Lessons from rolling out electric buses in Auckland

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NZ Electromoblity Summit

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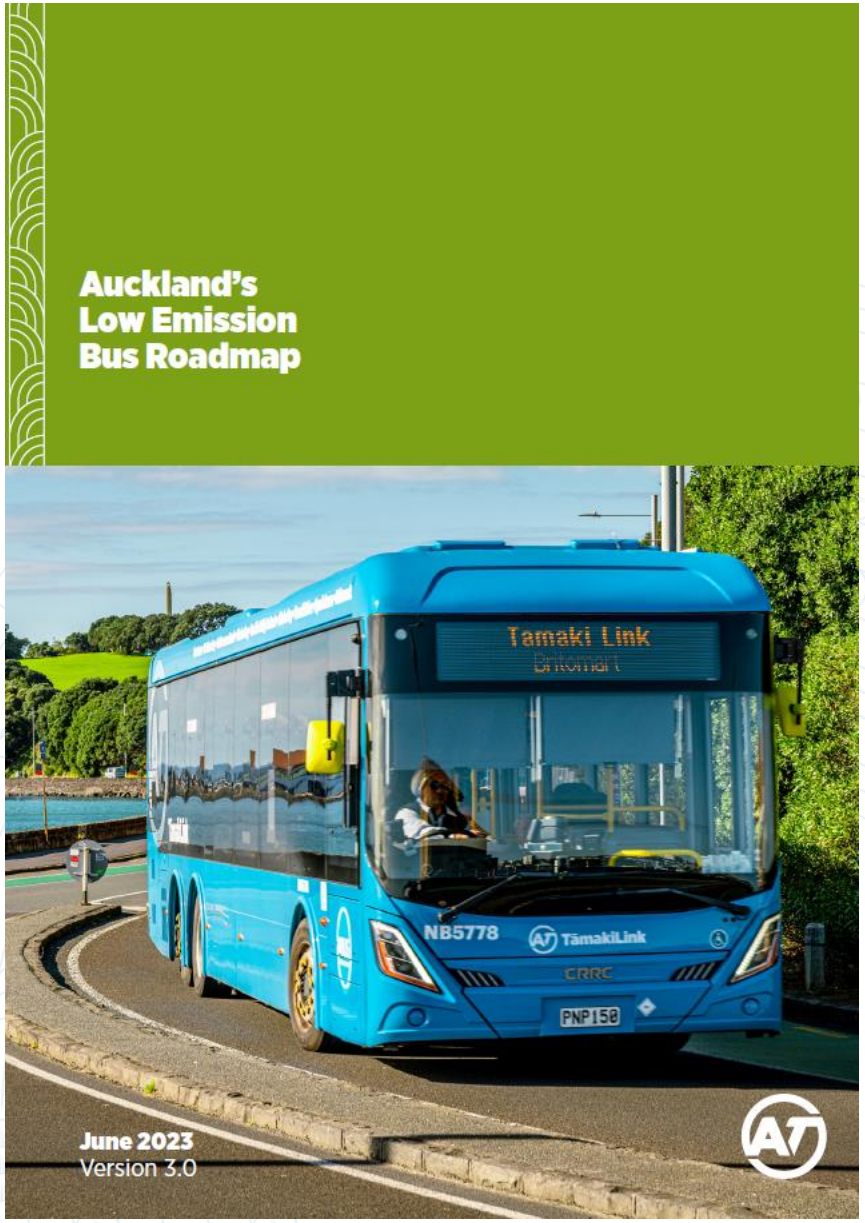
About Auckland Transport

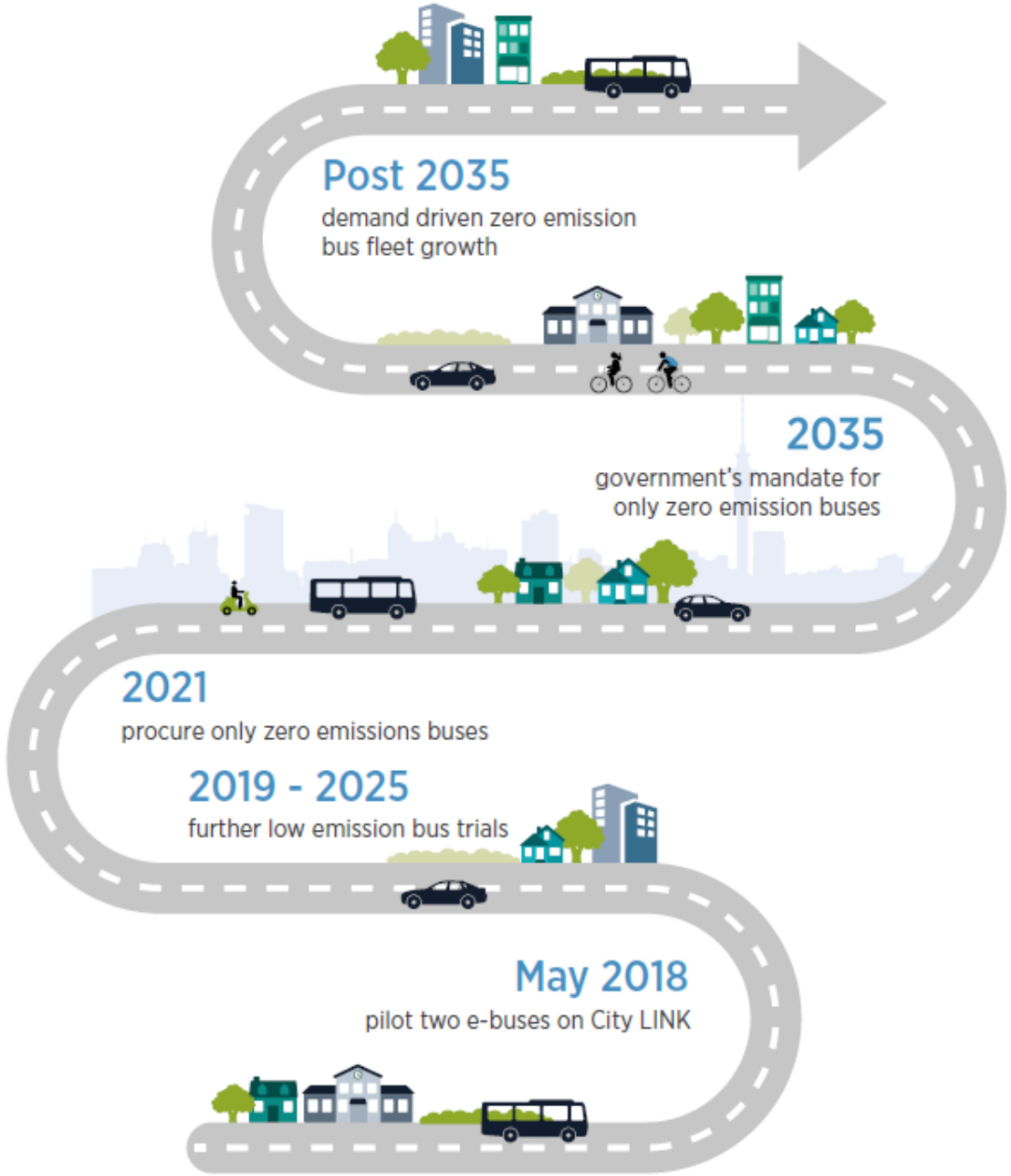
- We are an Auckland Council controlled organisation
- We plan and contract public transport services in Auckland
- The public transport fleet owned by us or our contracted operators includes:
  - 1350 buses
  - 29 ferries
  - 72 trains


7 Bus Operators
Approx 1350 Buses
186 Routes
56 million KMs travelled
in FY23

Low Emission Bus Roadmap

- Auckland has led the way trialling and introducing zero emission buses and associated technology in Aotearoa.
- Our Low Emission Bus Roadmap sets out our pathway to a zero emission bus fleet.
- Three versions have been published since 2018, the third was released this week.
- The cost of transitioning to a zero emission bus fleet is a $620 million premium compared to do nothing costs between 2021 and 2040.




Post 2035
demand driven zero emission
bus fleet growth
2035
government's mandate for
only zero emission buses
2021
procure only zero emissions buses
2019 - 2025
further low emission bus trials
May 2018
pilot two e-buses on City LINK

Bus decarbonisation milestones

- In 2021 our Airport Link and City Link services went electric
- In 2022 the Tāmaki Link service joined them
- 43 new electric buses joined the fleet this week
- There are now 133 zero emission buses in operation – roughly 10% of our fleet
- Opportunity to introduce significantly more zero emission buses as current contracts expire

Hydrogen bus trial

- Only Hydrogen fuel cell bus currently operating in New Zealand
- Current fuelling process slow and cumbersome
- Faster fuelling options becoming available soon
- This will allow the vehicle to be fully tested alongside equivalent diesel and electric buses

Bus depots

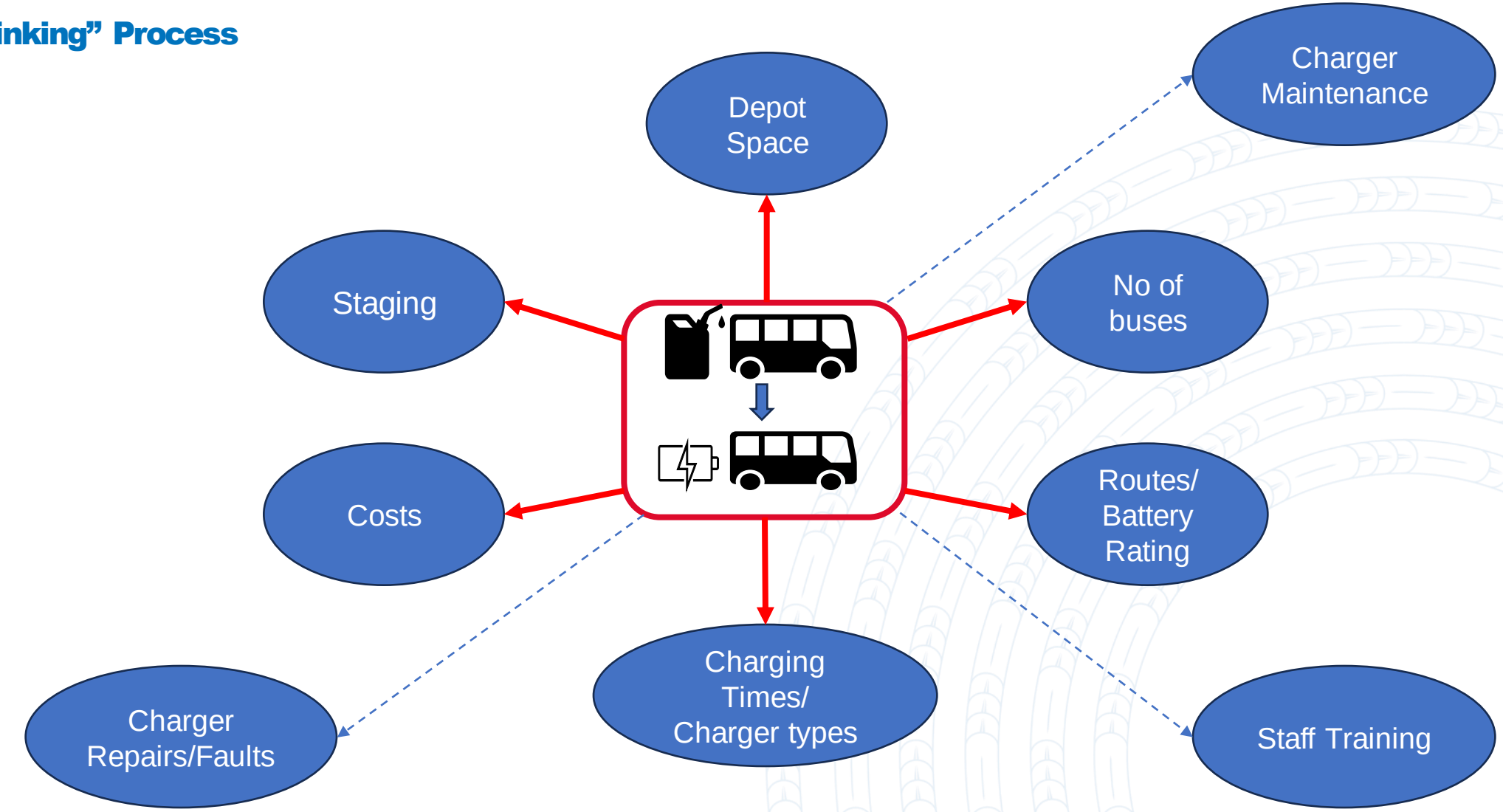
- Panmure depot was the first fully electric depot in New Zealand
- New Lynn depot is currently our largest electric depot
- Ti Rakau Drive depot is Auckland Transport owned, allowing us to get a better understanding of challenges and opportunities as infrastructure owner

Top-up chargers

- Means buses can be charged away from depots
- Can be aligned with when drivers are taking breaks
- Four locations around Auckland:
  - Manukau Bus Station (installed and operational)
  - Albany Bus Station (installed and operational)
  - Quay Street, near Spark Arena (project underway)
  - Panmure Station (project underway)

Depot Electrification

The “Thinking” Process



Depot Electrification

The Bigger Problem – Getting Power to Site

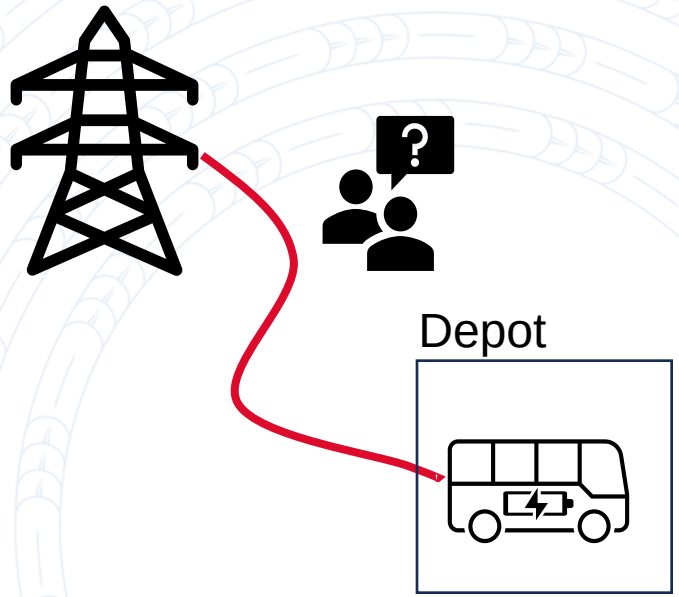
This can be challenging as the bus operator needs to be able to communicate the depot requirements to the local lines company.

Some information ***required*** by the lines company to be able to support the operators are

- Size of transformer required (kVA)
- Is the supply going to be HV or LV connection
- Location of transformers on site
- Daytime/nighttime power requirement

Some terminologies used by Lines company when giving solutions :

- Ring main units/HV switches
- N-1 supply
- Upstream works

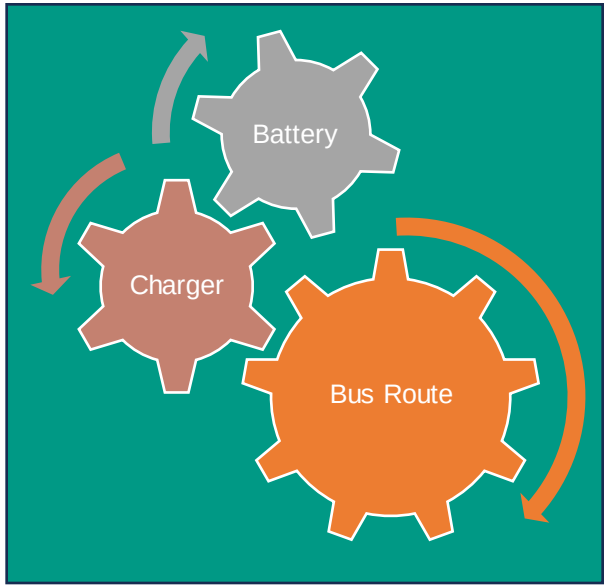


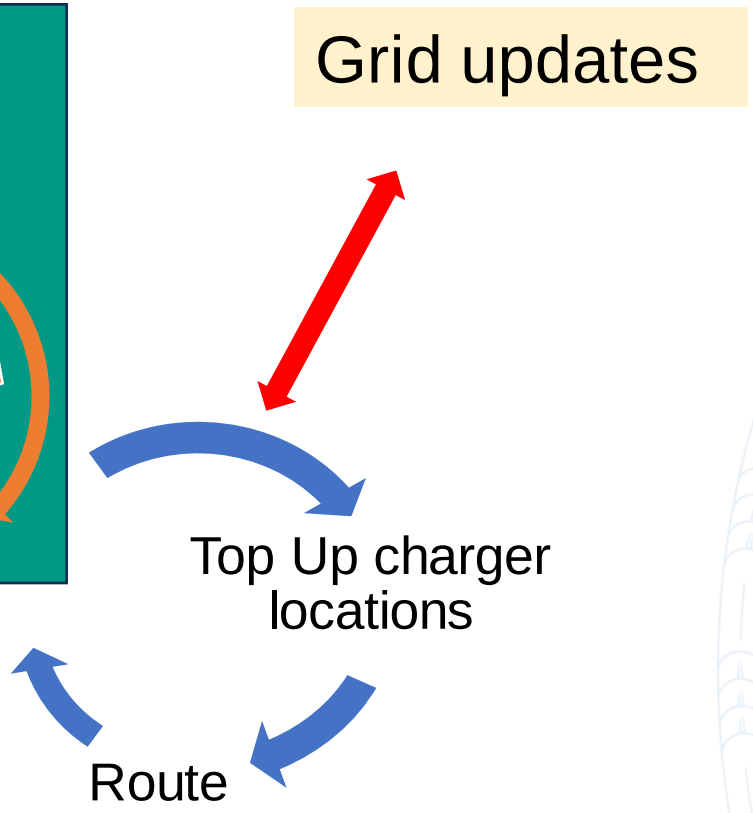
Depot Electrification – Working Together

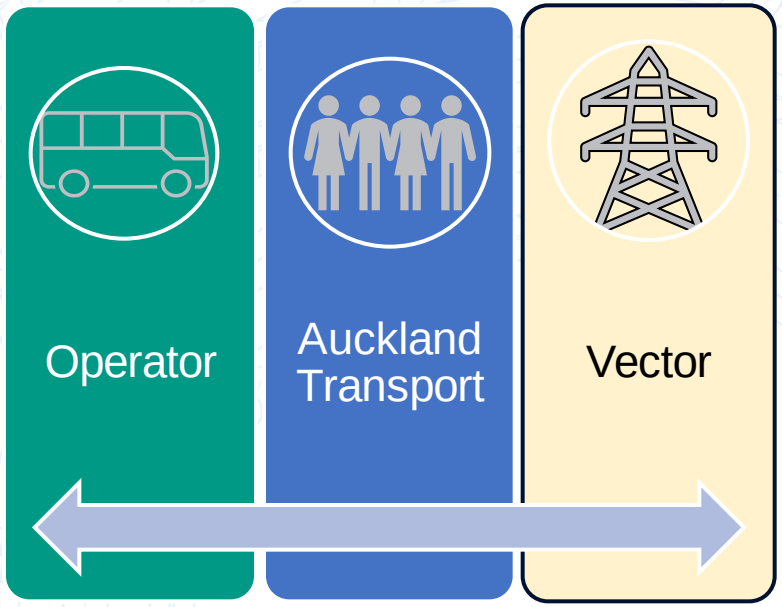
Bus Operator + Vector + Auckland Transport

Based on 2020 Grid Impact Study in 2020 with Vector:

Approx 1350 buses will about 63.5MW from grid.

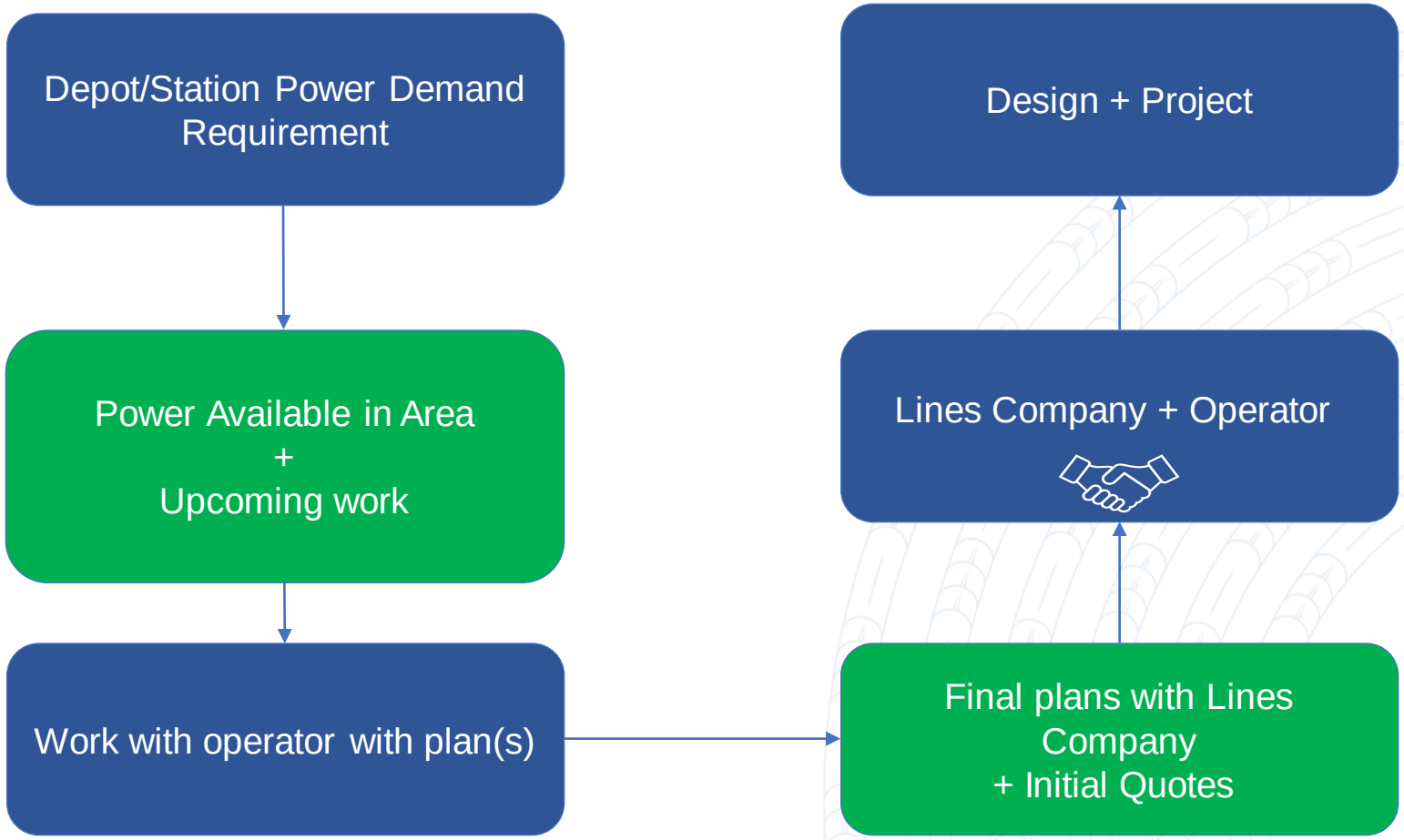






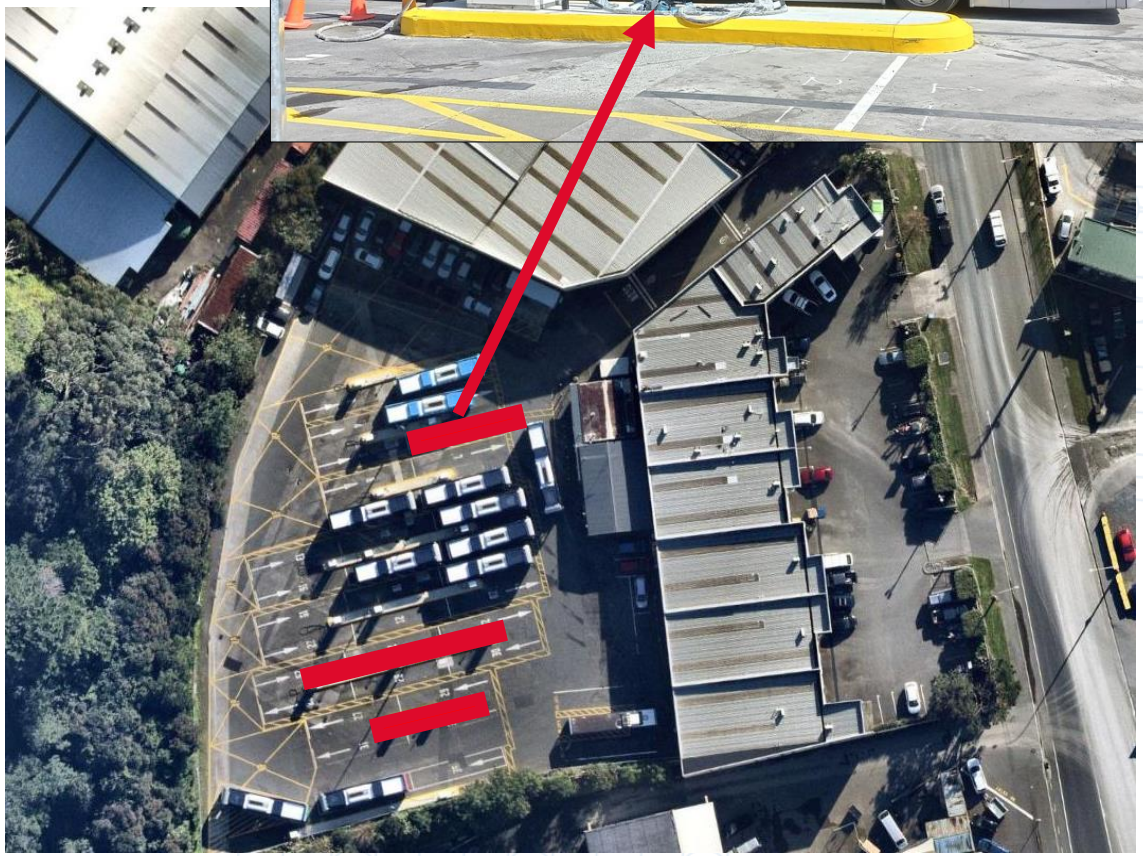
Depot Electrification

Planning Stage – Bring Depot & Lines Company Together (AT)



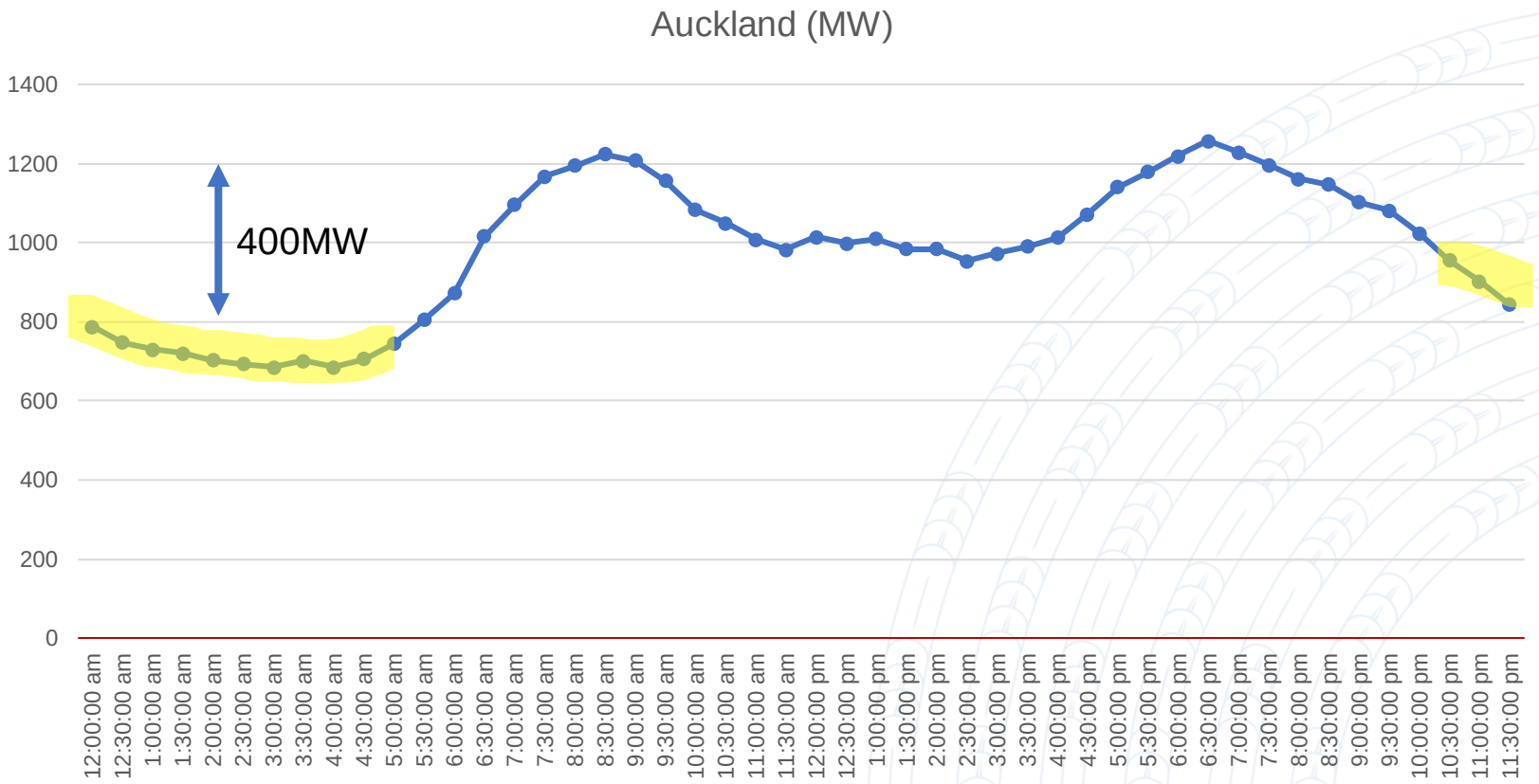
Challenges

Space Constraints



Challenges

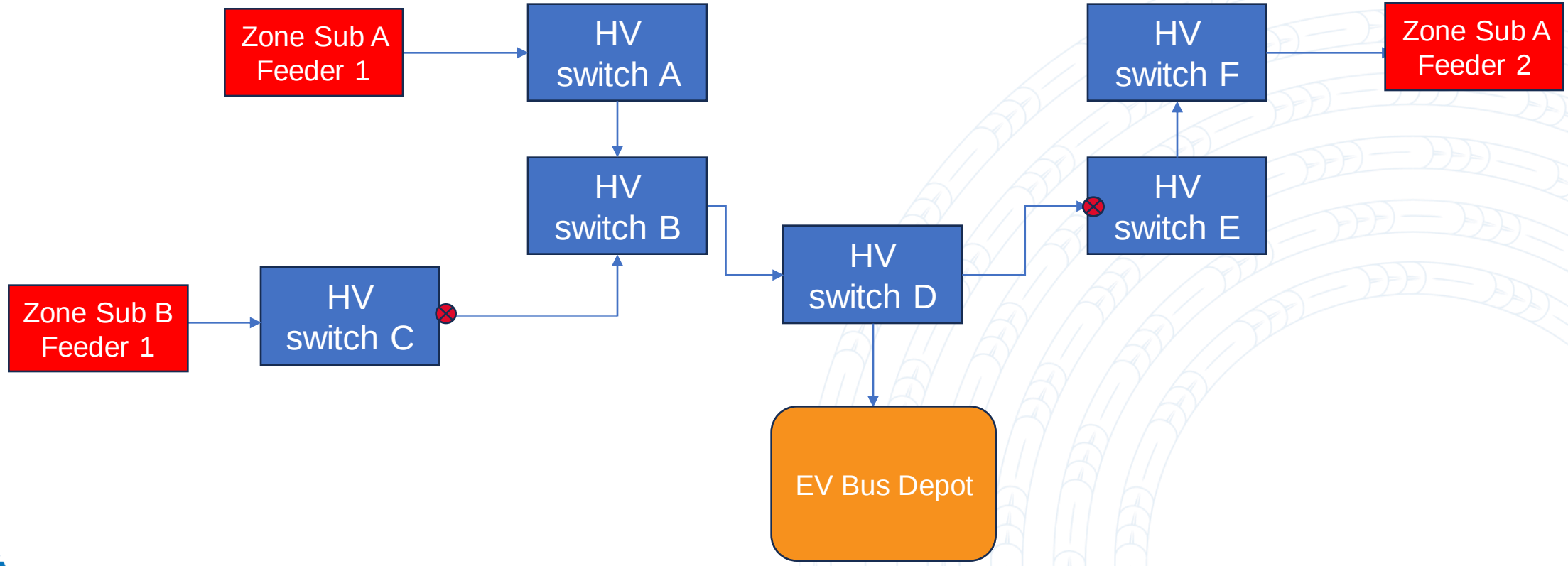
Day/night-time capacity



Source: Transpower Website – Live load Data (30th August 2023)
https://www.transpower.co.nz/system-operator/live-system-and-market-data/live-load-data

Challenges

Security of Supply



Challenges (continued)

Technology Advancements

(maintenance, repairs, spare parts, strategic spares)

Industry Practice Standards and Compliances

Unforeseen events

Bus on road running low on Charge

The lessons we've learnt along the way

- Engagement and partnerships are key
- Transparency between all parties involved is essential
- There's not always a one size fits all solution – tailor to specific situation and constraints
- Testing and trialling technologies helps build confidence
- Planning for and transitioning to a zero emission fleet is time and resource intensive, but worth it