



**TRANSIT
SYSTEMS**

Australia's Greenest Bus Fleet and Largest Electrified Depot

Developing the zero-emission fleet transition business case

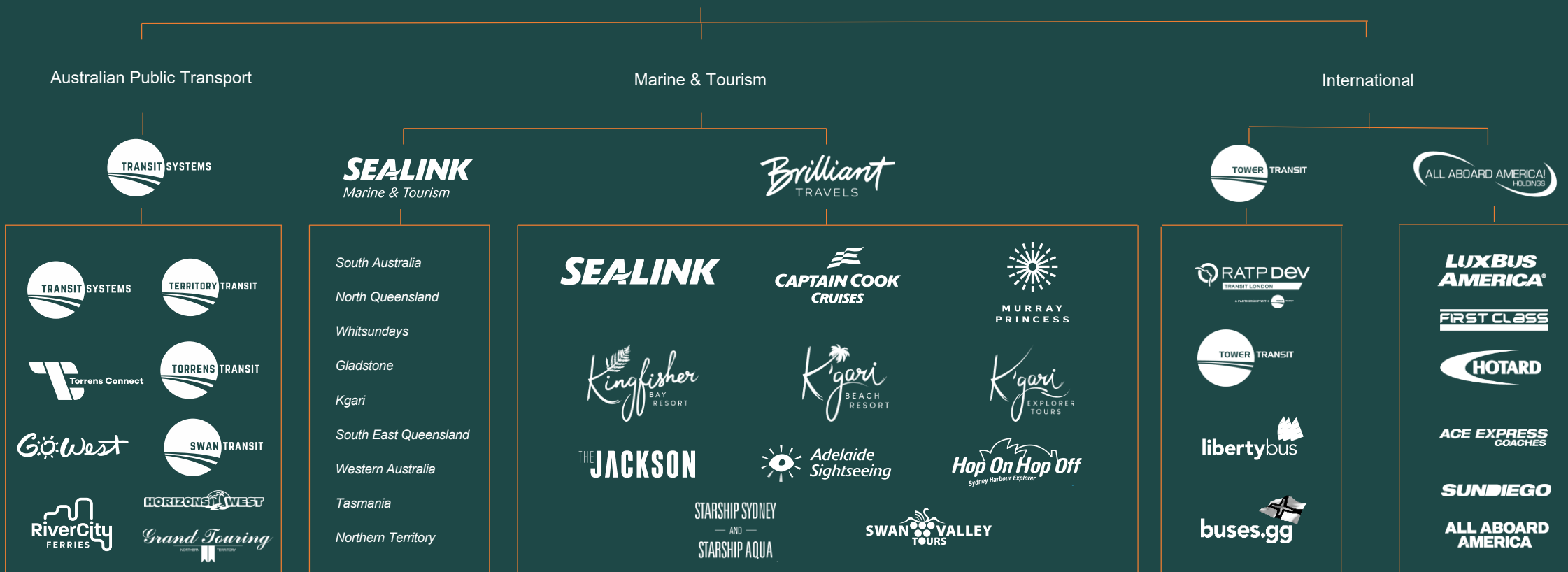
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Transit Systems

Part of Kelsian Group



Transit Systems

 164 Million Customer Journeys  6,699 Employees  3,703 Buses  102 ZEBs  32 Vessels





Australia's Greenest Bus Fleet

Our ZEB Fleet

4 (2019) to 102 (2024) Zero-Emission Buses



NSW

4 x BYD D9RA / Gemilang Eco BEBs
1 x Yutong E12 BEB

2019

2020



NSW

10 x BYD D9RA /
Gemilang Eco BEBs

2021



NSW

31 x BYD D9RA x
Gemilang Eco BEBs
9 x Yutong E12 BEBs

2022



WA

4 x Volvo BZL /
Volgren Optimus BEBs

2023



VIC

9 x BYD D9RA / Volgren Optimus BEBs
2 x ARCC HFCBs



SA

2 x Foton Mobility Distribution HFCBs
1 x Scania Bustech BEB



WA

1 x BCI Fleetmaster E BEC



NSW

6 x Custom Denning Element BEBs
10 x Yutong E12 BEBs
5 x BYD D9RA / Gemilang Eco BEBs
3 x BCI Citirider BEBs

2024



WA

WA: 1 x Yutong D7E BEB

Our Current Charging Infrastructure Manufacturers

Summary: 41 x AC charge points; and 39 DC charge points



Our ZEB Transition Partners



ZENOBÉ



Australia's Largest Electrified Bus Depot

Leichhardt Depot

Depot History

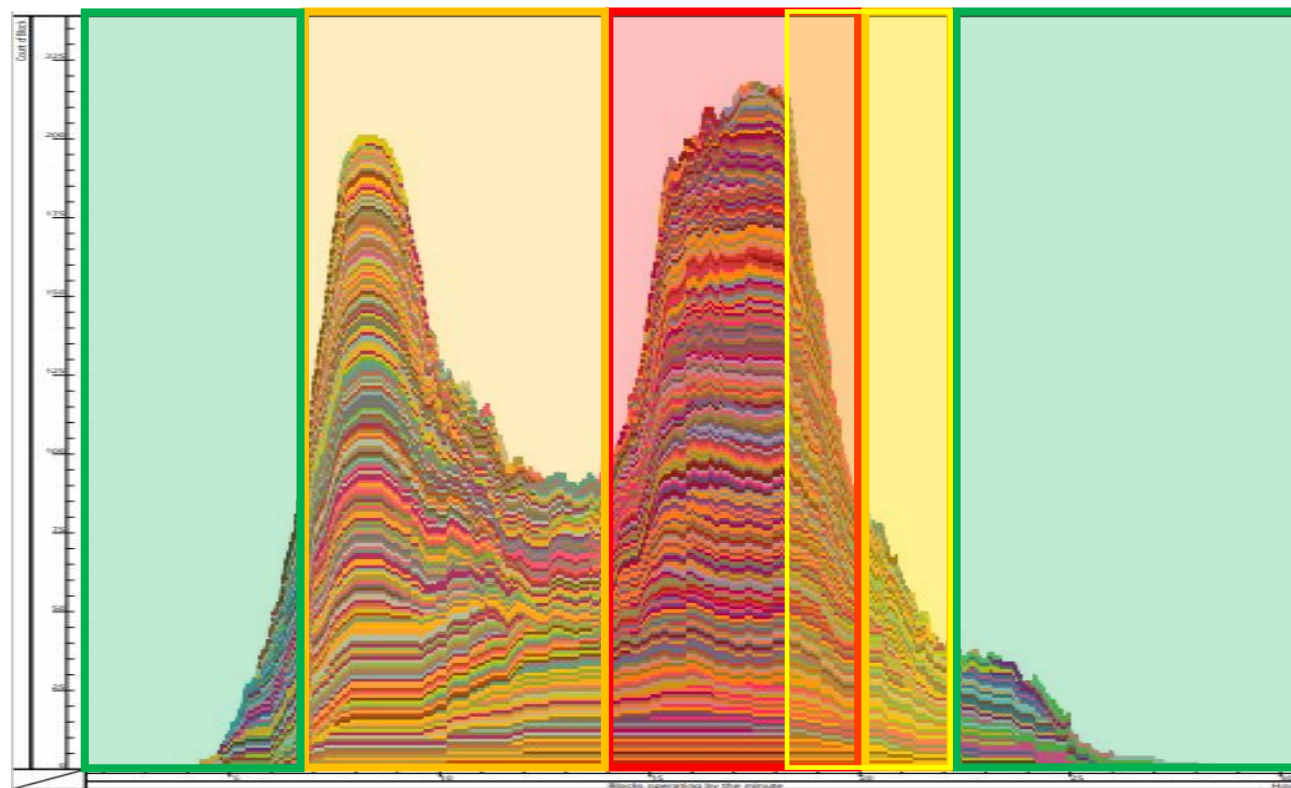
- Original site opened in 1915 as a tram storage facility
- Converted to a bus depot in 1937
- Opened new depot in 2009

Key Statistics

- **10-15** minutes west of Sydney
- **200** total bus fleet
- **59** x battery electric buses
- **49** x charge points
- **388kWhp** solar array
- **1.3MW / 2.6MWh** battery energy storage system



Solar / Battery / Grid Utilisation (Peak Shaving)



Electricity Tariffs: **Off Peak**; **Shoulder**; **Peak**

***** **Benefit of Solar / Battery** *****

Total Cost of Ownership Model

Considerations when developing the business case

Internal Combustion Engine Bus	Battery Electric Bus
Asset Capital Cost (↑)	Asset Capital Cost (↓)
Asset Residual Value (known)	Asset Residual Value (unknown)
Asset Design Life (25 years)	Asset Design Life (25 years)
Bus Range (~500km ↑)	Bus Range (~300-350km ↓)
Refuelling Infrastructure Costs (↓)	Charging Infrastructure (↑)
Diesel Fuel Cost (↑)	Green Energy (↓)
Economy Rate (L/100km)	Economy Rate (kWh/km)
Routine Asset Management (Labour / Parts ↑)	Routine Asset Management (Labour / Parts ↓)
Major Component Replacement (Engine / Transmission ?)	Major Component Replacement (Batteries / Motor/s / Controllers ?)
Training (Asset Management / Driver -)	Training (Asset Management / Driver -)
On Road Costs (Capital Cost ↓ / Risk -)	On Road Costs (Capital Cost ↓ / Risk -)

Non-Financial Benefits

Considerations when developing the business case

Internal Combustion Engine Bus	Battery Electric Bus
Strategy (ESG ✘)	Strategy (ESG ✔)
Environmental (Euro 6 ✘)	Environmental (Zero Emission ✔)
Community (Street Environment ✘)	Community (Street Environment ✔)
Residents (Bus Terminus / Bus Stops ✘)	Residents (Bus Terminus / Bus Stops ✔)
Customers (Comfort / Noise / Vibration ✘)	Customers (Comfort / Noise / Vibration ✔)

*“Just rode on one of the electric buses and wanted to say **the ride is fantastic – very smooth, quiet, and with no annoying vibration.** Very enjoyable experience and would definitely be more inclined to choose the bus given the ride quality.”*

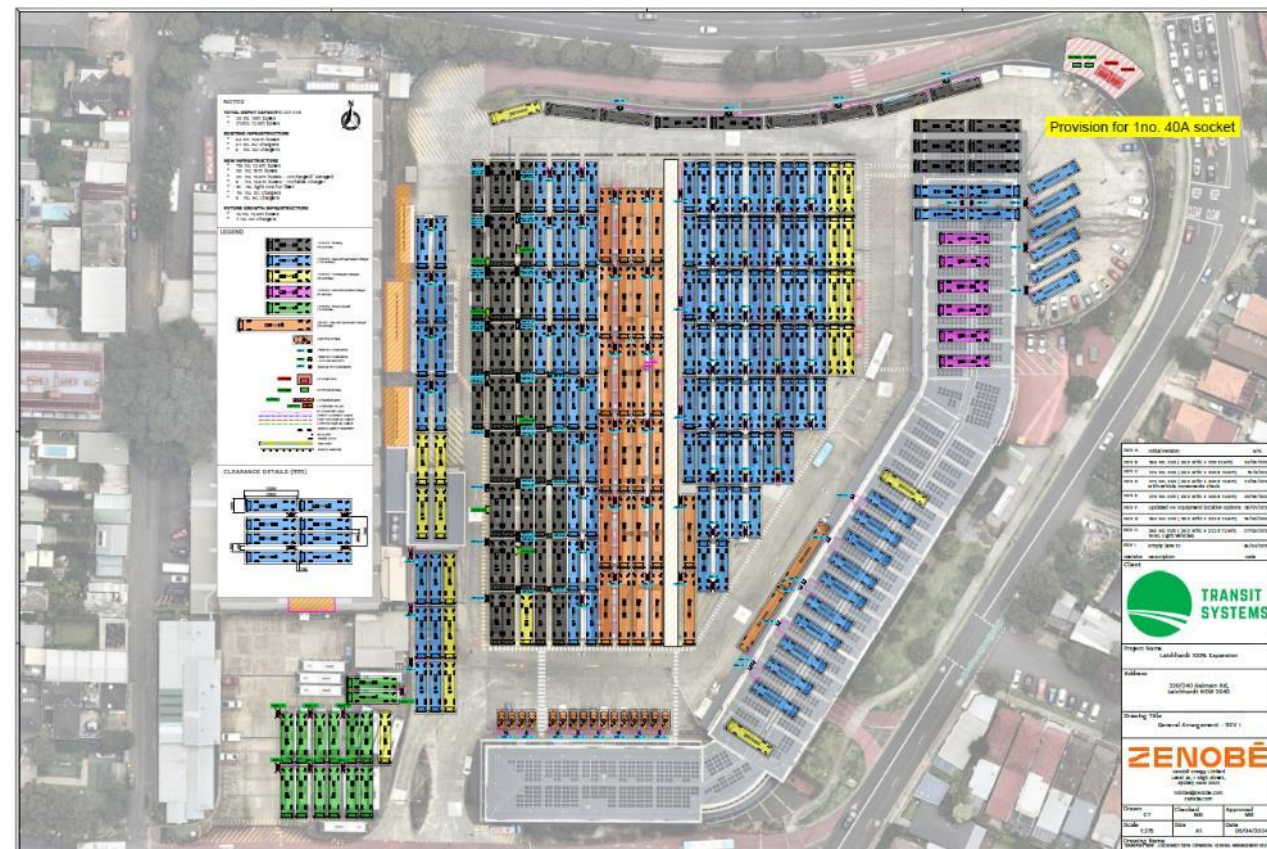
*“I am writing to compliment the recent project to trial electric buses around Sydney. I live on Burton Street in Darlinghurst and would **sadly be woken up quite regularly by the bus engines** as they have to hill start outside the apartment. **So loud, so noisy,** even when using earplugs. **The electric buses are quite honestly a dream!** Not only great for the environment but **so quiet.** I have been sleeping all through the night. People can often take the time to complain, and nowhere near as frequently compliment. This deserves a huge compliment, please keep it up!”*



What's Next?

What's Next?

- 100% depot electrification
 - Leichhardt
 - Kingsgrove
 - more developed, awaiting announcements
- Medium-scale hydrogen fuel bus deployments
- ZEB / charging infrastructure performance evaluation
- High-capacity ZEB trials (double-decker and articulated)
- Data analysis
- TCO model refinement





Thank you!