT was akin to an 'emergency' situation and were willing to tolerate a lower vehicle quality standard. However, access for disabled people and others with accessibility needs was non-negotiable. A minimum fleet standard was recommended, including accessible boarding and priority seating, bike racks, space for prams and Snapper card readers. Members also recommended consistent external livery to help with the identification of buses.

    c Finding and boarding – members described difficulties with finding and boarding services at Wellington Station as hundreds of people and a multitude of buses with different livery congregate on platform 10. Positively, members were complimentary of staff for supporting wayfinding. Their experience could be further enhanced by ensuring buses to certain destinations always depart from the same stops, organising people into queues, priority lanes for those with accessibility needs, 'help points' to access personalised service, and ensuring buses have consistent livery and destination displays. Outside of Wellington Station, some members noted the importance of ensuring staff presence. For example, a member with low vision described how they need in-person support to get to their service in the absence of tactiles and audio announcements at BRT stops.

    d Fares and paying – a common complaint was the lack of clarity about how to pay for a BRT service, particularly when lines are partially blocked. Members asked for clear information about where and when to tag on and off, and how to pay a cash fare in the absence of a 'clippie'. Ideally, members wanted the same standard payment process for 'business as usual' and BRT services. While there was minimal sensitivity to the price of the fare when trains are bus replaced, members asked for certainty of price to enable better planning.

e Routes and bus stop facilities – one group recommended redesigning the bus network to include BRT stops into core bus routes permanently. During rail disruptions, more buses can be added to these core routes to boost capacity and increase resilience. Along the routes, members were keen to see a range of improvements at bus stops including the provision of shelter and real time information with realistic estimations of BRT arrival times.

f Experience on bus – many members reported feeling lost and confused on the journey given the unfamiliarity of routes and recommended standardised routes and onboard announcements. Also, the prospect of a poor experience on a packed bus after an unplanned disruption was enough to deter members from taking public transport at all. It was recommended that Metlink match bus with rail capacity or set clearer expectations that commuters should find their own way home.

9. Groups were asked to prioritise improvements that would make the biggest difference to their experience of BRT. Number one across all groups was accessibility of services. This was followed by an increased focus on better communication, information and in-person support. Overall, members wanted to see greater consistency and standardisation of service.

Discussion: The case for allowing larger pet dogs on public transport

10. Due to frequent lobbying by pet owners, Metlink is considering changes to its conditions of carriage to enable travel with medium to large sized dogs that are too big to fit in a suitable pet carrier. This discussion explored members' views of the positives and negatives of allowing this, and conditions under which travel with larger dogs may be agreeable.

11. Consensus was that conditions of carriage should remain unchanged and continue to exclude larger pet dogs from Metlink services. While members recognised some benefits to pet-owners by accommodating larger dogs on public transport, the risks were perceived to outweigh these benefits.

12. Members agreed that the liberalisation of conditions supports pet ownership, especially for those with no other transport options. This enables access to essential services, like veterinary clinics. Other perceived benefits included fostering inclusion for those who consider pets to be family members and marginal increases in patronage.

13. Health and safety risks presented by dogs were key reasons members opposed changing conditions. Maintaining safety, including psychological safety, onboard vehicles was deemed important to enable access to public transport. Members agreed that the presence of larger dogs could undermine this sense of safety, especially for those who are fearful or had negative experiences with dogs. From a health perspective, exposure to allergens and biological hazards was discussed.

14. Concern was also expressed for the welfare of some dogs that may get stressed in an enclosed space crowded by people and other animals. A retired vet commented that some breeds would make inappropriate public transport companions given their aggressive tendencies. In his view, caged muzzles on these animals were likely to cause greater harm as dogs are known to use them as weapons.

15. Some groups discussed how a rule change could disadvantage those with accessibility needs wanting to use the priority seating area. On buses, larger dogs can only be accommodated in this area potentially reducing access to people in need. Co-locating pet dogs with disability assistance dogs could also lead to negative interactions and distractions. One group recommended co-designing any potential changes to conditions with the assistance dog community given they are likely to be more disproportionately impacted.

16. Members discussed a range of conditions under which larger dogs could travel on public transport but conceded that these would be difficult to monitor and enforce, especially on buses. Common measures discussed included allowing larger dogs to travel off-peak with a lead, muzzle and proof of registration. There was some concern that monitoring and enforcement activity would unfairly fall to bus drivers.

17. Accommodating larger pet dogs on trains was a more feasible proposition for two of the groups. Space for larger pets in cages could be made available in a luggage car or designated carriage.

Survey results: Metlink's approach to cash payment when the National Ticketing Solution is introduced

18. Officers presented the results of a survey of PTAG members intended to inform Council's approach to cash payment when the National Ticketing Solution (NTS) is introduced. There was a high response rate with 19 out of 25 members participating.

19. Overall, results indicated polarised views on cash removal. For instance, 32% of members supported the removal of cash payment onboard trains as soon as the NTS is introduced. 46% did not support this. However, there was 69% support for the removal of cash payment onboard with assistance and education over a two-year period.

20. On balance, if cash removal occurs, there is majority support to do this over a prolonged and careful transition period.

21. In the survey feedback, members asked us to be mindful about ensuring that new payment technologies are accessible to disabled people and those without access to a smartphone. An extensive and well-advertised retail network was also recommended.

Update: Progress on the new regional rail service for Wellington, the Wairarapa and Manawatū

22. Members were presented with a range of information that will be used to inform the design of the new rolling stock. This included a high-level summary of the desired characteristics of the trains that was developed based on feedback from PTAG members and other interest groups.

23. Members were also shown the design brief that will be used to inspire the design, 'look and feel' of the new services. Images depicted the Remutaka Ranges, Kāpiti Island, local flora and fauna, classic kiwi symbology like the koru, and natural materials including greenstone, pāua and woven flax.

Next meeting

24. The next Advisory Group meeting is scheduled for 1 August 2024.

Ngā kaiwaitohu
Signatories

Writer	Leigh-Ann Harris – Community Engagement Advisor, Network and Customer
Approvers	Andrew Lensen – Chair, Public Transport Advisory Group Bonnie Parfitt – Senior Manager, Network and Customer Samantha Gain – Kaiwhakahaere Matua Waka-ā-atea | Group Manager, Metlink

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or with Committee's terms of reference
The Committee's Terms of Reference sets out as a key responsibility that the Committee review, after each Public Transport Advisory Group meeting, a written report of the business conducted at that meeting.
Contribution to Annual Plan / Long Term Plan / Other key strategies and policies
The Advisory Group is one tool that enables Metlink to achieve a key result area set out in the 2021-31 Long Term Plan - "Improving the customer experience across all areas of the public transport network". In addition, a stated strategic focus area in the Wellington Regional Public Transport Plan is customer experience. Specifically, "Continue to improve customer experience across all aspects of the network".
Internal consultation
There was no internal consultation needed.
Risks and impacts - legal / health and safety etc.
There are no known risks or impacts.

Transport Committee
16 May 2024
Report 24.180

For Information

DELIVERY OF WELLINGTON REGIONAL PUBLIC TRANSPORT PLAN – UPDATE

Te take mō te pūrongo
Purpose

1. To provide the Transport Committee (the Committee) with an update on progress made in the delivery of the Wellington Regional Public Transport Plan.

Te tāhū kōrero
Background

Terms of Reference

2. The Committee's Terms of Reference set out its specific responsibilities. One of the specific responsibilities is for the Committee to:

   "2.6 Review periodically the performance and effectiveness of transport strategies, policies, plans, programmes, initiatives and indicators including:

   a Delivery of the Wellington Regional Public Transport Plan, including:

   i Inter-regional transport initiatives

   ii Fare strategies and methods

   iii Increased mode share to public transport and active modes

   iv Promoting transport equity, and increasing access to public transport, for groups that are more likely to be transport disadvantaged

   v Alignment of Greater Wellington's accessibility work to the United Nations Convention on the Rights of Persons with Disabilities 2006 (UNCRPD)."

Wellington Regional Public Transport Plan

3. Te Mahere Waka Whenua Tūmatanui o te Rohe o Pōneke Wellington Regional Public Transport Plan 2021-2031 (RPTP 2021-31) was adopted by Council on 29 June 2021 *(*Adoption of Te Mahere Waka Whenua Tūmatuni o Te Rohe o Pōneke Wellington Regional Public Transport Plan 2021-2031 – Report 21.168*)*.

4. The RPTP 2021-31 is primarily a policy document that sets out our approach to achieving the objectives for public transport set out in the Wellington Regional Land Transport Plan, the Government Policy Statement on Land Transport, and the Greater Wellington Regional Council (Greater Wellington) Long Term Plan. High level objectives, targets and

performance measures for public transport are set in these documents rather than in the RPTP 2021-31.

5. The RPTP 2021-31 has been built around the strategic priority of "an efficient, accessible and low carbon public transport network" achieved through mode shift, decarbonisation of the public transport fleet and improving customer experience.

Mode shift

6. For mode shift, the RPTP 2021-31 focuses on the key measure of 40% increase in active mode shift to public transport by 2030. The RPTP 2021-31 outlines that this will be done through delivery and implementation of Let's Get Wellington Moving and Wellington Regional Rail's Strategic Direction, and by:

    a Providing a high quality, high capacity, high frequency core network

    b Improving access to public transport

    c Promoting behaviour change.

Decarbonisation of the public transport fleet

7. The RPTP 2021-31 focuses on the key measures of: 60% reduction in public transport emissions by 2030; 30% reduction in carbon emissions for the Wellington Region by 2027; and 40% reduction in Greater Wellington generated emissions by 2025, and carbon neutral by 2030. The RPTP 2021-31 outlines that this will be done by accelerating decarbonisation of the public transport vehicle fleet including:

    a Driving environmental and cost sustainability by pursuing smart commercial opportunities and lower carbon technologies

    b Decarbonising the Metlink bus fleet by 2030

    c Exploring ways to further decarbonise the Metlink rail and ferry fleet.

Improving customer experience

8. The RPTP 2021-31 focuses on the key measure of maintain customer satisfaction rating greater than 92% for overall trip. The RPTP 2021-31 outlines that our focus on continuing to improve customer experience across all aspects of the network will be achieved by:

    a Providing greater choice and flexibility for journey planning, fares, and fare payment options

    b Improving the accessibility of public transport for all.

Safety

    a The RPTP 2021-31 focuses on the key measure of 40% reduction in serious injuries on the public transport network by 2030. The RPTP 2021-31 outlines that our focus on prioritising the safety and maintenance of the public transport network to encourage safe behaviours will be achieved by prioritising safety through continuous improvements to both infrastructure and operations.

Review of RPTP 2021-2031

9. A review of the RPTP 2021-2031 has been initiated. On 22 February 2024, the Committee agreed to delay the RPTP review programme by three to four months to allow Metlink to have greater certainty about the: Government Policy Statement on Land Transport; Replacement for Let's Get Wellington Moving; 2024-34 Long-Term Plan and the Regional Land Transport Plan 2021 Mid-term Review; NZ Transport Agency Waka Kotahi guidelines for RPTPs (under the Land Transport Management Act 2003); and procurement strategy for bus contracts.

10. A 'not significant variation' to the RPTP to amend some unit, bus timetable and exempt service matters is being considered by Council on 16 May 2024 (Report 24.181 Not Significant Variations to Wellington Regional Public Transport Plan).

Te tātaritanga
Analysis

Update on progress made in the delivery of the Wellington Regional Public Transport Plan

11. The paragraphs below provide an update on progress made in the delivery of the RPTP, up to 31 March 2024, focusing on:

    a Inter-regional transport initiatives

    b Fare strategies and methods

    c Increased mode share to public transport and active modes

    d Promoting transport equity, and increasing access to public transport, for groups that are more likely to be transport disadvantaged

    e Alignment of Greater Wellington's accessibility work to the United Nations Convention on the Rights of Persons with Disabilities 2006 (UNCRPD).

Inter-regional transport initiatives

<u>Lower North Island Rail Integrated Mobility</u>

12. As part of Budget 2023, the Government agreed funding for the Lower North Island Rail Integrated Mobility (LNIRIM). LNIRIM is the primary inter-regional transport initiative being undertaken; it includes 18 four-car, tri-mode trains, and associated infrastructure, for the Wairarapa and Manawatū rail lines. It is expected that the new trains will quadruple peak-time services between Palmerston North and Wellington on the Manawatū line and double them between Masterton and Wellington on the Wairarapa Line.

13. The key milestones for the procurement of the LNIRIM fleet and maintenance services include:

    a Approval of the Procurement Strategy

    b Expression of Interest release

    c Short list bidders

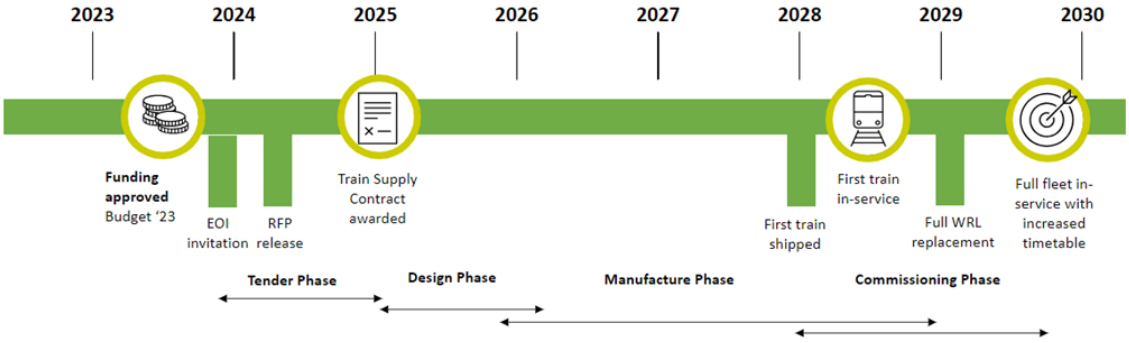
    d Request for Proposals release

e Preferred supplier

f Contract award

14. On 21 February 2024, Expressions of Interest (EOI) closed for providing a proposal to design, build and maintain 18 x 4-car low emission multiple units for improving the passenger rail service, capacity and frequency on Wairarapa and Manawatū lines. A satisfactory number of EOIs were received.

15. The following diagram sets out the indicative timeline for the Programme. The programme is on track.



Other inter-regional transport initiatives

16. Greater Wellington continues to co-fund the inter-regional route 291 bus service, linking Levin to Waikanae (Unit 19), operated under contract to Horizons Regional Council (Horizons). NZ Transport Agency Waka Kotahi (NZTA) has agreed to Horizons extending the existing contract (operated by Uzabus) on a non-trial basis until 2 March 2025. Horizons will review the service prior to the expiry of the contract with the involvement of Greater Wellington.

Fare strategies and methods

17. On 29 February 2024, the Council agreed to increase Metlink public transport fares by 10% from 1 July 2024. The fare increase was considered as part of the draft LTP 2024-2034 planning; it is estimated that without the 10 percent fares increase, a further 3.3 percent rates rise would be required.

18. In response to the change to Crown funding arrangements for the Community Connect Concessions Scheme, which resulted in Crown funding for free fares for 5-12 year olds and half price fares for 13-24 year olds on public transport ending on 30 April 2024, on 29 February 2024 the Council determined that it would terminate provision of the free travel for under 13 year olds and half-price fares for under 25 year olds from 1 May 2024, and continue with provision of the Community Connect scheme for the remaining groups (half-price fares for CSC holders and 75% Total Mobility taxi fare discounts) along with the regional targeted concessions under current policies.

19. Matters related to the structure and configuration of fares and fare products for implementation with the National Ticketing Solution (NTS) are being considered by Council on 16 May 2024 (Report 24.184 National Ticketing Solution Transition Matters*).*

The key elements to be considered by Council include introduction of an integrated fare structure and capping for bus and rail network at the commencement of the NTS, and a transition approach for cash payment.

20. A fares work stream has been established within Metlink's Integrated Fares and Ticketing programme with a focus on implementation of the Council's Future Fares Direction initiative (adopted by Council on 25 August 2022).

21. Metlink continues to work with NZTA and Public Transport Authorities across New Zealand towards implementation of the National Ticketing Solution (NTS).

22. Design of the aspects of the ticketing system which need to have national consistency is underway; this is required for Environment Canterbury's NTS implementation which is expected in late 2024.

23. Greater Wellington's NTS implementation date is scheduled for 2025. Metlink has commenced its transition planning.

Increased mode share to public transport and active modes

Targeting Employers to leverage Fringe Benefit Tax changes

24. On 31 March 2023, the Taxation (Annual Rates for 2022-23, Platform Economy, and Remedial Matters) Act 2023 came into force. This Act exempts Public Transport (which includes on-demand services); Total Mobility; bikes, e-bikes and scooters, and micro-mobility share services from fringe benefit tax (FBT) when being used for commuting to and from work.

25. The FBT exemptions give employers the ability to offer employees climate-friendly employment benefits without unnecessary financial administration; it offers employees an attractive incentive to uptake public transport and active modes without being penalised through increased taxation.

26. Metlink AND THE REGIONAL TRANSPORT TRAVEL CHOICE TEAM are undertaking work to assess the viability of developing business products that will enable employers to offer employer subsided fares to their employees. The joint project has the strategic outcome of encouraging travel choice (both active modes and public transport) that will help achieve the Government's key emissions reduction targets. Providing a FBT exemption for public transport supports this proposition and makes it more viable and attractive. As part of this work, the project team are exploring the possibility of undertaking a pilot in conjunction with a third-party provider to provide a mechanism for an employer to easily provide this benefit to their employees.

Connecting people to rail with active and shared modes

27. This project aims to encourage travel choice towards public transport by connecting people with active and shared modes to rail stations. We aim to support better information, and work collaboratively with customers to deliver more tailored solutions for more convenient, and safe connection to train stations without needing a car.

28. This project will be executed as a series of pilot projects in targeted areas - Lower Hutt, Upper Hutt and the Wairarapa (Featherston, Carterton, Masterton) as well as Kāpiti Coast and Porirua.

29. Having assessed stations for suitability, work has begun on the first pilot project which aims to increase the number of commuters using micromobility to access Waterloo Station to travel to central Wellington by rail.

Promoting transport equity, and increasing access to public transport, for groups that are more likely to be transport disadvantaged

Behaviour change to improve accessibility

30. This Accessibility Action Plan project aims to remove barriers for people with disabilities or impairments to travel by bus, by increasing the availability of priority seating.

31. The joint Metlink/Travel Choice pilot project tests an awareness campaign to disrupt the thinking of passengers who do not need to sit in the priority seating area but do so anyway. A follow-on awareness and behaviour change trial is under development.

Public Transport Advisory Group

32. Metlink continues to hold Public Transport Advisory Group (PTAG) meetings. PTAG is made up of up to 30 members to represent the following perspectives relating to public transport and active mode matters in the Wellington Region: Peak users (rail and bus); Off peak users (rail and bus); Active mode users (walking, cycling and micro-mobility); Transport equity; Rural; Disability accessibility; Transport dependent; Tertiary students; Youth; Senior citizens; Employers; Business / retail sector; Mana whenua, Māori; LGBTQIA+.

33. At the 6 May 2024 PTAG meeting, a session was held to gain views on: future public transport priorities to inform the current review of the RPTP; and Metlink's policy regarding the carriage of dogs on public transport. See Public Transport Advisory Group Meeting – 6 May 2024 – Report 24.182, which is on the agenda for the Committee meeting on 16 May 2024.

Other actions

34. Better access for the transport disadvantaged continues to be a key focus for the current RPTP review.

35. See paragraphs 37 to 39 below for further work that has been undertaken in relation to accessibility on the network.

Alignment of Greater Wellington's accessibility work to the United Nations Convention on the Rights of Persons with Disabilities 2006 (UNCRPD)

36. The Committee adopted a new Accessibility Charter on 9 September 2021. The Charter is the first step towards realising Metlink's vision "The Metlink public transport network is accessible for all with ease and dignity".

37. Officers worked with the disability sector, operators and key stakeholders to co-design an Accessibility Action Plan (AAP) to plan and prioritise improvements to the public transport network.

38. The current focus is on developing an approach for a number of priority improvements, in advance of funding being confirmed as part of the 2024-34 Long Term Plan, including:

    a Disability training for operational staff: Procurement strategy to be developed for a training provider

b Bus stop and station accessibility improvements: Accessibility ranking in development

c Hidden disabilities and priority seating: Campaign in development.

Ngā Take e hāngai ana te iwi Māori
Implications for Māori

39. The RPTP includes a key policy section 6.2, 'Partnering with mana whenua' with the objective, achieving 'an effective partnership with mana whenua'. Key actions from this policy are:

    a Build strong enduring relationships with mana whenua through all facets of public transport delivery.

    b Explore Māori values and sustainability interface within a Responsiveness to Māori framework.

    c Work with mana whenua to develop a Māori responsiveness plan for public transport, including consideration of principles to enhance design of public transport activity and guide current and future public transport policy.

    d Work with mana whenua to reach communities and build relationships to encourage public transport use.

    e Ensure that Māori values are considered in the built environment through our design principles.

    f Extend the use of Te Reo Māori in customer information channels and fare payment methods.

40. Metlink staff are working closely with Te Hunga Whiriwhiri to review RPTP content and provisions relating to Te Tiriti o Waitangi principles and specific policy outcomes for Māori. The review approach was workshopped with Te Tiriti o Waitangi Kōmiti in May and October 2023 and will be followed up with a report at an upcoming Te Tiriti o Waitangi Kōmiti meeting.

Te huritao ki te huringa o te āhuarangi
Consideration of climate change

41. Climate change mitigations are a key focus for the RPTP with its strategic priority an 'efficient, accessible and low carbon public transport network'. Relevant RPTP Strategic Focus Areas are:

    a Reduce public transport emissions by accelerating decarbonisation of the vehicle fleet.

    b Contribute to the regional target of a 40% increase in regional mode share from public transport and active modes by 2030, including delivery and implementation of Let's Get Wellington Moving and Wellington Regional Rail's Strategic Direction.

42. Relevant RPTP key measures are:

a 40% increase in mode shift to public transport by 2030

b 60% reduction in public transport emissions by 2030

c 35% reduction in transport generated carbon emissions for the Wellington region by 2027

d 40% reduction in Greater Wellington generated emissions by 2025, and carbon neutral by 2030.

43. Relevant RPTP themes are:

a Drive environmental and cost sustainability by pursuing smart commercial opportunities and lower carbon technologies.

b Decarbonise the Metlink bus fleet by 2030.

c Explore ways to further decarbonise the Metlink rail and ferry fleet.

Ngā tūāoma e whai ake nei
Next steps

44. Staff will provide the Committee with updates on progress against the RPTP on a quarterly basis.

Ngā kaiwaitohu
Signatories

Approvers	Luke Troy – Kaiwhakahaere Matua, Rautaki | Group Manager, Strategy Samantha Gain – Kaiwhakahaere Mauta, Waka-ā-atea | Group Manager, Metlink

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or with Committee's terms of reference
The Committee has the specific responsibility to review periodically the performance and effectiveness of transport strategies, policies, plans, programmes, initiatives and indicators including delivery of the Wellington Regional Public Transport Plan.
Contribution to Annual Plan / Long Term Plan / Other key strategies and policies
This report updates the Committee on progress against its stated priorities.
Internal consultation
Development of this report included input from the Metlink Group and Travel Choice within the Strategy Group.
Risks and impacts - legal / health and safety etc.
There are no known risks.

Transport Committee
16 May 2024
Report 24.183

For Information

PUBLIC TRANSPORT PERFORMANCE – UPDATE

Te take mō te pūrongo
Purpose

1. To update the Transport Committee (the Committee) on the current performance of the public transport network.

Te horopaki
Context

2. Since the introduction of the Public Transport Operating Model (PTOM) bus partnering contracts in July 2018, Metlink has had access to information that helps us to better appreciate and understand the performance of our public transport network.
3. Monthly operational performance reports were developed in early 2019; drawing on available information to provide performance reporting at the level provided in other authorities.
4. Monthly performance reports are published on the Metlink website to enable the public to easily access this information.
5. Over time, Metlink has amended the content of these operational reports to respond to requests from transport committees and to make improvements/changes identified by officers.
6. At recent meetings, members of the Committee have requested that the information provided in these performance reports be reviewed and amended to ensure that the information is reported on in the most useful and meaningful way possible.
7. Metlink met with relevant Committee members to better understand the performance outcome reporting Councillors would like to see and what performance data Metlink has to facilitate that requirement. It was agreed to include in reporting :

    a driver numbers

    b note on graphs the reasons for major spikes in performance

    c add a quarterly report on Health, Safety and Wellbeing

    d add ‘target’ patronage on the 12-month rolling graph

    e show suspended trips along with cancelled trips

    f accessibility

g bus capacity

h emissions/decarbonisation.

8. The performance reports incorporate the following requested changes:

a 2018/19 patronage line added to 'all modes' graph

b brief comments added on graphs for reliability and punctuality

c added suspended services to the bus cancellations graph

d section added on driver numbers

e bus emissions/ decarbonisation

f explanation of what is included under 'Other' in the complaints section.

9. A Health, Safety and Wellbeing update is included in this report.

10. Metlink expects to be able to provide the Committee with further changes over the next few months as data required for the additional sections is sourced and collated.

11. Monthly performance reports are published on the Metlink website at: https://www.metlink.org.nz/news-and-updates/surveys-and-reports/performance-of-our-network/#DataAndReports

12. **Attachment 1** contains an overview (including commentary) of the key results in Metlink's monthly performance report for March 2024.

13. Metlink looks forward to continuing to strengthen our access to data, insight, expertise, and capability.

Te tātaritanga
Analysis

Bus performance – March 2024

Patronage

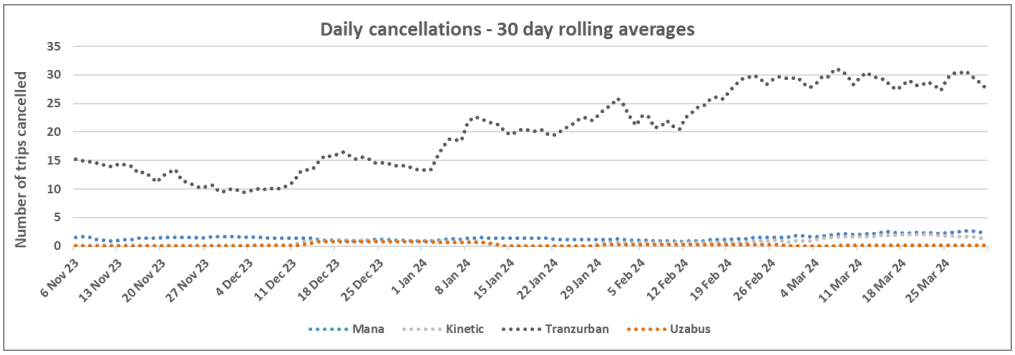
14. Bus passenger boardings for March 2024 were 2.5 million, this compares to boardings of 2.4 million in March 2019 (pre-COVID-19). Patronage for the year to date is at 106.1% of pre-COVID-19 levels.

Reliability

15. The reliability metric is a measure of services deemed to have run. The daily reliability target for our bus services is 98%.

16. Reliability for March 2024 was 99.0% compared to February 2024 was 98.9%. Reliability this month continues to reflect stabilising driver numbers and retention rates.

17. The graph below provides information on cancellation trends by operator.



18. All Operators are achieving the required performance levels for reliability. The slight rise in Tranzurban cancellation trends from February 2024 coincides with the start of Term 1 2024 school services. Metlink continues to work closely with Tranzurban on their driver recruitment levels and future plans. Tranzurban's recruitment is going well, and a recent Tranzurban Recruitment Day attracted eight new local drivers who are now in training.

Punctuality

19. The punctuality metric is a measure of services departing from origin, leaving between one minute early and five minutes late.

20. The punctuality target for our bus services is 95%.

21. Bus service punctuality was 93.3% in March 2024, compared to 92.4 in February 2024. Punctuality this month continues to reflect traffic congestion and disruption in the usual places in Wellington City (Karori Road, Thorndon Quay, Berhampore and Island Bay in particular), and late arriving buses replacing trains in the Wairarapa. March has also been a busy month for events requiring road closures, such as Cuba Dupa, Newtown Festival, and a number of protest marches.

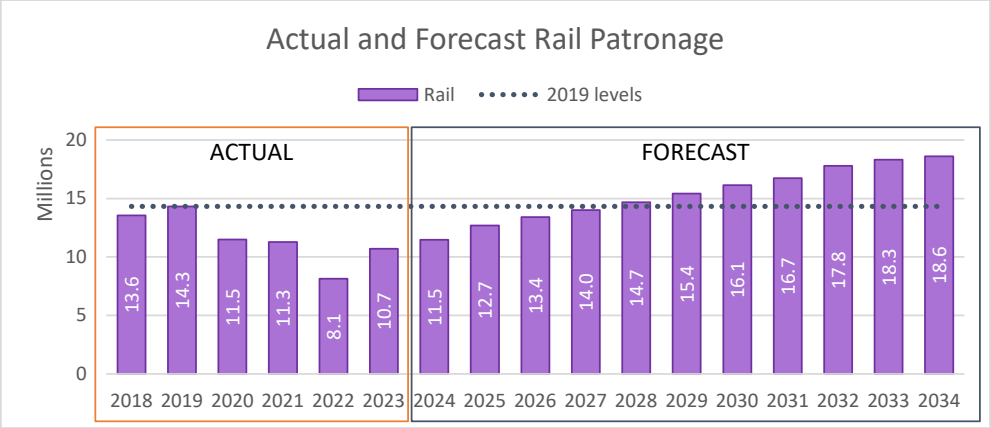
Rail performance – March 2024

Patronage

22. Rail passenger boardings for March 2024 were 1.0 million, this compares to boardings of 1.4 million in March 2019 (pre-COVID-19). Patronage for the year to date is at 79.6% of pre-COVID-19 levels, which may indicate changed travel behaviour.

Patronage trajectory

23. As requested by the Committee at its meeting on 4 April, information regarding rail patronage trajectory is provided below.



24. The projected rail patronage growth in the graph above assumes that:

    a the investments budgeted for service and infrastructure improvements over the years of the next Long Term Plan, and the move to the integrated fares and ticketing system will drive patronage growth.

    b The growth in rail patronage will be unconstrained (note any changes in service levels may impact these projections).

Reliability

25. The rail reliability measure shows the percentage of scheduled services that depart from origin and key stations no earlier than 30 seconds before the scheduled time, meet the consist size for the scheduled service, and stop at all stations timetabled for the service.

26. The rail reliability target is 99.5%.

27. Rail service reliability was 98.2% in March 2024, compared to 98.5% in February 2024. Reliability impacted by staff sickness accounted for 1.0% of the total scheduled services in March. While there were no major incidents in March, there was a slight increase in the number of trespass incidents during March. Trespass incidents can result in the Police closing a rail line.

28. Staff absence through sickness impacts reliability as there are agreed staffing levels to operate services. When a staff member is not available on a rostered shift and a replacement cannot be found, service levels are impacted.

Punctuality

29. The rail punctuality measure records the percentage of services arriving at key interchange stations and final destination within five minutes of the scheduled time.

30. The rail punctuality target is 90%.

31. Punctuality for March 2024 was 90.3%, compared to 86.9% in February 2024.

32. Punctuality continues to be impacted by a high level of speed restrictions across the network, in particular on the Kāpiti and Wairarapa lines. Hutt and Johnsonville line performance has improved.

Bus replacements

33. In March 2024, 8.1% of rail services were replaced by buses (planned and unplanned):

    a 7.1% of the rail services that were replaced by buses were planned.

    b 1.0% of the rail services that were replaced by buses were unplanned.

34. Of the 7.1% of planned rail services that were replaced by buses, 70% were awarded to Metlink bus operators (Tranzurban, Kinetic and Mana); the remainder were awarded to NCS buses, which meet Metlink's preferred fleet requirements (bike racks, accessible, and electronic ticketing).

35. Planned bus replacements are used to allow upgrade works across the rail network to continue on a regular basis.

Upcoming Blocks of Line (planned bus replacements)

36. Information on upcoming planned Blocks of Line covering the period May 2024 to June 2024 is attached as **Attachment 2** to this report. Note this information is subject to change (for example, late notice essential works). The most up-to-date information is available on our website: https://www.metlink.org.nz/news-and-updates/buses-replacing-trains/.

Ferry performance – March 2024

37. Ferry services have operated according to their reduced timetable; trips to Matiu / Somes Island are not operating as the island is closed for 6 to 8 months (from February 2024) for wharf improvements.

38. Boardings were 77.1% of March 2019 numbers (pre Covid).

Tawa Public Transport On Demand Trial – patronage

39. Tawa on Demand Trial passenger boardings for March 2024 were 4,722 this compares to boardings of 4,446 in March 2023. Patronage for the year to date is at 40,173 completed rides, this compares to 28,998 over the same period in 2022/23.

40. In the period since the commencement of the Tawa on Demand Trial on 16 May 2022 to 31 March 2024, there have been 82,743 completed rides and 2,715 unique riders have used the service.

41. The Tawa on Demand Trial expanded to the Porirua city centre on 6 November 2023; since the expansion on a rolling quarter average ridership has increased by 1%.

42. Sunday services for this trial started on 11 December 2023. There have been 803 completed rides on a Sunday compared to 1,685 for the same period on a Saturday.

43. The current gross costs for this financial year are $872,649, this is on track with the allocated budget of $1.2 million. Net costs are $763,980.

Fare revenue

44. In March 2024, there was a budget shortfall of $2.9 million for the month across bus and rail services.

45. The year-to-date budget shortfall is $34.9 million and is attributable to:

a $7.1 million due to the extended half-price fares scheme fares in July and August 2023 without NZ Transport Agency Waka Kotahi support.

b $27.8 million is due to the change in travel behaviour post-Covid compared to the travel assumptions set pre-Covid in 2020; 51% of this is claimable from NZ Transport Agency Waka Kotahi.

46. The budget does not include ferry fare revenue as harbour ferry services operate under a different (net) PTOM contract. Unlike the bus and rail operators, the ferry operator has revenue responsibility for its Metlink harbour ferry services.

Warranted Transport Officer activity - March

47. Metlink's Warranted Transport Officers undertook 3,075 payment validations onboard rail services in March 2024.

48. Payment validations on Metlink bus services are only required for passengers with paper tickets (this is due to the system operated and placement of the electronic ticketing system). Warranted Transport Officers engage in fare conversations with all passengers and have worked with drivers and passengers to remind them of the tickets to be issued for all non-snapper trips, including fares which do not incur a charge to the customer.

49. In March, no infringement notices were issued by Warranted Transport Officers.

50. The table below reports on the number of times when Warranted Transport Officers have sought customer details in relation to their non-payment of fares:

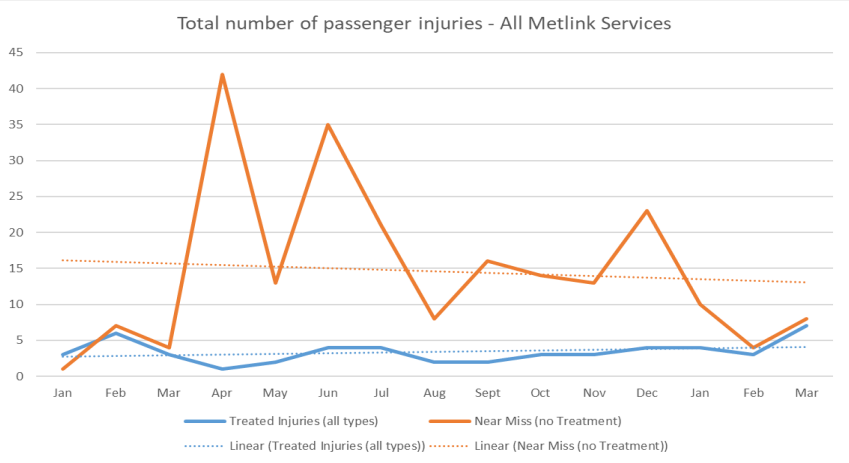
Mode	**Details sought (for non-payment)**
Rail - HVL	17
Rail – KPL	14
Rail - JVL	1
Rail - MEL	0
Rail - WRL	0
Bus	0
Ferry	0
TOTAL	**32**

Health, Safety and Wellbeing

Passenger injuries

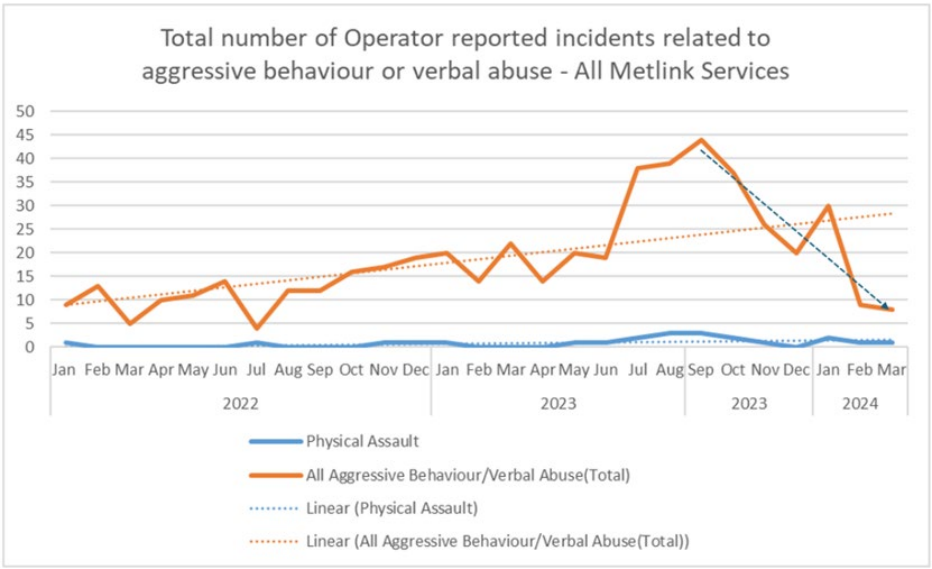
51. The graph below shows that the number of near misses involving passengers noticeably decreased in August 2023. This observation aligns with the health and safety social media campaign conducted by Metlink between August and December 2023. There has been a slight increase in the number of reported injuries that require treatment between 2023 and 2024.

52. The social media health and safety messages were displayed on the railway station platform screens and bus monitors in mid-March. The effect of this consistent messaging is not yet known.



Aggressive behaviour or verbal abuse

53. An increase in reported incidents of verbal abuse, and aggressive and threatening behaviour toward drivers across the network has been observed over the last two years. However, the chart below shows that reports of these types of incidents have decreased between September 2023 and March 2024.



Ngā āpitihanga
Attachments

Number	Title
1	Metlink performance report – March 2024
2	Upcoming Planned Rail Replacements - May 2024 to June 2024

Ngā kaiwaitohu
Signatories

Writers	Matthew Lear – Manager Network Operations Andrew Myers – Manager Customer Insights & Assets
Approvers	Fiona Abbott – Senior Manager Assets and Infrastructure Matthew Chote – Senior Manager Operations and Partnerships (Acting) Samantha Gain – Kaiwhakahaere Matua Waka-ā-atea | Group Manager Metlink

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or with Committee's terms of reference The Committee has the specific responsibility to review performance trends related to public transport and transport demand management activities as set out in the Committee's Terms of Reference.
Contribution to Annual Plan / Long Term Plan / Other key strategies and policies Certain performance measures in the 2021-31 Long-Term Plan relate to matters reported on in the operational performance report.
Internal consultation No other departments were consulted in preparing this report.
Risks and impacts - legal / health and safety etc. There are no risks arising from this report.

Performance report

March 2024

Contents

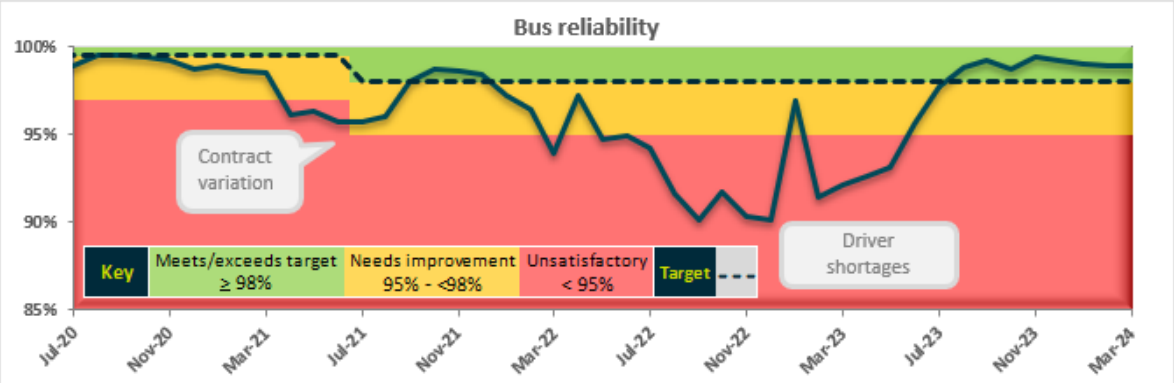
Partner Performance

Bus operators

Reliability

The bus reliability measure shows the percentage of scheduled services that ran, as tracked by RTI and Snapper systems.

In March, 99.0% of bus services were delivered, and 98.9% for the year to date. Reliability this month continues to reflect stabilising driver numbers and retention rates.

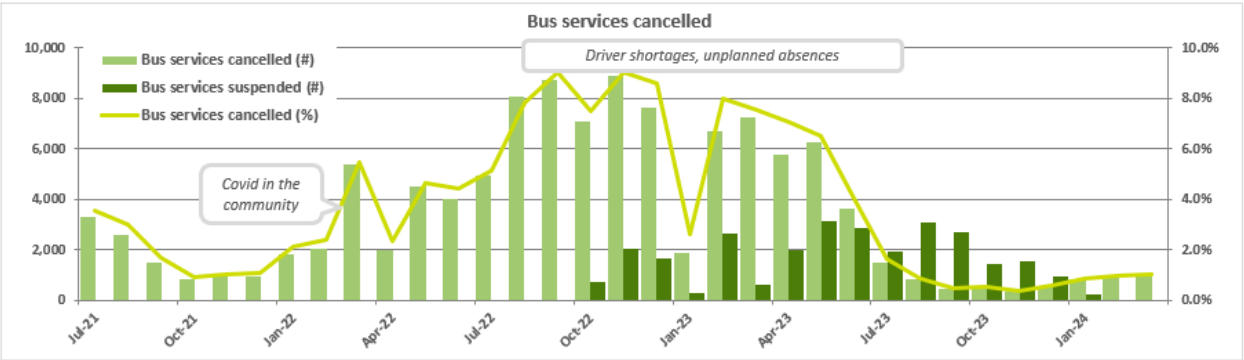


Reliability - current month

	Mar-24	Mar-23	% Change
Wellington City			
Newlands & Tawa	98.8%	98.1%	0.8%
East, West & City	99.7%	94.6%	5.0%
North, South, Khandallah & Brooklyn	97.6%	83.4%	14.2%
Hutt Valley	99.4%	94.2%	5.2%
Porirua	97.8%	86.7%	11.1%
Kapiti	99.9%	99.6%	0.3%
Wairarapa	99.3%	99.1%	0.2%
Total	99.0%	92.1%	**6.9%**

Reliability - year to date (Jul - Mar)

	2023/24	2022/23	% Change
Wellington City			
Newlands & Tawa	99.3%	98.7%	0.6%
East, West & City	99.8%	89.5%	10.3%
North, South, Khandallah & Brooklyn	97.5%	87.8%	9.7%
Hutt Valley	99.3%	95.5%	3.8%
Porirua	97.1%	90.1%	7.0%
Kapiti	99.4%	99.5%	-0.1%
Wairarapa	98.5%	98.8%	-0.3%
Total	98.9%	91.9%	**7.0%**

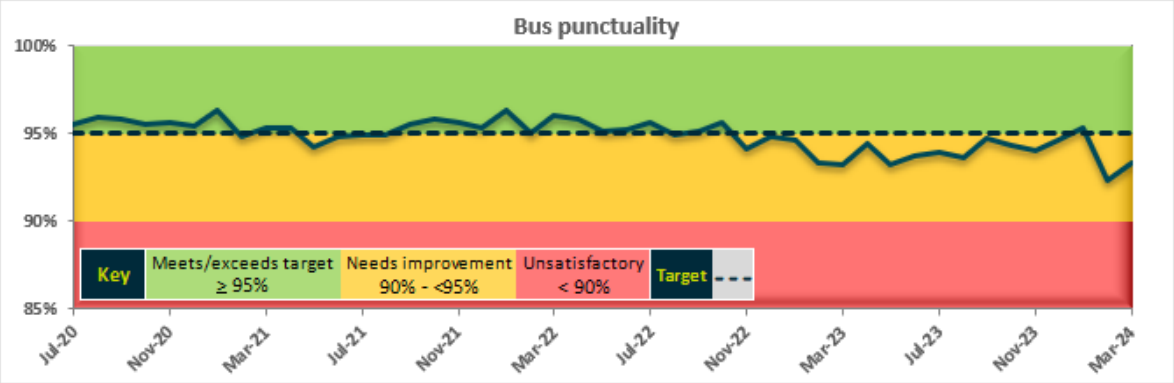


In March 97,600 bus trips ran, carrying 2.5 million passengers.

Punctuality

We measure bus punctuality by recording the bus departure from origin, leaving between one minute early and five minutes late.

Bus service punctuality was 93.3% in March and 94.0% for the year to date. Punctuality this month continues to reflect traffic congestion and disruption in the usual places in Wellington City (Karori Road, Thorndon Quay, Berhampore and Island Bay in particular), and late arriving buses replacing trains in the Wairarapa. March has also been a busy month for events requiring road closures, such as Cuba Dupa, Newtown Festival, and a number of protest marches.



Punctuality - current month

	Mar-24	Mar-23	% Change
Wellington City			
Newlands & Tawa	94.7%	92.4%	2.4%
East, West & City	94.2%	95.2%	-1.0%
North, South, Khandallah & Brooklyn	91.5%	88.1%	3.4%
Hutt Valley	92.3%	94.0%	-1.8%
Porirua	95.6%	95.2%	0.4%
Kapiti	94.0%	94.4%	-0.5%
Wairarapa	93.3%	88.9%	4.5%
Total	**93.3%**	**93.3%**	**0.1%**

Punctuality - year to date (Jul - Mar)

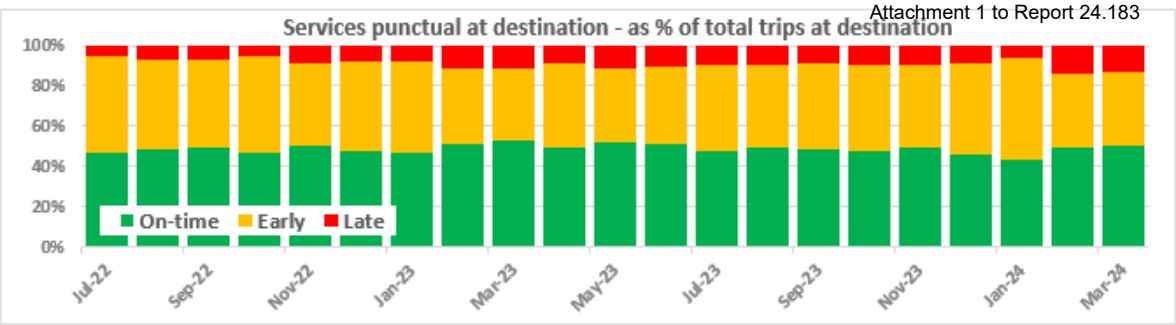
	2023/24	2022/23	% Change
Wellington City			
Newlands & Tawa	95.3%	95.6%	-0.3%
East, West & City	95.4%	96.2%	-0.8%
North, South, Khandallah & Brooklyn	91.0%	90.1%	0.9%
Hutt Valley	94.2%	95.2%	-1.0%
Porirua	95.2%	95.6%	-0.4%
Kapiti	93.2%	95.8%	-2.6%
Wairarapa	91.2%	93.0%	-1.8%
Total	**94.0%**	**94.6%**	**-0.6%**

Punctuality at destination

Bus punctuality at destination is not a contractual measure and is included here at the request of our auditors. We have used the same criteria as for punctuality at origin as a proxy, recording the bus arrival at destination between one minute early and five minutes late.

We have little influence over punctuality once a bus has departed from the origin stop, with factors such as traffic, passenger volumes and behaviour, weather events, accidents and roadworks all affecting the punctuality of services.

In March, 50.3% of bus services recorded at destination arrived on time, with a further 37.1% arriving more than one minute early, while 12.6% of services arrived more than five minutes late.



Punctuality at destination - current month

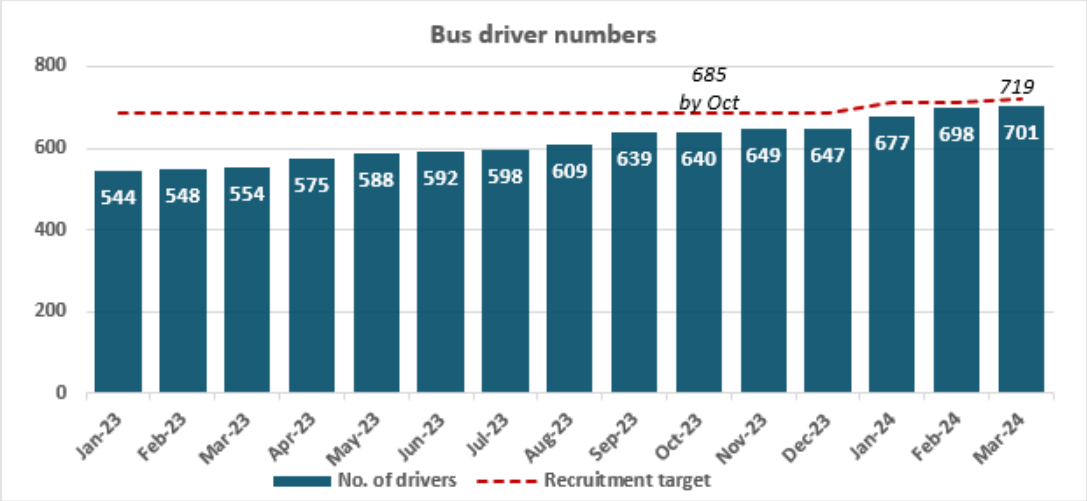
	Mar-24	Mar-23	% Change
On-time	50.3%	52.7%	-2.3%
Early	37.1%	35.8%	1.3%
Late	12.6%	11.6%	1.1%

Punctuality at destination - year to date (Jul - Mar)

	2023/24	2022/23	% Change
On-time	48.0%	49.0%	-0.9%
Early	42.2%	43.3%	-1.1%
Late	9.8%	7.8%	2.0%

Bus driver shortages

There is currently a shortage of bus drivers in the Greater Wellington Region – whilst driver numbers are increasing, there is a difference in the number of drivers required at different times of the day, e.g. during peak times, which impacts on the ability to run all timetabled services. The graph below shows monthly total numbers of bus drivers against the original recruitment target of having 685 drivers by October 2023, and the current target of 719 drivers required to run the network.

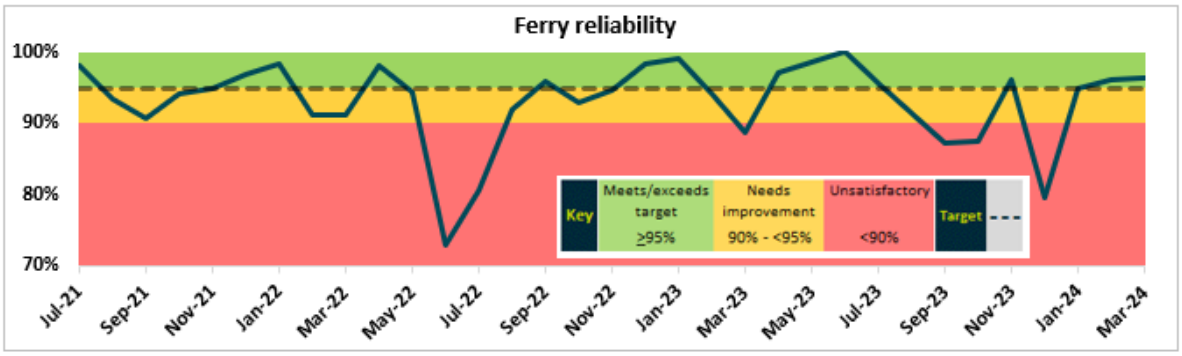


Ferry operator

Reliability

Ferry reliability is a measure of the number of scheduled services that ran.

Reliability for March was 96.3%, compared to 88.7% for the same month last year. There were 30 trips cancelled due to the weather this month.



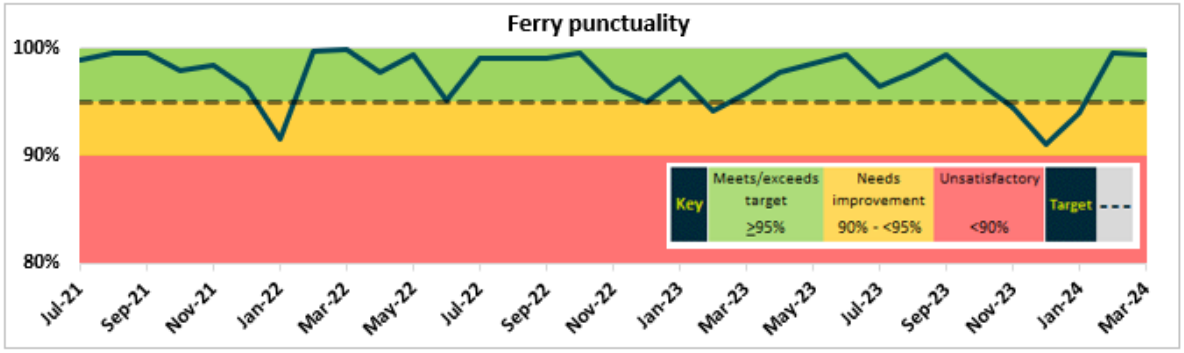
Reliability - current month

	Mar-24	Mar-23	% Change
Total	96.3%	88.7%	7.6%

Punctuality

Ferry punctuality is a measure of ferries leaving the origin wharf no earlier than 4 minutes 59 seconds before schedule.

Punctuality for March was 99.4%, compared to 95.8% for the same month last year.



Punctuality - current month

	Mar-24	Mar-23	% Change
Total	99.4%	95.8%	3.6%

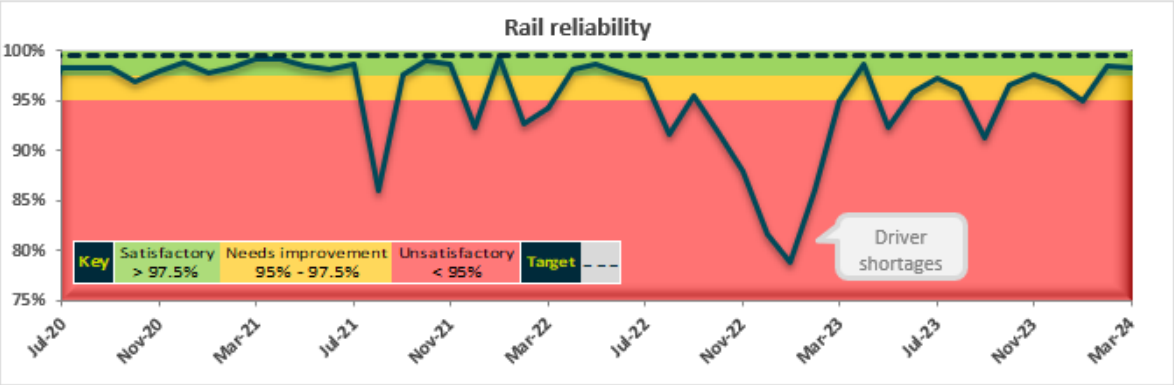
Rail operator

Reliability

The rail reliability measure shows the percentage of scheduled services that depart from origin and key stations no earlier than 30 seconds before the scheduled time, meet the consist size for the scheduled service, and stop at all stations timetabled for the service.

Rail service reliability was 98.2% in March, and 96.8% for the year to date.

No major disruptions during March, 1% of services were affected by staff sickness. There were also a number of trespass incidents during March which resulted in services being terminated early to enable a faster return to timetable.



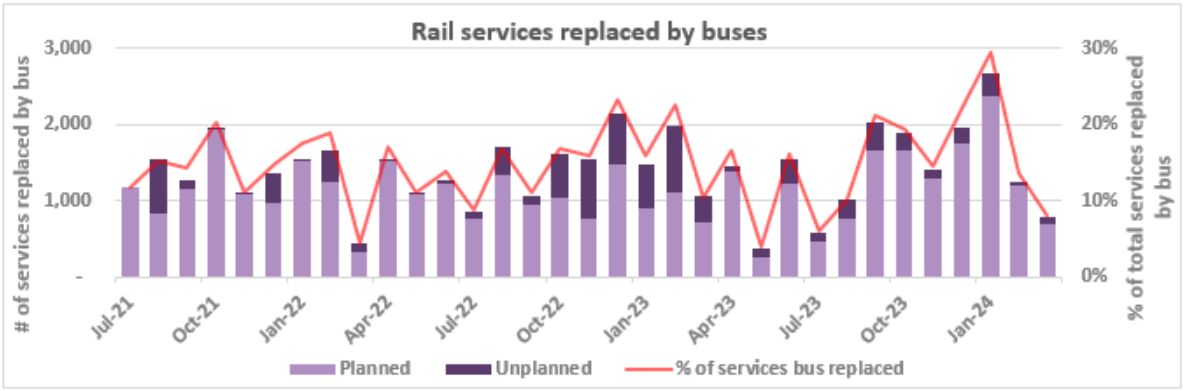
Reliability - current month

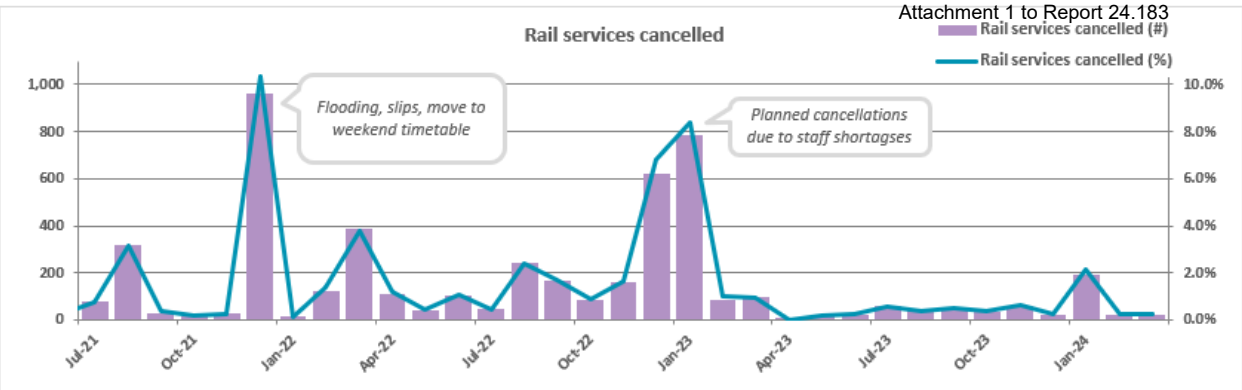
	Mar-24	Mar-23	% Change
Hutt Valley	98.8%	97.4%	1.4%
Johnsonville	97.9%	91.0%	6.9%
Kapiti	97.9%	94.9%	3.0%
Wairarapa	94.4%	96.3%	-1.9%
Total	**98.2%**	**95.0%**	**3.2%**

Reliability - year to date (Jul - Mar)

	2023/24	2022/23	% Change
Hutt Valley	97.4%	92.4%	5.0%
Johnsonville	96.0%	86.3%	9.7%
Kapiti	97.0%	88.3%	8.7%
Wairarapa	92.9%	95.6%	-2.7%
Total	**96.8%**	**89.6%**	**7.2%**

In March, 8.1% of rail services were replaced by buses, compared to 13.5% the previous month.



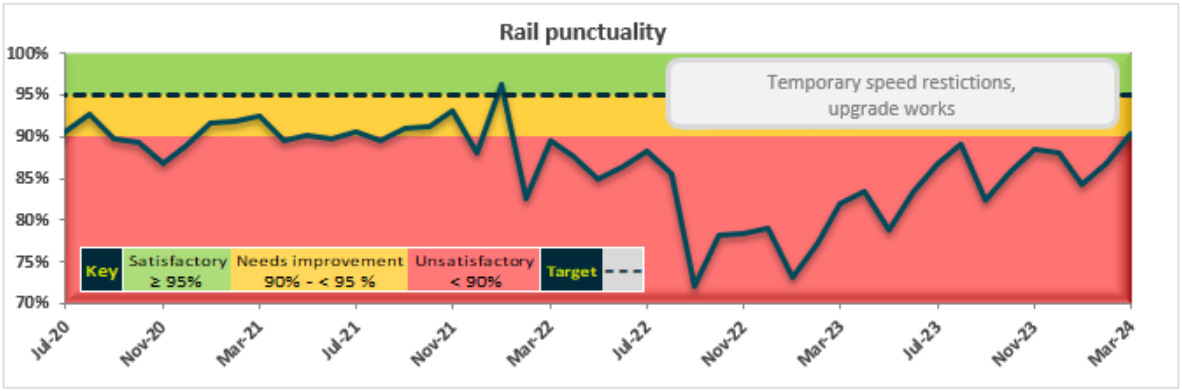


In March, there were 9,600 rail trips run, carrying 1.0 million passengers.

Punctuality

The rail punctuality measure records the percentage of services arriving at key interchange stations and at the final destination within five minutes of the scheduled time.

Punctuality for March was 90.3%, and 87.8% for the year to date. Punctuality continues to be impacted by a high level of speed restrictions across the network, in particular on the Kapiti and Wairarapa lines, however performance on the Johnsonville and Hutt lines has improved.



Punctuality - current month

	Mar-24	Mar-23	% Change
Hutt Valley	92.0%	82.3%	9.7%
Johnsonville	98.2%	95.3%	2.9%
Kapiti	88.2%	72.6%	15.6%
Wairarapa	11.2%	56.9%	-45.7%
Total	**90.3%**	**81.9%**	**8.4%**

Punctuality - year to date (Jul - Mar)

	2023/24	2022/23	% Change
Hutt Valley	88.3%	88.4%	-0.1%
Johnsonville	95.9%	92.3%	3.6%
Kapiti	85.6%	60.0%	25.6%
Wairarapa	27.0%	53.4%	-26.4%
Total	**87.8%**	**79.4%**	**8.4%**

Rail network owner

Commentary

March punctuality increased by 1.24% from the previous month, while overall reliability increased very slightly.

The main disruption during the month occurred on the 20th of March when A Box (signal box) took back a signal at WLG34. The flow on impact from this was that 8 services were cancelled, and 99 delay minutes incurred.

On the 22nd of March a broken weld was discovered on the Up Main at the 19km mark on the NIMT. This was plated and bonded by track staff with a 60kph TSR imposed over this site, with a rail closure planned in May for a permanent fix.

Minor disruptions during the month were signals related, incurring small delays including 59 points at Wellington failing on the 15th of March and "N" track dropping at South Junction on the 18th of March.

Delays due to Heat40 sites tapered off during the month with the last Heat Site of the season activated on the 9th of March. Speed restrictions related to WMUP works and carriage vibration issues continue to contribute to high delay minutes on the Wairarapa Line.

KPI summary

Network Availability
There were no unplanned line closures on all lines for the month of March.

Maintenance Compliance
Maintenance is 100% compliant to standards across both Track and STTE.

Health & safety

March saw 30 Zero Harm Free days.

Quarterly Overview – March 2024

Key Performance Indicators							
Punctuality	Reliability	Network Availability	Asset Condition Mapping	Maintenance Compliance	Maintenance Backlog	HSE Score	Planned Works Delivery
96.60%	*99.30%*	*Unplanned: 98.80%*		*100%*	Reducing Trend	*Zero Harm*	
99.43%	99.83%	Planned: 88.42% Unplanned: 99.72%	Track: 94.68% Structures: 100.00% Civil: 51.63% Traction: 100%	Track: 100% STTE: 100%	0	30 Zero Harm Free Days	100.00%

(Yellow row is KPI target)

Operational Performance

Patronage

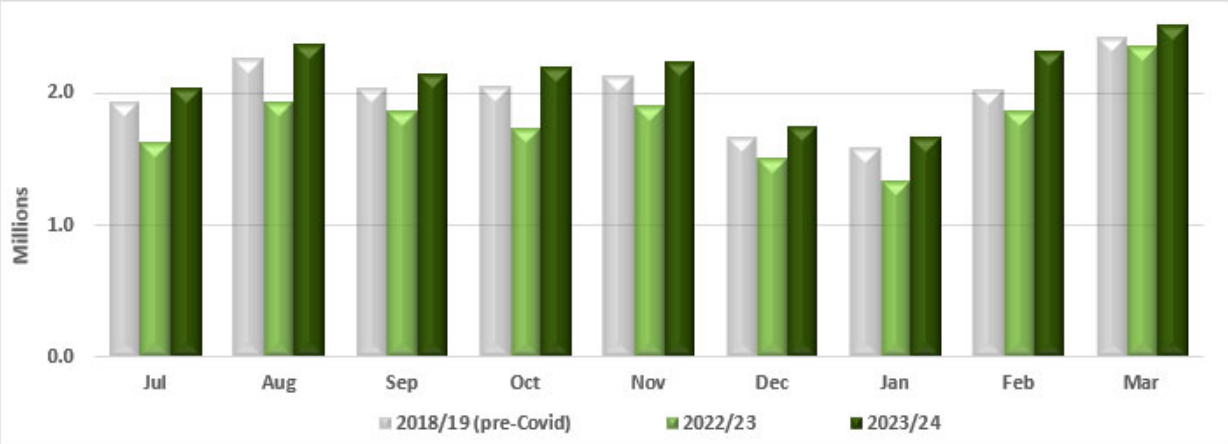
There are two ways to report on patronage - passenger boardings and passenger journeys. We calculate passenger journeys by subtracting recorded transfers (movements from one vehicle to another within 30 minutes) from passenger boardings. Metlink generally reports passenger boardings given the lack of visibility on transfers between modes and on rail and ferry services.

In March 2024, we saw increased passenger boardings when compared to the same month last year.

Bus passenger boardings

March bus passenger boardings were 6.6% higher than the same month last year, and 19.1% higher for the year to date.

Boardings this month were 3.6% higher than March 2019 numbers (pre-Covid).



Boardings by area - current month

	Mar-24	Mar-23	% Change
Wellington	1,861,185	1,760,252	5.7%
Hutt Valley	470,679	433,719	8.5%
Porirua	99,322	86,554	14.8%
Kapiti	71,197	65,698	8.4%
Wairarapa	16,765	17,576	-4.6%
Total	**2,519,148**	**2,363,799**	**6.6%**

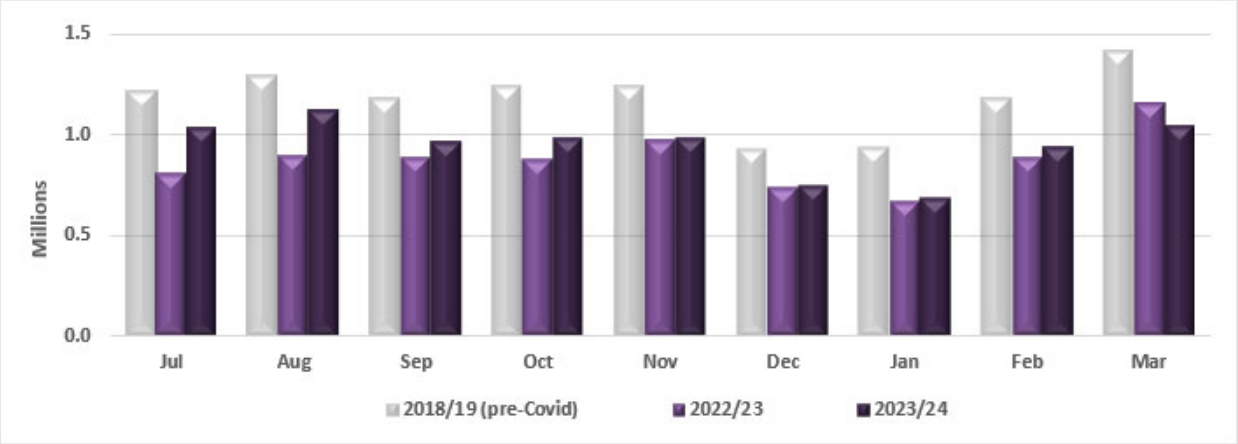
Boardings by area - year to date (Jul - Mar)

	2023/24	2022/23	% Change
Wellington	14,312,895	11,948,149	19.8%
Hutt Valley	3,672,684	3,109,937	18.1%
Porirua	692,005	591,905	16.9%
Kapiti	495,838	431,235	15.0%
Wairarapa	122,334	115,169	6.2%
Total	**19,295,756**	**16,196,395**	**19.1%**

Rail passenger boardings

March rail passenger boardings were 9.7% lower than the same month last year, and 7.8% higher for the year to date.

Boardings this month were 26.8% lower than March 2019 numbers (pre-Covid).



Boardings by line - current month

	Mar-24	Mar-23	% Change
Hutt Valley	449,903	496,409	-9.4%
Kapiti	421,673	456,674	-7.7%
Johnsonville	111,066	136,468	-18.6%
Wairarapa	53,979	58,414	-7.6%
Total	**1,036,621**	**1,147,965**	**-9.7%**

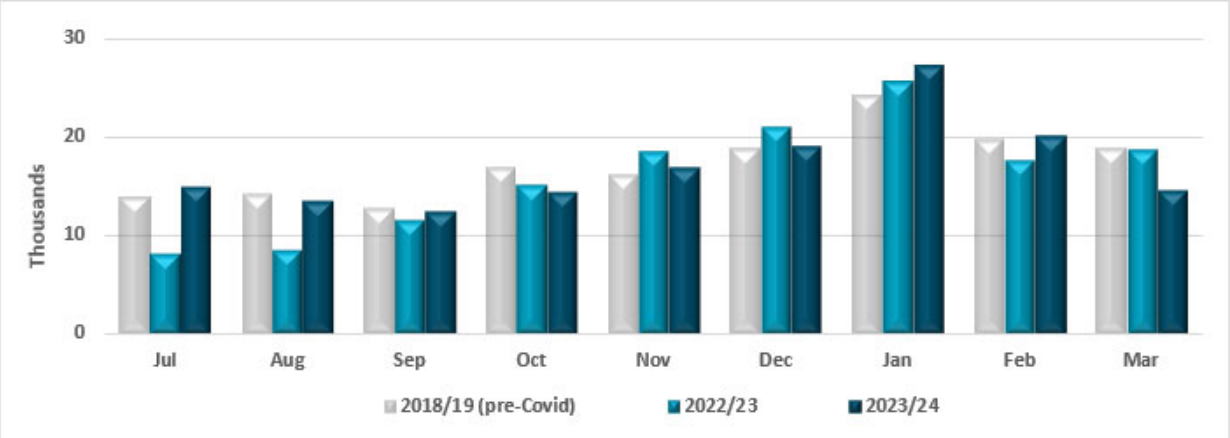
Boardings by line - year to date (Jul - Mar)

	2023/24	2022/23	% Change
Hutt Valley	3,609,397	3,371,678	7.1%
Kapiti	3,448,758	3,134,817	10.0%
Johnsonville	949,676	913,194	4.0%
Wairarapa	452,462	431,534	4.8%
Total	**8,460,293**	**7,851,223**	**7.8%**

Ferry passenger boardings

Ferry boardings show a decrease of 21.9% on the same month last year, and an increase of 5.7% for the year to date. Boardings are often affected by weather.

Boardings for the month were 22.9% lower than March 2019 numbers (pre-Covid).



Boardings - current month

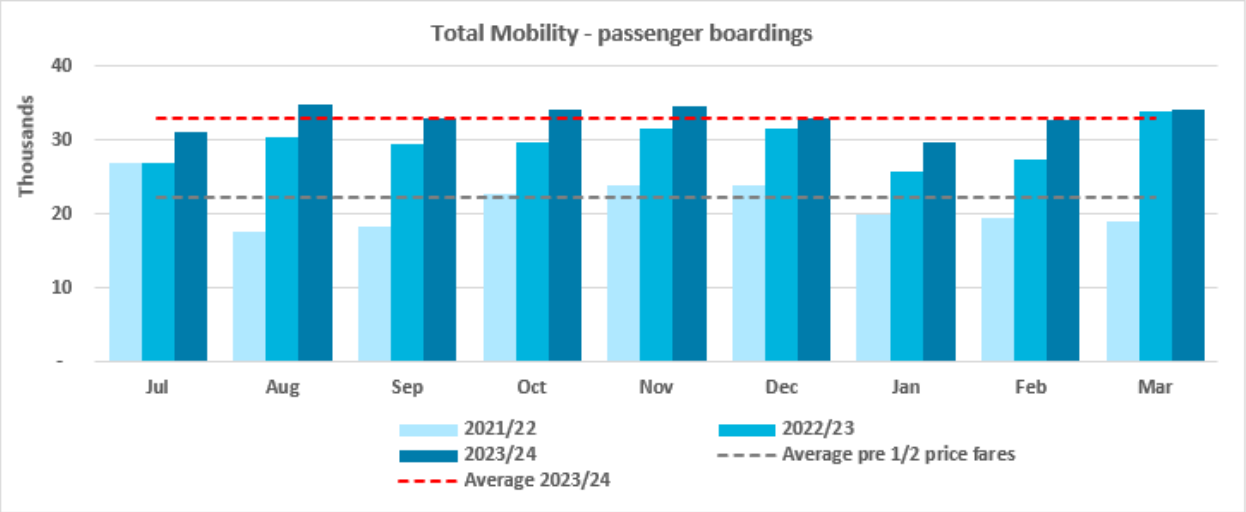
	Mar-24	Mar-23	% Change
Total	**14,622**	**18,731**	**-21.9%**

Boardings - year to date (Jul - Mar)

	2023/24	2022/23	% Change
Total	**154,170**	**145,901**	**5.7%**

Te Hunga Whaikaha Total Mobility passenger boardings

In March there were 34,171 Te Hunga Whaikaha Total Mobility trips, an increase of 0.7% compared to the same month in the previous year. This shows continuing strong levels of usage of Te Hunga Whaikaha Total Mobility, reflective of the half price fares initiative which is now permanent.



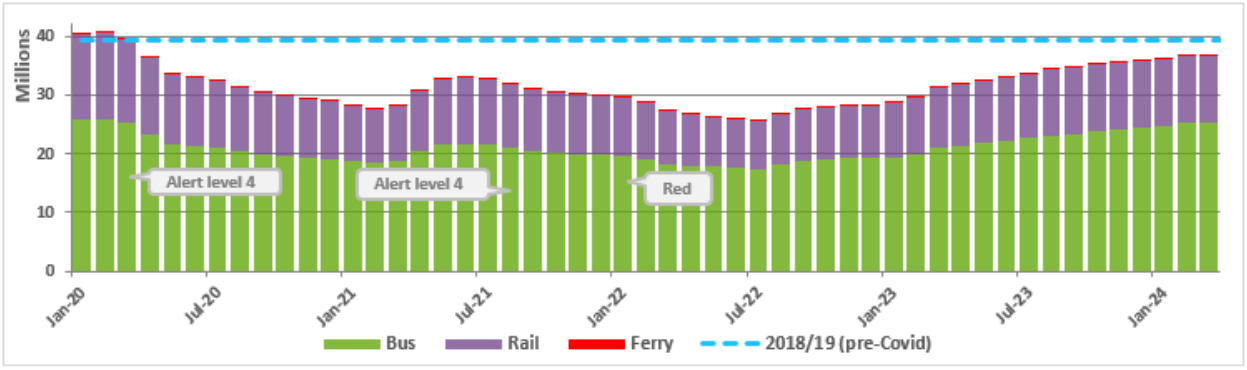
Passenger boardings trend – 12 month rolling totals

The following graphs show the number of passenger boardings using a 12-month rolling total.

Each column in the graphs below represents the total boardings for the 12 months prior (e.g., for January 2024, the column is total boardings for February 2023 to January 2024). Rolling totals smooth out any seasonal differences (e.g., school and public holidays) and are a better indication of growth trends overall. For month-on-month totals refer to the graphs in the section above.

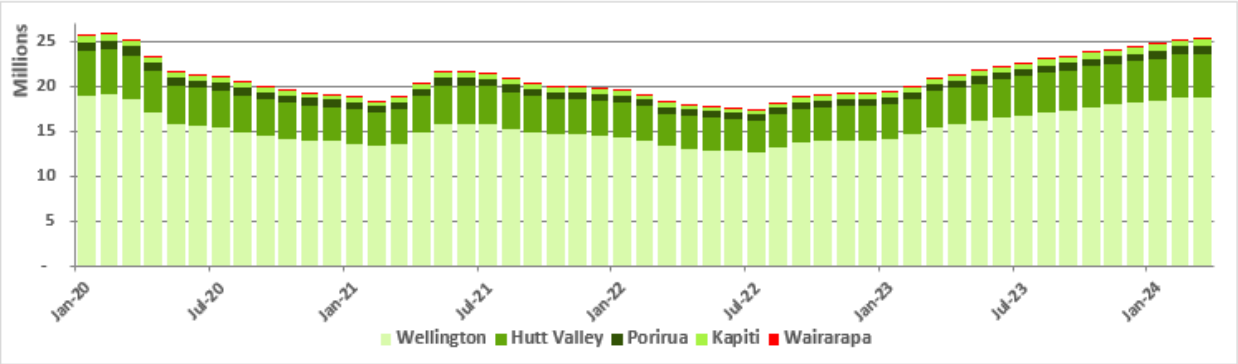
All modes

There had been continuing growth up to February 2020, then decreases with the Covid-19 pandemic (mid-March 2020 onwards, a move to level 4 in August 2021, and a move to Red of the Covid-19 Protection Framework in late January 2022) - we can now see trending growth again for all modes, but this has not yet reached pre-Covid levels, as shown by blue dotted line in the graph below.

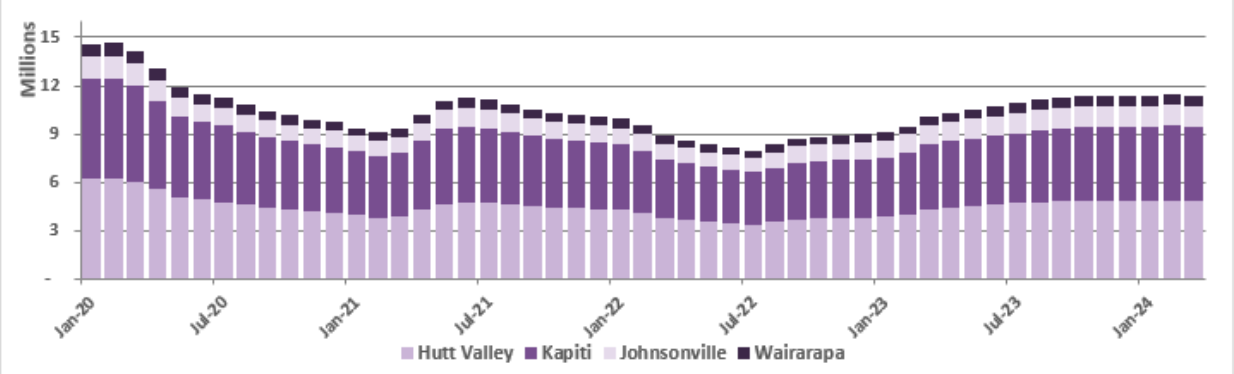


Attachment 1 to Report 24.183

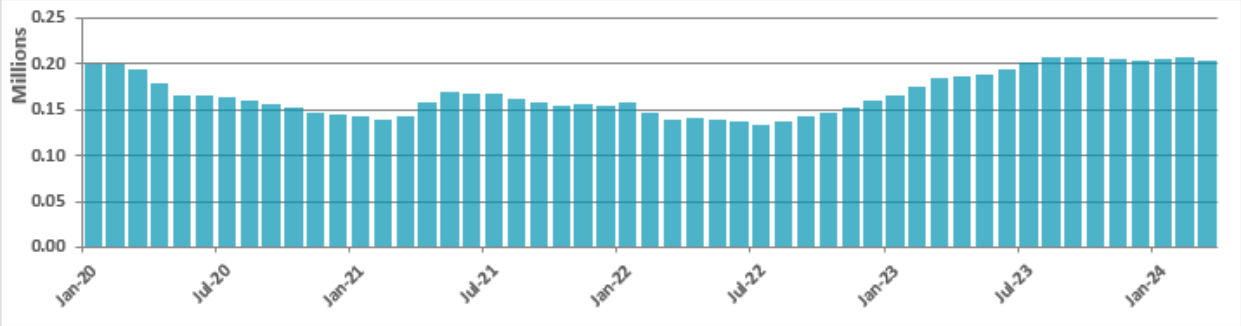
Bus



Rail



Ferry

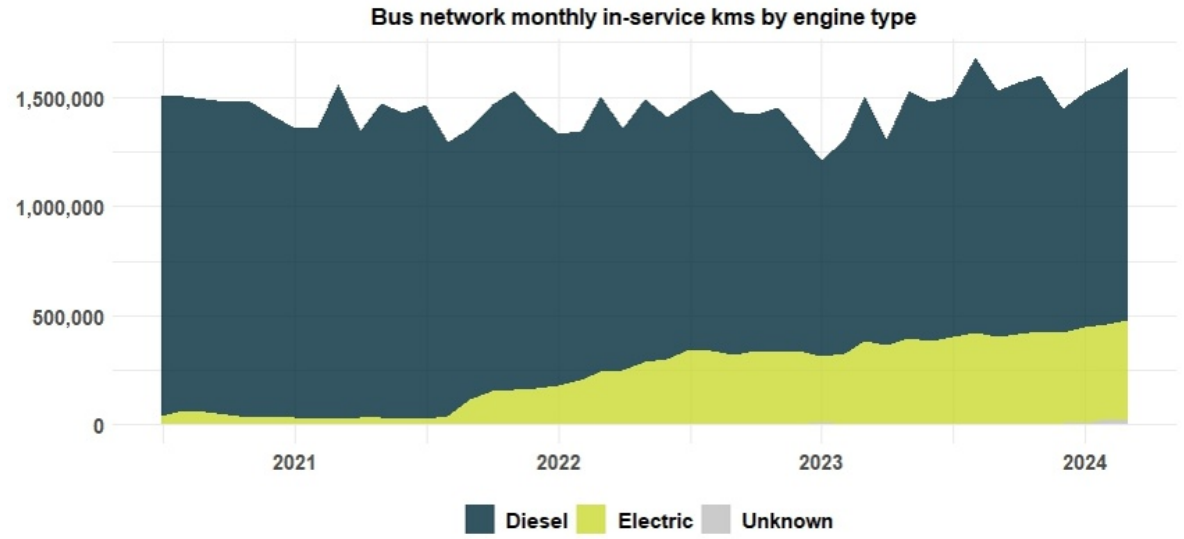


Bus emissions

Please note that numbers include a 15% adjustment estimated for dead running (e.g. moving from a depot to a first stop), and interpolation for unsighted stops or where there is other information missing (e.g. a vehicle cannot be matched to an engine type).

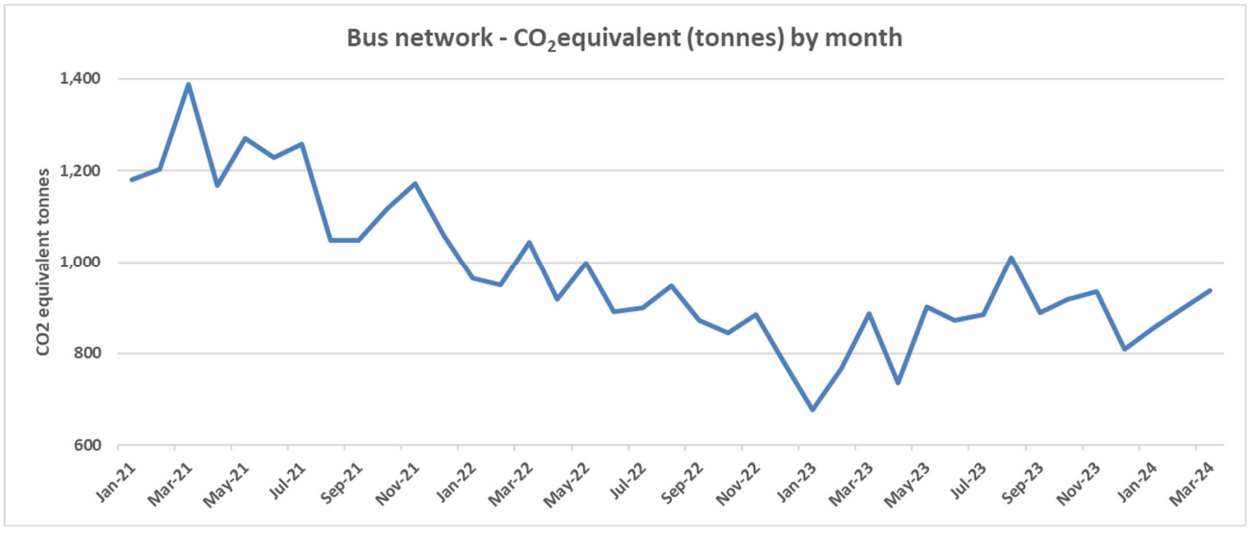
In-service kilometres by engine type

The graph below shows the monthly in-service kilometres by engine type for vehicles that have run Greater Wellington bus network services.



CO_2 equivalent tonnes

The graph below shows the monthly CO_2 equivalent tonnes emitted by vehicles that have run Greater Wellington bus network services.



Bus vehicles by engine type

The table below shows the number of vehicles by engine type that ran bus network services in the Greater Wellington region in March 2024.

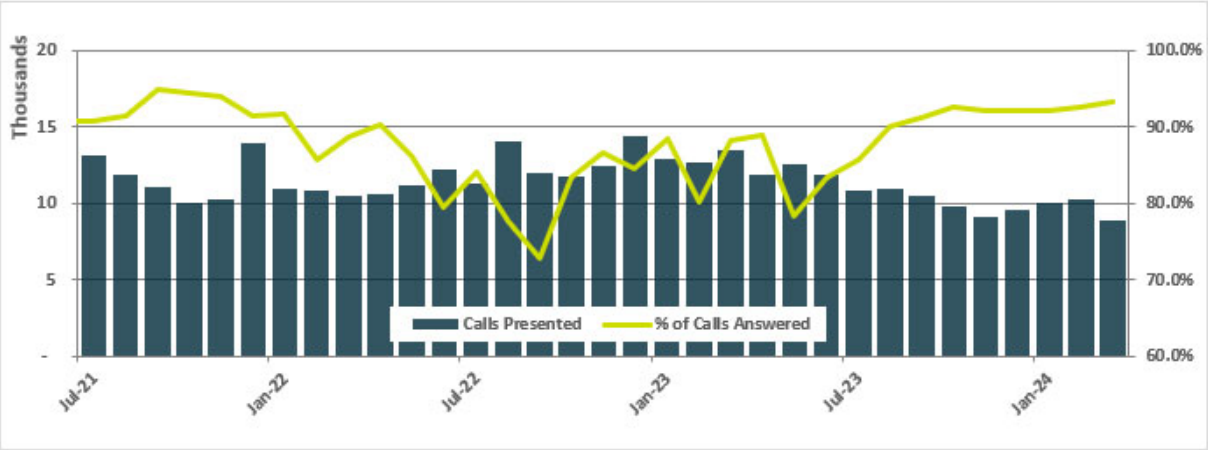
Number of vehicles by engine type - March 2024

ELECTRIC	EURO3	EURO4	EURO5	EURO6	Unknown	Total
99	38	19	58	128	13	355

Customer Contact

Call centre incoming calls

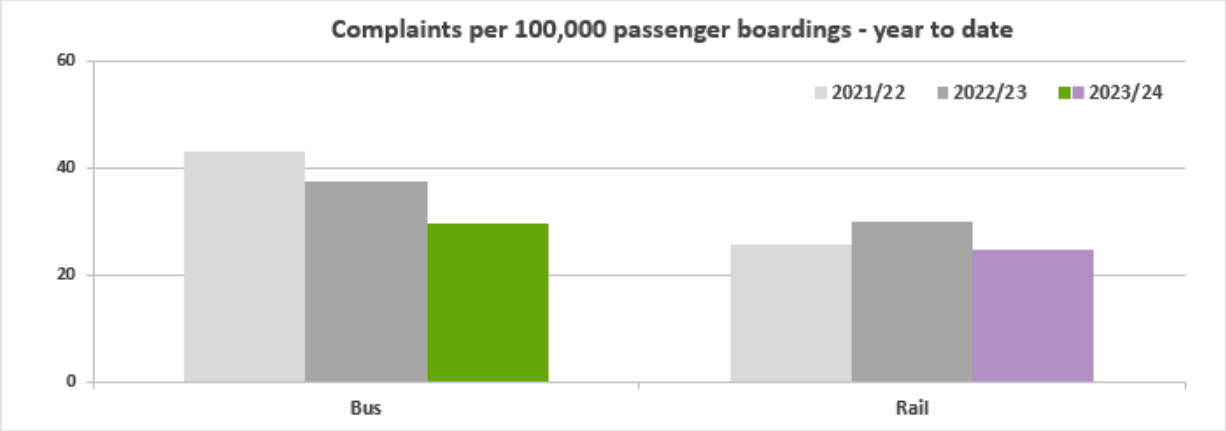
Metlink answered 93.3% of the 8,912 calls received in March.

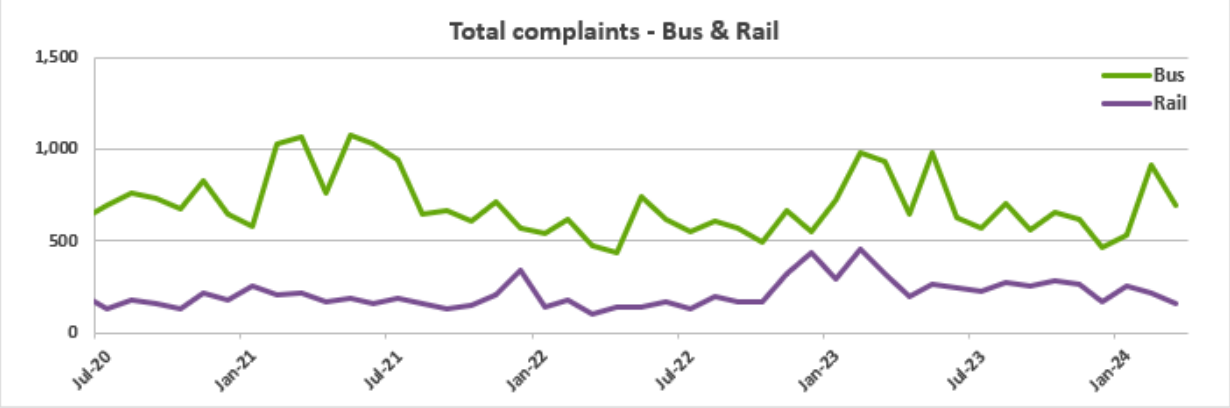


Complaints

Complaints volume

To compare complaint volumes, Metlink reports the number of complaints per 100,000 passenger boardings. This shows that complaint volumes relative to passenger boardings are slightly higher for bus than rail.

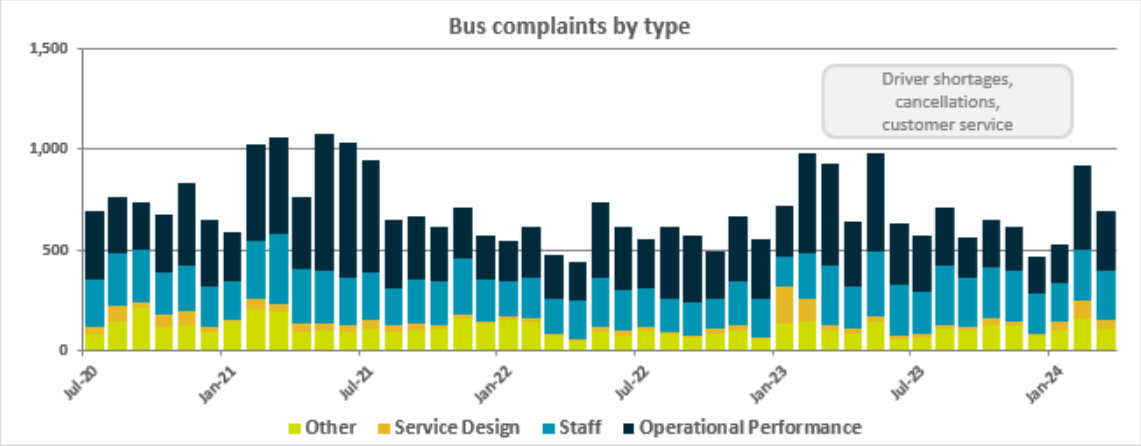




Bus complaints

Bus complaints for the month were 25.6% lower than in March last year, and 5.9% lower for the year to date.

Complaint levels for the month are returning to normal levels. They relate mostly to customer service and driver behavior.



'Other' includes complaints re: Covid, passenger information, stops/stations, vehicles.

Bus complaints - current month

	Mar-24	Mar-23	% Change
Wellington			
Newlands, Tawa	34	33	3.0%
East-West, City	208	248	-16.1%
North-south, Khandallah, Brooklyn	228	369	-38.2%
Hutt Valley	165	200	-17.5%
Porirua	34	59	-42.4%
Kapiti	18	15	20.0%
Wairarapa	6	7	-14.3%
Total	**693**	**931**	-25.6%

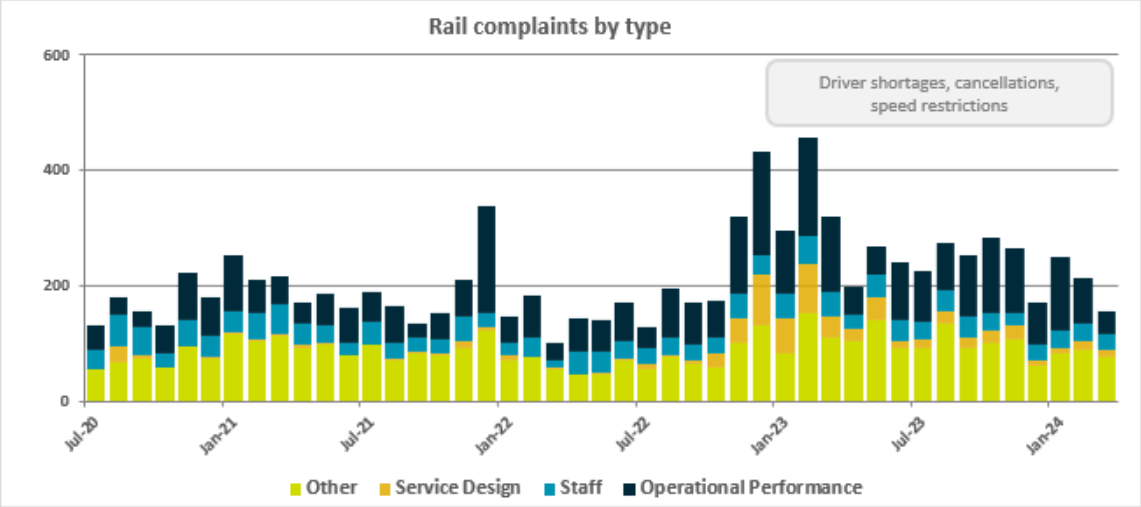
Bus complaints - year to date (Jul - Mar)

	2023/24	2022/23	% Change
Wellington			
Newlands, Tawa	335	185	81.1%
East-West, City	1,704	1,797	-5.2%
North-south, Khandallah, Brooklyn	1,744	2,241	-22.2%
Hutt Valley	1,395	1,239	12.6%
Porirua	300	401	-25.2%
Kapiti	181	183	-1.1%
Wairarapa	64	34	88.2%
Total	**5,723**	**6,080**	-5.9%

Rail complaints

Rail complaints for March were 51.2% lower than the same month last year, and 16.0% lower for the year to date.

Complaints were mainly related to bus replacements and services that have been affected by staff shortages, there has also been a significant increase in complaints related to the ongoing poor performance on the Wairarapa Line.



'Other' includes complaints re: Covid, passenger information, stops/stations, vehicles.

Rail complaints - current month

	Mar-24	Mar-23	% Change
Hutt Valley	45	136	-66.9%
Kapiti	53	81	-34.6%
Johnsonville	11	29	-62.1%
Wairarapa	23	16	43.8%
General	25	60	-58.3%
Total	**157**	**322**	-51.2%

Rail complaints - year to date (Jul - Mar)

	2023/24	2022/23	% Change
Hutt Valley	719	763	-5.8%
Kapiti	665	874	-23.9%
Johnsonville	114	243	-53.1%
Wairarapa	294	162	81.5%
General	311	461	-32.5%
Total	**2,103**	**2,503**	-16.0%

Financial Performance

Fare revenue

Bus and rail fare revenue

The table below compares revenue received for fares on bus and rail, compared to budgeted fare revenue.

In April 2022 the Government introduced half-price fares – numbers reported here are for actual fare revenue, without adjustment for any additional Waka Kotahi funding during the half-price fares period. Funding for half price fares is claimed through Waka Kotahi within grants and subsidies.

In March there was a budget shortfall of $2.9 million. Year to date the shortfall is $34.9 million – an estimated $7.1 million is due to providing half price fares in July and August without Waka Kotahi support, and $27.8 million is due to the change in travel behaviour post-Covid compared to the travel assumptions set pre-Covid in 2020. 51% of this is claimable from Waka Kotahi.

Fare revenue - current month

	Mar-24	Budget	Excess/Shortfall
Bus	2,381,961	4,319,701	- 1,937,740
Rail	3,767,758	4,702,354	- 934,596
Total	**$ 6,149,719**	**$ 9,022,055**	**-$ 2,872,336**

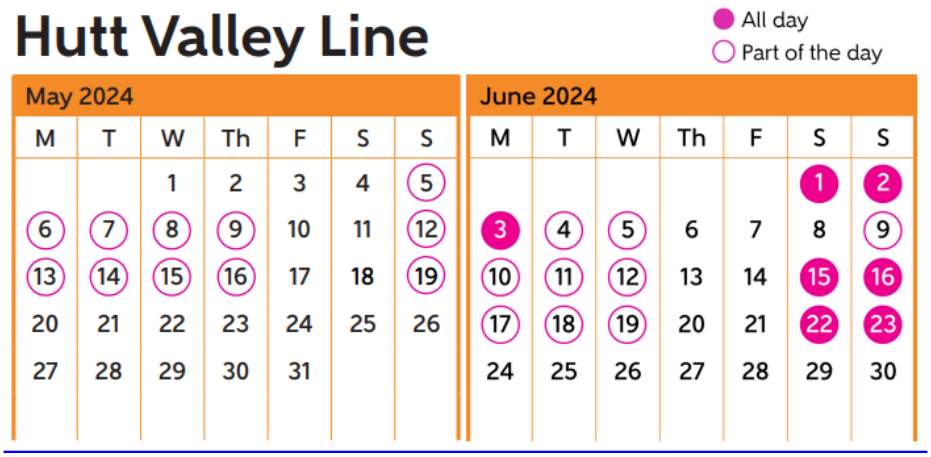
Fare revenue - year to date (Jul - Mar)

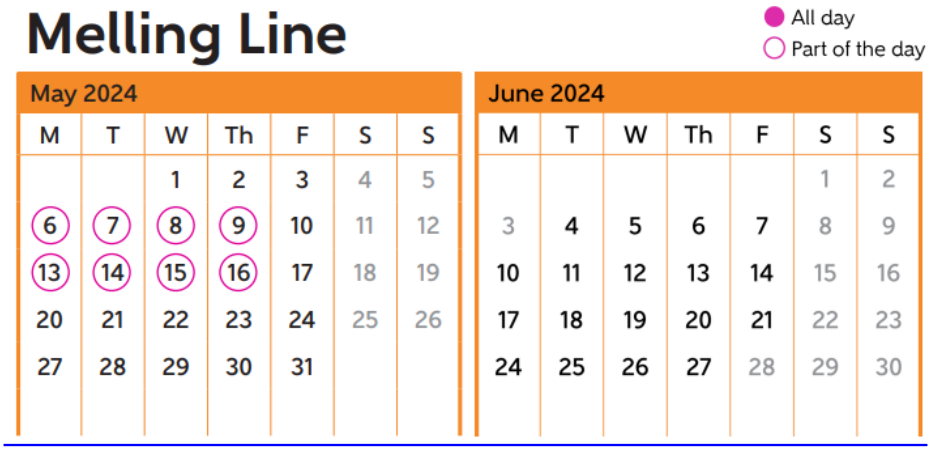
	2023/24	Budget	Excess/Shortfall
Bus	23,465,696	38,877,309	- 15,411,613
Rail	22,804,764	42,321,184	- 19,516,419
Total	**$46,270,461**	**$ 81,198,493**	**-$ 34,928,032**

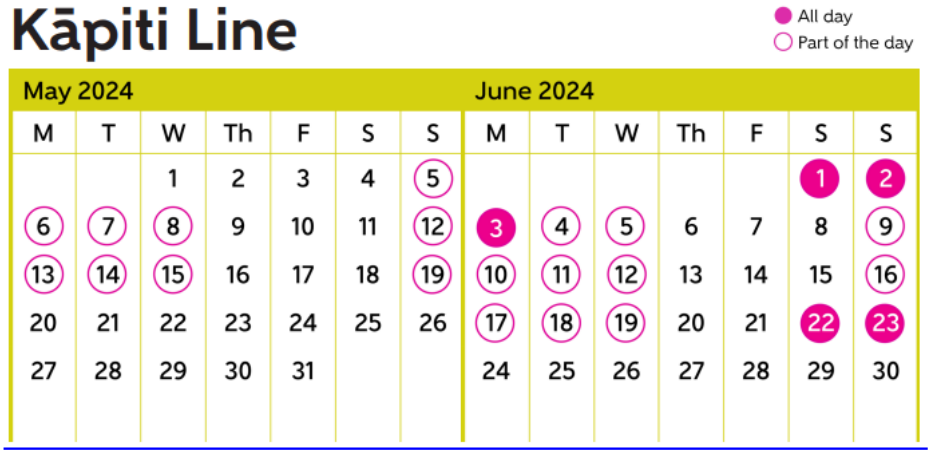
Attachment 2 to Report 24.183

Buses Replacing Trains – upcoming replacements

To help customers better plan their travel, **Bus replacement information** is available on the Metlink website on the buses replacing trains page.[1] Copies of the current calendars are provided below. Please click on the calendar to link through to the bus replacement information for that specific line, which includes bus replacement timetables for each date.

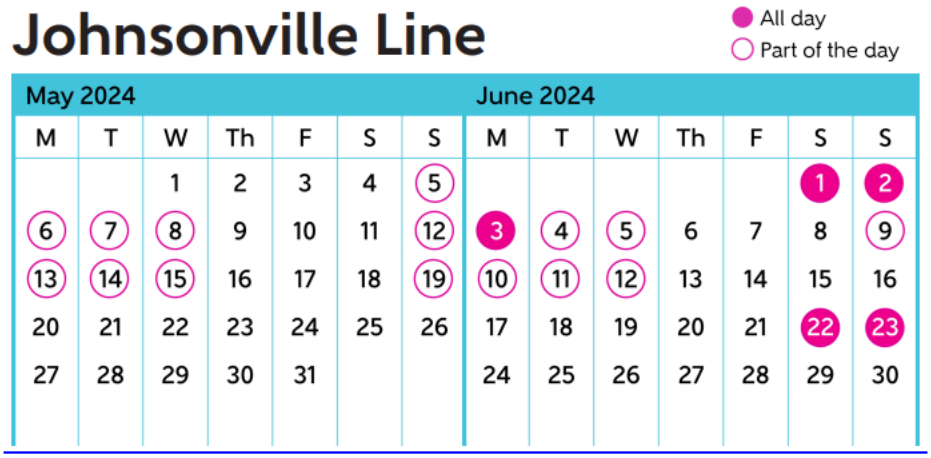






[1] https://www.metlink.org.nz/news-and-updates/buses-replacing-trains

Attachment 2 to Report 24.183



KiwiRail provides further information about the full programme of KiwiRail works on their website.[2]

[2] https://www.kiwirail.co.nz/our-network/our-regions/wellington/