

Implementation Committee Agenda - 8 Dec 2021



Meeting conducted in the Council Chamber at Lvl 2, Philip Laing House
144 Rattray St, Dunedin (Councillors and staff only)

Members of the public may view livestream at: [Otago Regional Council YouTube Channel](#)

Members:

Cr Bryan Scott, Co-Chair
Cr Carmen Hope, Co-Chair
Cr Hilary Calvert
Cr Michael Deaker
Cr Alexa Forbes
Cr Gary Kelliher
Cr Michael Laws
Cr Kevin Malcolm
Cr Andrew Noone
Cr Gretchen Robertson
Cr Kate Wilson

Senior Officer: Sarah Gardner, Chief Executive

Meeting Support: Liz Spector, Governance Support Officer

08 December 2021 10:30 AM

Agenda Topic	Page
1. APOLOGIES No apologies were received prior to publication of the agenda.	
2. PUBLIC FORUM No requests to address the Committee under Public Forum were received prior to publication of the agenda.	
3. CONFIRMATION OF AGENDA Note: Any additions must be approved by resolution with an explanation as to why they cannot be delayed until a future meeting.	
4. CONFLICT OF INTEREST Members are reminded of the need to stand aside from decision-making when a conflict arises between their role as an elected representative and any private or other external interest they might have.	
5. CONFIRMATION OF MINUTES Minutes of previous meetings of the Implementation Committee will be adopted as true and accurate record(s), with or without changes.	3
5.1 Minutes of the 8 September 2021 Implementation Committee meeting	3
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6. OUTSTANDING ACTIONS FROM RESOLUTIONS OF THE COMMITTEE Outstanding actions from resolutions of previous Implementation Committee meetings will be reviewed with staff.	9
7. MATTERS FOR CONSIDERATION	10

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	This report provides a quarterly summary of operational implementation activities undertaken in freshwater, biosecurity, and biodiversity and complements the Annual Plan quarterly reporting.	
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7.2	OUTCOMES FROM DUNEDIN ELECTRIC BUS TRIAL	40
	This report is provided to inform the Committee on outcomes of the electric bus trial conducted in Dunedin between 28 September and 29 October 2021.	
7.2.1	Dunedin Network Routes and Bridge Detail	53
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8.	RESOLUTION TO EXCLUDE THE PUBLIC	66
	Pursuant to the provisions of the Local Government Official Information and Meetings Act 1987, the public will be excluded from the following part of this meeting:	
	- 1.1 Decision on Future of Rabbit Control Assets	
9.	CLOSURE	



Minutes of a meeting of the
Implementation Committee held electronically
Wednesday 8 September 2021, commencing at 10:00 AM

Membership

Cr Carmen Hope (Co-Chair)
Cr Bryan Scott (Co-Chair)
Cr Hilary Calvert
Cr Michael Deaker
Cr Alexa Forbes
Hon Cr Marian Hobbs
Cr Gary Kelliher
Cr Michael Laws
Cr Kevin Malcolm
Cr Andrew Noone
Cr Gretchen Robertson
Cr Kate Wilson

Welcome

Co-Chair Carmen Hope welcomed Councillors and staff to the meeting at 10:04 am. Staff present included Sarah Gardner (Chief Executive), Nick Donnelly (GM Corporate Services), Gwyneth Elsum (GM Strategy, Policy and Science), Gavin Palmer (GM Operations), Richard Saunders (GM Regulatory and Communications), Liz Spector (Governance Support), Andrea Howard (Manager Environmental Implementation), and Murray Boardman (Performance and Delivery Specialist).

1. APOLOGIES

No apologies were submitted.

2. PUBLIC FORUM

No public forum was held.

3. CONFIRMATION OF AGENDA

The agenda was confirmed as published.

4. CONFLICT OF INTEREST

No conflicts of interest were advised.

5. PRESENTATIONS

The Otago Catchment Community Inc annual report to the ORC was presented by Sam Dixon, Regional Coordinator and supported by Lloyd McCall.

6. CONFIRMATION OF MINUTES

Resolution: Cr Wilson Moved, Cr Calvert Seconded

That the minutes of the meeting held on 9 June 2021 be received and confirmed as a true and accurate record, with or without changes.

MOTION CARRIED

Resolution: Cr Calvert Moved, Cr Wilson Seconded

That the minutes of the meeting held on 7 July 2021 be received and confirmed as a true and accurate record, with or without changes.

MOTION CARRIED

7. ACTIONS

Outstanding actions from resolutions of the committee were reviewed with staff.

8. MATTERS FOR CONSIDERATION

8.1. Biosecurity Operational Plan 2020/2021 Summary of Performance

The report was provided to detail progress made towards implementation of the Regional Pest Management Plan 2019-2029 (RPMP) as operationalised by the Biosecurity Operational Plan for the period July 2020 to June 2021. Andrea Howard (Manager Environmental Implementation), Murray Boardman (Performance and Delivery Specialist), and Gavin Palmer (General Manager Operations) were available to respond to questions about the report.

Several questions were responded to regarding statistics on rabbit counts and methods used to measure their population, along with tools used by the ORC to encourage rabbit control on local government authority and Crown-owned land. Ms Howard noted the ORC is working proactively to encourage public agencies to meet their obligations, stating staff will be meeting with each of the Otago territorial authorities over the next few weeks to discuss the issue.

Following further discussion of the report, Cr Calvert moved:

Resolution IMP21-113: Cr Calvert Moved, Cr Wilson Seconded

That the Committee:

- 1) **Notes** *this report and the range of work undertaken to give effect to Otago's Regional Pest Management Plan and the Biosecurity Act (1993).*
- 2) **Notes** *the full achievement and/or exceedance of 20 key performance indicators (KPIs), the partial achievement of 25 KPIs with 6 KPIs not achieved.*
- 3) **Notes** *that learnings from the operationalisation of Council's first BOP 2020-21 are being applied to the delivery of the BOP 2021-22.*

MOTION CARRIED

8.2. Environmental Implementation Update

The report provided a quarterly summary of operational implementation activities undertaken in the areas of freshwater, biosecurity, and biodiversity as a complement to Annual Plan quarterly reporting, including details of projects underway, and improvements made to processes and systems that support delivery of the activities. Andrea Howard (Manager Environmental Implementation) and Gavin Palmer (General Manager Operations) were available to respond to questions about the report.

After a discussion of the report, Cr Wilson thanked staff for the report and moved:

Resolution IMP21-114: Cr Wilson Moved, Cr Scott Seconded

That the Committee:

- 1) **Notes** *this report.*
- 2) **Notes** *the establishment of a new Environmental Implementation Team in July 2021 to support increased 'on the ground' action towards achieving Otago Regional Council's environmental objectives.*
- 3) **Notes** *the range of standard business and transformational activities being undertaken to maintain and improve Otago Regional Council's delivery of environmental implementation activities.*
- 4) **Notes** *Otago Regional Council's role in managing Jobs for Nature funded initiatives, and the associated increase in 'on the ground' biosecurity and biodiversity work.*
- 5) **Notes** *progress made with seven communities to develop long-term, sustainable approaches to rabbit management.*

MOTION CARRIED

9. NOTICES OF MOTION

9.1. Notice of Motion - Request for reports on gravel consents, river management work programmes, and asset management of riverbank plantings.

In accordance with Standing Order 27.1, a Notice of Motion was received from Cr Kate Wilson for inclusion on the 8 September 2021 Implementation Committee agenda. Cr Wilson spoke to this notice of motion, stating each of the recommendations arose from public submissions received during consultation on the Long-Term Plan 2021-31.

Cr Calvert asked for staff comments regarding the timeframes for the reports requested in the motion. Gavin Palmer (General Manager Operations) indicated that the information requested

for gravel extraction consents and work programmes for river management could be included in the standard quarterly reporting to the Committee, and further stated he was unclear what the third request was looking for. Cr Wilson said she was happy if the first two requests could be incorporated into existing reporting to the Committee. She stated the third request comes from the Infrastructure Strategy where ORC river plantings are discussed. She said she wants to understand who is responsible for assets such as trees and the extent of such plantings.

Following debate on the motion, Committee members decided to put Cr Wilson's motion to the vote.

Resolution IMP21-115: Cr Wilson Moved, Cr Laws Seconded

That the Committee:

- 1) *Requests staff report in December and three monthly thereafter to Council on progress on gravel extraction consents.*
- 2) *Requests staff report three monthly on development of work programmes for the 2022/23 and subsequent annual plans for river management.*
- 3) *Requests staff provide Council with a report on timeframes and process to better develop asset management plans for plantings alongside riverbanks.*

A division was called:

Vote

For:	Cr Deaker, Cr Hope, Cr Kelliher, Cr Laws, Cr Malcolm, Cr Noone, Cr Scott and Cr Wilson
Against:	Cr Forbes and Cr Robertson
Abstained:	Cr Calvert and Cr Hobbs

MOTION CARRIED, 8 for, 2 against and 2 abstentions.

10. RESOLUTION TO EXCLUDE THE PUBLIC

Resolution: Cr Noone Moved, Cr Forbes Seconded:

That the Committee excludes the public from the following part of the proceedings of this meeting pursuant to the provisions of LGOIMA 1987 48(1) Sec. 7(2)(h) and 7(2)(i), namely:

- Minutes of the 7 July 2021 Implementation Committee meeting.

MOTION CARRIED

11. CLOSURE

There was no further business and Co-Chair Hope declared the public portion of the meeting closed at 12:05pm.

Chairperson

Date



Minutes of a public-excluded meeting of the
Implementation Committee held in the
Council Chamber on Wednesday 8 September 2021,
commencing at 12:15PM

Membership

Cr Carmen Hope (Co-Chair)
Cr Bryan Scott (Co-Chair)
Cr Hilary Calvert
Cr Michael Deaker
Cr Alexa Forbes
Hon Cr Marian Hobbs
Cr Gary Kelliher
Cr Michael Laws
Cr Kevin Malcolm
Cr Andrew Noone
Cr Gretchen Robertson
Cr Kate Wilson

Welcome

Co-Chair Hope welcomed Councillors and staff to the meeting at 12:06pm. Staff present included Sarah Gardner (Chief Executive), Nick Donnelly (GM Corporate Services), Gwyneth Elsum (GM Strategy, Policy and Science), Gavin Palmer (GM Operations), Richard Saunders (GM Regulatory and Communications), and Liz Spector (Governance Support).

1. APOLOGIES

There were no apologies.

2. CONFLICT OF INTEREST

No conflicts of interest were advised.

3. CONFIRMATION OF MINUTES

Resolution: Cr Noone Moved, Cr Scott Seconded

That the minutes of the public excluded meeting held on 7 July 2021 be received and confirmed as a true and accurate record, with or without changes.

MOTION CARRIED

4. CLOSURE

There was no further business and Co-Chair Hope declared the public-excluded meeting closed at 12:15pm.

Chairperson

Date

ACTION REGISTER – IMPLEMENTATION COMMITTEE AT 8 DECEMBER 2021

Meeting Date	Item	Status	Action Required	Assignee/s	Action Taken	Due Date
08/09/2021	Notice of Motion - Request for Reports	Completed	Include details on progress on gravel extraction consents in regular quarterly reporting to the Implementation Committee. Res IMP21-115	General Manager Operations	25/11/2021 Dr Palmer (25/11/2021): Update provided in quarterly report "Council Activity Performance Report 1Q 2021/22" to the 24 Nov Finance Committee.	08/12/2021
14/10/2020	OPS1014 Biosecurity Implementation Improvement Update - Pest Management	Completed	Bring a paper to the Implementation Committee detailing pros and cons of Options 2 and 3 to determine future use of rabbit control assets.	General Manager Operations, Manager Biosecurity and Rural Liaison	19/10/2020 Work on this report to start. 1/09/2021 Dr Palmer, 1 Sept 2021: The condition and safety of existing assets has been assessed by an external expert and their findings are being reviewed by staff. This will inform further work on Options 2 and 3. 25/11/2021 Dr Palmer (25/11/21): Report being provided to the 8 Dec 2021 Implementation Committee.	15/12/2021
08/09/2021	Notice of Motion - Request for Reports	Completed	Include information on development of work programmes for the 2022/23 and subsequent annual plans for river management in regular quarterly reporting to the Implementation Committee. Res IMP21-115	General Manager Operations	25/11/2021 Dr Palmer (25/11/2021): Update provided in quarterly report "Council Activity Performance Report 1Q 2021/22" to the 24 Nov Finance Committee.	08/12/2021
08/09/2021	Notice of Motion - Request for Reports	In progress	Present a staff report detailing timeframes and process to better develop asset management plans for plantings alongside riverbanks. Res IMP21-115	General Manager Operations	25/11/2021 Dr Palmer (25/11/2021): Update provided in quarterly report "Council Activity Performance Report 1Q 2021/22" to the 24 Nov Finance Committee.	08/12/2021

7.1. Environmental Implementation Update

Prepared for:	Implementation Committee
Report No.	BIO2103
Activity:	Environmental: Land Environmental: Water
Author:	Andrea Howard, Manager Environmental Implementation
Endorsed by:	Gavin Palmer, General Manager Operations
Date:	8 December 2021

PURPOSE

- [1] To provide a quarterly summary of operational implementation activities being undertaken in the areas of freshwater, biosecurity, and biodiversity. This report complements the Annual Plan quarterly reporting. It includes details of projects underway, and improvements being made to processes and systems that support delivery of these activities.

RECOMMENDATION

That the Committee:

- 1) **Notes** this report.
- 2) **Notes** the range of standard business and transformational activities being undertaken to maintain and improve Otago Regional Council's delivery of environmental implementation activities.
- 3) **Notes** progress towards the development of a joint Memorandum of Understanding for a Southern Biosecurity Partnership between ORC, Environment Southland and Environment Canterbury which will be considered by Council in early 2022.

EXECUTIVE SUMMARY

- [2] Since the last quarterly report, the Environmental Implementation Team has recruited nine new staff covering areas including biosecurity, catchment management, community and agency partnerships and project delivery. Recruitment continues for the three remaining new roles in year 1 of the 2021-31 Long-Term Plan.
- [3] ORC is leading and delivering four Jobs for Nature projects:
- a. The National Wilding Conifer Control Programme to Boost Regional Economies and Employment: Otago,
 - b. Containing Wallabies to Protect Agriculture, Forestry and Native Plants, And Boost Regional Economies: Otago,
 - c. Private Land Biodiversity: Maintaining the Gains, and
 - d. (Unannounced) catchment-based intervention project to reduce sediment and nutrient inputs into a waterway.
- [4] Strengthening relationships with external agencies has been a focus over the past three months with positive engagement occurring with Territorial Local Authorities, crown
-

entities and other public agencies and key stakeholders. Conversations have been focused on rules, roles and responsibilities, alongside collaborative opportunities to align work programmes and deliver joint projects.

- [5] The Environmental Implementation Team will be supported by four University of Otago students over the summer period, conducting research on Wallabies, Wilding Conifers, Russell lupins and Marine Pests.
- [6] A new Memorandum of Understanding for a Southern Biosecurity Partnership between ORC, Environment Southland and Environment Canterbury is under development. The purpose of the partnership includes developing joint work programmes where efficiencies can benefit all parties, creating collaborative approaches to addressing issues which may now, or in the future, impact on the natural environment, particularly where they are cross border issues or require a pathway management approach and sharing specialist advice.
- [7] A draft framework for integrated catchment management (ICM) programme is being developed. It is intended that ICM will be given effect to through a Catchment Action Plan for each FMU/rohe across the region.
- [8] Staff have continued to provide support to existing catchment groups and advice to those who are in their infancy.
- [9] The water quality focused projects in Lake Hayes, Tomahawk and Tuakitoto continue to be implemented according to project plans and available budget. A Project Manager has been appointed to oversee the design and implementation of the new culvert on Hayes Creek (SH6) and preliminary geotechnical and flow modelling work is underway.
- [10] Otago's ecosystems and habitat mapping (both the current ecosystem coverage and the 'potential' ecosystem coverage of Otago) is available on Council's website (<https://maps.orc.govt.nz/OtagoMaps/>). The data provides baseline information of where indigenous biodiversity remains in Otago and will help inform where we work with partners and communities to maintain and enhance indigenous biodiversity.
- [11] Facilitation of community responses to rabbit management continues, with good progress being made with a number of communities across Otago to establish and deliver sustained rabbit management programmes.

DISCUSSION

1. Environmental Implementation Summary

- [12] Figure 1 provides a snapshot of environmental focused initiatives underway across the region. Some are led by the ORC, while others are community driven, with extensive central government investment.
- [13] These initiatives include at least 22 individual catchment groups in various stages of development. Many of these groups are now working under the umbrella of Otago Catchment Community.
- [14] As of 30 June 2021, 20 large projects in Otago have been funded by Jobs for Nature. These projects are worth \$39m to the region and will be delivered over several years. The projects are focused on ecosystem and freshwater restoration, pest control, recreational enhancement, regulatory implementation, and building capability. These are in addition to the four Climate Resilience (“shovel-ready”) flood protection projects being delivered by ORC’s Engineering team (\$5.4m of central government funding).

ORC Led:

1. National Wilding Conifer Control Programme to Boost Regional Economies and Employment: Otago.
2. Containing Wallabies to Protect Agriculture, Forestry and Native Plants, And Boost Regional Economies: Otago.
3. Maintaining the Gains - Protecting and restoring indigenous biodiversity on private land.
4. *Unannounced* Jobs for Nature – Intervention project to reduce sediment and nutrients in waterbody.

Community Led:

5. Hukarere Station Indigenous Planting
6. Pomahaka Water Care Group I
7. Halo Project - Source to Sea I
8. Makarora Catchment Threatened Species Project - From Ridge to River
9. Tucker Beach Habitat Restoration
10. Lake Dunstan Restoration & Community Engagement
11. Maniototo Tiaki - Preservation Maniototo
12. Wanaka Catchment Group Wai Ora Initiative
13. In the Wild – Queenstown & Fiordland Workforce Hub
14. WAI Wanaka - Wanaka Future Reset
15. South Otago - Tokomairiro
16. Lindis Catchment Group
17. North Otago Sustainable Land Management
18. Pomahaka Water Care Group II
19. Pomahaka Corridor Planting Project
20. Halo Project - Source to Sea II

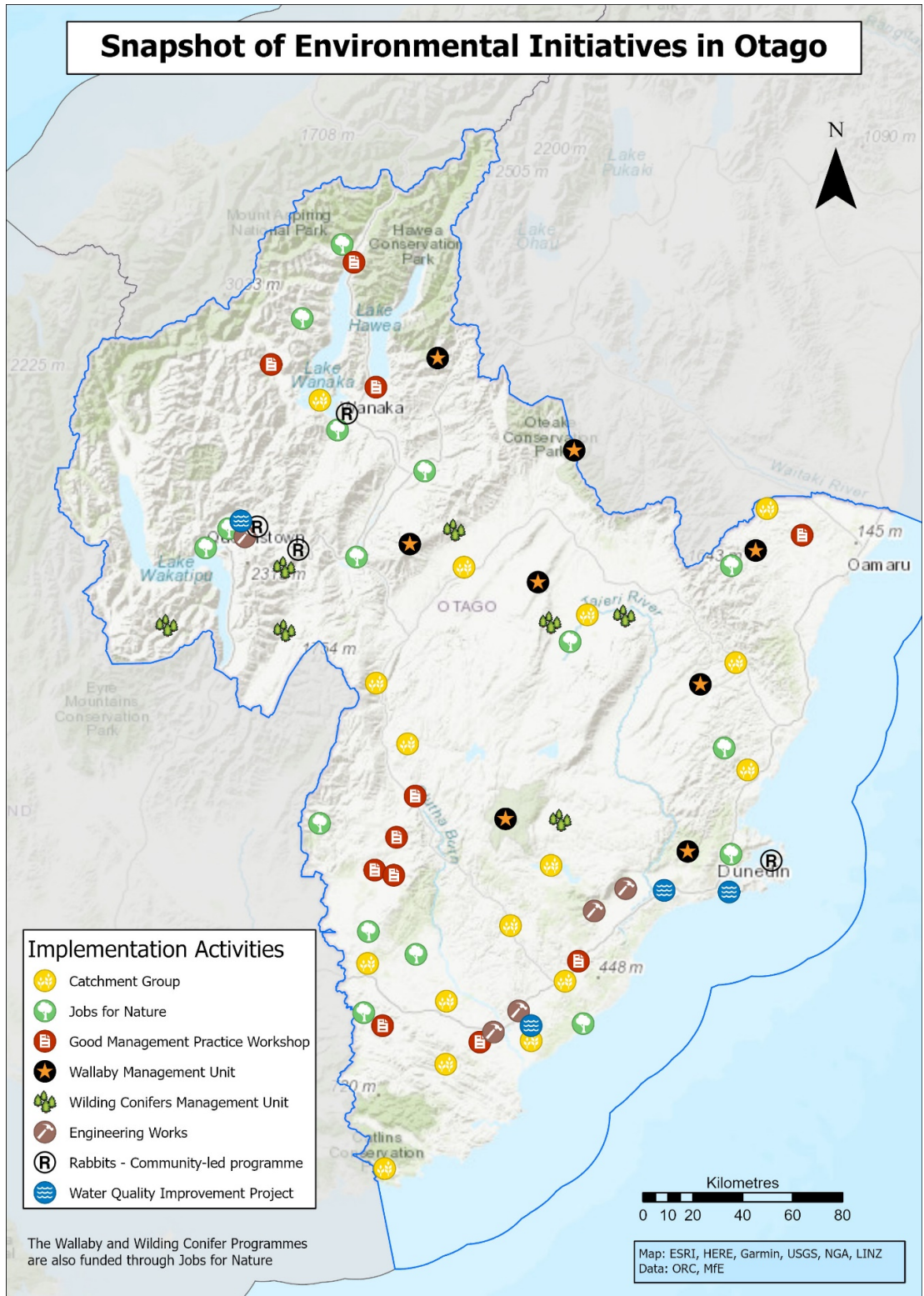


Figure 1: Environmental Implementation Regional Overview

2. Establishment of the Environmental Implementation Team

- [15] The following positions within the new Environmental Implementation Team have been filled over the past three months:
- a. Project Delivery Specialist – Biosecurity Programmes
 - b. Delivery Lead Catchments (Central Otago)
 - c. Catchment Advisors – (Coastal Otago) and (Central Otago) x 3
 - d. Partnership Lead – Community Education
 - e. Partnership Lead – Biodiversity (offer made)
 - f. Biosecurity Officers x 2
- [16] Recruitment continues for the following roles:
- a. Project Delivery Specialist – Regional Environmental Programmes
 - b. Project Delivery Specialist – Jobs for Nature Environmental Programmes
 - c. Delivery Lead Catchments – (Coastal Otago)

3. External Relationships

- [17] Regular meetings have been occurring with the Department of Conservation, Land Information New Zealand and the Ministry for the Environment. Topics of discussion include compliance, alignment of work programmes and future opportunities for collaboration. Further meetings are planned with other state-owned enterprises (e.g., Kiwirail).
- [18] The General Manager Operations, Manager Environmental Implementation and Team Leader Environmental Implementation have met with Central Otago District Council, Clutha District Council and Dunedin City Council on their obligations under the Regional Pest Management Plan and to explore opportunities for collaborative biosecurity and biodiversity action. Further meetings will take place with Waitaki District Council and Queenstown-Lakes District Council.
- [19] The General Manager Operations and Manager Environmental Implementation met with a Senior Adviser, Pest Management Strategy and Planning from the Ministry for Primary Industries regarding national level policy and research/innovation support for rabbit management in Otago. As a result of that meeting, the Ministry for Primary Industries are seeking to re-establish a national rabbit management coordination group.
- [20] A new Memorandum of Understanding for a Southern Biosecurity Partnership between ORC, Environment Southland and Environment Canterbury is under development. The MoU will be brought to Council for endorsement early in 2022. The purpose of the partnership includes:
- a. developing joint work programmes where efficiencies can benefit all parties on matters such as data sharing and management, processes and protocols (e.g., training, health and safety), detection tools, development of Regional Pest Management Plans, and cross border business processes.
 - b. Developing collaborative approaches to addressing issues which may now, or in the future, impact on the natural environment, particularly where they are cross border issues or require a pathway management approach.
 - c. Fostering and developing shared networks and leverage these networks for environmental gain.

- d. Developing opportunities for science-based programmes such as understanding the impact of future pests and climate change.
 - e. Sharing specialist advice.
 - f. Advocating key messages to key government agencies and crown entities; and
 - g. Progressing, overtime, a 'whole of South Island' collaborative approach.
- [21] Partnership opportunities are also being developed through building working relationships with the QEII Trust. Discussions include future opportunities for biodiversity and water outcomes through strategic on-ground actions.
- [22] The Environmental Implementation Team has the assistance of four student interns over the summer period from the University of Otago. Under the direction of University academics, the students will conduct research into:
- a. Marine Biosecurity – collecting baseline data on marine organisms of interest to inform Council's future marine biosecurity activities.
 - b. Wallaby Origins – undertaking strontium isotope analysis of wallaby teeth, hair and nails to identify the place of origin for three culled animals collected by hunters.
 - c. Wilding Conifer Distribution – collecting data sources to identify distribution and likely high risk spread areas.
 - d. Russell Lupins – Identifying and mapping baseline information on Russell lupin density and distribution in the region.

4. Integrated Catchment Management

- [23] ORC has functions across many different ecosystem elements. In the past year, ORC has scaled up its activity and implementation of environmental outcomes and this introduces complexity in cross-organisation planning (a risk and an opportunity). In particular, in relation to freshwater ORC has moved away from being solely a regulator to an implementor/facilitator as well.
- [24] In December 2020, Council's Strategy and Planning Committee approved the inclusion of the statement of proposal "integrated catchment management" for inclusion in the Draft Long-Term Plan (LTP) 2021-2031. Our performance measure in the LTP is to "lead the development, implementation and review of integrated catchment plans in collaboration with iwi and community", with a Year 1 (2021/22) target to "commence development of an integrated catchment planning programme".
- [25] A draft framework for integrated catchment management (ICM) programme is being developed. It is intended that ICM will be given effect to through a Catchment Action Plan for each FMU /rohe.
- [26] Catchment Action Plans will:
- a. Build on **current work** – aligning with plans already done or underway by ORC or other key stakeholders
 - b. Be developed through meaningful **engagement** with iwi partners and community
 - c. Use **program logic** to show a transparent, logical, and comprehensive planning process
 - d. Use best available information to develop **targets** and actions for building resilient landscapes

- e. Be developed at the freshwater management unit (FMU) scale – this will help **align** with the work underway for consulting on and developing the new Land and Water Regional Plan (LWRP).
 - f. Provide the ability to view and analyse activities, targets and priorities **spatially**.
 - g. **Prioritise** areas and/or activities for targeted investment using multi-criteria analysis and spatial data.
 - h. Specify agreed **roles and responsibilities** for partners in the catchment (where possible), including how existing catchment plans and strategies are linked or aligned.
 - i. Be **adaptive** to changing circumstances and knowledge including climate change.
- [27] Representatives from Aukaha and Te Ao Marama have been involved in early discussion and have provided positive in principle support.
- [28] Council will be briefed on the draft integrated catchment programme this week.

5. Freshwater Implementation

Government Funding to Accelerate Action

- [29] A Funding Deed with the Ministry for the Environment (MfE) has been signed to implement a range of interventions to reduce sediment and nutrient inputs and better safeguard the water resources from ki uta ki tai in a local river and estuary. A public announcement on the project location is imminent.
- [30] The work programme has been approved with MfE and work has commenced on community engagement strategies, the creation of a health and safety and risk management framework, engagement of technical expertise, e.g., forestry industry, and socio- environmental scan to inform project planning, and the development of partnership and governance structure to oversee the project.

Delivering Annual Plan Programmes

Support of Catchment Groups

- [31] The Council continues to work with, and support, the Otago Catchment Community (OCC). Staff interact with OCC at a range of levels across the organisation and formal quarterly meetings are held to ensure knowledge transfer and to discuss opportunities for collaboration.
- [32] Councillor Scott represents the ORC on OCC.
- [33] The government has recently announced further funding to support Catchment Groups in Otago, including \$545,000 to OCC to expand support for existing and emerging groups over the next three years.
- [34] Other government supported groups include: WAI Wānaka (\$3m), North Otago Sustainable Land Management (\$361,776), Lindis River Catchment (\$771,724), Pomahaka Water Care Group (\$531,517), Otago South River Care (\$1.88m) and East Otago Catchment Group (\$1.98m).
- [35] Staff attended the Pomahaka Watercare Group's celebration event in October 2021 to celebrate the milestone of planting 100,000 riparian plants and 56km of riparian fencing being installed. Councillor Wilson was also in attendance.

- [36] The Team Leader Environmental Implementation attended the Otago South Rivercare stakeholder meeting at Telford on the 26th October. Councillors Noone and Wilson were also in attendance.
- [37] Staff have provided advice and support to catchment groups who are in their infancy. The groups that have been supported in the last 3 months include Ida Valley and Strath Taieri.

Lake Hayes Water Quality Strategy

- [38] The Wai Whakaata /Lake Hayes Strategy Group is continuing to support the development of a refreshed strategy. The group focuses on:
 - a. Coordinating actions across member organisations in order to improve water quality.
 - b. Identifying significant existing and emerging issues affecting Wai Whakaata /Lake Hayes and responding appropriately.
 - c. Considering agreements, policies and strategies and all other proposals to achieve integrated outcomes for Wai Whakaata /Lake Hayes.
 - d. Identifying necessary actions by the partner organisations and other relevant organisations.
- [39] The group comprises representatives of mana whenua, ORC, Friends of Lake Hayes, Department of Conservation and Queenstown Lakes District Council.
- [40] The group is awaiting a cultural values assessment for Wai Whakaata /Lake Hayes, and working with mana whenua representatives, Aukaha and Te Ao Marama to ensure the refreshed strategy appropriately reflects and incorporates mana whenua values and environmental aspirations. The refreshed strategy will build on the direction and objectives of the 1995 strategy document and reflect on progress towards achieving these objectives. It will provide a mechanism to engage the community to better understand the issues facing the lake and identify actions to accelerate improvements to water quality in the lake and wider catchment.
- [41] ORC will lead a workshop with the group in early 2022, with the aim of creating a sub-catchment plan and to develop joint actions to be implemented as part of the refreshed strategy.

Lake Hayes Restoration

- [42] This project aims to improve water quality within Lake Hayes and reduce the risk of flooding along the perimeter of the lake. Currently there are flooding impacts to the existing recreational trail which affects public access, negatively impacts on the Crested Grebe habitat, increases runoff of nutrients from flooded land and impacts adversely on native planting, which has been established for local biodiversity restoration along the shores of Lake Hayes.
- [43] Engagement has occurred with Aukaha and Te Ao Marama regarding the overall objectives of the restoration work and the preferred options for improving water quality in the lake.
- [44] The General Manager Operations, Manager Environmental Implementation, Chair Friends of Lakes Hayes and ORC contracted Project Manager attended a site meeting in November to discuss the culvert upgrade.

- [45] ORC's Project Manager is currently preparing a detailed project plan. Survey works and preliminary geotechnical investigation for the culvert site was completed in early November. Flow modelling and work to determine the optimum lake level is underway.
- [46] The consent planner is meeting with the hydrologist and freshwater ecologist to progress the consenting side of the project.
- [47] Stakeholder engagement is ongoing. The key stakeholders involved in this project are Te Ao Marama, Aukaha, Queenstown-Lakes District Council, Department of Conservation, Waka Kotahi, Friends of Lake Hayes, Fish and Game and Wai Whakaata.

Tomahawk Lagoon Water Quality Project

- [48] Staff have developed a Tomahawk Lagoon Management Plan in consultation with the community.
- [49] A drop-in session was held to provide opportunity for the community to provide input and feedback in the Outline Management Plan on 29 April 2021. This was an opportunity for the community to provide feedback on which projects within the Plan should be prioritised.
- [50] Based on community input and feedback the three projects which were deemed to be the highest priority are: the support and formation of a catchment group, an ecological assessment of the catchment is to be undertaken and a permanent water quality monitoring site to be installed. This plan will come back to Council for final approval. Staff are currently scoping these projects and there is budget available for this in Year 2 (2022/23) of the 2021/31 Long-Term Plan. Regular communication is provided to key stakeholders within the Tomahawk Lagoon community.
- [51] The Ecological assessment for the Tomahawk Lagoon catchment and following up the formation of a catchment group for the area is to be progressed early next year, conversations are ongoing internally to have a permanent water quality monitoring site set up.

Lake Tuakitoto Water Quality Project

- [52] Staff have developed a Draft Lake Tuakitoto Management Plan based on community consultation which was undertaken in 2018. Goals, values, and potential projects were identified through this consultation process and the next step is to re-engage with the community to obtain their input and feedback into which of the projects are to be prioritised. Re-engagement with the community will now occur in early 2022 and a confirmed Management Plan (and associated implementation actions) will come back to Council for final approval.

Land Management

- [53] Over the past 9 months, there has been a concentrated effort on improving land management practices of Otago landowners. This programme of work has encompassed:
 - a. Development of a winter grazing template in partnership with Federated Farmers representatives. This template has provided an 'entry level' point for farmers who have not previously completed a written wintering plan. In addition to this template, the Ministry of Primary Industries wintering module has also been

widely promoted by the team, setting the expectation for documenting a winter grazing plan for the immediate years ahead.

- b. Provision of advice to Catchment groups. The team met with numerous catchment groups to advise on good management practices for grazing winter crops. These practices focused predominantly on Critical Source Area management, utilising grass or crop buffers, appropriate separation from creeks and waterways and grazing crops strategically. These sessions have occurred in:
- Hawea
 - Makarora
 - Matukituki
 - Glenorchy
 - Millers Flat
 - Dunback
 - Waitahuna
 - Five Folks
 - Heriot Burn
 - Crookston Burn
 - Spylaw
 - Upper Waipahi
 - Ida Valley
 - Kyeburn
 - Tarras

[54] Staff have attended and provided advice and support to the Lawrence Beef and Lamb Farm Environment Plan sessions. The outcome of this session was to provide guidance and support to landowners on best practice for their individual properties.

[55] A partnership opportunity is being explored with winegrowers in Central Otago with staff attending a meeting with them in early December 2021 to explore opportunities to work together to support improvements in biodiversity and freshwater.

6. Biodiversity Implementation

Government Funding to Accelerate Action

[56] Council has been awarded \$961,234 from the Jobs for Nature Private Land Biodiversity Fund to deliver a project titled “Maintaining the Gains – protecting and restoring indigenous biodiversity on private land”.

[57] The three-year project focuses on private land under legal protection (e.g., QEII covenants, protected Māori land, or land protected under private Trust). A partnership, between ORC, QEII and rūnaka, through Aukaha, will create jobs that protect covenanted sites across Otago within areas of high biodiversity value. It was a criterion of the Private Land Biodiversity Fund that only land that was under existing legal protection, or land that was committed to legal protection, was eligible for funded works.

[58] Newly created jobs will support private landowners to manage pest plants at their covenanted sites.

- [59] The Agreement between ORC and DOC has been signed and work is underway to employ the project manager, develop the project plan and start on the training plan for field staff.
- [60] Over the next 3 months, the project manager will start liaising with QEII covenant landholders (via QEII staff introductions) to engage them in the project and identify sites for weed management. Aukaha, our partners in the project, will begin setting up for employment of field staff.

Biodiversity Forum

- [61] The Otago Biodiversity Forum was held on Tuesday 23rd November 2021. Representatives from ORC, District Councils, Aukaha, Te Rūnanga o Ōtākou, DOC, LINZ and Otago Conservation Board attended.
- [62] Presentations to the Forum included: Mātauranga Māori from Edward Ellison, ecosystem ranking process from John Leathwick and an introduction to the Nga Awa Taieri Project from DOC.
- [63] The Forum is continuing to identify opportunities for collaboration and partnership projects for biodiversity.
- [64] One of the key datasets to inform our biodiversity work is now available on our website (<https://maps.orc.govt.nz/OtagoMaps/>). The ecosystems and habitat mapping includes both the current ecosystem coverage and the ‘potential’ ecosystem coverage of Otago. The ‘potential’ ecosystem mapping is an estimation of the likely indigenous ecosystem coverage that would exist across Otago today if humans hadn’t settled in the region.
- [65] The map gives us a baseline of where indigenous biodiversity remains in Otago and will help inform where we work with partners and communities to maintain and enhance indigenous biodiversity. A screen shot of the mapping is below (Figure 2).

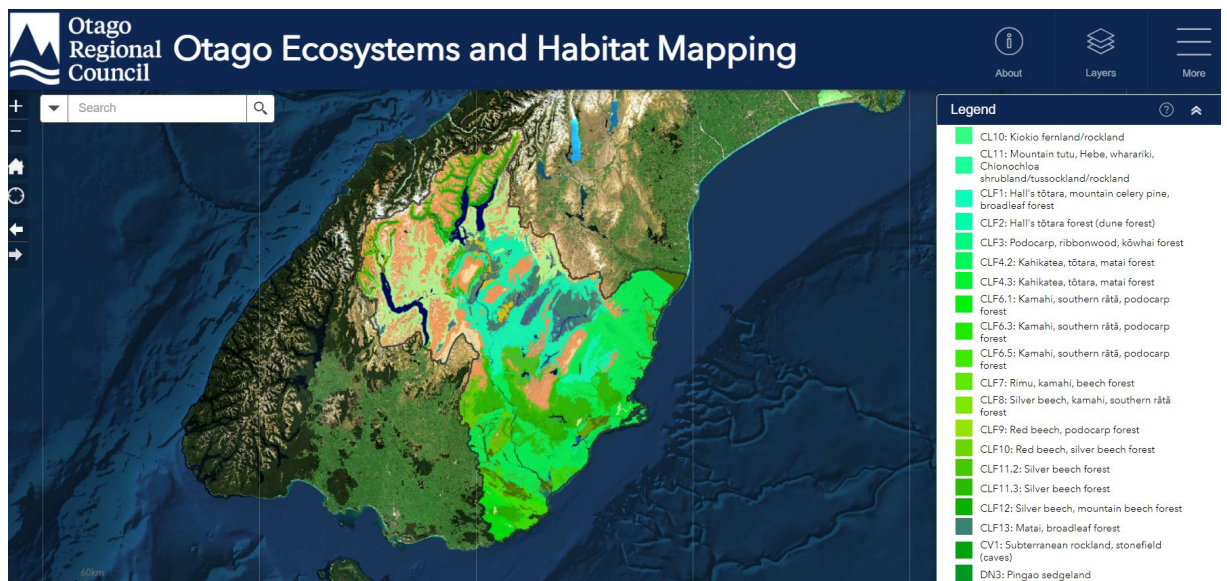


Figure 2: Otago Ecosystem and Habitat Mapping

7. Biosecurity Implementation

National Programme – Wilding Conifer

- [66] The National Wilding Conifer Programme was established by the Ministry of Primary Industries (MPI) in 2016 and aims to prevent the spread of wilding conifers and progressively remove these pest species from vulnerable landscapes within New Zealand.
- [67] Council is the “Recipient” for the National Programme in the Otago region and works collectively with the Wakatipu Wilding Conifer group and the Central Otago Wilding Conifer Control Group on operational plans and management for the control of wilding conifers throughout Otago (Figure 3).
- [68] The region received \$3.94 for the 2021-2022 operational year.



Figure 3: Map of the Otago Region divided into Management Units, highlighting newly ‘activated’ areas for the 2020-2024 National Wilding Conifer Programme and infestation data of wilding spread.

- [69] Whakatipu Wilding Control - Operations are progressing in the Whakatipu basin, control works are approximately 24% through the total budget for 2021/2022 season. Work has focused on the continuation of work from previous control season, such as containing ongoing spread from seed sources in the Rastusburn and Coronet faces. So far 7,418 hectares have been controlled by ground and ABBA methods¹.

¹ This method is where herbicide is directly applied to a tree via a lance or wand generally to the base of a tree. This is a targeted method and can be used on specific trees without harming surrounding vegetation and where trees are difficult to access for example cliff faces.

- [70] Central Otago Wilding Control – Operations commenced within the Central Wilding Conifer boundary for the season. Operations have progressed in the Rough Ridge and Dunstan Management Units. A total of 4,700 hectares of wilding conifers have initially controlled this season, protecting high water yield and recreation value areas within the Fraser and Butchers Dam catchment. Operational planning for the Community Partnership Projects is underway for areas located within the Maungatua and the Kakanui Ranges and control due to begin in February 2022, subject to contractor availability. The CWG have been focusing on Health and Safety improvements and have been undertaking regular auditing of the contractors. Ongoing education and advocacy work is planned with landowners to increase the profile of the programme and to prevent the spread of the wildings.
- [71] Luggate Control – Operational planning is well underway within the Luggate Management Unit. Key priority areas have been identified based on the strategic approach to contain the spread within a limited budget. The priority areas include Smiths Creek catchment, located adjacent to the Ohau Management Unit and the Pisa Range, located adjacent to the Kawarau Management Unit. Control work is expected to begin in late February, with the current focus on establishing documentation for landowner permissions and engagement.

Regional Leadership

- [72] A Regional Co-ordination Group (RCG) for Wilding Conifer management has been established, chaired by Councillor Forbes (with Councillor Wilson as Deputy Chair). The RCG focuses on matters such as ensuring:
- a. That operational activities are planned in a cohesive and coordinated way.
 - b. That operational activities achieve national strategy objectives.
 - c. Risks are identified and managed appropriately.
 - d. Progress towards operational plans is reported and accountabilities are understood.
- [73] An overview of the wilding conifer situation in Otago was prepared by consultant, Richard Bowman to help inform the group and support the development of a regional strategy in 2022/2023.

National Programme – Wallabies

2021/2022 Operations Overview

- [74] Central government for the 2021/2022 has been confirmed at \$1.594m. This represents a substantial increase in investment for Otago’s wallaby programme. Figure 4 provides an overview of planned surveillance areas for the current financial year, classified by priority.
- [75] A Regional Co-ordination Group (RCG) for Wallaby management has been established, chaired by Councillor Malcolm (with Councillor Kelliher as Deputy Chair). The RCG focuses on ensuring that operational activities are co-ordinated and meet national strategy objectives and that the potential threat wallabies pose to the environment is understood and communicated and solutions are sought and implemented effectively.

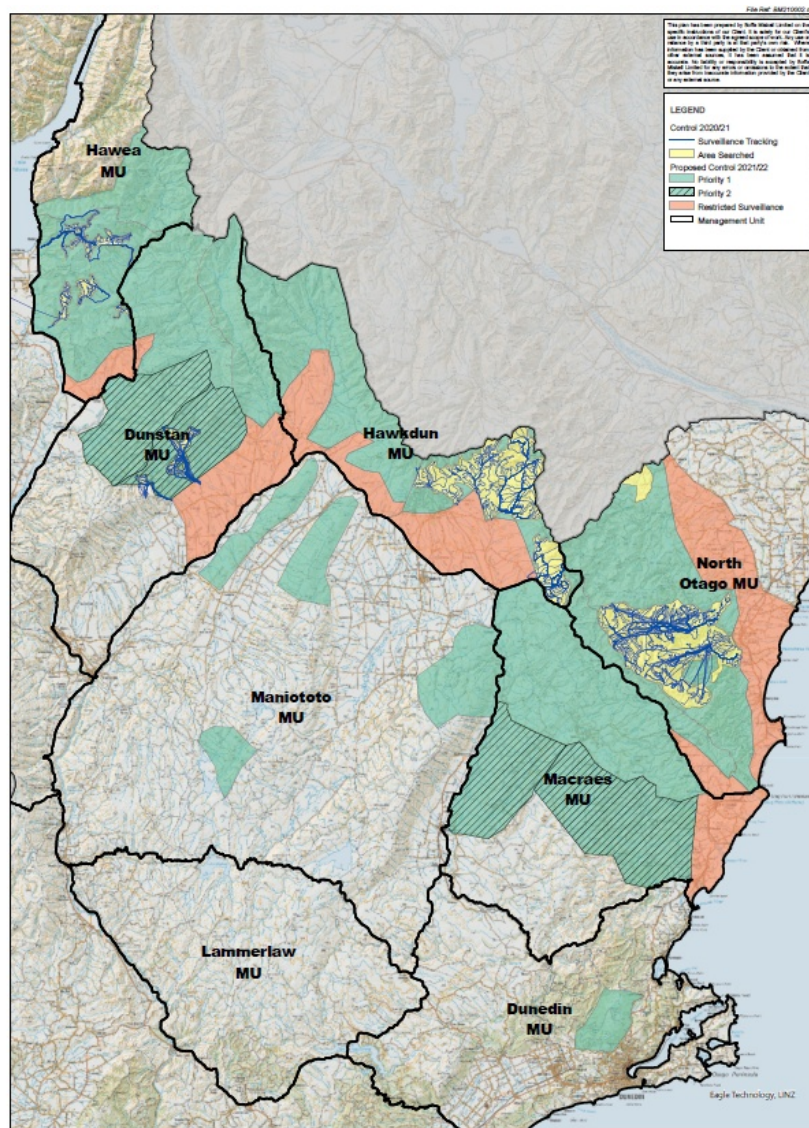


Figure 4: Wallaby Control Work Undertaken in 2020/2021 and Proposed Work for 2021/2022

- [76] During the first four months of this financial year (2021/2022), the following activities have occurred:
- a. National Programmes Delivery Specialist appointed - Programme Lead for Otago Wallaby Programme
 - b. Proactive surveillance is being carried out across six management units
 - c. Surveillance is scaling up in late November 2021 with larger teams commencing work
 - d. Four ground-based contractors utilising a range of surveillance methods, including:
 - Ground hunters with dogs
 - Ground hunters searching for field sign
 - Ground hunters utilising drones with thermal imagery
 - e. Two aerial operators working in two Management Units, including:
 - Thermal surveillance
 - Aerial transport
 - f. Surveillance results (as at 24/11/2021):

- Total area searched – 10,993 ha
- No wallabies destroyed in 2021/22 season
- Only sign found has been in area of previous wallaby kill

[77] Ground-based surveillance work is being carried out within the following Management Units (Figure 5):

- North Otago
- Hawkdun
- Dunstan
- Hawea
- Macraes Taieri
- Maniototo
-

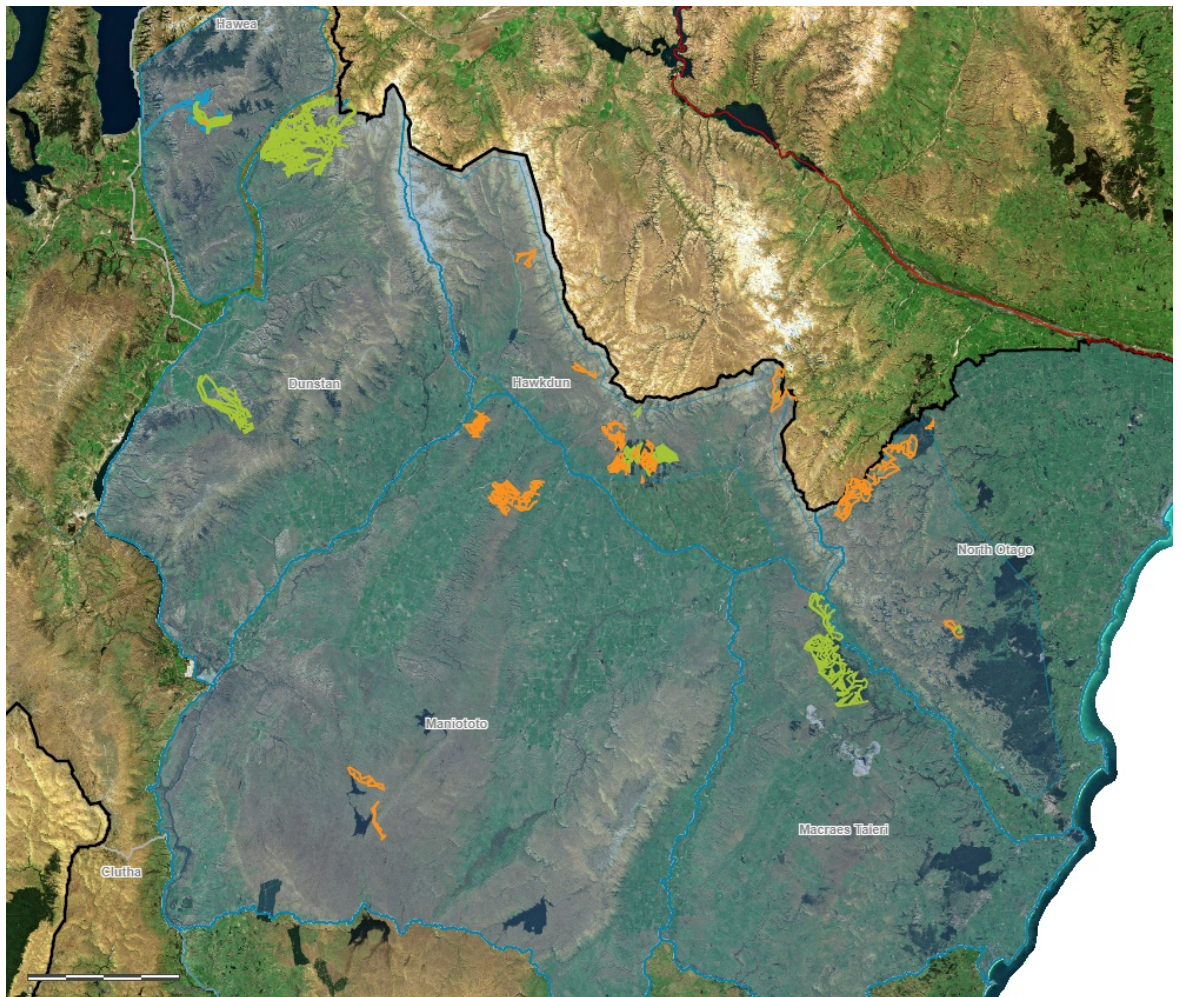


Figure 5: Surveillance and control activities carried out (so far) in the 2021/22 season

Biosecurity Operational Plan Implementation Rooks

[78] Inspections of known rookery sites were undertaken during September and October to coincide with the traditional breeding season. The Biosecurity Operational Plan has a target of 40 such inspections, 58 inspections have been carried out during the breeding

season across South Otago, Strath Taieri and Maniototo (Figure 6). No rooks were observed in the inspections. A follow up series of inspections will be undertaken in the Autumn.

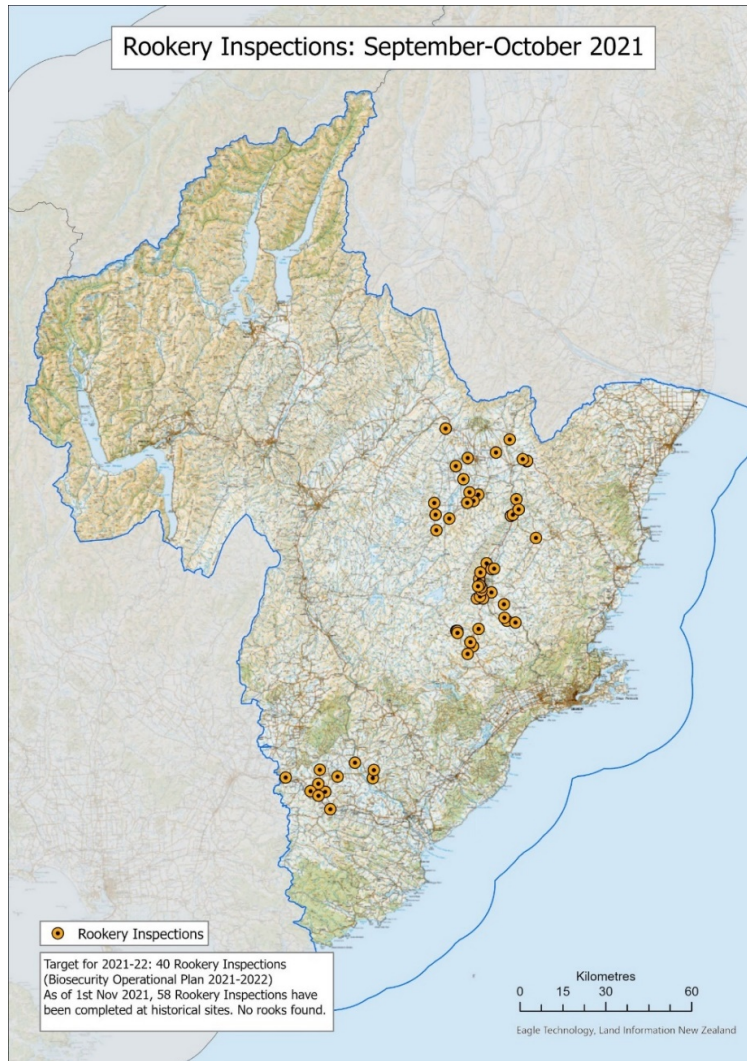


Figure 6: Rookery Inspections

Clean, Check Dry etc

- [79] ORC has been granted \$20,000 by the Ministry of Primary Industries to support the Region's Check, Clean Dry (CCD) Regional Advocacy Programme. This programme aims to stop the spread of freshwater weeds and pests through in-person advocacy and education activities carried out at major lakes across all major water bodies in Central Otago².
- [80] As part of this funding, Council will have two fixed term roles working over summer to run a programme to raise awareness about aquatic pests. These roles will focus on educating people on freshwater pests including Didymo, Lagarosiphon and Lake Snow and encourage them to take action to minimise their spread.

Rabbit Management

- [81] In August 2021, the Environmental Implementation Team rolled out the mobile phone-based survey (termed the 'Rabbit App') for staff to collect data on rabbit inspections (Figure 7). Prior to this, inspection data was manually recorded on paper forms making the management of data challenging.

² Including Arrow River, Bannockburn Inlet, Blue Lake, Butchers Dam, Clutha River, Conroys Dam, Diamond Creek Diamond Lake, Falls Dam, Frasers Dam, Greenstone River, Hawea River, Kawarau River, Lake Hawea, Lake Hayes, Lake Johnson, Lake Roxburgh, Lake St Bathans, Lake Wanaka, Lower Manorburn Dam, Makarora, Manuherikia, Moke Lake, Motatapu River, Naseby Swimming Dam, Pinders Pond, Routeburn River, Taieri River, Timaru River and Wilkin River.

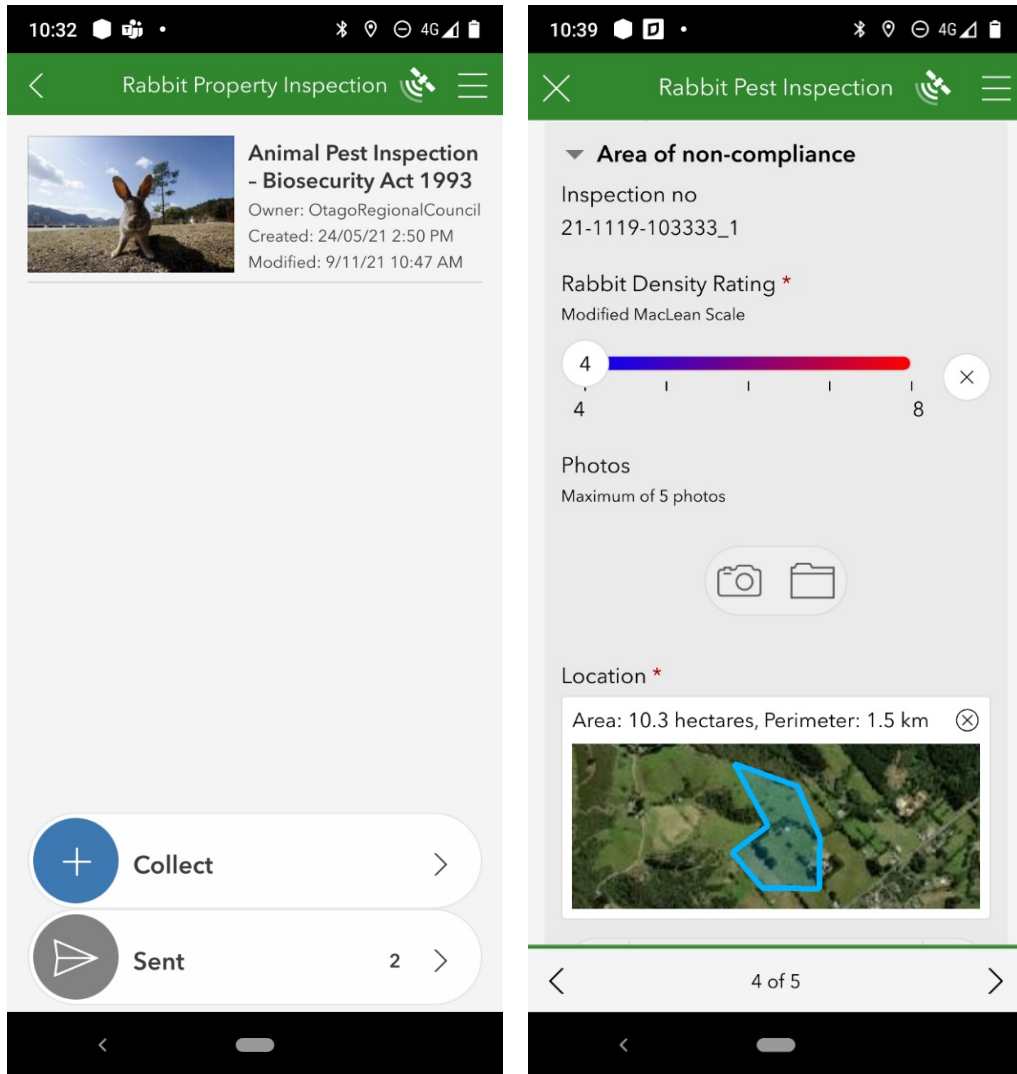


Figure 7: Screenshots of the Rabbit App (data is an example only)

- [82] The data recorded through the Rabbit App is now presented on a dashboard (Figure 8). This enables real-time management of rabbit inspection data, and improved data quality. The dashboard can be zoomed into property level detail.

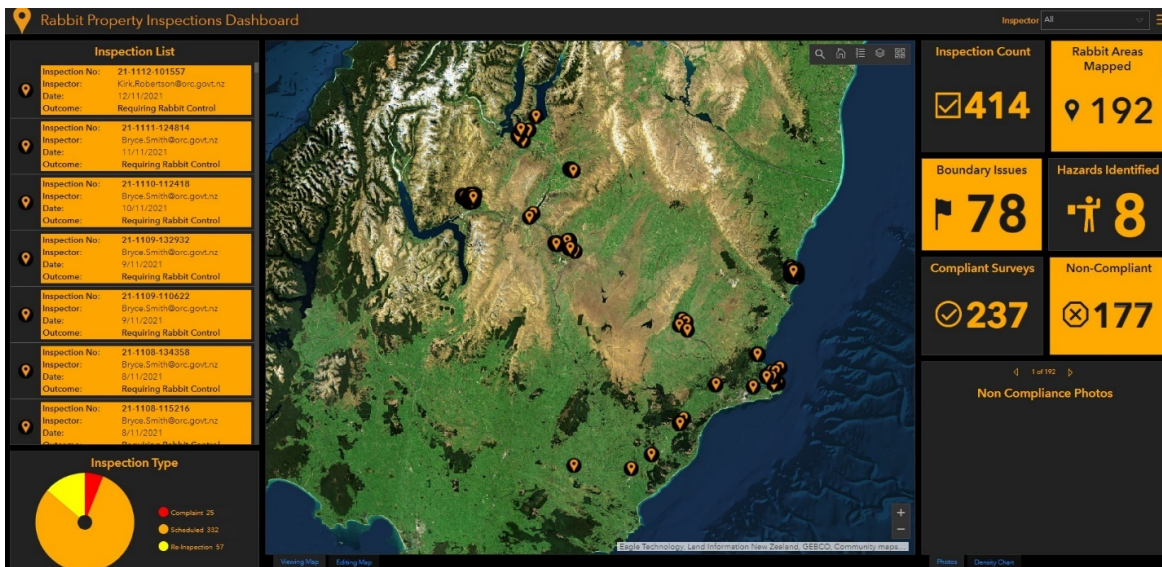


Figure 8: Screenshot of Rabbit App

Rural Inspections - Rabbit Management

- [83] Between July and October 2021, 79 rabbit inspections have been undertaken in rural areas (defined as those inspections which were not being part of a community rabbit programme). Data from the dashboard shows that 59% of the properties inspected were compliant to the RPMP rule for properties to have a Modified McLeans Scale of three or less (Figure 9).
- [84] Of the 79 properties inspected, 46 were re-inspections of non-compliant properties from the previous inspection carried out in 2020-21 (Table 1, Figure 9). Of those 46 re-inspected properties, 25 remained non-compliant. One property had an MMS rating of 6, five properties an MMS rating of 5, while the remaining 19 properties had an MMS rating of 4.

Inspection Type	Compliant	Non-compliant	Total
Scheduled	10	0	10
Re-Inspection	21	25	46
Complaint	16	7	23
Total	47	32	79

Table 1: Rural Rabbit Inspection by Type and Compliance (July – October 2021)

- [85] Following Council’s recently approved Biosecurity Compliance and Enforcement Policy³, a Notice of Direction process is required for the non-compliant properties. The formal enforcement process applies for private, public and crown land.

³ https://www.orc.govt.nz/media/10235/orc-biosecurity-compliance-enforcement-policy_final.pdf

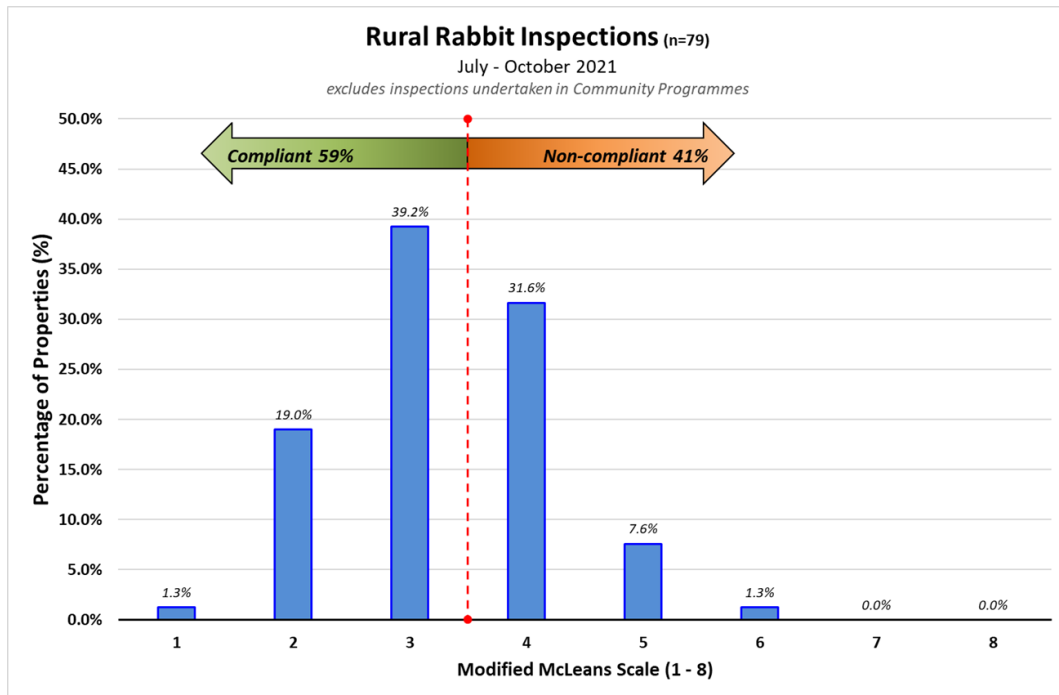


Figure 9: Rural Rabbit Inspections

Community Projects - Rabbit Management

- [86] In addition to standard compliance work within our rabbit programme, which has increased significantly in the past year, ORC is facilitating several large-scale community responses to better rabbit management in semi-rural and peri-urban environments. The ORC Biosecurity Operational Plan 2021-2022 has the target to facilitate and lead at least eight community responses to reduce rabbit populations in areas of high need across Otago.
- [87] Table 2/Figure 10 provides an overview of the seven communities that ORC is currently working with. Each approach is unique, based on the landscape, number of properties, land use activities and preferences of the community. The projects have been run simultaneously where possible but have had to be prioritised due to resourcing.

	COMMUNITY ENGAGEMENT					
	CONTINUOUS EFFORT					
	Initial Engagement	Initial Property Inspections	Situation Overview	Management Planning	Formal Compliance Inspections *	Default Work *
Lake Hayes						
Albert Town						
Gibbston						
Otago Peninsula						
Queensberry						
Moeraki						
Hidden Hills						

* Where work has not been undertaken voluntarily

Table 2: Summary of Actions Undertaken to Facilitate Community Responses to Rabbit Management



Figure 10: Community Rabbit Management Project Areas

Facilitated Approach

[88] A process for engaging landowners to ensure strategic responses and coordination of control efforts has been developed. The community-led strategic management approach will be facilitated and supported through the following means:

- a. Education and awareness - workshops, website, social media, pamphlets and one on one meetings/discussions highlighting:
 - Rules, roles and responsibilities.
 - Primary and secondary control techniques; and
 - Contractor selection.
- b. Information gathering to support recommendations and compliance action, including:

- Property inspections to identify properties that are at greatest risk of non-compliance, and to produce heat maps showing rabbit hotspots and to identify fences other than barriers that reduce the risk of reinvasion; and
- Ongoing monitoring of control efforts.
- Support with preparation of Management Plans - including technical advice on control methods.
- Compliance inspections and implementation of enforcement procedures. This is critical to increase recognition of ORC’s rules and compliance functions, and to ensure that a few non-compliant properties do not cause wider community efforts to fail.

[89] A process for facilitating Community-Led Rabbit Management Programmes (CLRMP) is outlined in Appendix 1, with a high-level summary below (Figure 11).

[90] This process is for ‘year one’ only. In subsequent years the process will need to be tailored to respond to the success (or nature) of the project after the first year. Consistent ongoing support and communication with community leaders will be critical to ensure the long-term viability of any community-led control work.

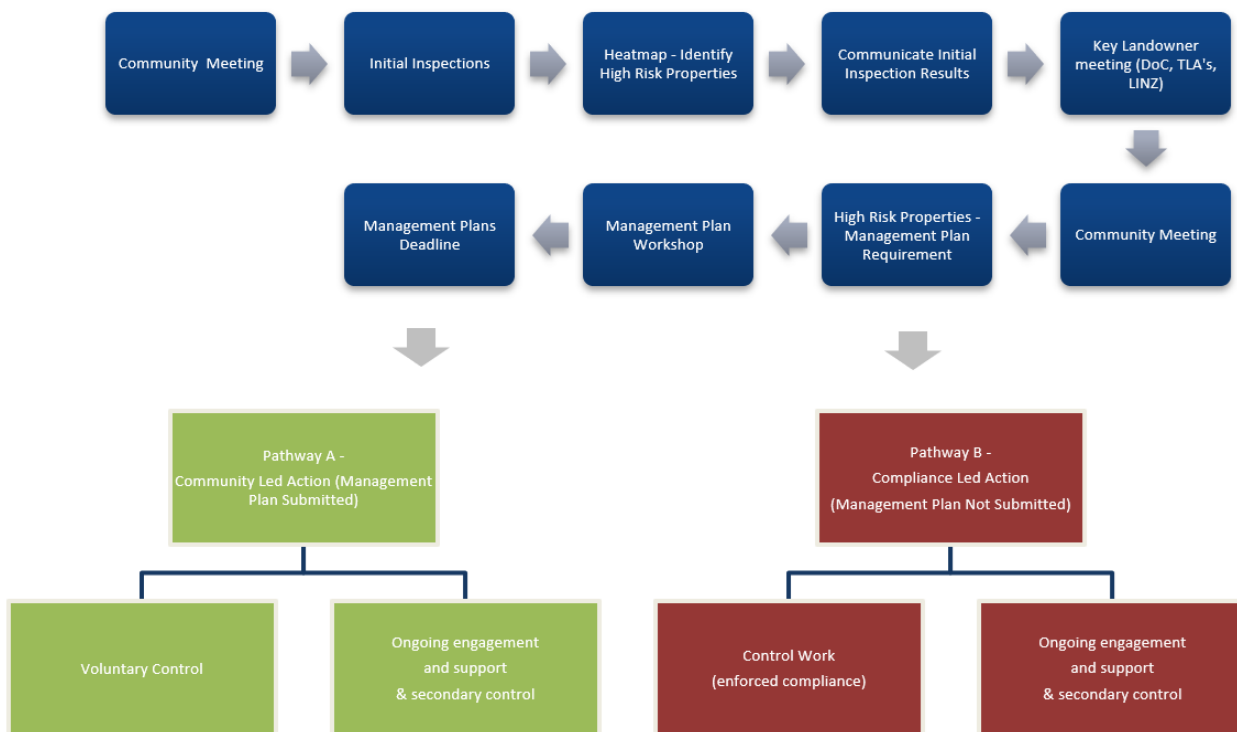


Figure 11: Community Project Process and Compliance Pathways

[91] Table 3 provides a breakdown of the inspections undertaken at three community programmes delivered during June to October: Gibbston, Lake Hayes and Moeraki.

- [92] Due of the limitations of the Modified McLeans Scale for small properties (under four hectares), these inspections are an indicative assessment of rabbit densities.

Location	Month	Number of Inspections	Indicative of...	
			Compliance	Non-Compliance
Gibbston	June/July 2021	173	54.9%	45.1%
Lake Hayes	October 2020	236	65.3%	34.7%
Moeraki	October 2021	89	37.1%	62.9%

Table 3: Summary of Community Project Inspections

- [93] Appendix 1 provides a more detailed summary of education, compliance, facilitation and engagement activities that have occurred in Gibbston, Lake Hayes and Moeraki this year and an overview of our community facilitation approach.

CONSIDERATIONS

Strategic Framework and Policy Considerations

- [94] No considerations arising from this paper.

Financial Considerations

- [95] No considerations arising from this paper.

Significance and Engagement Considerations

- [96] No considerations arising from this paper.

Legislative and Risk Considerations

- [97] No considerations arising from this paper.

Climate Change Considerations

- [98] No considerations arising from this paper.

Communications Considerations

- [99] No considerations arising from this paper.

ATTACHMENTS

1. Appendix 1 Process for Community Led Rabbit Management Programmes Council Report [7.1.1 - 6 pages]

Appendix 1: Summary of Community Engagement and Overall Approach

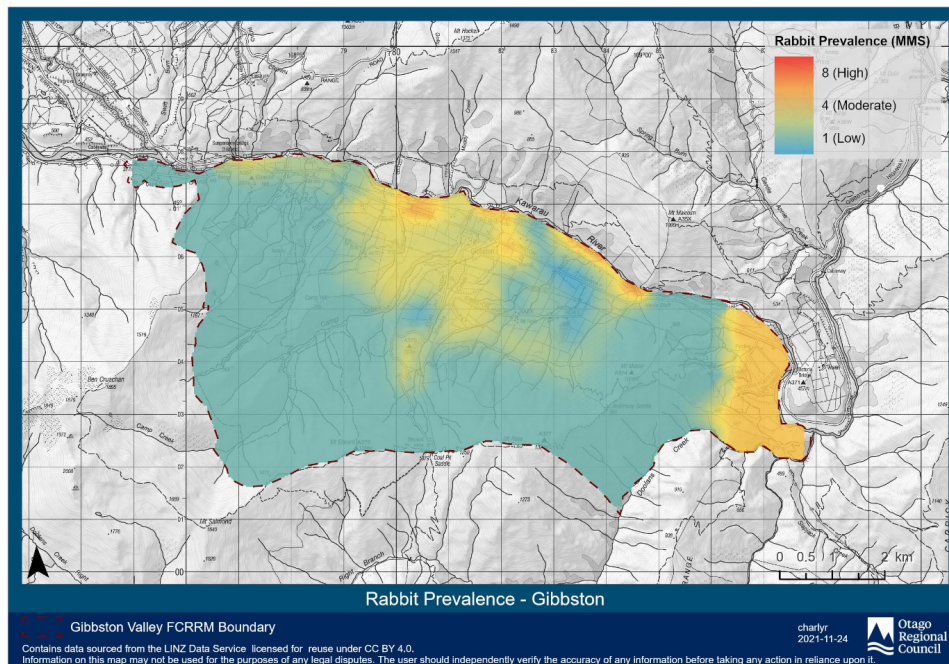
Gibbston

Our facilitation work undertaken in Gibbston this year has included:

- Attendance at a Gibbston Community Association meeting (24 June).
- Development of a dedicated project page: <https://yoursay.orc.govt.nz/gibbston-rabbits>
- Distribution of an online survey to better understand the problem from a local perspective, how rabbits affect residents, and rabbit control options currently used.
- 173 property inspections.
- Continued direct correspondence to all properties in project area and more detailed notification and requirements for high-risk properties.
- Online public meeting (18 October), covering results of inspections and next steps.
- Meetings with Queenstown Lakes District Council (QLDC), the Department of Conservation (DOC) to discuss compliance and their control plans.
- Delivery of a rabbit management plan workshop (18 November) to assist individuals and groups of high-risk landowners (Figure 10) develop a control plan.

Further meetings and workshops aimed at building community capacity and capabilities are planned to support the community to prepare for the winter control season in 2022.

Formal compliance inspections will occur in March 2022 for the high-risk properties who have not provided an adequate management plan or who have not engaged with us during the community facilitation process.



Community Project Compliance Heat Map – Gibbston

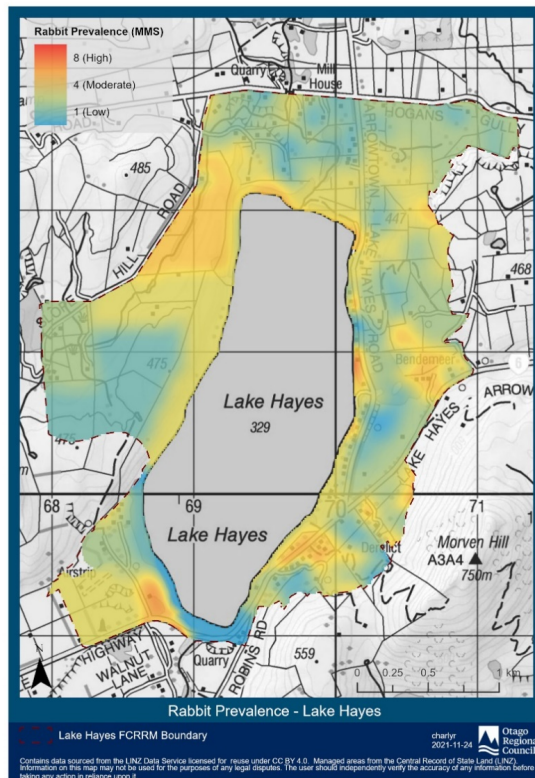
Lake Hayes

Project work undertaken in the Lake Hayes area this year has included:

- Engagement and meeting with key local influencers/property owners.
- Online survey and initial drop-in session (6 May) to better understand the problem from a local perspective, how rabbits affect residents, and rabbit control options currently used.
- Development of dedicated project page: www.orc.govt.nz/lake-hayes-rabbits
- Community meeting (14 July) to discuss how large-scale, long-term, sustainable rabbit management can be achieved across Lake Hayes.
- Meetings with Queenstown Lakes District Council (QLDC), the Department of Conservation (DOC) and Land Information New Zealand (LINZ) to discuss options for long-term, sustainable rabbit control on land that they own/administer.
- Formation of a Steering Group comprising five residents plus representatives from DOC and QLDC to support the development of a Management Plan for Lake Hayes, plus the inaugural meeting of this Steering Group.
- 236 property inspections, plus engagement with 80 other smaller (<0.5ha) properties.
- Continued direct correspondence to all properties in project area and more detailed notification and requirements for high-risk properties (Figure 11).
- Webinar community meeting (11 November), covering results of inspections and next steps.
- Delivery of a rabbit management plan workshop (19 November) to assist individuals and groups of high-risk landowners develop a control plan.

Further meetings and workshops aimed at building community capacity and capabilities are planned.

Formal compliance inspections will occur in March 2022 for the high-risk properties who have not provided an adequate management plan or who have not engaged with us during the community facilitation process.



Community Project Compliance Heat Map – Lake Hayes

Moeraki

Our facilitation work undertaken in Moeraki this year has included:

- Engagement and meeting with key local influencers/property owners.
- Development of a dedicated project page: www.orc.govt.nz/moeraki-rabbits
- 89 property inspections, plus engagement with 200 other smaller (<0.5ha) properties.
- Community meeting (18 November) to discuss how large-scale, long-term, sustainable rabbit management can be achieved across Lake Hayes.
- Meetings with Waitaki District Council (QLDC), and the local community board to discuss options for long-term, sustainable rabbit control on land that they own/administer.
- Delivery of community control plan and rabbit management workshop for high-risk properties on 24 November (Figure 12).

Work will continue with the community following our general community facilitation approach but tailored to the specific needs and geography of Moeraki.

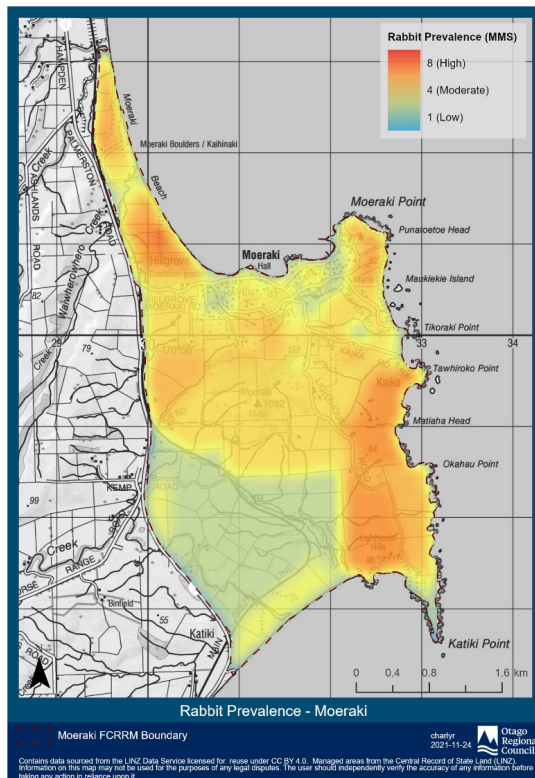


Figure 12: Community Project Compliance Heat Map – Moeraki

Otago Peninsula

The Otago Peninsula programme is underway and re-inspections on properties that have previously been inspected and found to require control works be undertaken are in progress. Fifteen re-inspections have been undertaken at the time of writing this report. These inspections are being undertaken to get an understanding of what control work had been completed since our initial inspection and to check in with landowners, allowing for further education and engagement.

Once the re-inspections in Otago Peninsula are complete letters will be sent out to the high-risk properties requesting that rabbit management plans be provided and outlining compliance procedures moving forward. A management plan workshop will also be held with this community to support them in creating these in February 2022.

Queensberry

The Queensberry programme will commence early in 2022.

Process for community-led rabbit management programmes

STEP 1 MAP PROGRAMME AREA	A map is prepared showing boundaries of the proposed rabbit management area.
STEP 2 INFORMATION LETTER	A letter is sent to all physical and ratepayer addresses (i.e. all occupiers and landowners) within the area informing that the Otago Regional Council (ORC) will be undertaking a combination of facilitation and compliance work in the coming months, including rabbit inspections, community meetings and workshops.
STEP 3 INITIAL INSPECTIONS	Inspections will be completed for all properties over 0.5 hectares within the area, gathering information such as existing rabbit control (e.g. fencing). An indicative assessment of rabbit prevalence using the Modified McLeans Scale will be made. Properties where indicative of non-compliance will be advised of a workshop to provide guidance in order to achieve compliance, and what will happen if their property remains non-compliant. For properties under 0.5 hectare, an engagement approach with the occupier/landowner will occur.
STEP 4 IDENTIFY HIGH-RISK PROPERTIES	The inspection data will be analysed to identify areas of rabbit 'hotspots' and determine high-risk properties.
STEP 5 LETTER AND EMAIL	A letter (and email) will be sent to all occupiers/landowners inviting them to a community meeting (Step 7).
STEP 6 INSTITUTIONAL LANDOWNERS MEETING	Meet with public and crown entity landowners (e.g., DOC/TLAs/LINZ/Kiwirail) to discuss issues in the area prior to the community meeting.
STEP 7 COMMUNITY MEETING	Facilitate a community meeting to educate occupiers/landowners about the rules, roles and responsibilities, discuss the different approaches to control work and risk factors, present data analysis. Outline process and provide examples of successful community-led action.
STEP 8 LETTER AND EMAIL	Send a letter (and email) to all occupiers/landowners. High-risk properties will be required to submit a Management Plan outlining how they will manage rabbits on their properties to meet the Regional Pest Management Plan. Other properties to be encouraged to keep up with their current management to ensure they remain compliant and seek advice from ORC if needed. Promote groups of occupiers/landowners to work collectively in developing management plans that cover an area rather than just their individual properties. Provide a Management Plan template, guidance notes, and an invite to the management plan workshop.
STEP 9 MANAGEMENT PLAN WORKSHOP	Organise a workshop to assist individual and groups of occupiers/landowners to prepare their management plans. Management Plans from all high-risk properties are mandatory and must be submitted by a given date. ORC to provide assistance to anyone who wants assistance in preparing a management plan.

STEP 10 MANAGEMENT PLANS RECEIVED/NOT RECEIVED	Review management plans and provide feedback for improvement where appropriate. Where a mandatory management plan has not been received, make direct contact with that landowner to discuss barriers and assist with preparing a management plan where possible.		
PATHWAY A – COMMUNITY-LED ACTION (preferred)		PATHWAY B – COMPLIANCE-LED ACTION	
STEP 11A ONGOING SUPPORT FOR COMMUNITY-LED ACTION	Continue to support community leaders to ensure community-led action is undertaken in a coordinated manner following best practice guidance. Host further workshops and demonstrations to educate and inform. Provide support to groups that wish to form by identifying opportunities for landowner collaboration and facilitating connections. Assist higher-risk properties and connect with ORC if needed.	STEP 11B – TOUCH BASE WITH HIGH-RISK PROPERTIES	Contact high-risk properties to make sure they're on track with implementing their management plans.
STEP 12A – COMMUNITY- LED ACTION IS UNDERWAY	Everyone understands the rules, roles and responsibilities, the target of 'sustained control' is universally adopted, groups have formed to increase impact, Management Plans have been voluntarily developed and implemented, fencing and other control work has been undertaken, coordinated Pindone operations are occurring.	STEP 12B – COMPLIANCE INSPECTIONS	Undertake compliance inspections of all properties where MMS can be applied. Focus on high-risk properties and where compliance may be challenging. Progress compliance policy to ensure compliance including issuing of a Notice of Direction (NOD) if needed.
		STEP 13B – REINSPECTION	Reinspect all those properties who received a NOD. For continued non-compliance, undertake a formal MMS inspection and issue a 'Notice of Intention to Act on Default'. Arrange for contractor to undertake work as needed.

7.2. Outcomes from Dunedin Electric Bus Trial

Prepared for: Implementation Committee
Report No. PPT2117
Activity: Transport: Public Passenger Transport
Author: Abbey Chamberlain, Implementation Advisor – Transport
Garry Maloney, Manager Transport
Endorsed by: Gavin Palmer, General Manager Operations
Date: 8 December 2021

PURPOSE

- [1] The purpose of this report is to outline the outcomes from the electric bus trial that operated in Dunedin from 28 September to 29 October 2021.

EXECUTIVE SUMMARY

- [2] Central and Local Governments are working toward national decarbonisation, planning to transition to zero emission public transport fleets in the near future. ORC, in the Regional Public Transport Plan (RPTP) intends to introduce zero-emission vehicles, aligning with national direction.¹
- [3] Working with Go Bus Transport, an opportunity was offered to Council to undertake a trial of a fully electric bus for one month to test how electric vehicles might operate on part of the Dunedin network.
- [4] The trial was undertaken between 28 September to 29 October 2021, using a 35-seater Enviroline bus, built by Global Bus Ventures (GBV), in Rolleston.
- [5] The purpose of the trial was to see how an electric bus of this make might perform on Dunedin topography. It sought to increase passenger understanding of electric vehicles and decarbonisation and promote public transport. Any changes which might be required to peak vehicle requirements (PVR) for contracts were a trial consideration.
- [6] To achieve the objectives, the bus was operated on a variety of routes, with intermittent testing completed on other routes while out of service.
- [7] Overall, the trial can be seen as a success, having provided valuable data for understanding of operational performance on part of the Dunedin network, positive feedback from stakeholders, and providing a normal service level throughout.

¹ ORC Regional Public Transport Plan – reference 5.1.3 - Transition to a lower-emission public transport network.

Ministry of Transport Decarbonisation & Government commitment:
<https://www.transport.govt.nz/area-of-interest/environment-and-climate-change/public-transport-decarbonisation/>

RECOMMENDATION

That the Committee:

- 1) **Notes** this report.
- 2) **Notes** that the trial was successful in providing a range of valuable data about operational performance of an electric vehicle in Dunedin.
- 3) **Notes** that the trial is representative of contracts operated by Go Bus Transport.
- 4) **Endorses** Council staff preparing a subsequent report for Council consideration in 2022, on the scope to prepare a transition plan to a zero-emission public transport fleet.

BACKGROUND

- [8] Council is committed to reducing emissions from public transport, providing sustainable, safe, and inclusive transport for all. As planned for in the Regional Public Transport Plan, ORC intends to transition to a lower emission public transport network, introducing non-CO₂ emitting vehicles in a phased approach within contract tendering or earlier through contract variations. In addition to local planning, central government has announced from 2025 no new fossil-fuelled buses can be introduced to service, and by 2035, the Ministry of Transport is targeting complete decarbonisation of the public transport fleet.².
- [9] ORC has signalled in the RPTP to trial new technologies and engage with operators on earlier introduction of sustainable fleets than of retendering of bus contracts. Following this, the Council was given the opportunity to trial an electric bus in Dunedin before it went into service in Christchurch in November 2021. The bus had been built for Go Bus Transport by Global Bus Ventures in Rolleston and the opportunity of the trial was offered by Go Bus.
- [10] The purpose of the trial was to see how an electric bus would perform within the Dunedin topography. The bus primarily operated routes 8 (St Clair/Normanby), 44 (St Kilda/Halfway bush), 55 (St Kilda/Brockville) and 77 (City/Mosgiel) to give the best representation on varying topography and give the most opportunity for passengers to experience the bus. Route maps are appended to this report for reference.
- [11] In addition to operating the vehicle to test operational performance, broader objectives of the trial included understanding potential challenges with the introduction of electric vehicles (EVs) (e.g. any weight restrictions, changes to the number of vehicles required) increasing public understanding of EVs and gauging passenger opinions regarding decarbonisation of the fleet.
- [12] Go Bus provided a NZ built bus, manufactured by Global Bus Ventures of Rolleston. The bus was a 35 seat Enviroline – specifically built to meet NZ road standards (Figure 1). This bus is lighter than many EVs in service in NZ, weighing around 3 tonnes less than imported electric buses.

² <https://www.transport.govt.nz/area-of-interest/environment-and-climate-change/public-transport-decarbonisation/>

- [13] The vehicle trialled was built with motors in the wheels, rather than under the rear of the bus, as standard diesel vehicles are built. This means there is more space at the rear of the vehicle, and no requirement for stairs leading to the rear of the bus. Figure 2 displays the low floor of the vehicle, which is made possible through the motor placement on the vehicle.



Figure 1: Exterior of EV trial bus in wrapped design



Figure 2: Interior of EV trial bus showing low floor to rear seats.

- [14] The bus was charged using a portable charger for the duration of the trial, which is not representative of the permanent charging infrastructure required for the introduction of an EV fleet. As such the trial has not provided any information for discussion on charging detail with this electric bus.
- [15] Initial operational concerns – which did not eventuate – were around potential range issues with battery output, poor performance on hill routes and a wider turning circle impacting driving. Of these, the bus had no issues with range (using between 40-50% when operating a full day of service) and performed well on the hill routes. The turning circle with the vehicle’s wider wheelbase was considered the biggest risk, with some routes having tight intersections and narrow roads. This turned out to be less of an issue than anticipated, with concerns largely mitigated through careful driver training and precise driving.
- [16] Go Bus ran the vehicle on the following routes and encountered no issues. Routes listed as ‘operated’ were run in service, with passengers on board. Those listed as ‘tested’ were operated out of service in a testing capacity only. Route descriptions are listed in Table 1, and the Go Bus route map is appended to this report for visual representation.

Table 1: Go Bus Routes

EV routes operated/ tested
8 St. Clair/Normanby operated
77 Mosgiel operated
70 Brighton tested
61 Kenmure tested
3 Ocean Grove/ Ross Creek tested
33 Wakari tested
50 Helensburgh/Corstorphine tested
44 Halfway Bush/St Kilda tested
55 St Kilda/ Brockville tested
19 Waverley/ Belleknowes Operated

DISCUSSION

- [17] Over the course of the trial, the bus carried 3,193 passengers, travelled 198 hours in service, including 3,148kms of zero emission travel. Over the course of the trial, there is an estimated saving of 2,511kgs of CO2 (without taking into consideration other CO2 reductions such as removing single occupancy cars - noting that a single fully occupied bus could equate to a maximum of 50 single-occupant passenger vehicles).
- [18] On day two of the trial, the bus had a minor operational issue with an air hose, which was quickly resolved by representatives from Global Bus Ventures. The issue was unrelated to the vehicle being electric.

Battery usage and efficiency

- [19] To validate the vehicle could operate in service without issues, GBV were able to provide detail on battery consumption relative to the Dunedin topography, and insight into other operational variables.
- [20] With a range of around 400kms on a single charge, the bus had no range issues operating a full day of service on the Dunedin network.
- [21] Operating on routes between 8-14 hours per day, the bus averaged 40-50% battery consumption during service. On steeper routes, more battery was used, but this was regenerated through braking on downhill sections.
- [22] The use of air conditioning reduces the efficiency of the vehicle, as experienced with Dunedin's colder temperatures and requirement for heating.
- [23] Charging information relating to the vehicle in the trial could not be assessed, due to the charger not being representative of what permanent infrastructure is required for future electric fleet. It is worth noting that to convert to an EV fleet, there will be a requirement for depots to install charging infrastructure to support the network.
- [24] Issues for consideration in making this change are:
 1. What type of charger will be installed? Whether a fast charger, or shared charging facilities with other operators.
 2. Whether the existing power grid has enough electricity to manage, or if an upgrade is required.
 3. Timeframes on installations which may be lengthy as the nation transitions to electric in a relatively small timeframe.
 4. Depot locations having enough space to host the charging facilities and the fleet (Noting that currently not all fleet vehicles overnight in the depot, some remain overnight in outer locations such as Mosgiel).

Fleet

- [25] Anecdotal discussions with the transport industry suggest that introducing EVs might mean an increased vehicle requirement - up to 1.3 EVs for every non-electric vehicle. Consideration needs to be given to charging facilities and locations, running hours and KMs back to the depot which would factor into total vehicles required.
- [26] The cost increase from purchasing EVs can be offset over the years, with lower running costs of electric vehicles.
- [27] Costs for electric vehicles can vary, depending on the model, and the manufacturer. The bus on trial was NZ built, specifically designed for NZ roads, and is more expensive for this reason. Many electric buses are imported into NZ, retailing at a lower price than the NZ built vehicle trialled.
- [28] Alternative options such as Hydrogen fuel cell buses retail at a much higher price currently due to being emerging technology and limited suppliers and refuelling options.

- [29] There are a range of factors impacting the retail price/commercial value of these vehicles, payable by operators. These factors include at least the following:
- Size of vehicle
 - Weight of vehicle
 - Imported vs. Locally sourced
 - Bulk discounts
 - Timeframe on delivery, premium prices for earlier delivery
- [30] The cost and consenting process for an operator to establish permanent charging infrastructure at a depot is significant and comes with increased costs and reduced depot parking space. Location for charging infrastructure may impact service requirements, as a number of vehicles on outer routes currently overnight away from the depot.

Weight limitations

- [31] Key to the trial was to understand what operational limitations might be in place with the introduction of electric vehicles, especially as electric vehicles are heavier than diesel vehicles.
- [32] Before the trial, ORC was advised that there were weight restrictions for some bridges in Dunedin meaning the EV would not be able to pass over them. Four bridges were included in these restrictions, but were not located on routes operated by Go Bus Transport; thus not an issue for the duration of the trial. Bridges in Dunedin affected by this are:
1. DCC Bridge 501 Forth St (built 1924) – affects routes 15, 37 & 38
 2. DCC Bridge 531 Roslyn Overbridge (built 1953) – affects route 15
 3. DCC Bridge 409 North Taieri Rd (built 1930)
 4. DCC Bridge 410 Neill St (built 1930)
- [33] Maps are appended detailing routes tested and those affected by the bridge weight restrictions.
- [34] The EV model used for the trial is the lightest available in NZ, being road legal without operating permits, where many operational EVs require special permits to operate. Any introduction of electric buses would require investigation into weights and permits that may be required for service operation across Otago.
- [35] As not all EVs are the same, future council procurements will need to consider how vehicle types are evaluated. That is, whether vehicles that do not require special permits to operate due to their weight would be favoured or perhaps mandatory in a tendering process.

Road infrastructure

- [36] One of the main issues identified in the trial, was the challenge in navigating some of the built infrastructure with this specific EV model. This infrastructure includes bus stops and key intersections which do not sufficiently accommodate large buses, being historic infrastructure.

- [37] It was anticipated that the wider turning circle of the e-bus would present an issue on narrow roads and intersections. This bus has a wider circle than a standard two axle diesel bus typically used in Dunedin at present.
- [38] Through testing the bus on a number of routes, the issue was found to be manageable, through precise driver manoeuvring of the vehicle and with driver training.
- [39] It should be noted that only very experienced drivers were trained to drive the e-bus, and that road infrastructure should allow a small margin of error for drivers to safely operate.
- [40] While this issue exists for this specific model of bus, there would be opportunities for different models to reduce the wheelbase length to mitigate the issue should this be required.

Low noise

- [41] The low noise of the vehicle was also flagged as one of the challenges with this trial, and for the future when there are more EVs in service. Passengers were concerned about the impact on the low-vision community who often rely on hearing the bus approaching to travel.
- [42] To mitigate the challenges presented with limited vehicle sounds, the bus was equipped with a bell to be used to alert other road users of its presence. In addition to this, it was raised as a specific training point for Go Bus when training their drivers to use the vehicle, to ensure low-vision passengers would not be disadvantaged during the trial.

Community engagement

- [43] With respect to the trial, engagement was a key piece of work, whereby staff sought to provide key information to the public about the e-bus and gather feedback from passengers and stakeholders.
- [44] While the bus was in Dunedin for the trial, the vehicle was promoted amongst key stakeholders, including with Otago Museum, Dunedin City Council and Waka Kotahi New Zealand Transport Agency, and sought feedback from users.
- [45] During the school holidays, where patronage on board would be lower than during the school term, Council staff organised the bus as a special feature exhibit at Otago Museum. The bus spent four days at the Museum, with science communicators on board facilitating information sessions with the public, incorporating into their climate exhibitions (Figures 3 and 4).

Members of the public who were at the Museum, or passing by on Albany St, would have seen the bus and been able to come on board. The bus was not situated right outside the Museum entrance, due to road layout preventing this, however the number of visitors was pleasing to see.

- [46] For the duration of the stay, the bus was offering short rides to those interested, twelve times per day – allowing the public to experience how the bus performs in Dunedin,

without having to commit to a full ride as per normal service. The table below displays the patronage breakdown of passengers during the museum visit, as recorded by Museum staff. It is noted that Museum staff only recorded numbers who rode on the bus, rather than those who visited – so the actual number of engagements during this time is higher than that listed in Table 2.

Table 2: Otago Museum E-bus Patronage

	Fri 8 Oct	Sat 9 Oct	Sun 10 Oct	Mon 11 Oct
Adults	28	65	27	24
Children	28	42	15	24
Total	56	107	42	48
Overall total:	253 passengers			

- [47] Common questions presented from the public were around the running and charging costs of the vehicle, the timeframe on when electric buses might be introduced on a permanent basis, and if council/operators will replace all diesel buses with electric once they reach their end of life.
- [48] Other questions fielded were able to be answered by the science communicators, with reference to the FAQs as listed in the appendix. Feedback from the science communicators around customer interest and interaction at the Museum included is also appended to the report.



Figure 3 : E-bus at Otago Museum – 8 October 2021



Figure 4 : E-bus at Otago Museum – 8 October 2021

- [49] An event was organised with DCC and WKNZTA, where the Executive Vice President from Global Bus Ventures was present to give more detailed technical information about the bus. On this day, stakeholders went on a journey around one of the hill routes – Route 19 – up to Waverley, to see how the bus performs on the hilly terrain, and to discuss the technology on board.

- [50] Prior to the bus launching, staff established a web page for customers. The web page (<https://www.orc.govt.nz/public-transport/general-orbus-information/dunedin-e-bus-trial>) received over 500 unique page views from at least 420 visitors. While visitors aren't high in numbers, they spent considerable time on the page (nearly four minutes), indicating interest in the e-Bus.



Figure 5: Infographic displayed on the e-bus page on ORC website

- [51] For the duration of the trial, ORC ran four social media competitions, promoting engagement relating to the e-bus. Alongside this, regular content was posted providing facts about the bus and trial. An example from the social media campaign is displayed in Figure 6.
- [52] Reach on e-bus posts on the Orbus DN Facebook page peaked at just over 6700 users. Alongside this, engagement was high, with posts reaching up to 880 clicks and over 400 reactions (comments or 'likes').
- [53] For three weeks, staff ran a survey for the e-bus, both on board and online. Passengers were asked a range of questions, from their understanding of the travelling range of an electric bus, through to if their transport was currently influenced by climate issues.
- [54] Although the survey undertaken had a small number of respondents compared with the total number of passengers throughout the trial, feedback from respondents was positive with passengers excited to see more electric vehicles in service with decarbonisation of the fleet.

- [55] A key finding from the survey, was that 73% of respondents listed their current travel mode to be influenced, or somewhat influenced by climate change issues³. Alongside this, passengers were asked if they would be more likely to recommend taking the bus to friends/family if more electric vehicles were in the fleet – to which 84% of respondents said yes.
- [56] Full survey results are appended to this report.

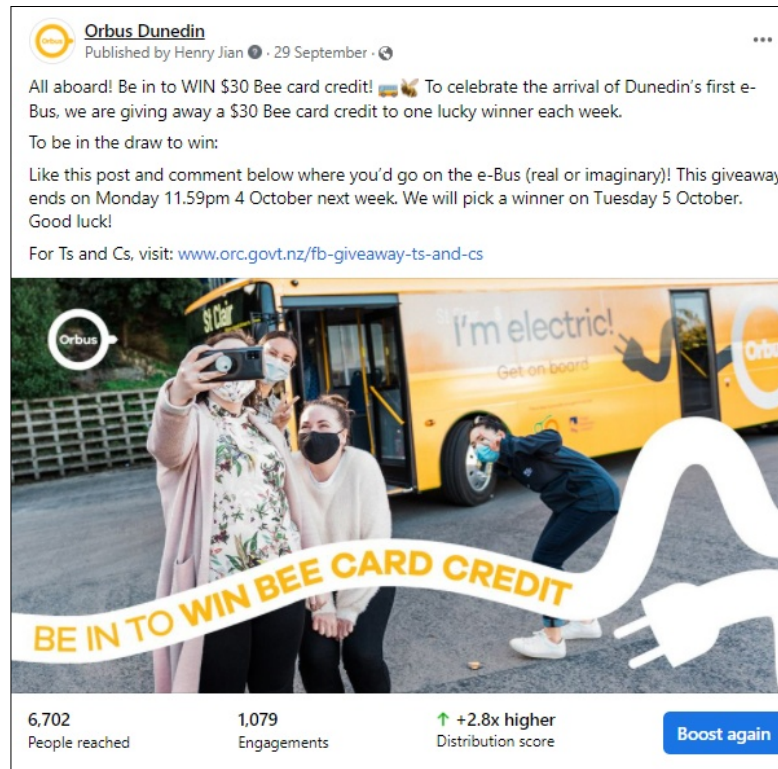


Figure 6: One of the social media competition posts

Cost of trial

- [57] Costs incurred by Council during the trial came to approximately \$30,000 including operational costs for ticketing equipment, marketing and branding costs, and staff time.
- [58] Go Bus Transport provided the vehicle and covered operational costs incurred throughout the trial.
- [59] Global Bus Ventures committed time to being available in Dunedin for the first weeks of launch in case of any issues, and for two events – being on hand to answer questions about the vehicle. This commitment was greatly appreciated.

The Future

³ 92 responses received over 3 weeks from survey conducted on board the e-bus and online.

- [60] As indicated by the preceding sections, the trial has highlighted how complex it will be to transition from fossil-fuelled to carbon emission-free public transport. About the only certainty (if it can be called that), is that in 2025, no **new** fossil-fueled buses can be introduced in to service. That, however, does not mean that fleets of new diesel buses will not be built prior to that date, and they will have at least a ten-year operating life.
- [61] As noted below, one of the key objectives of the new Regional Public Transport Plan is the carbon reduction, through growing mode share and phasing the introduction of carbon-emission free buses.
- [62] The Queenstown Public Transport Business Case will investigate future fleet options and associated issues (such as asset ownership – fleet, depots, charging infrastructure, etc) for the Wakatipu. While it is likely that many of those learnings will also be applicable to Dunedin, it is the view of Council staff that there would be added value in undertaking a wider exercise to proactively plan for a future transition away from fossil fuels for contracted buses.
- [63] The first step in doing that, would be to decide what the scope of any such transition plan should include. To that end, staff recommend to Council that it agree to staff bringing back a further report to Council in 2022 to refine that scope.

OPTIONS

- [64] In regard to the decisions, Council has at least two options relating to the scoping exercise for the transition plan for fleet decarbonisation. The options are:
1. Scope a transition plan in advance of Central Government mandates coming into effect in 2025.
 2. Do not scope a transition plan before this time.
- [65] The recommended option is option 1 as it will allow for planning in advance on the mandate coming into force, and time to work with operators on their plans. This will also allow time for consideration to be given to sourcing issues with electric vehicles and planning a realistic transition timeframe that is not rushed.

CONSIDERATIONS

Strategic Framework and Policy Considerations

- [66] There are no strategic framework and policy considerations in regard to the decisions recommended in this report.
- [67] The electric bus trial was consistent with the Otago/Southland RLTP, which seeks to decrease transport emissions through:
- supporting initiatives that move the region towards better environmental outcomes.
 - communicating and engaging on issues and targets to build understanding, support, and momentum for change.

[68] One of the key elements of the new Regional Public Transport Plan is the decarbonisation of the public transport fleet.

[69] The trial provided a first glimpse into what the future of public transport might present in Otago and the vehicle used was one example of what sustainable fleet options are currently available to assist with the decarbonisation in the coming years.

Financial Considerations

[70] If the transition plan is to be prepared, Council will need to provide a budget allocation for this, as it is unbudgeted in the Long-Term Plan.

Significance and Engagement Considerations

[71] There are no significance and engagement considerations in regard to the decisions recommended in this report.

Legislative and Risk Considerations

[72] There are no legislative and risk considerations in regard to the decisions recommended in this report.

Climate Change Considerations

[73] There are no climate change considerations in regard to the decisions recommended in this report.

[74] Continued focus on increasing the uptake of public transport in Otago will contribute to reductions in greenhouse gas levels / CO₂ output from transport. Noting that a single fully occupied bus could equate to a maximum of 50 single-occupant passenger vehicles).

[75] As noted earlier in the report, the bus travelled a total of 3,148 kms during the trial. This distance would be the equivalent of approximately 2,511kgs of CO₂ saved (without taking into consideration additional CO₂ reducing factors such as removing single occupancy cars, as listed above).

Communications Considerations

[76] There are no communications considerations in regard to the decisions recommended in this report.

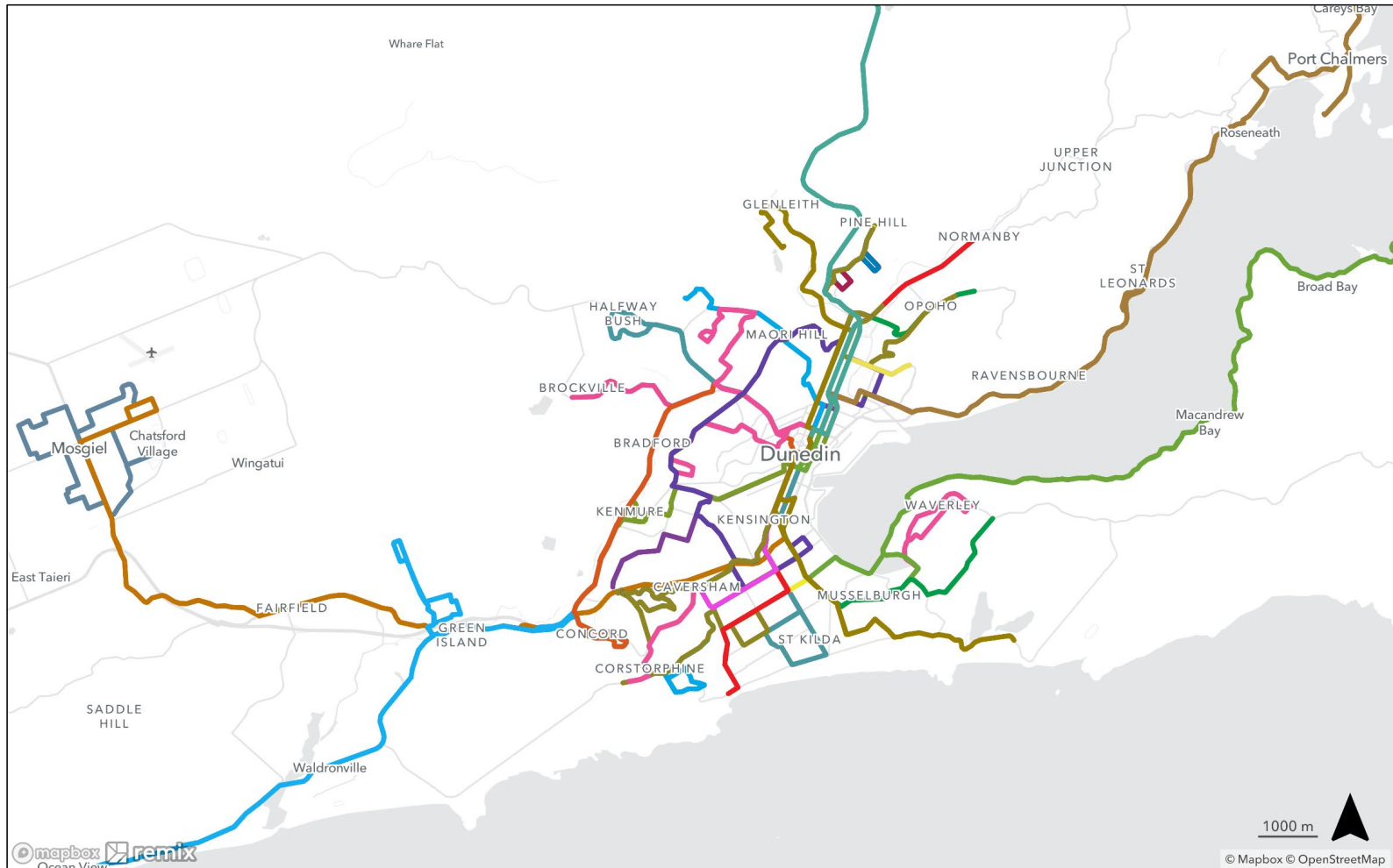
NEXT STEPS

[77] Once the results have been presented to Council, a media release will be published detailing the statistics and findings of the trial. This will be made public on the ORC website for future reference.

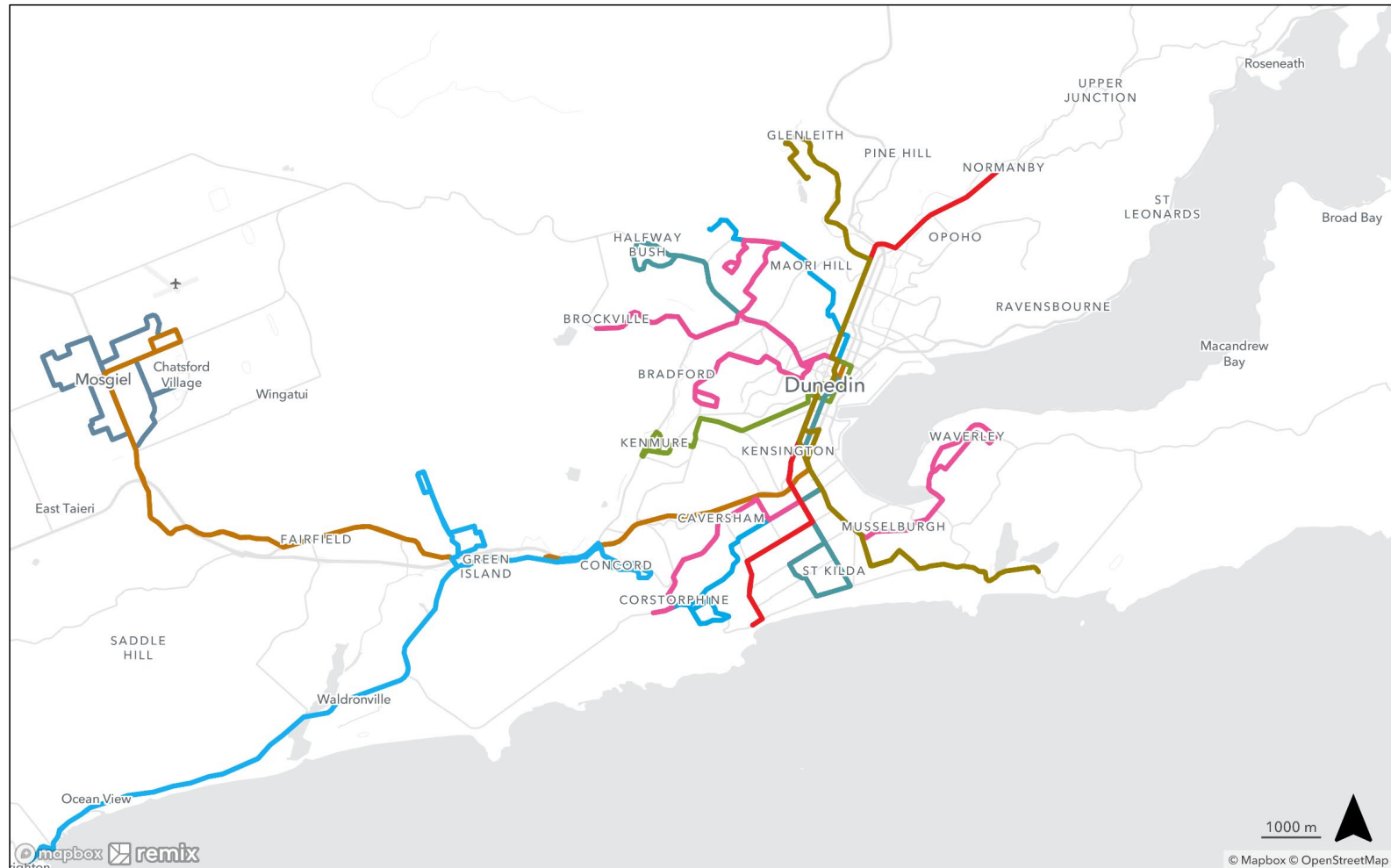
ATTACHMENTS

1. Dunedin network routes & bridge detail [7.2.1 - 4 pages]
2. FAQs from Global Bus Ventures [7.2.2 - 4 pages]
3. Otago Museum Feedback [7.2.3 - 1 page]
4. E-bus survey results [7.2.4 - 4 pages]

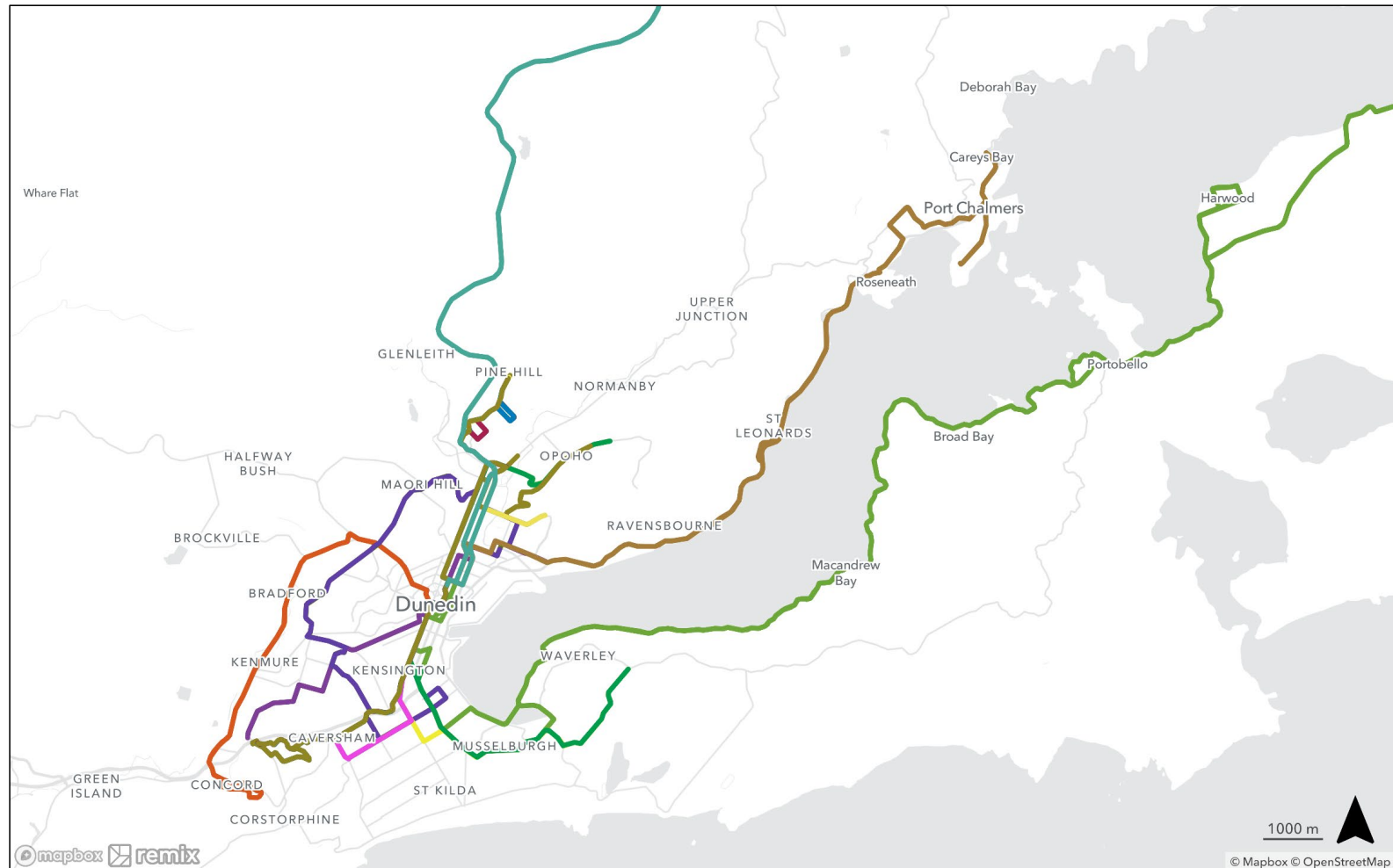
Dunedin Network – Missing ends of Route 1, 14, 18 & 70



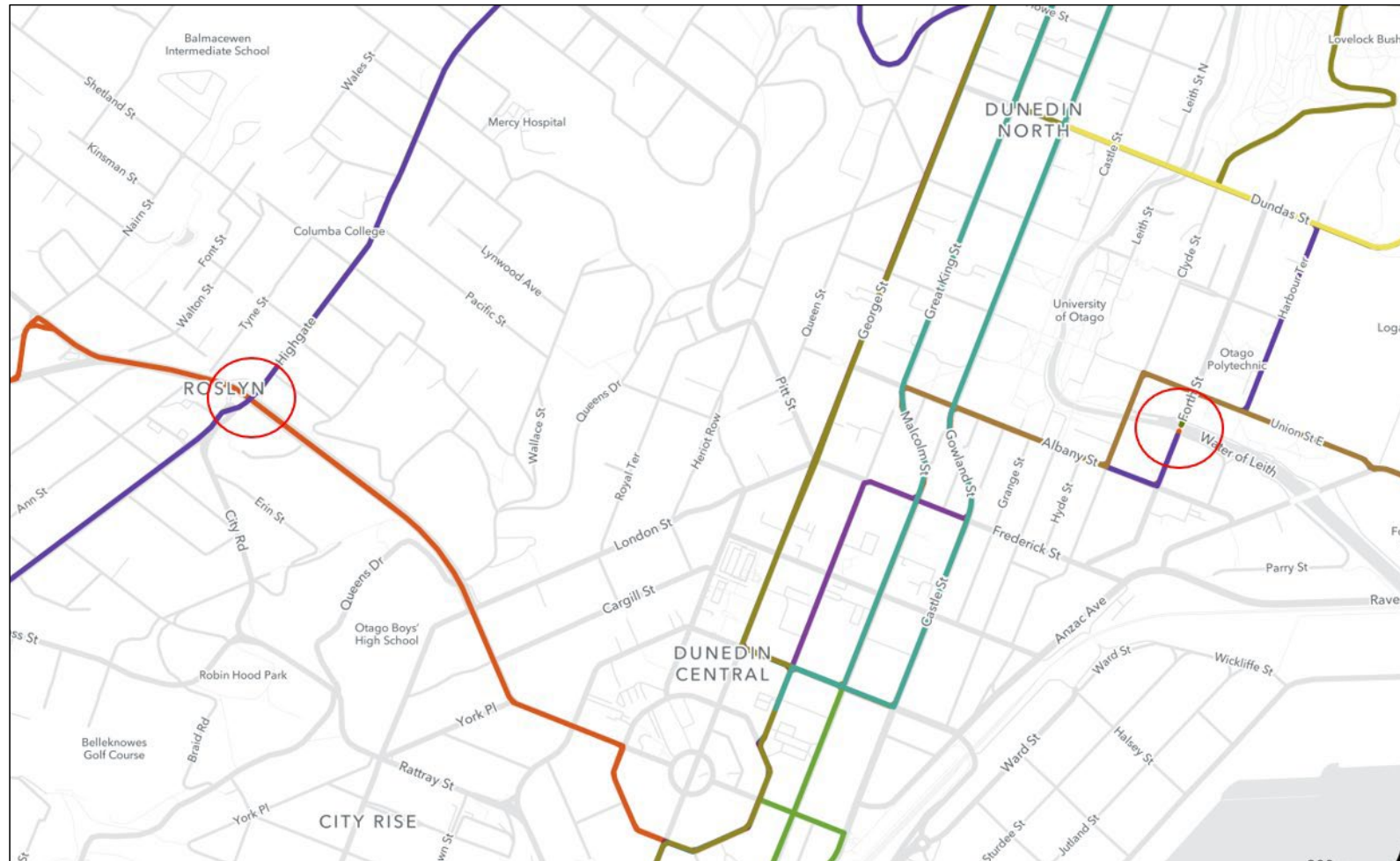
Go Bus Operated Routes:



Ritchies Operated Routes:



Routes with bridges with weight restrictions:



FAQs from Global Bus Ventures:

Key Points:

- Designed and built in New Zealand
- Pure electric
- Zero emission
- 11.5m long, 35 seat
- Quiet and comfortable ride quality (vastly improved over legacy diesel buses)
- Smoother acceleration and deceleration (greater driver reaction with reduced impact on traffic congestion)
- No toxic exhaust and greatly reduced noise pollution in the city
- Electric Hub motors built into the wheels
- Low floor
- Light weight alloy body

Question	Answer
Where was it made?	This bus was made locally in Rolleston
Where are the motors?	This bus has special motors which are actually into the wheels at the back of the bus.
Does the bus have regenerative braking?	Yes it does, When the bus slows down the motor act as generators and use the kinetic energy to re charge the batteries.
Can it climb up the hills?	Yes it has very powerful motors 250kw so it climbs the hills easy.
How fast can it go?	This one has a speed limit of 80kph as it is design for city use.
How much does it weigh?	This is one of the lightest in New Zealand. It only weighs 11 tonnes. It is light because of the unique low floor, low roof height and alloy body.
How many batteries does it have?	It has 12 boxes of batteries.
How much battery capacity does it have?	It has 396kWh of battery storage, this is enough to power to boil 4000 jugs of water.
What is the battery voltage?	650 V DC.
How long does it take to charge?	It can be re charged from empty in 4 hours.
What type of batteries are they?	Lithium Iron Phosphate (LFP)

Are the batteries safe?	Yes, LFP are one of the more stable lithium battery types and are not prone to the thermal runaway fires that some lithium batteries are known for. All batteries store a lot of electricity so must be treated with care.
How long will the batteries last?	The batteries will last up to 10 years. They do lose some storage over that time. Once they are finished in the bus, they can be used for household storage.
How far can it travel?	Depending on the circuit it can do 350-400km, they drove it down here from Rolleston.
I heard making batteries is bad for the environment. How are EV's eco-friendly with rare earth metal mining?	There are existing and upcoming developments toward large scale recycling of batteries to raw materials for greater sustainability. Notably, companies such as Redwood Materials aims to bring battery recycling to the mainstream and has signed contracts with companies such as Tesla and Ford. There are also other existing companies which do recycling of lithium-based batteries.
How much will these cost taxpayers?	Initial upfront costs are higher with electric vehicles than diesel counterparts but the cumulative gains from reduced toxic exhaust, reduced noise pollution, and reduced maintenance requirements are expected to offset the higher capital cost during its operational lifetime.
Is recharging the batteries eco-friendly?	All power supplied in the South Island is generated from renewable energy sources. In fact, the majority of power generated in New Zealand (more than 80%) is via renewable sources.
Where do they get charged?	At the depot where they have dedicated high power chargers. Technically, any location with a power outlet and connection to the power grid can charge an electric vehicle. In this regard, EVs have greater refill flexibility over diesel or gasoline powered vehicles which require fuelling stations.
What happens if it is struck by lightning?	The high volts are isolated, so the batteries are safe. As to the energy from the lightning, it is transferred to the ground via the chassis and through the wheels as it does on any other vehicle.
How quiet are they?	Quiet enough to enjoy a conversation without having to speak over the vibration of diesel engines.

<p>Is an EV safe if it catches fire / has an accident?</p>	<p>Yes, we have integrated safety features to mitigate risks to the public and its passengers. We are also working in collaboration with the fire department to assist in training first responders to better handle such incidents should they occur.</p>
<p>What are the advantages to designing and building in NZ over purchasing one from overseas?</p>	<p>Overseas manufacturers usually build in large volumes for generalized market requirements. Buses designed and built in New Zealand are better optimized for New Zealand operating conditions (roads, specific gear ratios, weather conditions, vehicle features, operator support, etc) and provide greater peace of mind on ethical concerns associated with certain competitors.</p>
<p>Are there any ethical concerns surrounding EV buses?</p>	<p>Some overseas manufacturers have had allegations of using forced labour in their manufacturing process to reduce prices and undercut competitors. We do our best to avoid components from suppliers which work in a similar fashion and manage our own manufacturing plant here in New Zealand.</p>
<p>Are batteries really better for the environment?</p>	<p>Yes. Batteries have all their constituent materials encased and stored which allows for easier recycling than combusted exhaust gases which dilute into the atmosphere and is harder to recapture.</p>
<p>I heard batteries are bad for the environment. Is this true?</p>	<p>This is referring to mining rare earth metals which are hard to find on Earth. Their unique properties are invaluable to making high tech equipment such as batteries and traditional open-pit mining is damaging for the environment. Fortunately, there are new techniques and battery chemistries in development to reduce reliance on these materials. In addition, battery recycling can also help prevent rare earth metals being cast into landfills and polluting the earth.</p>
<p>If batteries are so toxic, isn't it better to have cleaner diesel engines?</p>	<p>There is a limited supply of fossil fuel with ever-increasing costs to extract what little remains. Internal combustion engines also have a theoretical maximum efficiency of only about 50~60%. Real world numbers are closer to 30~40% which is notably lower than electric motors which consistently have greater than 80% efficiency with most modern electric motors achieving 90+% efficiencies in real world conditions. This offers significant savings in operating costs and reduces energy waste. Materials used in batteries can also be easily recycled whereas</p>

	carbon dioxide and other gases released to the atmosphere is more difficult to capture and store.
What happens to batteries at the end of their life?	<p>Degraded EV batteries can find new life as power backup units for private houses, power substations, and other light duty services. Once they reach end of life, they can be recycled to harvest the raw materials within them for creating new batteries. Downcycling and recycling allows transition towards and circular economy where batteries are saved from landfills to reduce pollution and significantly increase sustainability.</p> <p>Existing companies already do similar work but new companies, such as Redwood Materials, aims to bring mass battery recycling to the mainstream and has signed contracts with companies such as Tesla and Ford. There are also other existing companies which do recycling of lithium-based batteries.</p>
Are there any viable alternatives to EV buses?	Depending on the size and expected performance of the bus, Hydrogen Fuel Cell EV buses offer a great alternative to Battery EV buses as they do not have the same weight penalty faced by heavier batteries. HFCEV buses do have some batteries for handling energy buffers in accelerating and braking but they are much reduced in capacity compared to BEVs.

Feedback from Otago Museum, 8-11 October

Feedback below as provided by Otago Museum staff who were on hand presentencing to members of the public for the duration of the e-bus visit to the museum:

Science Communicator - Sophie Sparrow:

“Visitors to the e-bus were curious to learn what kind of mileage the bus could get from a single charge, and how long it takes to charge the batteries. They were interested to hear about how electric buses are being used in other New Zealand cities and that the bus was able to generate electricity while going downhill. Many enjoyed seeing how fast the bus was able to get up Dunedin’s hills and appreciated how quiet it was compared to diesel buses.”

Science Communicator - Catriona Gower:

“Most of the visitors were very excited that we might have electric buses in Dunedin soon and had come specifically to get a look around and ask questions. They were very impressed by just how quiet it was, how well it dealt with hills and that it recharged on the way down too! They wanted to know how long recharging took, what distance the full range was (and were suitably impressed by the answer of Christchurch to Dunedin), if the new recharging facilities at the depot would be difficult to install, if smaller buses were being considered and how soon they might be on Dunedin streets. Many, especially children, loved the bells used to warn pedestrians and when reversing; after all, the bus was very quiet when moving.”

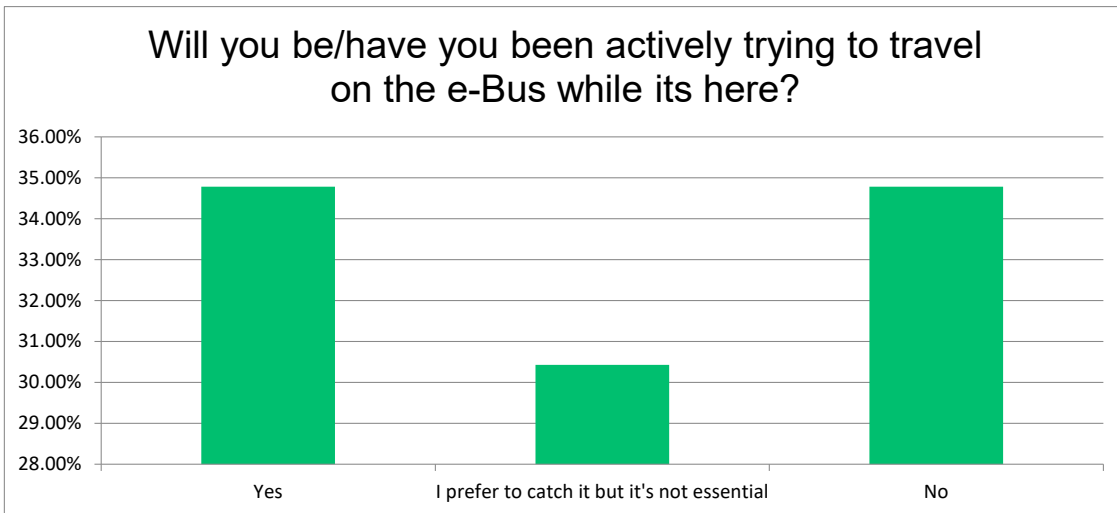
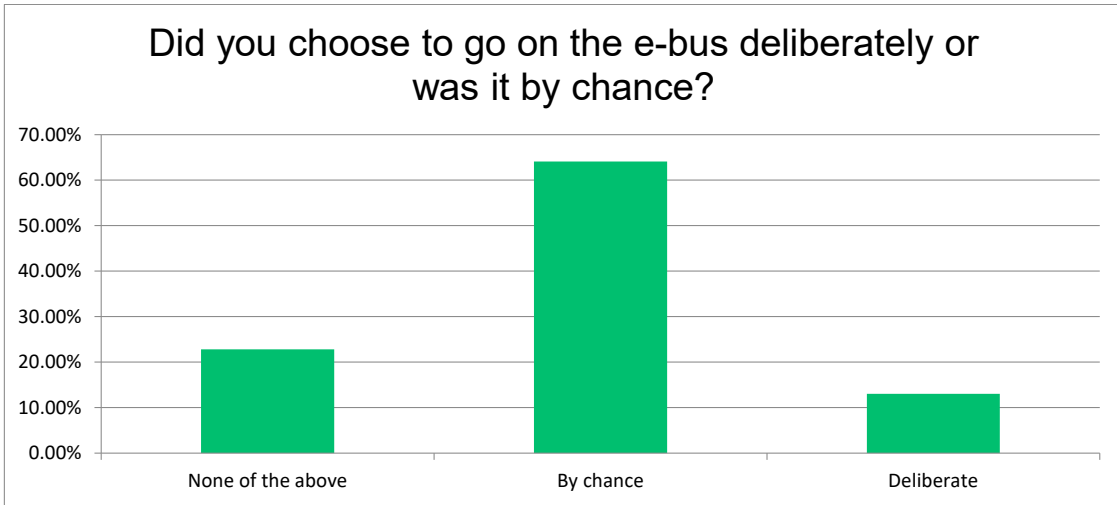
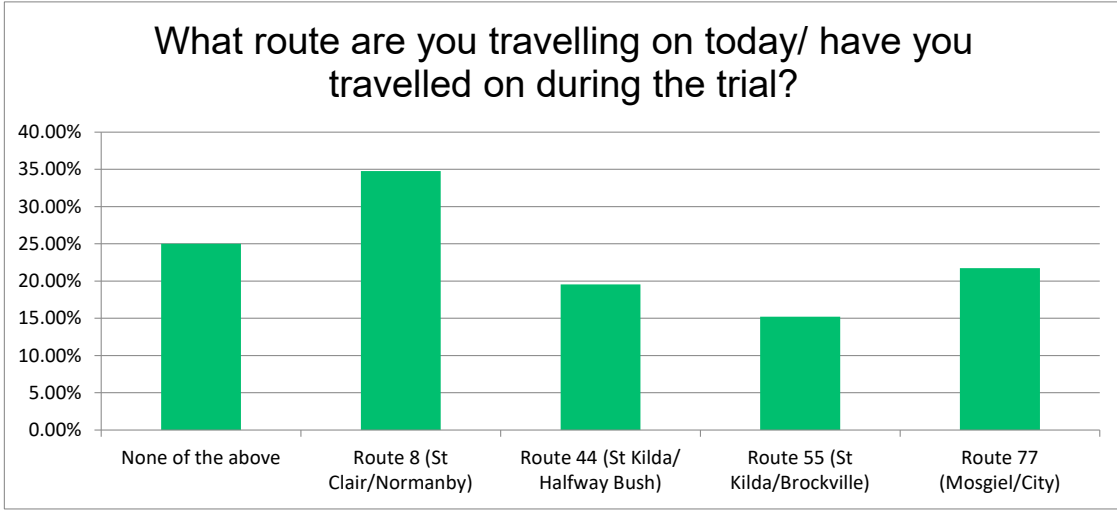
Science Communicator - Marijn Kouwenhoven:

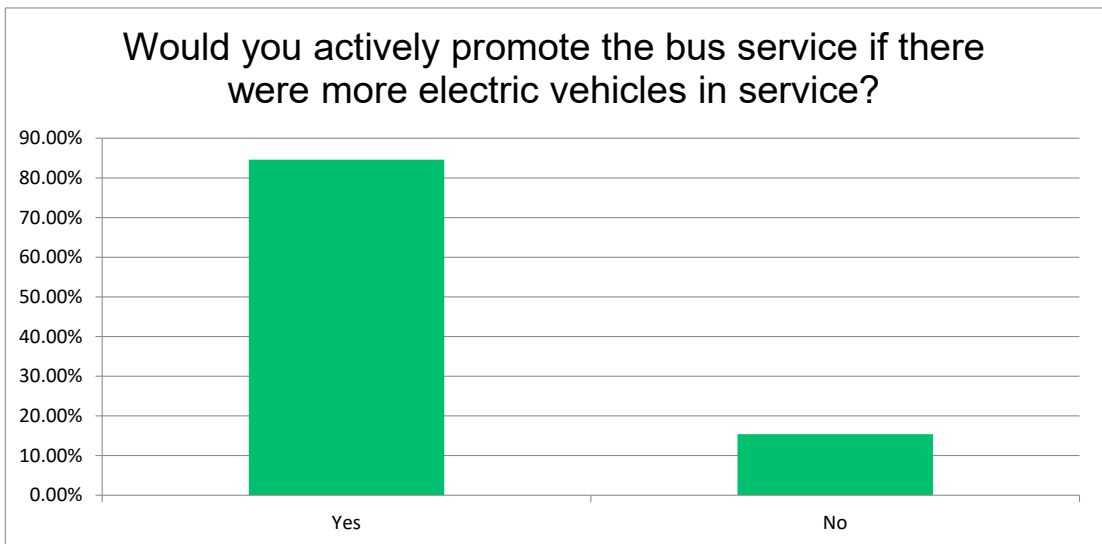
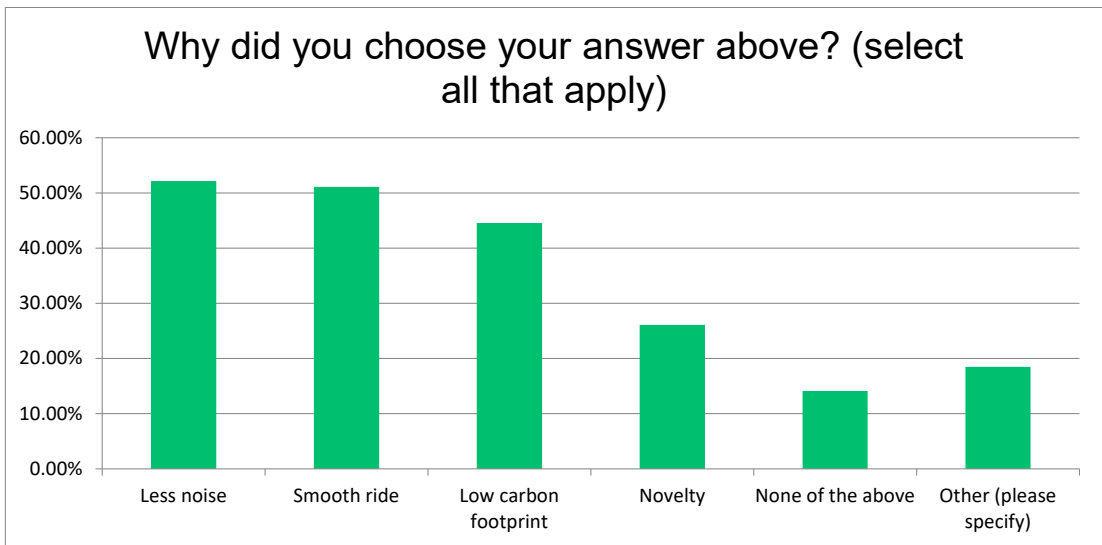
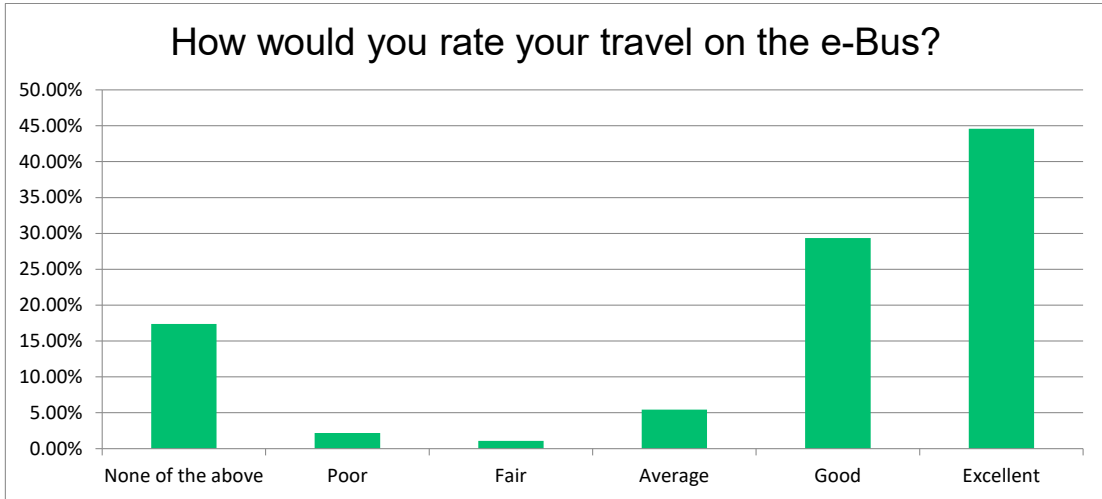
“Most visitors were interested in comparisons between electric and diesel buses, and asked questions about speed, longevity, and running costs, although the most frequently asked question was probably ‘how fast can it go uphill compared to the diesel bus’! They were also curious about the efficiency of the electric bus; how long/far it could go on a single charge, how long it takes to fully charge the batteries, and what the expected lifespan of the batteries is. Younger visitors enjoyed guessing where the batteries were located, and the fact that the bus could accelerate a lot faster than diesel buses. We had one very young visitor who had never been on a bus before - so having the free electric bus over the weekend was a great opportunity for her and her family!”

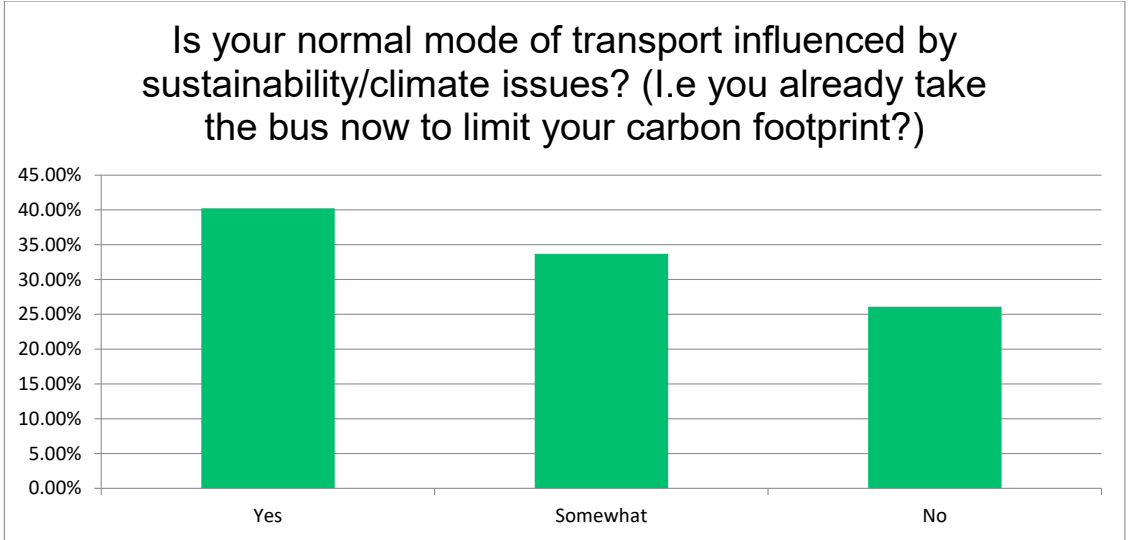
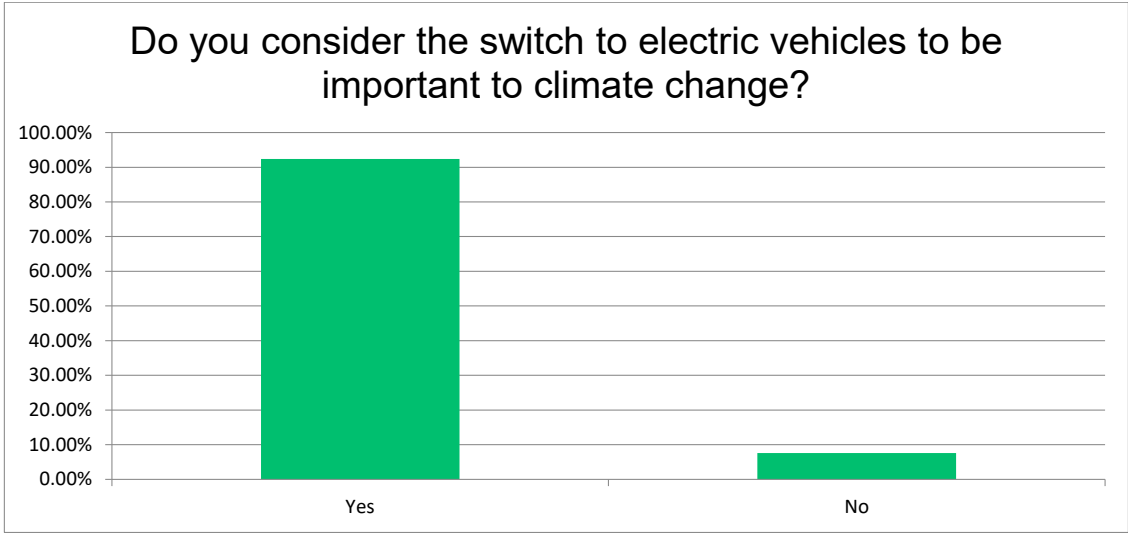
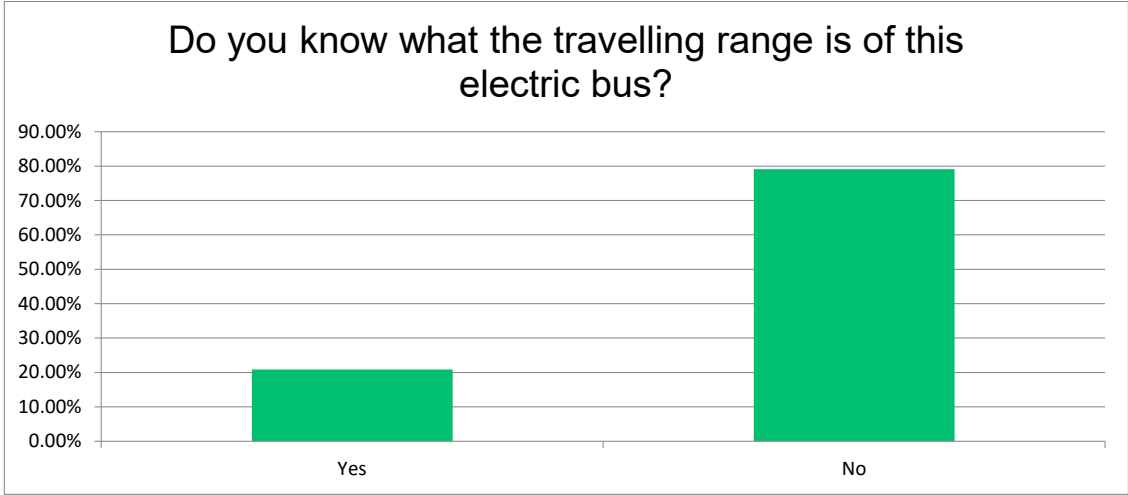
Director, Visitor Experience & Science Engagement - Craig Grant:

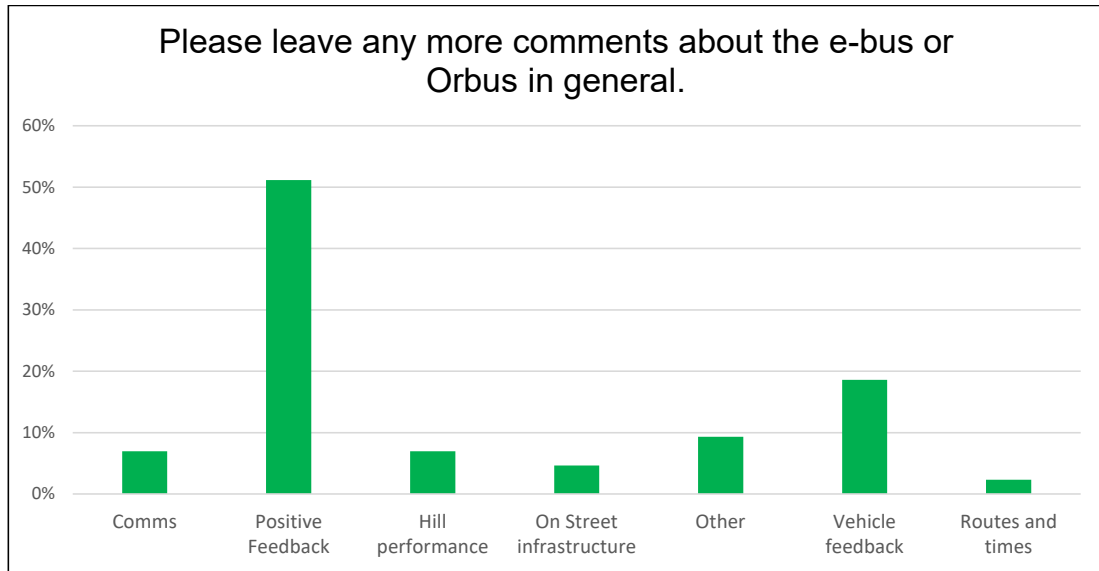
“The public were really curious to see just what an electric bus would be like and how it might differ from traditional buses. The quietness and the power/torque (especially going up hills) were particularly noticeable and commented on. People also found it reassuringly familiar in that in all other respects it seemed to look/feel like buses they are used to. There were lots of questions about how far it could go on a charge and how long it would take to charge up. People seemed really keen to see electric buses on our roads. Also keen to see perhaps smaller versions on less popular/hilly routes. Families enjoyed learning about the different carbon footprints different modes of transport have in Aotearoa and were surprised at just how large a footprint our private vehicle fleet had.”

E-Bus survey responses:









That the Council excludes the public from the following part of the proceedings of this meeting (pursuant to the provisions of the Local Government Official Information and Meetings Act 1987)

1.1 Decision on Future of Rabbit Control Assets

The general subject of the matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter, and the specific grounds under [section 48\(1\)](#) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution is as follows:

General subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Ground(s) under section 48(1) for the passing of this resolution
<i>1.1 Decision on Future of Rabbit Control Assets</i>	<p>To protect information where the making available of the information— would be likely unreasonably to prejudice the commercial position of the person who supplied or who is the subject of the information – Section 7(2)(b)(ii);</p> <p>To enable any local authority holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) – Section 7(2)(i)</p>	Section 48(1)(a): Subject to subsection (3), a local authority may by resolution exclude the public from the whole or any part of the proceedings of any meeting only on 1 or more of the following grounds: (a) that the public conduct of the whole or the relevant part of the proceedings of the meeting would be likely to result in the disclosure of information for which good reason for withholding would exist.

This resolution is made in reliance on [section 48\(1\)\(a\)](#) of the Local Government Official Information and Meetings Act 1987 and the particular interest or interests protected by [section 6](#) or [section 7](#) of that Act or [section 6](#) or [section 7](#) or [section 9](#) of the Official Information Act 1982, as the case may require, which would be prejudiced by the holding of the whole or the relevant part of the proceedings of the meeting in public.