



Report RPE 19.188
Date 9 May 2019
File CCAB-8-2244

Committee Council
Author Andrew Cooper, Advisor

Future fleet options

1. Purpose

To update Council on:

1. Negotiations with NZ Bus for the replacement of the retired trolley buses;
2. Tranzit's electric fleet commitments;
- 7(2)(b)(ii) & 7(2)(i) 3. [REDACTED]
4. Development of the electric bus strategy.

This report also seeks decisions by Council to enable NZ Bus to initiate and seek proposals for the possible procurement of 51 new electric buses. Any final commitment to NZ Bus to procure the 51 new electric buses will be the subject of a further Council decision.

2. Exclusion of the public

Grounds for exclusion of the public under section 48(1) of the Local Government Official Information and Meetings Act 1987 are:

The information contained in this report sets out the future requirements for the Wellington Region's Public Transport Network and includes commercial information relating to operators. Having this part of the meeting open to the public would disadvantage GWRC in its negotiations with other parties as it would reveal GWRC's negotiation strategy, and would be likely unreasonably to prejudice the commercial position of the operators. GWRC has not been able to identify a public interest favouring disclosure of this particular information in public proceedings of the meeting that would override this prejudice.

3. Trolley bus replacement

3.1. Background

In 2017, the electric trolley bus fleet was retired from service and the overhead catenary wire network decommissioned and removed. Retirement of the trolley buses was intended to be a transition measure until appropriate modern electric buses can be deployed to replace them. Diesel buses have been deployed by NZ Bus as an interim measure until replacement electric buses are deployed.

As outlined in earlier reports, the Partnering Contracts require NZ Bus to provide “New Large Vehicles” being either:

1. 49 brand new diesel vehicles (the Diesel Option), or
2. 57 Electric converted vehicles (the Electric Converted Option).

Following the initial failure to successfully prototype the Electric Converted Option (i.e. a converted trolley bus with Wrightspeed technology), NZ Bus put forward an alternative Electric Converted Option; to convert 51 trolley buses¹ to be fully electric buses using an electric powertrain technology supplied by Times Electric Group (TEG), a subsidiary of China Rail. TEG is the same provider of the electric powertrain used by Tranzit in the electric double deckers, however the cost of the alternative conversion solution is higher than the previously contracted price for the Electric Converted Option.

As a consequence of the failure of the Wrightspeed technology and the higher cost of the alternative TEG Electric Converted Option and our understanding that NZ Bus (as a result of the increased cost) was unlikely to trigger the Electric Converted Option, GWRC investigated the option of requiring NZ Bus (by negotiated contract variation) to procure new electric buses. This investigation found that a NZ compliant large electric bus could be sourced for a similar whole of life cost to the Electric Converted Option with substantial additional benefits, particularly from a customer experience perspective, over the Electric Converted Option.

In October 2018, Council directed GWRC officers to request prices from NZ Bus for the possible procurement of new electric buses.

3.2. Converted trolley bus considerations

During discussions with NZ Bus, a number of issues and risks have surfaced in relation to the converted trolley option. These include:

1. Whole of life cost more expensive than new electric bus.
2. A contributing factor to the higher whole of life cost is a short battery warranty of 5 years for the converted trolley option, meaning batteries would be replaced at 5 years at an unknown cost, which would accrue to GWRC.

¹ The explanation for the proposed number of 51 buses is outlined in Section 3.6 below.

3. The trolleys are now 12 years old. With a maximum age under NZ Transport Agency (NZTA) rules of 20 years, an exemption from NZTA would be required to enable the converted trolleys to remain operational to the end of NZ Bus's 12 year contracts. If an exemption was not granted, there would be a need for NZ Bus to procure replacement buses in the remaining two years of the contracts.
4. The trolleys are old buses, and while they would be refurbished, would remain old buses and would lack the same customer amenity and quality of ride as a new electric bus. In assessing the trolley buses against GWRC's Vehicle Quality Standards (VQS), it has become apparent that a number of compromises and exemptions to the VQS would be required should this option be pursued.
5. NZ Bus has disbanded their conversion project.

As a consequence of the additional issues and risks of the converted trolleys, it is the recommendation of GWRC officers that the Electric Converted Option be terminated.

NZ Bus have reached the same conclusion and do not intend to undertake further work on this option.

3.3. Commercial principles

Officers have been negotiating a proposal for a pre-agreed pricing methodology and commercial principles with NZ Bus as a pre-condition to NZ Bus seeking proposals from the market for new electric buses.

GWRC and NZ Bus officers have now reached in-principle agreement on high level commercial terms that are acceptable to both parties. A Memorandum of Understanding recording the agreement has been signed by the Chief Executives of GWRC and NZ Bus and is attached to this report as **Attachment 1**.

Following endorsement by Council, NZ Bus's Board and Next Capital (NZ Bus future owner), NZ Bus will undertake an RFP process to price a new electric bus solution.

On receipt of market prices for new electric buses, if all parties agree to proceed (and a contract variation is agreed), NZ Bus will procure the first tranche of electric buses in accordance with the agreed procurement profile. If one of the parties does not agree to proceed, the parties will negotiate in good faith to agree an alternative fleet acquisition programme. If an alternative programme cannot be agreed then NZ Bus will procure 51 new diesel buses.

3.3.1. Pricing methodology

NZ Bus and GWRC have reached agreement on a financial model that will establish the finance charge (price) to be paid by GWRC to NZ Bus for new electric buses.

The financial model compares the pricing of the new e-bus options against the contracted Diesel Option price. The difference against the Diesel Option price will be the incremental annual payment that GWRC would pay NZ Bus over the remaining term of the NZ Bus Partnering Contracts..

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7(2)(b)(ii)

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- [Redacted list item]

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3.4. EECA funding considerations

[Redacted text block]

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- [Redacted bullet point]

[Redacted text block]

3.5. Indicative financial impact

[Redacted text block]

7(2)(b)(ii)

[Redacted text block]

[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]

[REDACTED]		[REDACTED]
[REDACTED]		[REDACTED]

Assumptions to the indicative financial impact include:

- [REDACTED]
- Road User Charge reinstatement on heavy EVs in 2025 at current equivalent diesel RUC levels
- Average electricity consumption of 1.3kWh/km for electric buses

7(2)(i)

[REDACTED]

3.6. Bus number requirements

While the ex trolley buses number 57, negotiations with NZ Bus to date have been based on 51 buses.

NZ Bus has explained the reason that they have limited the number of proposed electric buses to 51 is that this is the optimal fleet number for the available battery range of the proposed trolley conversion option. 51 is also the number of 'new' buses required by NZ Bus to comply with GWRC's 50% new bus rule for all operators.

Since July 2018, NZ Bus's fleet requirements have increased by approximately 18 buses as at February 2019, taking NZ Bus's immediate need to 69 buses. The additional 18 buses are as a result of:

- Amended timetables to address runtime issues
- Additional services to address capacity
- Additional services in response to community concerns from network changes

The additional 18 buses do not include additional fleet requirements that will be necessary to provide for the new meal and rest time provisions.

The PT Network Design team are currently reviewing requirements to build in additional resilience to the network and cater for demand growth over the next two years. Final agreement with NZ Bus, and the RFP for new e-buses, will include optionality for additional buses to meet future growth in fleet requirements.

NZ Bus's future fleet requirement will necessitate the requirement for additional double decker buses of 95+ passenger capacity. At present there are no known electric bus options that can deliver to this capacity under New Zealand conditions.³ Consequently, there may be a requirement to purchase diesel double decker buses in future if current capacity constraints are to be addressed.

3.7. Current proposal

3.7.1. Electric buses

On endorsement of the proposal for new e-buses outlined in the attached MOU by Council, NZ Bus's Board and Next Capital (the proposed new owner of NZ Bus), NZ Bus will seek an RFP for new electric buses from at least two suppliers who are known to be able to offer large electric buses compliant with NZ conditions – the two known suppliers are ADL and TEG.

GWRC has been involved in the vehicle specification contained in the proposed RFP and will be involved in the selection of the preferred solution.

Following receipt of new e-bus prices and application of the pricing methodology, if all parties agree to proceed, NZ Bus will procure the first tranche of electric buses in accordance with the agreed procurement profile. If one of the parties does not agree to proceed, the parties will negotiate in good faith to agree an alternative fleet acquisition programme. If an alternative programme cannot be agreed then NZ Bus will procure 51 new diesel buses.

Due to the significant capital expenditure involved, together with the technology risk of a new electric bus that will have to be designed and built specifically for New Zealand's unique road conditions (no such bus exists and therefore there are no off the shelf options), NZ Bus propose to take a phased approach to the procurement and introduction of 51 new electric buses.

This phased approach will be similar to that taken by Transit for the EVDD, with an initial batch that will be used to test and refine the solution before committing to further orders. The RFP will define this approach.

The proposal is currently for an initial order of 17 new electric buses, with a target in-service date of November 2020. The first 17 buses will be operated for a period of six months to test and refine before an order is placed for the remaining 34 buses, either by a single or multiple orders. The second tranche of 34 new electric buses will have a target in-service date of mid-2022.

3.7.2. Fulfilling additional bus requirements

To address the additional 18 buses that have been added to NZ Bus's fleet requirements since contract commencement, NZ Bus has proposed to upgrade 18 interim buses to 'Existing' buses, i.e. undertake a full mid-life refurbishment of 18 interim buses to bring them up to standard of the post mid-

³ Transit's EV double deckers have a maximum capacity of 82 passengers and are officially classified as a Large Vehicle (LV) and not a double decker (DD) for timetabling purposes.

life specification of GWRC’s vehicle quality standards. This upgrade will see the buses painted in full Metlink external livery and interior furnishings and layout upgraded to Metlink livery and specification.

The 18 buses proposed to be refurbished and reclassified as ‘Existing’ buses are 10 year old Euro IV and Euro V buses.

The upgrade of these buses will be undertaken in a measured approach to minimise the impacts on bus availability and provision of capacity.

This will see buses periodically removed from service for external painting and branding and fitting of bike racks over the next 18 months.

The full internal refurbishment of these buses will take each bus out of service for an extended period of time, therefore this aspect of the programme will not take place until the first of the new electric buses enters services to provide the necessary capacity coverage while each upgraded bus is taken out of service.

The intent of this approach is to cater for recent fleet growth by upgrading existing buses at a substantially lower overall cost than investment in new fleet.

NZ Bus has also proposed that if required by GWRC (and at GWRC cost) to externally paint and rebrand to Metlink livery up to 33 other interim vehicles as soon as practicable to provide a more consistent looking bus fleet until all electric buses are in place.

3.8. Timeline and fleet profile

A timeline summary of the proposal to procure 51 new electric buses is provided in **Attachment 2** to this report.

The indicative NZ Bus fleet profile based on currently known numbers and including the proposed 51 new electric buses is shown in Table 2.

Table 2: Indicative NZ Bus fleet profile

	July 18	May 19	Nov 20	July 22
‘Existing’ fleet in Metlink livery	68	68	86	86
‘Interim’ fleet – not rebranded	68	69	0	0
‘Interim’ fleet – rebranded	0	0	34	0
New Double Deckers	0	17	17	17
New electric buses	0	0	17	51
Total	136	154	154	154

3.9. Impact on Long-term Plan

Payment of the increased incremental contract service fee to NZ Bus will be made on a pro-rata basis as buses enter service, the change in the contract service fee will need to be agreed by NZ Bus and GWRC and recorded as an agreed Contract Variation.

With 17 electric buses proposed to enter service in November 2020 and the remaining 34 in mid-2022, the following is the expected impact on the LTP budget:

- [REDACTED]
- 7(2)(i) [REDACTED]
- [REDACTED]
 - [REDACTED]
 - [REDACTED]

From FY22, additional budget has been allowed for the future introduction of electric buses – “motive power premium”. As indicated in Table 3, this premium provides budget headroom for the indicative incremental cost of trolley replacements from FY22. [REDACTED]

- 7(2)(i) [REDACTED]
- [REDACTED]
 - [REDACTED]
 - [REDACTED]
 - [REDACTED]
 - [REDACTED]

Table 3: Impact on LTP budget

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

3.10. Other considerations

The final decision on purchase of electric vehicles remains with NZ Bus and, due to the pending change in ownership, will be subject to approval from both NZ Bus’s existing board and the new incoming board.

[REDACTED]

- [REDACTED]

- [REDACTED]

[REDACTED]

- [REDACTED]

- [REDACTED]

The Council decisions that are the subject of this report will be taken prior to a Council decision about whether or not to approve the proposed change of ownership of NZ Bus. A Council decision on the proposed NZ Bus change of ownership will be sought at the 13 June 2019 Council meeting.

4. Transit fleet

The current Transit fleet includes 10 electric double decker buses (EVDD). The first 10 EVDD are performing well, with four now fitted with new telescopic pantographs, allowing these four to operate all day using the Reef Street fast charger. The buses yet to be fitted return to depot for charging between the morning and evening peak services.



The buses fitted with pantographs are achieving 250-300kms per day, whereas those without a pantograph are covering 100-120kms per day. The remaining six are planned to be fitted over the next six weeks.

The second tranche of 10 EVDD is contracted to be in operation by July 2020 and the third tranche of 12 EVDD by July 2021.

To provide additional charging resilience and enable routes other than the No 1 route to have all day services performed by electric buses, we are working with Transit to install a fast charger at the Wellington Station interchange. Initially Transit's portable fast charger will be utilised until a permanent charging facility can be installed. A permanent charger will be installed in conjunction with construction of the hotel development on Kate Sheppard Place which will extend into the interchange. A date for the development is not yet known.

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7(2)(b)(ii)

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- [Redacted list item]

7(2)(b)(ii)

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5.

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7(2)(b)(ii)
&
7(2)(f)(i)

[Redacted text block]

[Redacted text block]

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6. Development of GWRC Electric Bus Strategy

GWRC is preparing an Electric Bus Strategy to guide future decisions about the acquisition of electric buses to service the Metlink network. An electric bus strategy is required to inform a transition approach, transition targets and investment requirements to achieve a fully electric bus fleet.

Three transition scenarios for different rates of electric bus deployment are being considered for the purposes of this strategy. Note that scenarios 1 and 2, which assume current interim buses are replaced with diesel, were scoped prior to GWRC reaching in-principle agreement with NZ Bus for the replacement of 51 interim buses with new electric buses.

The three transition scenarios modelled are:

1. 'Organic' - Electric buses only are procured from 2021 to meet growth needs and to replace age expiring buses, i.e. as existing buses reach 20 years of age. This scenario assumes that buses needed to meet immediate capacity gaps and the replacement of current interim buses are fulfilled by new diesel buses.
2. 'Big bang 2027' - As for Scenario 1 but electric vehicles only are specified in all future bus contracts from 2027, i.e. at the re-tendering of the current PTOM bus contracts at end of term.
3. 'Aggressive from 2020' - As for Scenario 2, but including the immediate investment in electric buses to meet immediate capacity gaps and the replacement of current interim buses.

These scenarios are being compared against a do nothing base case of diesel only buses for the foreseeable future.

We have engaged external advice to support the development of the electric bus strategy. An engineering consultancy has been engaged to undertake a high level review of the region's electrical infrastructure, in relation to electric bus charging, to understand where electrical capacity may be a constraint to the deployment of electric buses and any costs associated with removing this constraint. A financial consultancy has also been engaged to develop a financial cost model which sets out the costs for different electric vehicle transition options and to update GWRC's existing Emissions Model to calculate changes in emissions from the different transition options.

The strategy provides a high level assessment of different transition scenarios, using known technology in battery electric buses. While the strategy describes alternative technologies in zero emission buses, such as hydrogen fuel cells, it does not go into the tactical deployment of an electric bus pathway by recommending specific technologies or specific route deployments.

The critical path activity for developing the electric bus strategy is the electrical infrastructure review. We have received a draft report for this activity and expect this to be finalised by mid-May 2019. The financial model will be completed using inputs from the electrical infrastructure review, and therefore final considerations for the transition scenarios and recommendations will follow the final financial model outputs.

It is therefore proposed to workshop indicative findings of the electric bus strategy at the Council workshop on 4 June and present the final strategy for endorsement at the Sustainable Transport Committee meeting on 19 June.

**These items
were not
presented at
these
meetings**

7. Communication

External communication is required as an outcome of this report with affected stakeholders.

No other external communication is required at this stage; however, Council may wish to consider providing an update to the public on the process that is being followed to implement the next stages of its transition to an electric bus future.

8. Consideration of climate change

The matters addressed in this report have been considered by officers in accordance with the process set out in the GWRC Climate Change Consideration Guide. The matters addressed in this paper report on future fleet options that will contribute to an overall reduction in gross regional greenhouse gas emissions.

9. The decision-making process and significance

Officers recognise that the matters referenced in this report may have a high degree of importance to affected or interested parties.

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

9.1. Significance of the decision

Part 6 requires GWRC to consider the significance of the decision. The term 'significance' has a statutory definition set out in the Act.

Officers have considered the significance of the matters, taking the Council's significance and engagement policy and decision-making guidelines into account. Officers recommend that the matters be considered to have low significance as they relate to the next steps to effect previous decisions made by Council.

9.2. Engagement

Engagement on the matters contained in this report aligns with the level of significance assessed. In accordance with the significance and engagement policy, no engagement on the matters for decision is required.

10. Recommendations

That the Council:

- 1. Receives the report.*
- 2. Notes the content of the report.*

NZ Bus electric bus proposal

3. *Notes that a Council decision about whether to approve Next Capital as the proposed new owner of the NZ Bus Group has not yet been made.*
4. *Notes the challenges and risks associated with the converted trolley option*
5. *Agrees that the converted trolley bus option will not proceed.*
6. *Notes the contents of the Memorandum of Understanding agreed between the Chief Executives of GWRC and NZ Bus as set out in Attachment 1 to this report.*

7(2)(b)(ii)

7. [REDACTED]
8. *Notes the indicative impact on the long term plan budget if the proposed procurement of 51 new electric buses proceeds.*
9. *Notes that the final cost of 51 new electric buses is subject to NZ Bus seeking pricing proposals from the market.*
10. *Agrees to the proposal from NZ Bus (subject to Next Capital approval) to seek proposals for the procurement and phased introduction of 51 new electric buses.*
11. *Notes that each of Council, NZ Bus's Board and Next Capital must agree to proceed with the proposed procurement of the new electric buses following receipt of proposals from the market.*
12. *Notes that any final Council decision to approve the NZ Bus procurement of 51 new electric buses will be subject to:*
 - a. *final pricing being approved by GWRC, and*
 - b. *the terms and conditions of a Contract Variation (on terms satisfactory to GWRC) being agreed by NZ Bus and approved by Council.*
13. *Notes the proposed refurbishment of approximately 18 'interim' buses to Metlink standards to meet fleet growth requirements since Partnering Contract commencement as outlined in the Memorandum of Understanding set out in Attachment 1 to this report, is subject to the terms and conditions of a Contract Variation (on terms satisfactory to GWRC) being agreed by NZ Bus and approved by Council (if required).*

7(2)(b)(ii)

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

7(2)(b)(ii)

Electric bus strategy

16. Notes the scope of the Electric Bus Strategy and the timing for presentation to Council.

Report prepared by:

Andrew Cooper
Advisor, Public
Transport

Report approved by:

Wayne Hastie
General Manager,
Strategic Programmes

Report approved by:

Greg Campbell
Chief Executive

Attachment 1: Memorandum of Understanding

Attachment 2: Timeline of proposal

Restricted public excluded