

# Yarra Trams Neighbourhood Battery Investigation



Keolis Downer, proud operator of Yarra Trams, has undertaken a project to investigate the feasibility of hosting neighbourhood batteries on land within the tram rail network.

## Introduction

Neighbourhood batteries are mid-scale energy storage solutions that can generate financial, network and community benefits. Neighbourhood batteries could support Yarra Trams existing sustainability and emissions reduction efforts, help to facilitate the transition to electric passenger vehicles and provide benefits to the community. Understanding that land availability can be a key barrier for neighbourhood battery deployment, this project explored the feasibility and opportunity of using land in the tram rail network for front-of-meter neighbourhood batteries.

This project was funded by the Department of Energy, Environment and Climate Action (DEECA) via the Neighbourhood Battery Initiative program (round 3), and Yarra Trams partnered with Yarra Energy Foundation to deliver the project.

## Objectives

The objective of this project was for Yarra Trams to develop a business case for neighbourhood batteries at different locations across the tram network and sought to understand challenges and opportunities for neighbourhood battery deployment specific to transport land. The project has developed a business case for neighbourhood batteries on tram land, considering sites across multiple locations, including rail corridors, substations and depots. The final business case

assesses, in detail, 14 locations in four network areas (Jemena, AusNet, CitiPower and United Energy) for potential implementation of a Battery Energy Storage System (BESS).

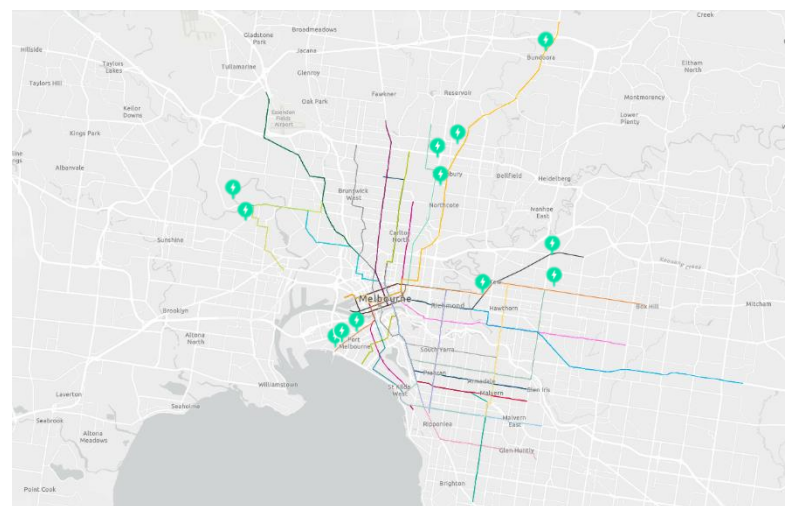


Figure 1 Assessed Locations

The business case quantifies the community and, where relevant, the network benefits arising from each of the neighbourhood batteries. It details the economic and environmental value, including business models, project benefits, and risk considerations. Financial projections, informed by battery suppliers and retail/system dispatch service providers, cover revenue, earnings, and Net Present Value (NPV) for each battery. Implementation guidance for each identified location includes indicative project plans and budgets, site overviews, and possible installation layouts. Additionally, an overarching Stakeholder Engagement Plan outlines best-practice engagement activities to support the delivery and installation of battery projects.

### **Key Findings from Financial Projections**

For all sites, the financial projections excluded potential revenue from peak price events, future markets, and electric vehicle charging, and as such the financial performance could improve if these value streams are included. All systems were found to have positive earnings, with total revenues per system modelled to be between \$100,000 and \$130,000 over 10 years of operation. The best returns were observed in the CitiPower network.

Only two of the fourteen locations investigated were found to have positive NPVs, while all other sites returned negative NPVs. The positive NPV is largely attributed to project cost savings at sites where a neighbourhood battery could be installed alongside planned substation projects.

### **Key Considerations for Transport Land**

Assessment of several potential sites identified benefits and disadvantages of different locations for hosting a neighbourhood battery, particularly with regard to installation costs, potential benefits for Yarra Trams and community impact.

Acknowledging the unique tram corridor environment, the project developed a strategy for earthing, bonding, and electrolysis requirements for community battery installations. In developing this strategy, four key risks that could be introduced by the installation of the community batteries were identified:

- Corrosion risks due to stray Direct Current,
- Earth potential rise (EPR) risks due to faults in the Yarra Trams 600 VDC system,
- EPR risks due to a High Voltage (HV) Alternating Current (AC) earth fault at a Yarra Trams asset, and
- EPR risks due to an HV AC earth fault in the electrical supply authority's system.

The strategy proposed measures to address these risks, including a minimum clearance between the BESS and metal assets, and a site-specific earthing assessment before installation to determine if additional measures are needed.

### **Outlook**

Neighbourhood batteries have the potential to play an important role in the energy transition, however land access remains a major barrier to their deployment. This project demonstrated opportunities to use tram land to contribute to the energy transition, and provide community and environmental benefits.

The project has offered a deeper understanding of the feasibility of installing neighbourhood batteries on tram land, while also identifying key challenges and opportunities. The comprehensive business case and site assessments have demonstrated how community value could be maximised if Yarra Trams proceed with the installation in the future.