Sustainable action for a better tomorrow

The ENA and Associated North Island EDBs

North Island EV Journey Charging Project – Methodology Report

Final Report

11/02/2026

Revision	Date	Revision Details	Author	Verifier	Approved
1	26/11/2025	Initial Report	HOC/SC	DT	RS
2	11/02/2026	Final Report	HOC/SC	DT	RS

Contents

1. Glossary

EV	Electric Vehicle
DC	Direct Current
EDB	Electricity Distribution Business
CPO	Charge Point Operator
NZTA	NZ Transport Agency/Waka Kotahi
AADT	Annual Average Daily Traffic
CCC	Climate Change Commission
EECA	Energy Efficiency and Conservation Authority
Location	Refers to the townships/places around the North Island that have been analysed
RFI	Request for Information

2. Project Details

2.1 Project Background

The New Zealand Government has committed to installing 10,000 public electric vehicle charging points across the country by 2030. Achieving this ambitious target requires thoughtful and informed decisions regarding the location and capacity of charging points to enable efficient investment in infrastructure. To date there has been no detailed analysis to identify suitable locations for these charging points, with respect to both traffic patterns and networks' available electrical capacity. A two-stage study was conducted to address this gap.

2.2 Stage 1: Modelling Charging Demand

DETA conducted a North Island wide analysis of light vehicle traffic flows using daily NZTA through-traffic data for major traffic routes to identify areas where charge points will be needed to service 2030 EV journey charging demand. Average, peak and 90^{th} percentile traffic flows in each location were analysed to ensure the charging points will cope during peak traffic seasons.

This analysis focuses only on **light vehicles** (less than 3.5 T) and **journey charging** needs. The demand forecast does not aim to meet the public charging needs of local traffic in the area as it was assumed a large amount of this charging would occur at home, or any destination charging requirements. Current charging capacity only considers public DC chargers with capacities of 50 kW or above in each location. However, in some circumstances certain chargers will not be counted and classified as destination charging, rather than journey charging, such if they were far away from main travelling roads.

2.3 Stage 2: EDB Engagement

On completion of modelling 2030 charging demand, DETA engaged with EDBs to gain information about the available electrical capacity on their network to meet the forecast demand. Information regarding available transformer capacity to meet the forecasted 2030 demand, suitable charging sites and high-level connection costs was sought.

Data tables for each EDB were formed, showing transformers in each location with spare capacity and their indicative costs to connect to a nearby proposed charging site.

2.4 Document Purpose

This document provides a detailed description of the assumptions and methodology used in the model to forecast the 2030 journey charging demand and how EDBs were engaged to gain capacity and costing data.

A summary of each section follows:

- **Modelling Assumptions:** States assumptions and data used in the model
- **Modelling Methodology:** Step by step process of how the demand forecast was built, broken down into location and traffic monitoring site selection, traffic analysis, and demand forecasting
- **EDB Engagement Approach:** Description of information requested from EDBs
- **Variations:** Description of variations between the North Island and South Island studies that arose due to feedback and recent findings
- **Appendices:** Supporting information on the choice of traffic monitoring sites, EV uptake forecast, turn-in rates, average battery capacity and current charging capacity

3. Model Assumptions and Data Sources

This section details all assumptions and data sources used to create the model, with explanations around why these assumptions were chosen.

Selected Locations and Traffic Monitoring Sites

- Locations were selected to ensure sufficient coverage of places to charge along the state highways of the North Island. EDBs were consulted on the list of locations in their area. Locations were assigned a relevant NZTA state highway traffic monitoring site[1] to provide representative traffic data. For larger locations where more than one state highway passes through, multiple traffic monitoring sites were used to represent the total traffic flow.

Traffic Counts

- 2021 quarter hourly traffic counts[2] from NZTA were used for building high-resolution traffic profiles. Aggregated 2021 daily traffic counts[3] were used to calculate peak and 90th percentile factors and estimate the peak and 90th percentile traffic counts.
    - 2021 data sets are the most recent and complete annual data sets available from NZTA for quarter hourly traffic flows.
    - While the traffic forecast generally correlated well following comparisons to daily traffic counts in 2024, individual adjustment factors were overlaid to improve accuracy by aligning modelled daily totals with 2024 NZTA daily totals data[4]. This was done for all locations for consistency.
- A request was made to NZTA to obtain more recent quarter hourly data, but the request was denied due to the volume of data. The traffic analysis should therefore be reviewed following the publication of more recent data.
- Annual traffic was assumed to increase in-line with New Zealand's forecast economic growth rate of 3% pa[5].

Turn-in Rates

- Major towns with a population over 35,000 were given a blanket turn-in rate of 20%. It was assumed that drivers are more likely to turn in at these places while travelling given the number of amenities available, making them attractive locations to stop and charge.
- Turn-in rates for other locations were estimated based on how far away traffic monitoring sites were from a 'medium' or 'major' town, determined by population. Medium towns were classified to have a population of 1,000 - 10,000, while major towns were classified to have a population over 10,000. It was assumed that the closer a monitoring site is to a major town, the lower the turn-in rate would be as the respective town is more likely to be a destination rather than a stop on a driver's journey.

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[1] State highway traffic monitoring sites
[2] TMS traffic quarter-hourly: Oct 2020 to Jan 2022 | Waka Kotahi open data
[3] TMS daily traffic counts CSV | Waka Kotahi open data
[4] State highway traffic monitoring sites | Waka Kotahi open data
[5] Regional Economic Profile | New Zealand | Economic growth

- Distances were calculated using Google Maps. Local population data used to determine turn-in rates were taken from the 2023 census[6]
- See Appendix A.3 for further details.

Charging Demand

- BEV uptake in New Zealand will be 10% of the total light vehicle fleet in 2030.
  - This number is an average of EECA's TIMES-NZ 2.0[7] TUI and KEA models and the CCC's model[8] for the percentage of EVs in the national light vehicle fleet. Note that the TIMES-NZ 2.0 models were published in 2021.
  - 10% is seen to be very optimistic at this stage due to the reduced uptake in recent years attributed to the removal of government financial incentives.
  - See Appendix A.2 for further details.
- Average light EV battery capacity will be 70 kWh based on current NZ EV market share[9]. See Appendix A.4.
- EVs will stop and charge their battery for an average of 30% of battery capacity over a half hour period. This is based on the small amount of NZ public charging data that DETA has access to, giving an average energy delivered per charge of 21 kWh.

Charging Supply

- Current charging capacity only considers public DC chargers with capacities of 50 kW or above in each location. However, for some circumstances, certain chargers were not counted as they were classified as destination charging, rather than journey charging. These are chargers that are further than 2.5 km from highway exit/entry points in large centres (pop. >35,000) due to required detours to reach them.
- Current charging capacity data was retrieved from:
  - EECA Public EV Chargers[10], NZTA Journey Planner[11], ChargeNet NZ[12], PlugShare[13], Tesla FindUs[14], Z Energy and BP apps
- The maximum output of chargers was limited to 170 kW to reflect the average maximum charging rate of the top 10 EVs purchased in 2025[15]
- Charging capacities were also reduced by an additional 30%:
  - 20% accounts for operational issues and downtime of chargers. Studies overseas have found that EV owners experience a problem during 1 in every 5 public charging sessions they initiate[16,17]

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[6] Place and ethnic group summaries | Stats NZ
[7] New Zealand Energy Scenarios TIMES-NZ 2.0 | EECA
[8] Ināia tonu nei: Modelling and data | Climate Change Commission
[9] EV Market Stats 2024 | EVDBNZ
[10] Data sources | EECA
[11] EV Chargers | NZTA Journey Planner
[12] Find your local EV charging station | ChargeNet
[13] EV Charging Station Map | PlugShare
[14] Find Us | Tesla
[15] Top Selling Electric Cars in New Zealand | Canstar
[16] The state of EV charging in America | Harvard Business School
[17] Many public EV chargers are unusable | The Conversation

    - 10% accounts for the model assuming perfect changeover of cars after each 30-minute charging slot, which does not reflect reality as some remain connected even after their car has been charged, causing inefficient use of the charger.
- Historical charging data would improve accuracy as it allows for a better understanding of charging profiles, behaviours, and outages. This was requested but was unable to be provided and used for this study.

4. Methodology

The methodology consists of three stages:

- Location and Traffic Monitoring Site Selection
- Traffic Analysis
- Demand Forecast

4.1 Location and Traffic Monitoring Site Selection

1. **Location Selection**
   - Locations on state highways around the North Island were analysed for journey charging suitability. This considered distance between locations with the aim of ensuring no more than 100 km between locations.
   - A qualitative assessment was undertaken to assess where drivers are most likely to stop on journeys between destinations in terms of amenities and routes.
   - Locations were selected, collated and sent to EDBs for feedback before confirmation.

2. **Traffic Monitoring Site Selection**
   - Once locations were confirmed, NZTA traffic monitoring sites were selected to assign traffic data to each location for modelling.
   - For some locations, multiple monitoring sites were selected and combined for analysis. This was due to two reasons:
     i. Some locations had three or more highways running through it, and in some cases, one site was not representative of the total traffic travelling to/through the location.
     ii. Some sections of highways had high volumes of traffic and so traffic monitoring sites only monitor one side of the road. To capture traffic flows in both directions, data from two sites on opposite side of the road were combined.
   - Sites were chosen using the following criteria:
     i. The monitoring site/s must count both lanes of traffic. Exceptions were made for busier state highway stretches (e.g. Auckland, Hamilton), where two sites were used to count, one in each direction.
     ii. The site/s should be at least 5 km away from a town centre to help minimise the impact of local travel. While a minimum of 5 km was targeted, sites are chosen on a case-by-case basis, so some will be located within this distance due to lack of other adequate sites. The list of traffic monitoring sites used can be found in Appendix A.1.
     iii. Where applicable, the site/s must have the highest annual average daily traffic (AADT) total out of each potential site on state highways passing through or leading to a town. The maximum AADT provides a conservative basis (highest volume of traffic) for charging demand. In most cases, a traffic balance around the town added up to AADT total where there are multiple state highways passing through or leading to a town.

- Note that the quantity of 2021 quarter hourly traffic data differed between sites. For example, some sites had data for all 12 months, while others only had data for 3 months. This may impact the accuracy of the data due to seasonal variations.
- Five locations (Ōhope, Te Puke, Papamoa, Mangawhai & Havelock North) were assumed to require EV charging in the future but were not assigned sites as they were not on state highways. 15% of the traffic flow from the closest location was assumed to pass through these places, noted in Appendix A.1.

4.2 Traffic Analysis

1. **2021 Traffic Profiles**
    - For each monitoring site, quarter hourly traffic data from NZTA was aggregated to half hour periods for an average day over each month of 2021. These daily profiles for each month were averaged to provide an average daily profile for 2021. Note that some sites did not have data for the full 12 months, which may increase uncertainty due to seasonal variations.

2. **2021 Traffic Profiles**
    - Daily traffic profiles were forecast out to 2030 using the 2021 average annual traffic profile and an assumed traffic growth rate of 3.0% pa. To increase accuracy, AADT data for 2024 was used to adjust the modelled 2024 profiles for all locations to align with 2024 AADT from NZTA.

4.3 Demand Forecast

1. **Average Charging Demand at Peak Half-hour**
    - To estimate the peak half-hour EV charging demand on the average day in 2030, the 2030 average half-hourly traffic forecast for each site was multiplied by the following parameters:
        i. 10% EV uptake
        ii. Turn-in rate % (percentage of EVs stopping to charge over total EVs driving past)
        iii. 21 kWh (Average battery capacity of 70 kWh charged by 30%)
        iv. 2 (factor to convert kWh to kW)

$$\text{Avg Half Hourly Demand (kW)} = \text{Halfhourly Traffic Count} \times \text{EV Uptake (10\%)} \times \text{Turnin Rate} \times \text{Charge (kWh)} \times 2$$

2. **Peak and 90th Percentile Charging Demand at Peak Half-hour**
    - Peak and 90th percentile factors were calculated by:
        i. Identifying the peak daily total traffic count in 2021.
        ii. The peak day factor was calculated by taking the 2021 peak daily traffic count over the 2021 AADT.
        iii. Calculating the yearly 90th percentile daily traffic count for 2021.
        iv. The 90th percentile factor was calculated by taking the 2021 90th percentile daily traffic count over the 2021 AADT.

- Peak charging demand was calculated by:
  i. Multiplying the average 2030 charging demand by the peak day factor.
  ii. Forecasts were compared to actual peak half hours on peak traffic days in 2021 to ensure correlation. An additional factor was used to adjust if required.
- 90th percentile charging demand was calculated by:
  i. Multiplying the average 2030 demand profile by the yearly 90th percentile factor.

3. **2030 Demand Forecast and Charging Requirements**
   - 2030 Demand Forecast:
     i. This is the forecast charging demand for the peak half hour for the average, peak and 90th percentile day in 2030.
   - 2025 Charging Capacity:
     i. Current public charging capacity determined using public charging data from various sources. See section 3.1.
   - 2030 Additional Charging Capacity:
     i. Subtracting current 2025 charging capacity from 2030 charging demand gave the average, peak and 90th percentile additional charging capacity forecasts.

5. EDB Engagement Approach

On the completion of modelling the 2030 charging demand in each location, each EDB was sent a Request for Information (RFI). The following information was requested for each location on the EDB's network:

1. A list of the **top 5 distribution transformers in terms of low connection cost** with spare capacity that can currently meet the **2030 peak traffic day peak additional demand** (rounded up to the nearest 50 kW).

   For each transformer, consideration should be given to the following EECA guideline points around public EV charging hubs:
   - Hubs in highly visible locations on, or adjacent to the highway network
   - Proximity to customer services such as cafeterias, other food, and toilets

   For each transformer, EDBs were requested to provide:
   - Transformer reference/ID
   - The rated capacity and available capacity (kVA)
   - General location of proposed charging site near each transformer
   - Location in coordinates of proposed charging site
   - Indicative connection cost from the transformers (+/- 20%) including cost caveats
   - Indication on if the spare capacity on the 5 transformers can meet the demand and if not, which transformer(s) are easiest to upgrade and provide upgrade cost
   - Any additional comments specific to the transformer

2. Information about current available capacity and plans to upgrade transformers in the next five years.

3. Specific sites where it would be cheap to connect with available capacity, and there is space for cars to charge (e.g. carpark near the council building on West St.).

An indicative costing note was provided by DETA:
- *DETA is not looking for tariff information, just the cost of connection, and the trenching and cabling costs to the selected charging site.*

- *This cost of connection is the net connection cost - if the total connection cost is $200k including any upfront capacity charges, and the EDB contributes 50%, then the connection cost we are looking for in this work is the $100k that the CPO pays upfront.*

- *DETA will state in the report the period that the costs were provided in and valid for and recognises that the work will be out of date as soon as it is published. It is a snapshot in time to share useful information.*

The Request for Information sent to each EDB included the information listed below, and a template for EDBs to fill out for each location that was forecasted to required additional capacity in 2030.

- 2025 DC charging capacity
- 2030 additional capacity required (average & peak)
- Peak time
- Peak/Avg factor
- Turn-in rate

It was stated that “Negative 2030 peak additional capacity shows that the model has forecasted that there will be sufficient charging capacity in 2030 in these locations. **Distribution transformer data is not necessary** to find for these places.” However, some EDBs provided upgrade costs for these locations.

An example of the *Data Template* tab in the RFI can be found in Appendix B.

The *Accompanying Information* tab included a space for EDBs to list any costing caveats or other information about how they bult up the indicative connection costs and chose the sites.

6. Variations

Updates Since South Island Study

While this North Island study follows on from the study completed in the South Island, we are continuously trying to improve our models and understanding of journey EV charging and best reflect reality. Therefore, more aggressive assumptions have been used in this piece of work with the updates collated below.

- Current charging capacity made up of ≥50 kW DC chargers (previously any DC charger):
  - The North Island study only considers a journey charger to be a DC charger that is 50 kW or greater. The original South Island work specified DC chargers of any capacity.
  - This change was made as it is unlikely that 22 kW DC chargers would be used for journey charging due to the increased time it would take to deliver energy to the car. Drivers would prefer to utilise higher capacity chargers to reduce time spent refuelling en-route to their destination.
- Existing charger capacity reductions
  - Public DC chargers (≥50 kW) were assumed to have a maximum output of 170 kW to reflect the average maximum charging rate of the top 10 EVs purchased in NZ in 2025. Studies overseas have found that people experience an issue with every 1 in 5 public chargers they use. To account for this and other inefficiencies in charging behaviour, all charging capacities were reduced by 30%.
- Peak day vs 90th percentile
  - EDBs were asked to use peak day demand data instead of 90th percentile demand data to find capacity on their networks. This was due to the peak day demand being the focus of the South Island study, making the 90th percentile values more redundant.
- Peak day correction factor
  - An additional correction factor was used to adjust the modelled peak half hour in the peak traffic day in 2021 to better align with the actual peak half hour using 2021 NZTA quarter hourly data.
- Turn-in rates
  - Following the South Island study, all turn-in rates were increased by 5%. This was done to account for:
    - Overly cautious drivers who may charge batteries up more often
    - Potential energy lost by travelling uphill
    - Drivers that are not aware of recharging properties when travelling downhill
  - Large towns with a population over 35,000 were given a blanket turn-in rate of 20%. It was assumed that drivers are more likely to turn in at these places given the number of amenities available, making them attractive locations to stop and charge.

Appendix A: Assumptions and Data

A.1 List of Traffic Monitoring Sites

The table below lists all locations and the assigned traffic monitoring sites used for traffic count data in the model. Note that Some locations have two traffic monitoring sites listed.

Five locations were not assigned sites as these were not close to state highways. These locations were assumed to have 15% of the traffic from the closest location, as noted in the table.

Table 1: Description of the Traffic Monitoring Sites for each Location

EDB	Location	Traffic Monitoring Site
1. Central Lines Ltd	Tikokino	500 m Sth of Makaretu River Bridge
1. Central Lines Ltd	Waipukurau	249 North Te Onepu Rd
2. Counties Energy	Pōkeno	MANGATAWHIRI - Telemetry Site 74 SH1 SH2 Interchange NB
2. Counties Energy	Pukekohe	SH22 East of Heights Rd
3. Electra	Foxton	Whirokino
3. Electra	Levin	OHAU - Telemetry Site 56
3. Electra	Ōtaki	Nth of Waitohu River Bridge
3. Electra	Paraparaumu	Nth of Waitohu River Bridge
4. Firstlight Network	Gisborne	Gisborne City Boundary
4. Firstlight Network	Matawai	ORMOND : Telemetry Site 26
4. Firstlight Network	Te Araroa	North of Tolaga Bay - Telemetry Site 115 (New Apr 2014)
4. Firstlight Network	Te Puia Springs	100 m Sth of Marotiri Culvert
4. Firstlight Network	Tolaga Bay	Uawa River Bridge
4. Firstlight Network	Wairoa	SH2 Ngamotu Rd North of Wairoa
5. Horizon Energy	Awakeri	OHINEPANEA - Telemetry Site 13 - West of Rogers Rd
5. Horizon Energy	Galatea	50m Sth of Forestry Rd overbridge
5. Horizon Energy	Kaingaroa	165m past SH5 (Waiotapu)
5. Horizon Energy	Kawerau	LAKE ROTOMA - Telemetry Site 22
5. Horizon Energy	Matata	OHINEPANEA - Telemetry Site 13 - West of Rogers Rd
5. Horizon Energy	Ōpōtiki	525m before Paerata Ridge Rd (Before Opotiki)
5. Horizon Energy	Te Kaha	1588 past Church Rd (Te Kaha)
5. Horizon Energy	Waimana	100m before Wainui Rd
5. Horizon Energy	Whakatāne	AWAKERI - Telemetry Site 92
5. Horizon	Ōhope	*15% of Whakatāne*
6. Northpower	Dargaville	MAUNGATAPERE - Telemetry Site 104
6. Northpower	Ruawai	About 1.5km east of Ararua Rd 1km west of Petley Rd
6. Northpower	Waipu/Ruakākā	Nth of Maungakaramea Rd Puwera
6. Northpower	Whangārei	Nth of Maungakaramea Rd Puwera
6. Northpower	Mangawhai	*15% of Waipu/Ruakaka*
7. Powerco	Bulls	SANSON - Telemetry Site 38
7. Powerco	Carterton/Greytown	CLAREVILLE - Telemetry Site 80 - Nth of Whites Line
7. Powerco	Coromandel	435m Nth of Rd 309 Coromandel
7. Powerco	Featherston	Sth of Tauherenikau River Bridge
7. Powerco	Feilding	Almadale Rd
7. Powerco	Hāwera	Hawera
7. Powerco	Hunterville	Vinegar Hill
7. Powerco	Kakatahi	SH4 @ Kakatahi - Nth of Lakes Hill Depot
7. Powerco	Martinborough	West of Princess St (Martinborough)
7. Powerco	Masterton	CLAREVILLE - Telemetry Site 80 - Nth of Whites Line
7. Powerco	Matarangi	12m before 1st Abut Opitonui Stream Bridge
7. Powerco	New Plymouth	TARIKI - Telemetry Site 6
7. Powerco	Ōmokoroa	Whakamarama Telemetry Site 124
7. Powerco	Ōpunake	Opua Rd

7. Powerco	Paeroa	WAIHI - Telemetry Site 34 - East of Samson Rd West
7. Powerco	Pahiatua	Ngawaparua
7. Powerco	Palmerston North	Ngui Rd Taonui Culvert
7. Powerco	Pauanui	65m before State Highway 25A
7. Powerco	Putāruru	LICHFIELD - Telemetry Site 21 - Sth of Baldwin Rd
7. Powerco	Stratford	TARIKI - Telemetry Site 6
7. Powerco	Taihape	Utiku Straights
7. Powerco	Tauranga	Whakamarama Telemetry Site 124 KAIMAI - Telemetry Site 12 - 100m past Boulder Brg (Kaukumoutiti Stream)
7. Powerco	Thames	200m Sth of SH25 Junction
7. Powerco	Tirau	50m Nth of Oraka Stream Bridge
7. Powerco	Tokoroa	TOKOROA - Telemetry Site 51 - (WIM Site)
7. Powerco	Waihi	WAIHI - Telemetry Site 34 - East of Samson Rd West
7. Powerco	Waiouru	HIHITAHI - Telemetry Site 29
7. Powerco	Waverley	WAITOTARA - Telemetry Site 5
7. Powerco	Whangamatā	Nth of Gladestone Rd
7. Powerco	Whangamōmona	Whangamomona
7. Powerco	Whanganui	Marangai
7. Powerco	Whitianga	790m past Cooks Beach Rd
7. Powerco	Te Puke	*15% of Tauranga*
7. Powerco	Papamoa	*15% of Tauranga*
8. Scanpower NZ	Dannevirke	Oringi
9. The Lines Company	Mokau	TONGAPORUTU Brg - Telemetry Site 78
9. The Lines Company	National Park	HOROPITO - Telemetry Site 37
9. The Lines Company	Ohakune	Ohakune East
9. The Lines Company	Otorohanga	100m Sth of Mangapu #2 Bridge
9. The Lines Company	Taumarunui	Okaihae Rd
9. The Lines Company	Te Kūiti	800m past State Highway 37 (Waitomo Rd)
9. The Lines Company	Tūrangi	HALLETTS BAY - Telemetry Site 42
10. Top Energy	Cape Reinga	South of Te Hapua Rd about 100m S of restaurant/service station.
10. Top Energy	Coopers Beach	East of Lake Ohia Bridge midway btwn Inland Rd & Pekerau Rd
10. Top Energy	Kaikohe	South of Old School Rd (about 7km east of Kaikohe)
10. Top Energy	Kaitaia	Sth (physically East) of Fryer Rd (about 1.3km W of Ruaroa Rd)
10. Top Energy	Kawakawa/Moerewa	KAWAKAWA - Telemetry Site 18 about 1.2km south of SH11
10. Top Energy	Kerikeri/Waipapa	Nth of Wakelin Rd (about 3.5km north of SH11)
10. Top Energy	Ōkaihau	Nth of Bullman Rd
10. Top Energy	Opononi	West of Waiotemarama Gorge Rd Pakanae
10. Top Energy	Pukenui	Nth of Ninety Mile Beach Rd (about 1.5km S of Waiharara)
11. Unison Networks Ltd	Hastings	330m Nth of Franklin Rd
11. Unison Networks Ltd	Napier	330m Nth of Franklin Rd
11. Unison Networks Ltd	Reporoa	98m before State Highway 1 (Wairakei)
11. Unison Networks Ltd	Rotorua	WAIPA - Telemetry Site 41- Sth of SH30 TARUKENGA - Telemetry Site 15 - 4.45km West of Dalbeth Rd
11. Unison Networks Ltd	Taupō	LICHFIELD - Telemetry Site 21 - Sth of Baldwin Rd HALLETTS BAY - Telemetry Site 42
11. Unison Networks Ltd	Te Haroto	TE POHUE -Telemetry Site 23 -1km Nth of Oakmere Station Gateway
11. Unison Networks Ltd	Tutira/Putorino	Tutira between Sandy Creek Rd & Matahoura Rd Sth
11. Unison	Havelock North	*15% of Hastings*
12. Vector	Auckland	Rosehill - Telemetry Site 7 - NB (Park Estate) Rosehill - Telemetry Site 7 - SB (Park Estate)
12. Vector	Helensville	SH16 Sth of Hutchison Rd
12. Vector	Kumeū /Waimauku	SH16 Sth of Matua Rd (Nth)
12. Vector	Silverdale	SH1 Silverdale Interchange NB (N11) SH1 Silverdale Interchange SB (N11)
12. Vector	Warkworth	Sth of Centennial Park Rd (Sth of Wellsford)
12. Vector	Wellsford	Sth of Centennial Park Rd (Sth of Wellsford)
13. Waipa Networks Ltd	Cambridge	KARAPIRO - Telemetry Site 20
13. Waipa Networks Ltd	Te Awamutu	OHAUPO - Telemetry Site 119

14. WEL Networks	Hamilton	OHAUPO - Telemetry Site 119 KARAPIRO - Telemetry Site 20
14. WEL Networks	Huntly	TAUPIRI - Telemetry Site 19 - Nth of Gordonton Rd
14. WEL Networks	Raglan	200m West of Maori Point Rd
15. Wellington Electricity	Lower Hutt	REMUTAKA - Telemetry Site 01- Pakuratahi River Brg
15. Wellington Electricity	Porirua	PAEKAKARIKI - Telemetry Site 47 (Piezo Axle Classification)
15. Wellington Electricity	Upper Hutt	REMUTAKA - Telemetry Site 01- Pakuratahi River Brg Poplar Ave Int Mainline Northbound

A.2 Chosen EV Uptake Forecast

The Climate Change Commission (CCC), TIMES-NZ TUI and TIMES-NZ KEA EV uptake forecasts (as a percentage of the total light vehicle fleet in New Zealand) can be seen in Figure 1.

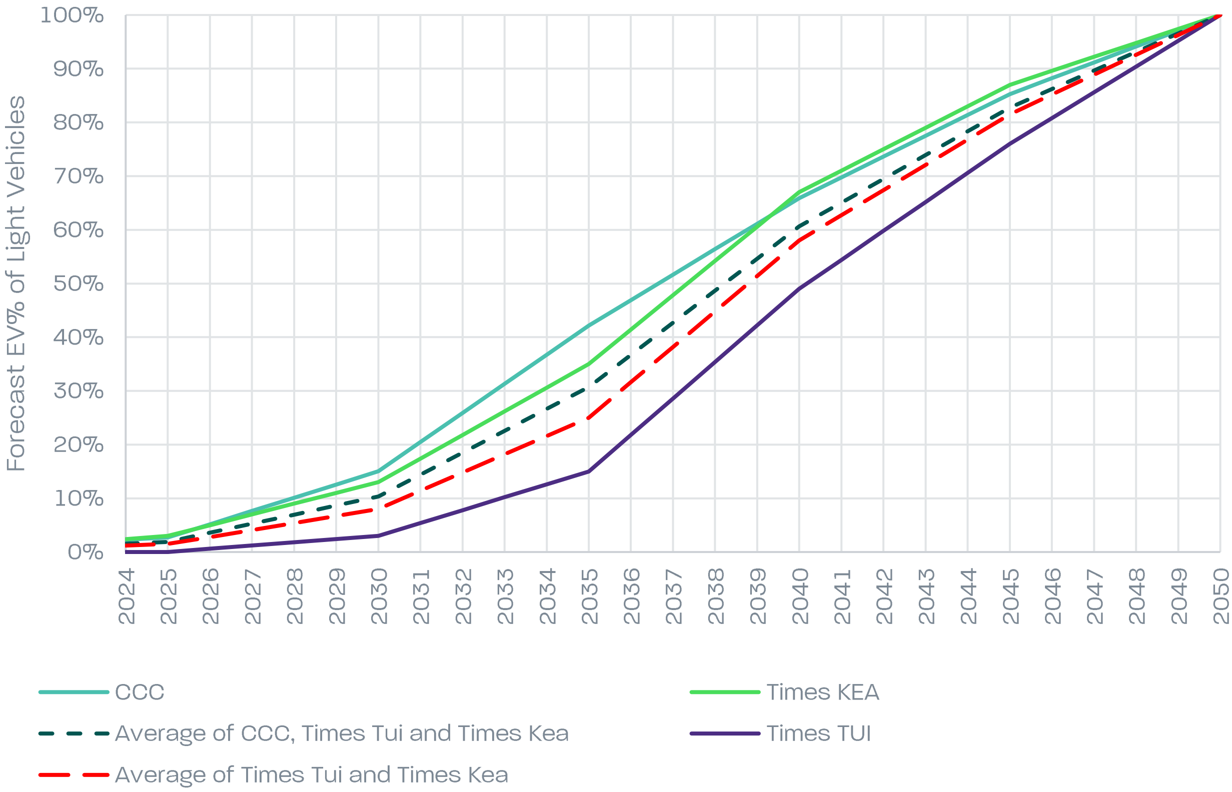

Figure 1: EV Uptake Forecasts (% of Total Light Vehicle Fleet in NZ)

- TIMES-NZ TUI represents a scenario where climate change is recognised as an important issue among various priorities, with most decisions driven by individual choices and market forces.
- TIMES-NZ KEA represents a scenario where climate change is treated as the top priority, with New Zealand intentionally adopting coordinated strategies to transition to a low-emissions economy.
- The current proportion of BEVs in New Zealand's light vehicle fleet is 1.9%[9], at 86,00 vehicles. The increase in number of BEVs within New Zealand's light vehicle fleet from 2017-2024 (year to date) can be seen in Figure 2.

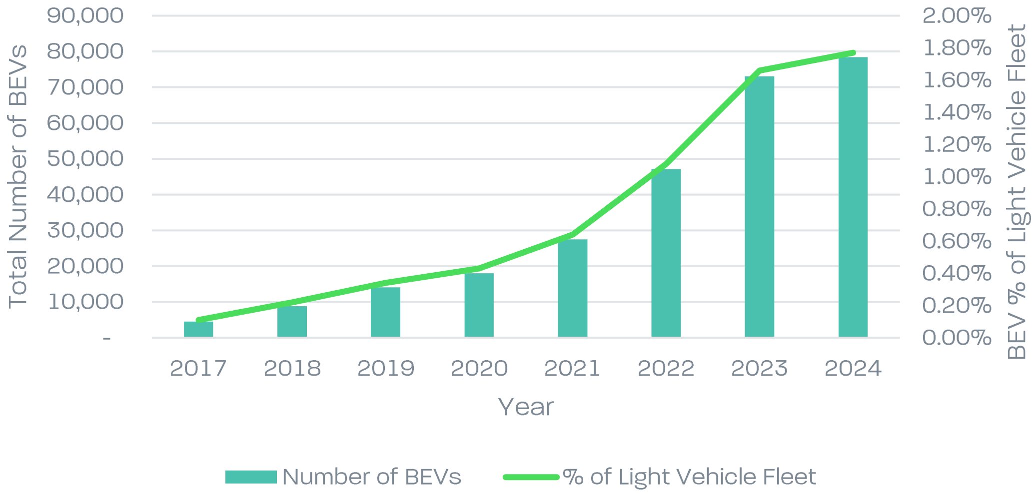

Figure 2: Number of BEVs and %BEVs within Light Vehicle Fleet from 2017-2024(YTD)[18]

Between 2017 and 2024, the percentage of BEVs in NZ's light vehicle fleet has increased by 1.7%, from 0.11% to 1.77%. It could be expected that EV uptake between 2024-2030 would be higher than from 2017-2024. However, this comparison makes the 15% (CCC), and 11% (TIMES-NZ KEA) by 2030 appear optimistic.

On the other hand, TIMES-NZ TUI forecasts 3% by 2030. This would mean a slower average annual rate of BEV increase than 2017-2024, which is also not an expected outcome.

An average of the three models was taken, which projects approximately 10% by 2030. This projection may seem reasonably optimistic but will ultimately depend on several unknown factors including technology advancements and associated costs of BEVs, cost of electricity/fossil fuels, government policies and social influences.

A.3 Turn-in rates

The turn-in rate estimates how many EVs will turn in at each location based on how far away a traffic monitoring site is to a medium or major town. Medium towns were classified to have a population of 1,000 - 10,000, while major towns were classified to have a population over 10,000. The most recent 2023 census population data was used.

Various criteria were used to allocate different turn-in rates based on the distance traffic monitoring sites are away from a town, with the conditions shown in Table 2.

[18] EV Market Stats (2025) | EVDBNZ

Table 2: Turn-in rate conditions

Condition #	Condition Description	Turn-in rate
1	If within 20 km of major town	10%
2	If between 20 – 50 km of major town and within 20km of medium town	15%
3	If between 20 – 50 km of major town and 20 – 50 km of a medium town	15%
4	If between 50 – 80 km of major town and within 20km of medium town	20%
5	If between 50-80 km from a major town and between 20 – 50 km from medium town	20%
6	If between 50 – 80 km from a major town and between 50 – 80 km from a medium town	25%
7	If further than 80 km from a major town, and within 20 km from a medium town	20%
8	If further than 80 km from a major town and between 20 – 50 km from medium town	25%
9	If further than 80km from a major town and between 50 – 80 km from medium town	40%
10	If further than 80 km from a major town, and further than 80 km from a medium town	40%

Lower turn in rates were assumed for monitoring sites that are closer to major towns due to the assumption that traffic heading to major towns is likely returning home or staying for a period of time, thus will likely charge either residentially, or using destination chargers.

Large towns with a population over 35,000 were given a blanket turn-in rate of 20%. It was assumed that drivers are more likely to turn in at these places given the number of amenities available, making them attractive locations to stop and charge.

A.4 Average Battery Capacity and Average Charge in 2030

The 2024 EV market share was used to estimate the average 2030 EV battery capacity as 70 kWh, as seen in Table 2. Another data source gives 71.3 kWh as an average battery capacity[19].

It was assumed that the type of light EVs entering the country in 2024 will be mainstream in 2030, as these vehicles enter the second-hand market. 30% of the light EV fleet in NZ is currently made up of Nissan Leafs with 30 kWh batteries, however, it is assumed that Nissan Leafs will be used less on the open road where data for this analysis is taken, so the lower capacity will have less of an impact in 2030.

An average of 30% of vehicle battery capacity per charging session was assumed to remain constant from 2024 to 2030. This average was taken from current NZ EV charging data DETA Consulting has access to. This approach could result in the modelling underestimating overall journey charging demand as battery sizes increase in the future. However, as battery capacities increase, vehicles will also need to stop to charge less (which will result in a lower turn-in factor), which is assumed to balance out any charging demand increase from increased battery sizes.

[19] Useable Battery Capacity of EVs | EV Database

Table 3: Light EV market share data

Light EV type	Battery capacity range (kWh)	Average battery capacity (kWh)	% of light EV market share	Average market share battery capacity (kWh)
Compact	10 – 50	40	10%	70
Mid-size	51 – 70	60	30%	
High-end	71 - 120	80	60%	

A.5 List of Current Charging Capacity for Each Location

The table below lists the total public journey charging capacity for each location. The recorded capacity was pulled directly from the various data sources. Adjusted capacity includes the following assumptions:

- Maximum output of chargers has been limited to 170 kW to reflect the average maximum charging rate of the top 10 EVs purchased in 2025
- Charging capacities were reduced by 30% to account for operational faults, inefficiencies and charging behaviour

Table 4: Current Charging Capacity (2025) for Each Location

EDB	Location	Recorded Capacity (kW)	Adjusted Capacity (kW)
1. Central Lines Ltd	Tikokino	-	-
	Waipukurau	50	35
2. Counties Energy	Pōkeno	3,525	1,656
	Pukekohe	300	210
3. Electra	Foxton	100	70
	Levin	875	550
	Ōtaki	100	70
	Paraparaumu	1,425	830
4. Firstlight Network	Gisborne	210	147
	Matawai	50	35
	Te Araroa	-	-
	Te Puia Springs	-	-
	Tolaga Bay	-	-
	Wairoa	350	245
5. Horizon Energy	Awakeri	-	-
	Galatea	50	35
	Kaingaroa	-	-
	Kawerau	50	35
	Matata	-	-
	Ōpōtiki	50	35
	Te Kaha	50	35
	Waimana	-	-
	Whakatāne	1,350	945
6. Northpower	Dargaville	50	35
	Ruawai	-	-
	Waipu/Ruakākā	50	35
	Whangārei	1,780	1,246
7. Powerco	Bulls	2,200	1,022
	Carterton/Greytown	-	-
	Coromandel	50	35
	Featherston	400	280
	Feilding	50	35
	Hāwera	50	35
	Hunterville	-	-

	Kakatahi	-	-
	Martinborough	-	-
	Masterton	968	594
	Matarangi	-	-
	New Plymouth	3,260	1,932
	Ōmokoroa	-	-
	Ōpunake	50	35
	Paeroa	800	476
	Pahiatua	50	35
	Palmerston North	720	504
	Pauanui	100	70
	Putāruru	280	196
	Stratford	360	238
	Taihape	2,175	1,187
	Tauranga	5,115	2,660
	Thames	450	315
	Tirau	775	543
	Tokoroa	260	182
	Waihi	250	175
	Waiouru	900	546
	Waverley	50	35
	Whangamatā	50	35
	Whangamōmona	-	-
	Whanganui	600	420
	Whitianga	450	315
8. Scanpower NZ	Dannevirke	350	245
9. The Lines Company	Mokau	50	35
	National Park	100	70
	Ohakune	100	70
	Otorohanga	50	35
	Taumarunui	200	140
	Te Kūiti	1,780	903
	Tūrangi	1,100	665
10. Top Energy	Cape Reinga	50	35
	Coopers Beach	510	343
	Kaikohe	-	-
	Kaitaia	150	105
	Kawakawa/Moerewa	50	35
	Kerikeri/Waipapa	225	158
	Ōkaihau	-	-
	Opononi	50	35
	Pukenui	-	-
11. Unison Networks Ltd	Hastings	200	140
	Napier	950	602
	Reporoa	-	-
	Rotorua	4,560	2,436
	Taupō	4,475	2,265
	Te Haroto	100	70
	Tutira/Putorino	50	35
12. Vector	Auckland	16,390	9,632
	Helensville	-	-
	Kumeū /Waimauku	720	490
	Silverdale	350	245
	Warkworth	585	396
	Wellsford	1,350	581
13. Waipa Networks Ltd	Cambridge	775	543
	Te Awamutu	100	70
14. WEL Networks	Hamilton	4,140	2,538
	Huntly	-	-
	Raglan	50	35
15. Wellington Electricity	Lower Hutt	1,525	1,005

	Porirua	225	158
	Upper Hutt	125	88
	Wellington	2,045	1,418

Appendix B: Example EDB RFI

		2030					Constant factors		
Location	Traffic Monitoring Site Description	2030 Total Forecasted Demand For Peak Half Hour of Day		Current Charging Capacity >=50 kW	2030 Additional Capacity Needed (Factoring In Current Charging Capacity)		Peak Time	Peak / Avg	Turn-in rate
		Avg Day (kW)	Peak Day (kW)	(kW)	Avg Day (kW)	Peak Day (kW)			
Location 1	Site 1								
Location 2	Site 2								

Find enough transformer capacity to meet the **positive** values in this column, rounded up to the nearest 50 kW.

Negative additional capacity, shown in red, means that the model has forecasted that there is currently sufficient charging capacity to meet 2030 demand in these locations. **Distribution transformer data is not necessary** to find for these places, but if there are sites that make sense for EV charging and would be useful to share, please include this data.

Location 1							
	Transformer reference/ID	Rated capacity (kVA)	Available capacity (kVA)	Indicative connection cost ($)	Proposed charging site general location	Proposed charging site coordinates	Comments
Transformer 1							
Transformer 2							
Transformer 3							
Transformer 4							
Transformer 5							

Location 2							
	Transformer reference/ID	Rated capacity (kVA)	Available capacity (kVA)	Indicative connection cost ($)	Proposed charging site general location	Proposed charging site coordinates	Comments
Transformer 1							
Transformer 2							
Transformer 3							
Transformer 4							
Transformer 5							