Randwick City Council
a sense of community

WAVERLEY COUNCIL

WOOLLAHRA MUNICIPAL COUNCIL

Leading the Charge

Supporting Documentation

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Background to Electric Vehicles and Chargers

What are electric vehicles?

Passenger vehicles can be categorised by their fuel type and usage as shown in the table below, however this strategy focusses primarily on plug-in hybrid and battery EVs – both of which can be charged from an electric plug.

Image: Resident walking towards her electric vehicle

Feature	Internal Combustion Engine	Hybrid	Plug-in Hybrid	Battery Electric	Hydrogen Fuel Cell
Fuel	Petrol/Diesel	Petrol/Diesel + Small Battery	Petrol/Diesel + Large Battery	Large Battery	Hydrogen
Tailpipe Emissions	High	Medium	Low	Zero	Zero
Examples	Ford Ranger	Toyota Prius	MG HS Plus EV	Tesla Model 3	Hyundai Mirai

Electric vehicle uptake

Electric vehicle uptake is heavily influenced by factors such as price, model availability, government policies, charging infrastructure availability and customer awareness, hence it can be difficult to accurately predict the rate and pattern of adoption.

> In 2022, 3.8% of all new vehicles purchased in Australia were EVs (Electric Vehicle Council, Jan 2023) – a 86% increase from 2.05% during 2021.

Of the 39,353 EVs sold in 2022, approximately 50% were the Tesla Model 3 and the Tesla Model Y.

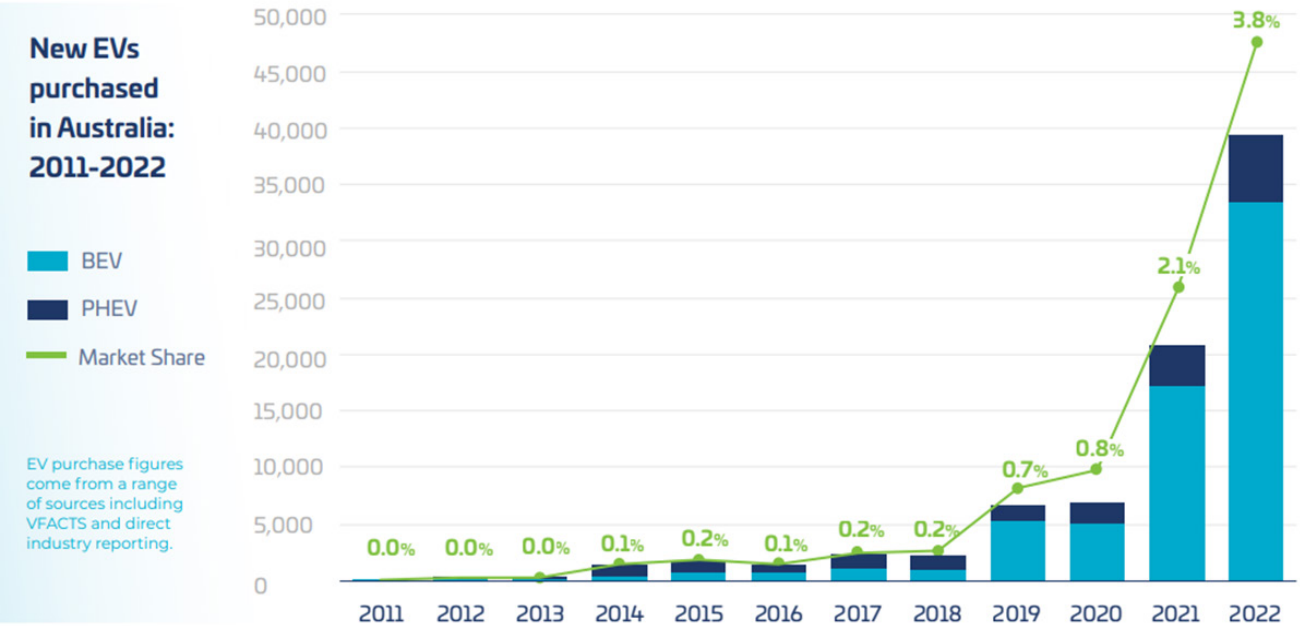


Figure 1: EV Sales in Australia (EV Council, 2022)

What are EV charging stations?

EV chargers vary by their power, plug types and current types (i.e., alternating current or direct current). Each EV typically has two sockets – one for alternating current (AC) charging and one for direct current (DC) charging, as shown in the figure on the right.

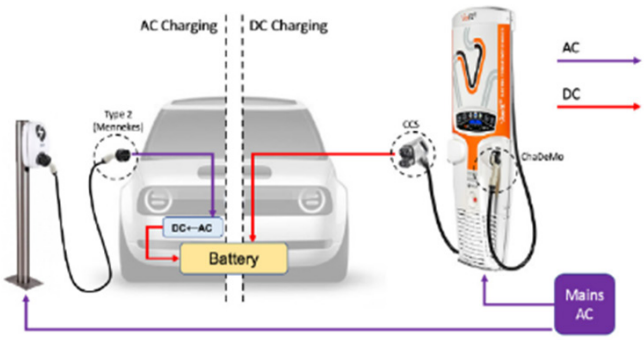


Figure 2: AC and DC Charging (Charge Together Fleets)

Image: EV charging plug in use

> It is important to note that the power outputs of charging stations are commonly limited by the maximum AC and DC charging rates of the car.

For example, a 2022 MG ZS EV can charge at a maximum of 11 kW AC or 80 kW DC, regardless of whether the charger can output more power than this.

A comparison of charging types by charge rates can be found in Figure 3 below. This table also shows how different types of chargers are suitable for different locations and purposes, and how a range of charging station types are required to facilitate the uptake of EVs.

Type	Power	Range added per hour	Charging Time	Applications
Level 1 – Single Phase (domestic)	2.4 – 3.7 kW AC	10 – 20 km	5 – 16 hrs	Home
Level 2 – Single Phase (domestic or public)	7 kW AC	30 – 45 km	2 – 5 hrs	Home, work, shopping centres, carparks, kerbside
Level 2 – Three Phase (public)	11 – 22 kW AC	50 – 130 km	30 mins – 2 hrs	Kerbside
Level 3 – Fast (public)	50 kW DC	250 – 300 km	20 – 60 mins	Large carparks, highways
Level 4 – Super-fast/Rapid (public)	120 kW DC	400 – 500 km	20 – 40 mins	Highways
Ultra-fast	350 kW DC	1000+ km	10 – 15 mins	Highways

Table 3: EV Charger Types (Transport for NSW, 2022)

Whilst a range of charging plugs can be found globally, EV manufacturers are coming closer to standardising plug types in Australia. The three main plug types* commonly used in Australia are shown in the table below.

* Based on vehicles currently sold in Australia	**Type 2 (Mennekes)** 	**Combined Charging System (CCS)** 	**Charge de Move (CHAdeMO)** 
Charging Rate *	Up to 22 kW AC	25 - 350 kW DC	25 – 50 kW DC
Australian Vehicles *	All	All except Nissan and Mitsubishi	Nissan and Mitsubishi

Table 4: Plug Types

Charging station uptake

> Charging infrastructure in Australia continues to expand, but at a rate much slower than EV uptake.

As of 30 June 2022, the number of public charging locations was 2,147, while the number of individual public EV chargers in service was 3,669. This is a 15% increase in charging locations compared to early 2021.

Note that many of these locations have multiple charging bays in place, to support multiple cars charging simultaneously. Of these locations, 356 have fast or super-fast (rapid) charging infrastructure. This is a 22% increase in the number of locations since 2021.

Figure 5: Public Charging Locations by Year (EV Council, 2022)

02

Local Charging Station Availability

A range of EV charging station networks are already operating in the Eastern Suburbs. As of March 2023, there are a total of 59 individual charging ports located at 26 different locations across the Eastern Suburbs, which can deliver a total capacity of 1,278 kW.

All of these chargers are classified as public chargers and are accessible to the public for a fee. Out of the 26 locations, 24 are AC chargers capable of delivering 50-150km of range per hour.

Network Operator	Site Name	Price	Charger Type	Number of Charging Ports	Power Rating Charger	Power Available (kW)
Randwick LGA						
Wilson Carpark	Brigidine College	60c/kWh	AC	2	7	14
UNSW	UNSW Botany St Carpark	Up to 25c/kWh	AC	6	7	42
Tesla	Crowne Plaza	$35/day	AC	2	22	44
JOLT	Anzac Parade Car Park	40c/kWh	DC	1	25	25
JOLT	Goodwood St	40c/kWh	DC	1	25	25
Evie Networks	Royal Randwick	40c/kWh	DC	2	50	100
Eastern Suburbs Public Electric Vehicle Charging Station Network	Des Renford Leisure Centre – Carpark	40c/kWh	AC	2	7	14
	Randwick Community Centre – Munda St	40c/kWh	AC	2	22	44
	Randwick Junction – Silver St Carpark	40c/kWh	AC	2	22	44
	Coogee Oval – Brook St	40c/kWh	AC	2	22	44
	La Perouse – Endeavour Ave	40c/kWh	AC	2	22	44
	Matraville – Baird Ave Carpark	40c/kWh	AC	2	22	44
	Heffron Centre – Carpark	40c/kWh	DC	4	25	100
	Sub-total			**30**		**584**

Network Operator	Site Name	Price	Charger Type	Number of Charging Ports	Power Rating Charger	Power Available (kW)
Waverley LGA						
Westfield Shopping Centres	Westfield Bondi Junction – P3	Free	AC	3	22	66
Tesla	Westfield Bondi Junction – P4	15c/kWh	AC	4	22	88
Tesla	Pacific Bondi Beach	Payment Required	AC	2	22	44
Evie Networks	Eastgate Bondi Junction	40c/kWh	DC	2	50	100
Eastern Suburbs Public Electric Vehicle Charging Station Network	Bondi Junction – Grafton St	40c/kWh	AC	2	22	44
	Bondi Beach – Queen Elizabeth Drive	40c/kWh	AC	2	22	44
	South Bondi – Castlefield St	40c/kWh	AC	2	22	44
	Bronte – Trafalgar St	40c/kWh	AC	2	22	44
	Sub-total			**17**		**474**
Woollahra LGA						
Eastern Suburbs Public Electric Vehicle Charging Station Network	Five Ways – Goodhope St	40c/kWh	AC	2	22	44
	Kiaora Place Shopping Centre – Level 1	40c/kWh	AC	2	22	44
	Rose Bay Shops – Richmond Rd	40c/kWh	AC	2	22	44
	Christison Park – Old South Head Rd	40c/kWh	AC	2	22	44
	Belleview Hill – Birriga Rd	40c/kWh	AC	2	22	44
	Sub-total			**10**		**220**
3-Council Total				**59**		**1,278**

Charging the East – The Eastern Suburbs Public Charging Network

> The 3-Councils own and operate local public charging stations known as the 'Charging the East'.

When these stations were installed, they were the first on-street public charging stations of this type in Sydney, and the first local government-backed on-street charging infrastructure in NSW. A map of the chargers is shown below.

This public on-street EV charging network currently comprises of 16 public AC charging stations and 4 public DC chargers located in key destination hotspots across Sydney's Eastern Suburbs. The charging stations are powered by 100% renewable energy.

The number of chargers across the network has grown from 6 in 2019 to 20 in 2022. A further 20 chargers are planned for installation in 2023. Throughout this time the number of charging sessions has grown exponentially from around 10 sessions per month across the network to over 1,200 sessions per month, with 2,000 monthly sessions expected to be exceeded in 2023. Averaging 1,000 monthly sessions across the network on a per charger bases translates to approximately 4 sessions per charger per day, 100 sessions per month or 1,200 sessions per year. Based on international research, 4 hours of usage per charging port per day is considered full utilisation.

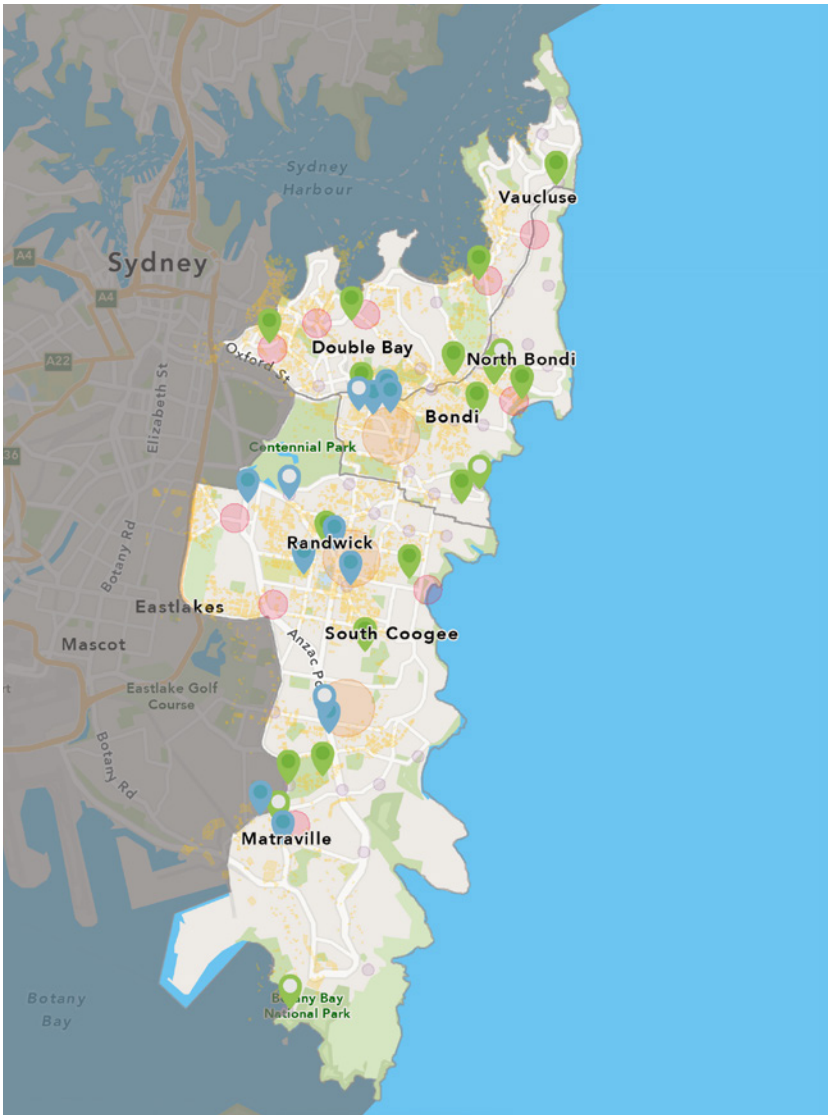


Figure 6: Eastern Suburbs Public EV Charging Station Network

Legends

Electric Vehicle Installations

- Council – Installed
- Council – Awaiting Install
- Private – Installed
- Private – Awaiting Install

Centres

- Neighbourhood Centre
- Local Centre
- Regional Centre

Apartments

- Apartment blocks

The graph below shows this historical usage data (from ChargeFox – 3-Council's EV Platform). Note that the growing number of chargers in the network has been accounted for in the 'Average Sessions per Charger'.

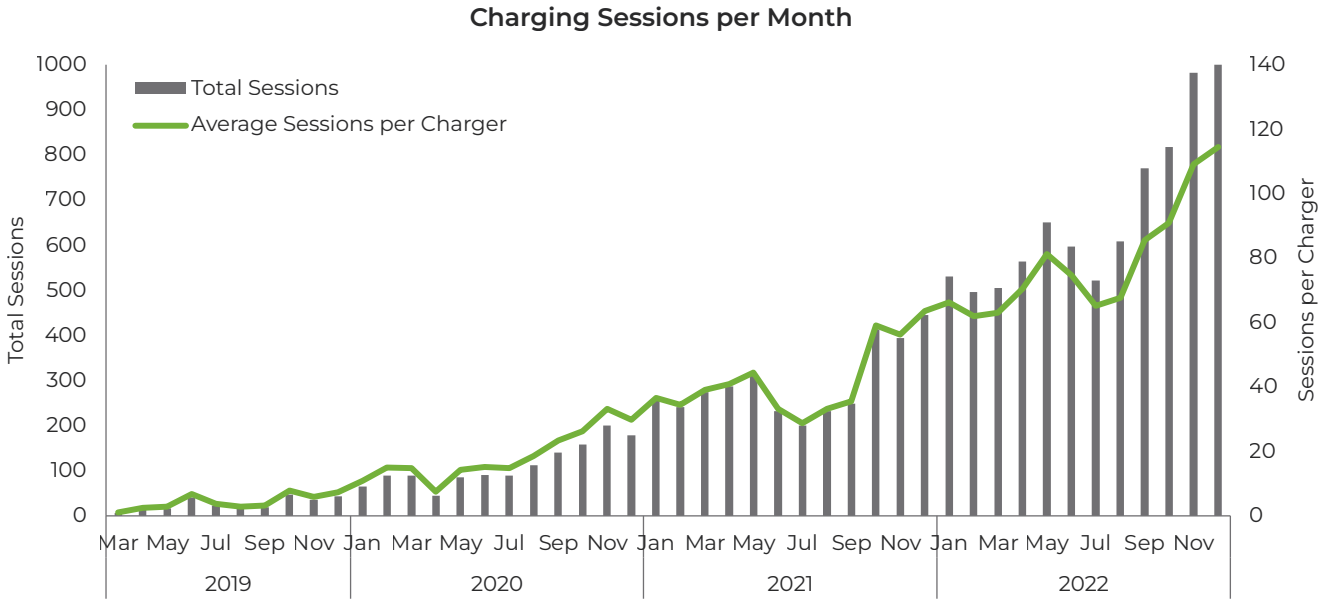


Figure 7: Charging Sessions per Month (ChargeFox)

Pricing

The pricing for the Eastern Suburbs EV Charging Network will increase in 2023/24 financial year. The updated pricing is based on partial cost recovery model whereby the annual revenue from users covers the operational and maintenance costs of the charges but not the cost of the capital cost of the charger. The updated pricing means the chargers are cost neutral for Council to run from an operational perspective.

The table below shows the current and new pricing structures.

Current Resident Prices Dec 2019-June 2023 (ex. GST)	**New Prices** 2023-24 FY (ex. GST)
$0.25 per kWh (2pm – 8pm Mon – Fri) $0.15 per kWh (7am – 2pm Mon – Fri) $0.15 per kWh (8pm – 10pm Mon – Fri) $0.10 per kWh (at all other times)	$0.38 per kWh flat rate. Minimum fee of $1 for all sessions which are charging for more than 5 minutes.

Image: Zero emissions electricity to EV chargers

The pricing should be based on the following principles:

1. Pricing should be similar to what residents pay for electricity at home. If pricing is cheaper at public chargers it may lead to non-essential usage of charging stations by residents who should be charging at home/work.
2. Pricing and tariff structure should align with pricing from other charging station providers.
3. Pricing should be set at level to ensure the Eastern Suburbs network has high reliability, availability and coverage.
4. Over time and with the addition of funding from the Federal and State Governments, Council should pursue a full cost recovery model in line with market rates. This includes capital costs as well as the operational costs of operating and maintaining the charging station network; including but not limited to proactive and reactive maintenance, user and Council payment and data platform, and electricity supply and electricity demand charges.

Charging Station Emission Savings

Historical data from the Eastern Suburbs Network shows that the average charging session:

- Provided 16 kWh of electricity.
- Had a duration of 2.5 hours (based on a Tesla Model 3, which is the most popular EV in the Eastern Suburbs, which has an efficiency of approximately 0.15 kWh/km).
- Provided 107 km of range to each vehicle.

Each of the 3-Councils have a 100% renewable electricity agreement which provide zero emissions electricity to all the chargers.

Compared to non-EVs, each charging sessions saves around 19 kg of CO_2, which equates to around 19,000 kg (19 tonnes) of CO_2 annually (based on the Green Vehicle Guide's (Australian Government) estimate that the average new light vehicle sold in Australia produces 81 grams of CO_2 per kilometre).

03

Government Programs and Policies

Electric Vehicle Strategies have been developed by all levels of government over the past few years. A summary of the relevant policies are shown below.

State Government

Policy	Description
NSW Electric Vehicle Strategy	The Strategy is expected to increase EV sales to 52% by 2030-31 and the NSW Government's objectives are to achieve that goal and see the vast majority of new car sales being EVs by 2035. Actions include: • Stamp duty was removed for EVs under $78,000 purchased from 1 September 2021 and for all EVs including plug-in hybrids from 1 July 2027 or when EVs make up at least 30% of new car sales (whichever is earlier). • Rebates of $3000 on the purchase of the first 25,000 EVs sold in New South Wales (under $68,750) from 1 September 2021. • Incentives to support medium to large sized fleets, such as local councils, businesses, car leasing companies and car share companies, to purchase battery or hydrogen fuel cell EVs. • Target of electrifying NSW Government passenger vehicle fleet procurement by 2030, with an interim target of 50% EV procurement by 2026. • Update policies and legislation to allow EV drivers to use transit lanes such as T2 and T3 lanes.
Drive Electric EV Kerbside Charging Grants	The Drive Electric NSW EV Kerbside Charging Grants will provide co-funding to councils and EV charge point operators for public chargers in high density areas. The NSW Government has committed $10 million to co-fund the installation of 500 kerbside charging points in residential areas where off-street parking is limited. A further $10 million will co-fund the installation of charging stations across 125 medium and large apartment buildings – those with more than 100 car parking spaces. A further $18 million will be provided as grants to support the installation of additional fast-charging stations and the expansion of existing charging points in high-density urban areas.
Net Zero Plan	Target to achieve net zero by 2050. Encouraging the uptake of EVs and rollout of charging infrastructure is a key feature of the plan.

Image: Resident waiting for EV to charge

Federal Government

Policy	Description
National Electric Vehicle Strategy	The Australian Government through the National Electric Vehicle Strategy is responsible for: 1. Increasing the supply of affordable and accessible EVs by introducing a Fuel Efficiency Standard. 2. Establishing the resources, systems and infrastructure to enable rapid EV uptake by building a National EV Charging Network. 3. Encourage increase in EV Demand through the Electric Car Discount.
Electric Cars FBT exemption	Includes a Fringe Benefit Tax (FBT) exemption for EVs purchased after 1 July 2022 under the luxury car tax threshold, and also exempts eligible EVs from a 5% import tariff.
Future Fuels Program	Delivered by ARENA, this fund supports the installation of public fast charging infrastructure.
National Construction Code	Now requires all new apartments built in Australia from October 2023 to be constructed with the capability to charge EVs. Clause J1P4 states 'A building must have features that facilitate the future installation of on-site renewable energy generation and storage and EV charging equipment'.

Local Government Strategic Alignment

The 3-Council Public Electric Vehicle Charging Strategy aligns with a number of action plans, policies and strategies already adopted by the respective councils as shown in the table below.

Policy	Description
Woollahra	
Woollahra Local Strategic Planning Statement (LSPS)	Planning Priority 1, Action 12. Continue to support and promote use of shared vehicles and electric vehicles in development, on-street and in Council car parks. Planning Priority 9, Action 49. Continue to support increased uptake of electric vehicles through planning controls and provision of publicly accessible chargers.
Community Strategic Plan, *Woollahra 2032*.	Council's vision is a *thriving, inclusive, sustainable, and resilient community that will benefit future generations*; and Council's mission includes: *to lead climate action by prioritising carbon neutrality, environmental sustainability, and community resilience to meet the challenges of climate change*. Goal: Sustainable use of resources. Strategies: Reduce greenhouse gas emissions; provide support to the community to reduce their environmental impact. Our Environmental Measure: Increase public electric vehicle charging by 2 stations per year.
Council's response to the Climate Emergency	Action to install additional on-street public electric vehicle charging stations, and work towards achieving Council's adopted aspirational target of net zero community emissions by 2030.
Electric Vehicle Charging Infrastructure Policy	Provides Woollahra Council with direction on installing public chargers, including locations, signage, and community engagement. Seeks to further establish Woollahra as a leader in electric vehicles.
Waverley	
Waverley Council People, Movement and Places	Council will encourage more electric vehicle charging.
Waverley Council Environmental Action Plan 2022–2032	Council will encourage the uptake of Electric Vehicles and active transport, supporting the deployment of charging stations.
Waverley Local Strategic Planning Statement (LSPS)	Undertake initiatives to further support public charging points for EVs are underway, with the vision for all key centres and public places to have access to a charging point.
Waverley Electric Vehicle and Transportation Policy	Council actively supports the provision of a comprehensive network of electric vehicle charging stations on street and at car parks that they manage.

Image: EV being charged

Policy	Description
Randwick	
Randwick Community Strategic Plan	Objectives: Achieve an ownership rate of 5,000 electric or hybrid vehicles by 2031.
Randwick's Integrated Transport Strategy	Outcome 1: Achieve an ownership rate of 5,000 electric or hybrid vehicles by 2031. Strategic Approach 1.17: Require the provision of electric vehicle and electric bicycle charging stations in new residential and commercial buildings and investigate the feasibility of providing subsidies to encourage installation of charging stations in existing residential and commercial buildings by 2025. Strategic Approach 1.18: Provide 5 new publicly accessible electric vehicle charging stations per year until 2031.
Randwick Local Strategic Planning Statement (LSPS)	Planning Priority 18: Reduce the consumption of energy and water. While high density dwellings have significant challenges in increasing renewable energy, energy efficiency and water efficiency, there are opportunities...including installing electric vehicle charging stations.

Table 8: Strategic Alignment

3-Council DCP Requirements

Woollahra

Objective:

O1 To encourage and support increased usage of electric vehicles.

Controls:

Electric circuitry to accommodate 'Level 2' electric vehicle charging points must be integrated into all off-street car parking of new residential and non-residential development to ensure that 100% of car spaces can install electric vehicle charging points in the future. This must include:

1. Ensuring adequate electrical capacity and infrastructure (cable size, distribution board size etc.) for the electric vehicle charging point system; and
2. Providing either buried cables underground or cable trays sufficient to accommodate electric circuitry to each car space (see Figure 1 and Figure 2).

Minimum electric circuitry for a 'Level 2' electric vehicle charging point is required to be:

1. Privately available spaces: 'Level 2' slow – single phase with 7kW power; and
2. Publicly available spaces : 'Level 2' fast – three-phase with 11-22kW power.

The installation of a 'Level 2' electric vehicle charging point is encouraged for new dwelling houses, semi-detached dwellings or dual occupancies.

All new residential and non-residential development (other than for dwelling houses, semi-detached dwellings or dual occupancies) must provide 1 car parking space or 10% of all car parking spaces – whichever is greater - to have a 'Level 2' electric vehicle charging point installed.

Waverley

Objective:

To prepare future buildings for the requirements of electric vehicles.

Controls:

1. Electric vehicle chargers and Electric Vehicle Ready infrastructure should be installed as per the rates and specifications in Table 7.
2. Electric Vehicle Distribution Boards should be installed to achieve the requirements in Table 7.
3. All charging point locations are to be identified on CC Plans.
4. All charging points are to have clear signage identifying location, any fees and charges and whether the bay is for public or private use only.
5. Charging stations should allow for monitoring and individual billing payment through an Open Charge Point Protocol compatible software back end and NMI registered electricity meters.

All mixed use, commercial and residential flat building development with on-site car parking should provide at least 1 dedicated space and charging point to be used for electric bicycles and mobility scooters.

Definitions:

- Electric Vehicle Ready: a dedicated circuit and cable storage for each parking space with power demand management system to enable all circuits to be used simultaneously.
- Electric Vehicle Distribution Board: a distribution board dedicated to EV charging that is capable of supplying at least 50% of EV connections at full power at any one time during off peak periods. The distribution board will be complete with an EV Load Management System and an active suitably sized connection to the main switchboard.
- Charging Station: an electric vehicle charging station with a minimum power output of 7kW single phase.

Image: EV at charging station in Bondi

Building Class	**Car Space Type**	**Minimum Charging Stations Installed (% of spaces)**	**Minimum Number of EV Ready Spaces (%)**	**Minimum Current per Space (A)**	**Minimum Energy Capacity per Space** Day = 9am–5pm Night = 11pm–7am (kWh)
Low density residential	Resident	0	100	16	Night 24
Medium and high density residential (3 + dwellings)	Resident	20	100	16	Night 15
	Visitor	100	100	32	Day 15
Boarding houses, co-living, hostels, hotels, motels	Any	20	40	32	Night 48
Business and office premises	Any	20	40	32	Day 15
Retail premises	Any	20	40	32	Day 15
Other premises	Any	20	40	32	Day 15

Image: Charging station at Randwick community centre

Randwick

Controls:

The following applied to Housing investigation Areas (HIAs) within the Kensington and Kingsford Town Centres.

Development must provide one electric vehicle charging point per five car parking spaces and demonstrate appropriate electrical infrastructure and capacity for the remaining Lot Owners (Eligible Lot Owner) to install a vehicle charging point at a later date.

Development must install appropriate electrical infrastructure and capacity to allow at least 20% of Lot Owners (Eligible Lot Owner) to charge an electric vehicle at any one time in their own car space. Such infrastructure should:

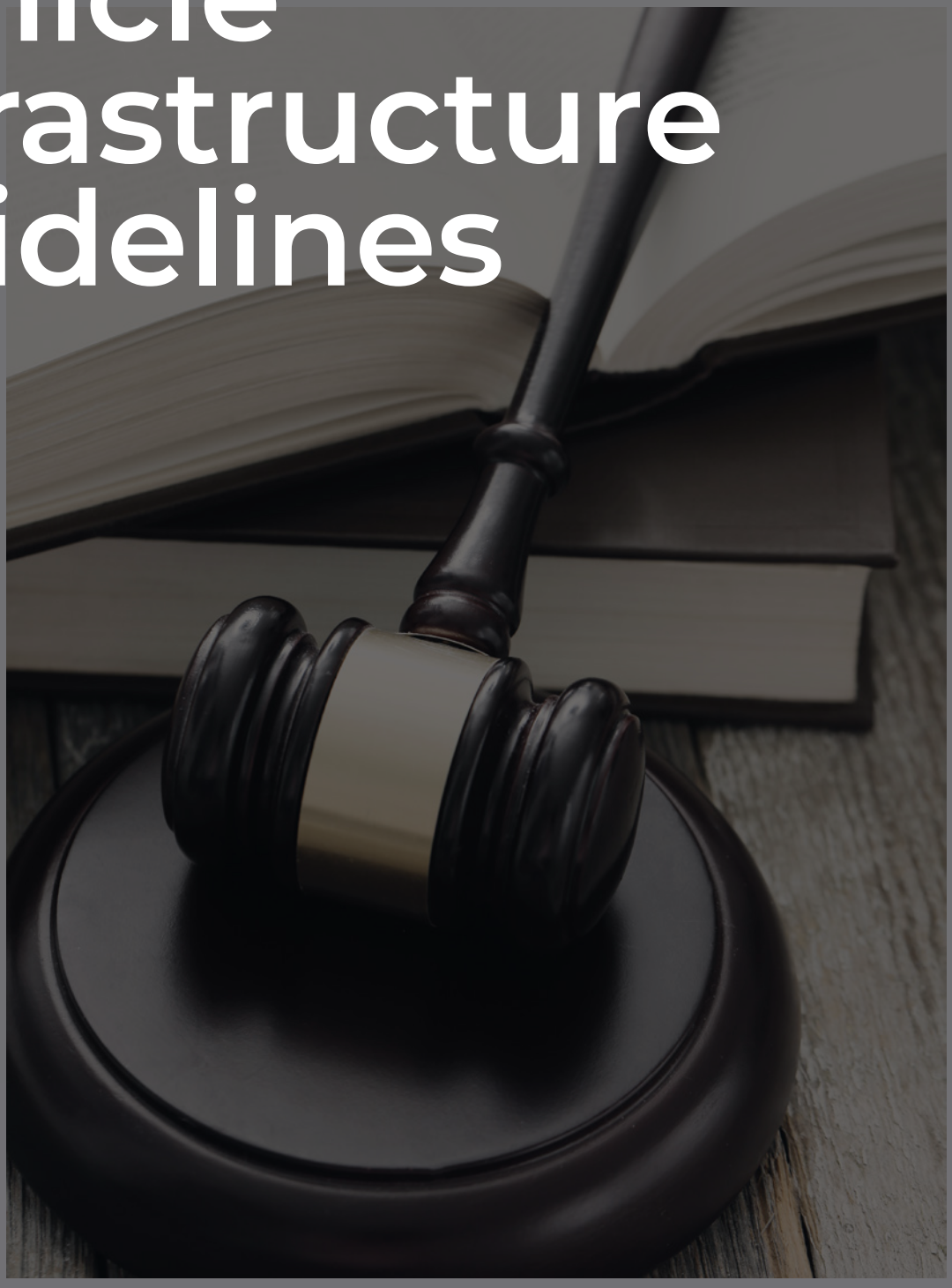
1. Allow for a minimum of 16A single phase charging per Eligible Lot Owner
2. Be easily accessible for any Lot Owner to run a dedicated circuit to their own car space for the purposes of EV charging
3. Be monitored by the Owners Corporation or a 3rd party on behalf of the Owners Corporation
4. Include capacity for a billing system to account for electricity used, time or a flat fee
5. Measure electricity used by using utility grade, NMI registered electricity meters

The installation of two 'Level 2' AC fast charging EV charging points is required in the common parking areas. The circuit is to be suitably located to provide for convenient, shared access for residents (and where relevant, commercial users). The charging point should:

1. Be equipped with 62196-2 Type 2 socket
2. Provide up to 22kW or 32A three phase charging per port
3. Be installed on a dedicated circuit
4. Allow for monitoring and individual billing payment through an OCPP compatible software back end
5. Provide dedicated space for electric vehicles to park and charge

04

Electric Vehicle Infrastructure Guidelines



The following guidelines are based on the Southern Sydney Regional Organisation of Councils (SSROC) Draft Electric Vehicle Charging Infrastructure Guidelines, with additional input from the REP Team.

> Their purpose is to provide conditions for the provision, installation, management, maintenance and removal of EV charging infrastructure on public land in the 3-Councils' LGAs.

They apply to all publicly accessible EV Charging Infrastructure installed on Council land, whether installed by Council or Third-Party Private operators.

Image: EV owner using charging station

Site Selection Criteria for EV Charging Infrastructure on Public Land

Policy	Description	Selection Options
Mandatory Criteria		
Electrical Connection	Is electrical connection available to the site?	Yes/No
Footpath	Is there low impact on the footpath and pedestrian traffic.	Yes/No
Accessibility	Is this site accessible to disabled residents?	Yes/No
Vandalism Risk	Is the site have a low vandalism risk?	Yes/No
Lighting	Is adequate lighting available at the site?	Yes/No
Nearby Chargers	Is there a gap in charging infrastructure available in surrounding area?	Yes/No
Parking Availability	Is adequate parking available nearby relative to demand?	Yes/No

Policy	Description	Selection Options
Desirable Criteria		
Availability	Is the site accessible at all times?	Yes/No
Parking Angle	What is the angle of car relative to kerb?	Perpendicular/Angled/ Parallel
Spare Spaces	Are spare spaces available for future expansion?	Yes/No
Parking Fees	Is parking free at the site?	Yes/No
Adjacent Land	What is Type directly adjacent to the parking space?	Council Site* / Council Carpark* / Beach* / Park* / Property with Off-Street Parking* / House with Off-Street Parking* / Property without Off-Street Parking
Land Owner	Who is the owner of the parking space land?	Council* / Roads* / Crown / Private
Community Consultation	Is the feedback from the community likely to be positive or neutral?	Yes/No
Ranking Criteria		
Beaches & Parks	Proximity to popular beaches or parks. E.g., < 50m away = 10, 200m away = 5, > 400m away = 0	0 – 10
Shops & Cafes	Proximity to popular shops and cafes. E.g., < 50m away = 10, 200m away = 5, > 400m away = 0	0 – 10
Apartments/ Mult-unit dwellings	Proximity to apartments, multi-unit dwellings E.g., < 50m away = 10, 200m away = 5, > 400m away = 0	0 – 10
Score	Sum of ranking criteria	0 – 9 = low suitability 10 – 19 = medium suitability 20 – 30 = high suitability

Design Considerations

Site Selection

A site may be considered suitable for EV charging infrastructure where the proposal demonstrates to Council's satisfaction that:

1. The land is 'public land' or 'public road', as defined in the Local Government Act 1993 and Roads Act 1993 respectively.
2. The land classification has been considered; land classified as operational land is preferred, however community land may be considered suitable where the proposal is in accordance with the Local Government Act 1993, Crown Land Management Act 2016, applicable land category core objectives and is expressly authorised in the relevant Plan of Management for that land.
3. Electric Vehicle charging stations are permissible under the relevant legislation at the proposed location. This includes, but is not limited to:
    - ◇ Waverley Local Environmental Plan 2012
    - ◇ Woollahra Local Environmental Plan 2014
    - ◇ Randwick Local Environmental Plan 2012
    - ◇ State Environmental Planning Policy (Transport and Infrastructure) 2021
    - ◇ The Roads Act 1993
    - ◇ Local Government Act 1993
    - ◇ Crown Land Management Act 2016
    - ◇ Disability Discrimination Act 1992

    Note: the provider is responsible for securing development consent or approval, where applicable from Randwick, Waverley or Woollahra Council.
4. Environmental constraints, characteristics and amenity have been considered.
5. The electricity supply infrastructure capacity of the existing supply network is suitable (or can be reasonably upgraded).

    Note: Council will bear no cost or responsibility for the provision of, or upgrade to, electrical supply infrastructure to service an EV charging site, unless by prior agreement.
6. The land has reasonable connection to the wider road network.
7. The land is not earmarked for infrastructure upgrades, bus or bike lanes and road reconfiguration.
8. The facility and its operation will not adversely impact upon the amenity of surrounding development or access to an enjoyment of the public domain.
9. The facility is safe with adequate lighting, and pedestrian and vehicle access available at all times of the day and night.
10. The facility is compliant with the relevant Australian Standards and Regulations for workplace health and safety. Charging station hardware must be located a safe distance away from hazards (e.g. dangerous goods and fuels).
11. Consultation with the local community and relevant stakeholders is satisfactorily undertaken in conjunction with site selection.
12. The land is in close proximity to at least one of the following:
    - ◇ Parks beaches, and community facilities
    - ◇ Local small businesses
    - ◇ Apartments and dwellings without off street parking

Visibility and Identification

The facility and all ancillary infrastructure (including signage, parking bays and charging infrastructure) shall be easily visible and accessible for users to find, with consideration of the following:

- All EV charging bays shall be clearly marked with the words 'EV Charging Only' painted on the ground. Note: Non-compliance with this provision may be considered in areas where it is inappropriate, provided sufficient alternative identification can be provided to the satisfaction of Council or where the

Image: Charging station at Randwick community centre

infrastructure is provided in a manner that allows for more widespread charging including the use of 'Smart Poles' or other similar infrastructure.

- Appropriate signage must be installed to indicate the parking spaces are allocated for EV charging only. Signage shall be provided in accordance with Transport Roads and Maritime Service Sign No. R5-41-5 or equivalent.
- Adequate lighting must be provided for the safety and security of drivers, passengers, vehicles and associated infrastructure. Lighting must be sufficient to easily read associated signs, instructions, controls on vehicles/EV infrastructure and identify all possible EV charging inlet locations and for charging cable visibility.
- Parking spaces shall be located to ensure safe sight distances for pedestrians, vehicles, and bicycles are provided.
- It is expected that users of socket AC chargers will provide their own Type 2 EV Charging Cables with a minimum length of 5m to allow the vehicle to park on either side of the charger.
- The use of advertising by any provider is to be disclosed to Council in the initial application process and disclosed as part of the community engagement process. Separate planning approvals may be required for the presence of advertising. Advertising must comply with the relevant standards. Advertising that contains tobacco, nicotine, alcohol and gambling will be prohibited on any EV charging infrastructure.

Note: That liability of on-street charging infrastructure is the responsibility of the provider and Council will not be held liable under any circumstances.

Parking Configuration

The following must be considered at a minimum:

- All aspects of EV charging bays are to be designed and constructed in accordance with the relevant Australian Standards.
- All new EV carparking spaces or charging bay pavements shall be constructed to Council's specifications including sealing, kerb and guttering, pram ramps, signage and line marking.
- Preference is given to the provision of EV charging infrastructure at a minimum of two related (example adjoining/adjacent) carparking spaces in any given location.

Image: Shopper charging EV

- All EV charging bays are to be compliant with the Disability Discrimination Act 1992 which includes compliance with current standards for access (AS2890.5/AS2890.6).
- EV charging occurs only on one side of the street.
- Preference is given to the provision of EV charging infrastructure in perpendicular parking spaces.
- Parking fees and timing:
  - ◇ Non-EV should not be allowed to park
  - ◇ All EV charging spaces are also subject to any parking fees that apply in the area
  - ◇ All EV charging spaces should require to be charging to park there i.e. “EV Only Excepted While Charging”
  - ◇ Preferred timing:
    - AC: 3P-4P 8am-8pm or 8am to 10pm
    - DC (25-50kW): 1P-2P EV Only Excepted While Charging
    - DC (51-350kW): 30min -1P EV Only Excepted While Charging
- Parking spots should be changed to allow both ‘front to kerb’ and ‘rear to kerb’ to facilitate charging for vehicles that have their plugs at the front and back of the vehicles.
- Standard EV parking bay should be 6.3m in length or 5.5m when one end is unobstructed.

Electric Vehicle Charging Hardware

The installation of EV charging on Public Land within Randwick, Waverley and Woollahra LGAs shall be consistent with the State Government Policy Future Transport 2056 – NSW Electric and Hybrid Vehicle Plan and at a minimum include:

- Consistent standards for charging connections based on European CCS2 DC fast chargers, and Type 2 for AC charging. A ChAdeMO plug should be included if there are more than 4 chargers being installed or there is no ChAdeMO plug within a 1km radius.
- Preference for connected and smart chargers, to allow the most efficient energy use for both consumers and network operators.
- Public access and open payment options platforms (credit/debit cards).
- Preference for all EV charging infrastructure to be dual port and have a minimum input power output of 7 kW AC and 25kW DC with preference for 22kW AC and 50kW DC.

- The DC charging the charging cable shall have the capacity to reach all points of the carparking space, to cater for EVs with front, rear or side charging points where possible and in accordance with current industry practices and guidelines. Cables should not be a hazard for pedestrians or other vehicles at any given time.
- The provision of cloud-based monitoring system software to allow regular monitoring and reporting of usage of the EV charging infrastructure by users over time, preferably free of charge to Council.
- Anti-vandalism solutions, such as CCTV and lighting should be installed to protect EV chargers and their components, particularly charging leads and screens.
- Preference for DC chargers to have retractable cable management to minimise the risk of trips.
- Load management smart system to manage power supply and demand per location as appropriate.

The provider may be required to upgrade existing EV charging infrastructure to meet the industry standards and requirements. Council will bear no cost or responsibility for this upgrade.

Provisions and requirements under this item may be altered where future EV charging infrastructure supersedes that which is written in this Guideline, particularly if smarter and more sustainable alternatives are demonstrated to be suitable, to the satisfaction of Council.

Heritage

Measures should be taken to decrease the impact of EV charging in heritage areas such as:

- Minimising the number of charging units – installing dual port chargers where possible.
- Ensuring the charging units have vinyl wraps that are sympathetic to the heritage values of the area.

Environmental

All applications from third party providers must use renewable energy sources to power EV Chargers on public land or alternative arrangements to purchase accredited GreenPower. Demonstration of this ongoing power or offset registration is required to be submitted to Council annually and include total tonnes of CO_2 equivalent. SSROC EV Charging Working Group Issues & Strategy Options January 2023 10.

Maintenance and Monitoring

Reactive and proactive maintenance contracts are required for all chargers to minimise downtime.

Licensing Arrangements

- Provision of EV charging stations on public land will be subject to licensing/leasing arrangements, or similar, with Council and where appropriate, the relevant Minister as it relates to Crown Land.
- License and/or lease terms shall be in accordance with Council's Property Lease and License Policy, and where appropriate, those terms and conditions required by the relevant Minister as it relates Crown Land.
- The license period should be negotiated with a maximum of 15 years and where possible options to cease after 5 and 10 years at Councils discretion.
- Council reserves the right to require appropriate remuneration for use of Public Land for the purposes of EV charging stations. This may be in the form of a lease/license fee, apportionment of user fees, or other benefits such as provision of AC charging for Council

vehicles. This is to be determined on a case-by-case basis as part of any license/lease (or other) agreement.

- Council should be reimbursed by the Licensee for any costs incurred relating to contract reviews and electrical or structural assessments.
- A maintenance schedule including regular inspections shall be implemented by the Provider. All maintenance and works are to be carried out in a timely manner to avoid delays to service. Information on the maintenance response times is to be provided to Council to demonstrate compliance. Further requirements will be specified as part of any license/lease agreement.
- The Provider must agree to a minimum uptime of 98%, excluding power outages.
- Entering into a lease or license agreement with Council to utilise public land for installation and operation of an EV charging station in no way guarantees development consent or approval. All risk, public safety and legal liability issues will be specified via any condition of any development consent and where applicable, the license/lease agreement. Costs associated with the negotiation and finalisation of any lease or license agreement will be at the cost of the Provider.
- Non-compliance with the Policy may lead to the termination of any agreement between the provider and Council and may result in the forced removal of EV charging and ancillary infrastructure, at the cost and responsibility of the provider. The specific terms are to be determined as part of any license/lease agreement.
- The Licensee agrees to share data with and provide a report to the Licensor, on a quarterly basis, specifying the number of charging sessions and the charging time for each user during the relevant quarter. Where possible Council should have access to a live dashboard showing real time usage.

Image: Charging station in Bondi

Parking and Signage

> In November 2022, Transport for NSW introduced a range of new regulatory signage for EV parking.

This included signs for timed parking restrictions from between 1 hour to 12 hours as well as metered parking for EVs only while charging. Outside of the time restrictions on the signage any vehicle, including non-EVs, can park at the spot. However, all EV spots should be 'EV Only Parking' 24/7 in order to avoid the confusion of the public seeing non-EVs parked in the spot and maximise the use and investment in charging infrastructure.

Charging is demonstrated by the charging cable being connected from the vehicle to the charge station. Should an EV not be charging, or another vehicle parked in the space, the

Figure 9: Electric Vehicle Charging Regulatory Signage

driver could incur a fine (equivalent to 'Disobey No Parking' fine).

In addtion, new EV pavement marking, direction signage and sticker/plates have been introduced by TfNSW (see Figure 10). The EV Pavement Marking will be deployed in a green colour to avoid confusion with disabled parking bays which is similarly white with a blue background. The regulatory signage and pavement marking should be used in conjunction and pavement marking alone should not be relied upon for for designation or enfocement.

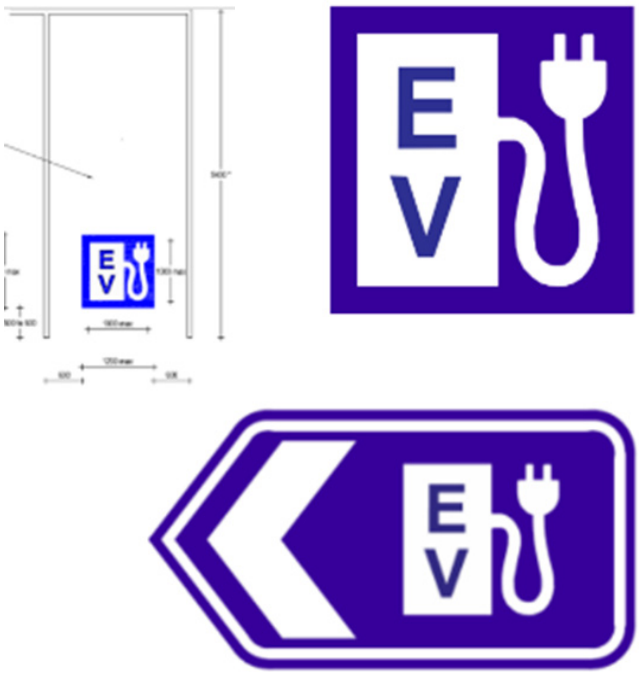


Figure 10: EV Pavement Marking and Direction Signage

Risk Assessment

Risk	Potential Causes	Potential Consequence	Consequence Rating	Likelihood Rating	Overall Risk Rating	All Current Existing Risk Controls (in place) Additional controls being investigated
Trip hazard from cables	Member of public trips over cables connected/unconnected to vehicles	Injury to public Insurance claim Negative media	Catastrophic	Unlikely	**High**	Use of BYO cable model with socket only chargers to minimise cables not in use being left as a potential trip hazard
Theft of personal cable	Cables left behind Cables stolen while attached	Insurance claim by vehicle owner Dissatisfied customer Negative media	Minor	Likely	**High**	EV chargers lock at station end when in use Most existing vehicles and all new vehicles lock at the vehicle when in use, preventing removal of cable
Electric shock from damaged cables or incorrectly used cables	Damaged cables used Incorrect use of cable Non-Australian Standard cables used Damaged or faulty EV charger unit	Insurance claim Injury to public	Catastrophic	Unlikely	**High**	Schedule maintenance contracted with Jetcharge and other charger station operators Type 2 sockets used to require purchase of a non-standard plug and cable from EV industry rather than a conventional extension cable (10 or 15 Amp)
EVSE damage	Vehicle impact Equipment vandalised/stolen	Insurance claim EV Charger not available for public use Loss of revenue	Minor	Almost Certain	**High**	Insured Bollards installed in all sites where possible Set back 1m from kerb where possible
Failure of Technology (App)	Chargefox App not working – glitches and app failing to launch Chargefox app not working to enable end of charging session	Loss of revenue Dissatisfied customers – customer complaints	Minor	Almost Certain	**High**	Monitoring and reporting contract managed User experience feedback Field testing Chargefox 1300 listed as contact for assistance
Conventional ICE vehicles parked in allocated bays for EV chargers	Customers do not understand the dedicated EV parking bays signage (non electric vehicles parked)	Dissatisfied Customers Customer complaints - PPO to attend Loss of revenue Impacts on reputation as a leader in environmental change	Minor	Almost Certain	**High**	Awareness campaign to be implemented to enhance community understanding and compliance PPO to book ICE vehicles Notifications from Chargefox App New EV signage issues by TfNSW with time limits Notification to PPO of a vehicle parked in the EV charging bay but not charging
Overstays by EVs	Vehicle is parked all day as there are no parking time limit	Loss of revenue Dissatisfied customers – customer complaints	Minor	Almost Certain	**High**	Signage installed and area monitored by PPO New EV signage issues by TfNSW with time limits
Definition of electric vehicle not widely known	Definition of an electric vehicle is not widely known	Confusion about what is an electric vehicle Loss of revenue Dissatisfied customers	Minor	Likely	**High**	Education from the local, EV Council and State Government on 3 types of EV - hybrid, plug-in and hydrogen

Risk	Potential Causes	Potential Consequence	Consequence Rating	Likelihood Rating	Overall Risk Rating	All Current Existing Risk Controls (in place) Additional controls being investigated
Communication with existing users	Difficultly in communicating with current EV charger users as they communicate directly with charge station operators e.g. Chargefox	Lack of data about EV charger usage, user behaviour or intentions	Minor	Almost Certain	**High**	One on one communication with EV owners Engage with charge station operators to obtain regular usage and reporting information Conduct EV survey Stay up to date with latest EV research QR codes on chargers to communicate directly with users, and have an annual user satisfaction survey
Communication with new users	Difficultly in communicating directly with potential new EV charger users	Lack of knowledge on the number of new EV chargers required and where they should go	Minor	Almost Certain	**High**	Set up reporting process for residents wanting EV chargers Adopt a proactive/strategic approach to rollout based on empirical data
EV Uptake lower than expected	EV Uptake is governed by factors outside Council control e.g. car-marker decisions, global supply issues, Australian dollar, government subsidies, public perceptions	The number of EV chargers will vary accordingly and lead to a potential oversupply or undersupply	Minor	Almost Certain	**High**	Develop a robust model of EV uptake and charging requirements using lead indicators Procure the best available data
Charging locations not appropriate	Charging locations aren't appropriate or are not in areas where they are likely to get maximum use	Lower utilisation Poor return on investment	Major	Possible	**High**	Strategically place EV chargers Use a rigorous site identification checklist
Changing charging preferences	Over-estimate the proportion of charging that will occur in the public domain – carparks or kerbside	Negative public perception Poor return on investment Reduced internal support for funding new chargers Unproductive/stranded assets	Major	Possible	**High**	Continue to monitor the metric charging sessions/ charger to look for any decline
Limited budget for EVSE	Budget for implementation currently relies on capital works bids and funding from each Council	Budget not available for future EV charging installations	Moderate	Possible	**High**	Ensure necessary internal support confirmed prior to bid, well-considered business case presented Keep on top of any other funding avenues available
Technology superseded	Technology is out of date within 5 years Move to DC charging	Loss of revenue Increase in financial costs to upgrade (not budgeted for)	Moderate	Possible	**High**	Advice of industry experts, in particular manufacturers followed on technology mix

05

EV Charging Community Survey

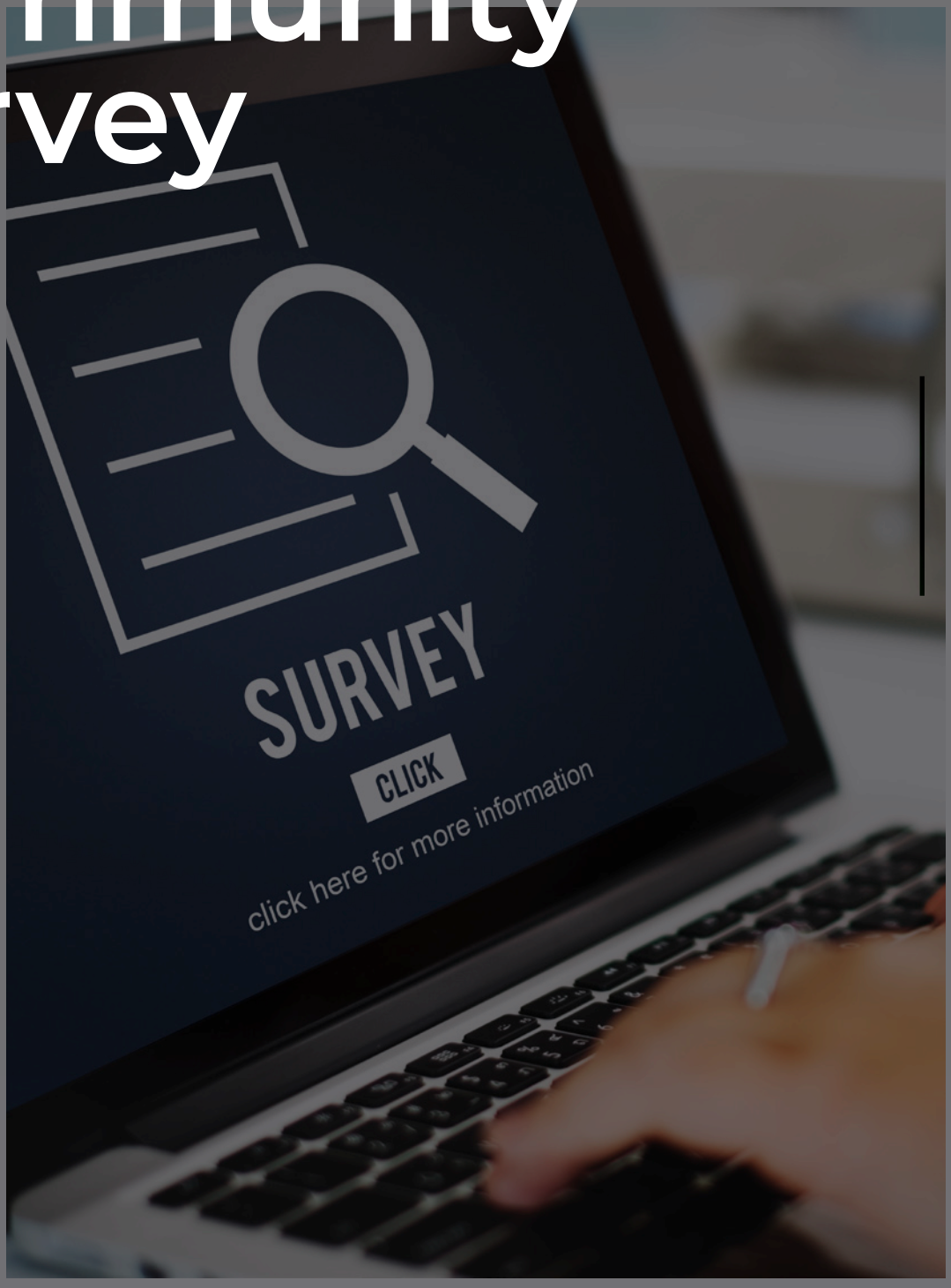


Figure 11: Eastern Suburbs EV Charging Community Survey

The Eastern Suburbs Electric Vehicle (EV) Charging Community Survey was developed by the 3-Council's Regional Environment Program. The purpose of the survey was to gauge the level of knowledge and interest from the community on EV purchasing, their charging options, and preferred locations for public EV charging in the Eastern Suburbs.

The survey was conducted online from 31 July – 3 September 2021 and was promoted through several communication channels including Council's e-News, Have Your Say forum, Council's Facebook, and EV user forums. There were 1,363 unique visits to the survey website and 1,186 respondents. There was also good representation of respondents who lived and/or worked in the Eastern Suburbs and from the various suburbs as shown in the figures below.

Do you have access to a garage, carport or parking space where there is a power point or electrical connection nearby?

Summary: 53% of the respondents reported that they had a garage or carport at home where they could charge, and 43% of respondents do not have access to private charging facilities.

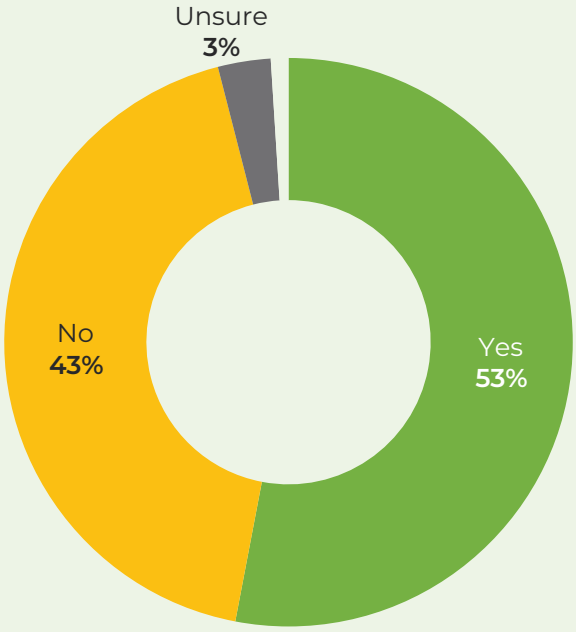


Figure 12: Access to Home Charging

Are you aware that there are currently 8 public charging stations across the eastern suburbs, as part of the 3-Council EV Charging Network?

Summary: only 7% of respondents were aware of all the eight EV public charging stations located across the Eastern Suburbs as part of the 3-Council EV charging network. Approximately one third of respondents (31%) knew of at least one station. 61% of participants did not know about the stations.

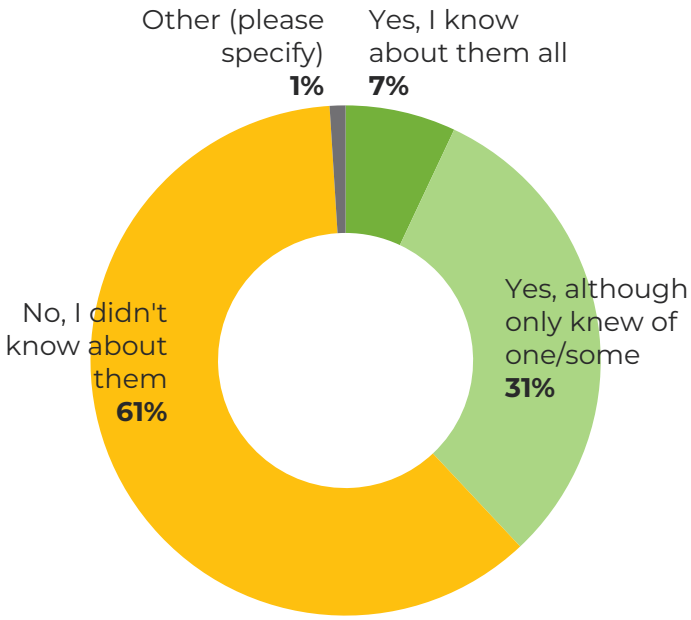


Figure 13: Awareness of Current Public EV Charging Stations

How long/far would you be willing to walk from your home or workplace to use an EV charger?

Summary: 59% of respondents stated that they would be willing to walk up to 200m (3mins walk) to use an EV charger while 89% said that would be willing to walk up to 500m (8mins).

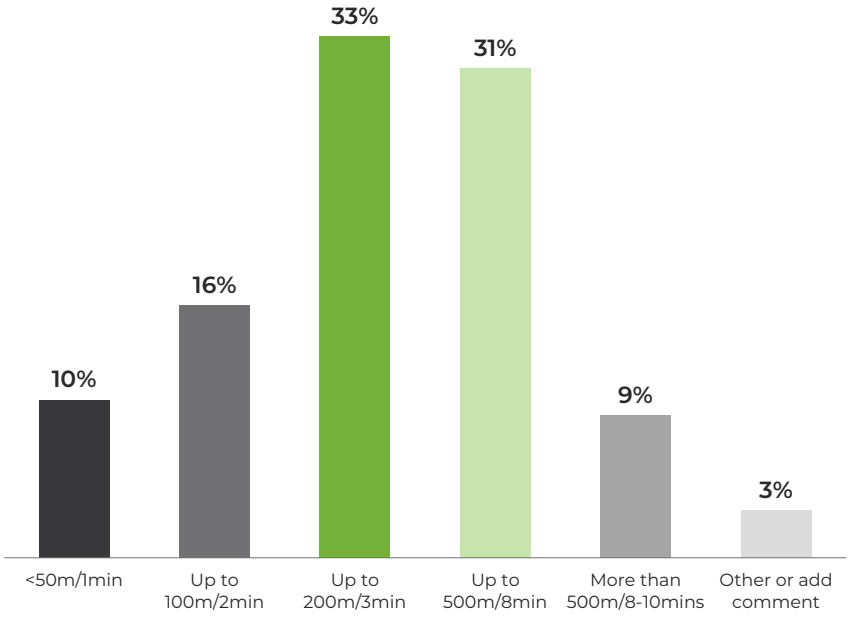


Figure 14: Distance between EV Charging Stations

Would the increased availability in public EV charging stations in the eastern suburbs influence your decision to purchase an EV?

Summary: most respondents (79%) reported that they would consider purchasing a hybrid or electric vehicle if there were more public charging stations available.

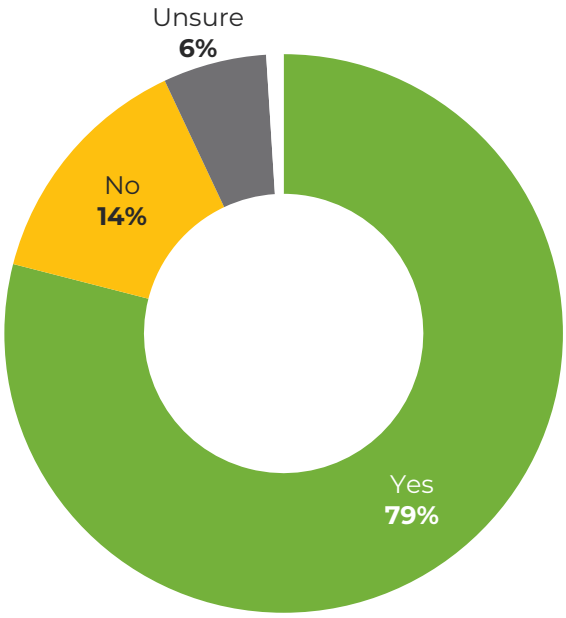


Figure 15: Impact of Public Charging Infrastructure on Electric Vehicle Uptake

Where should Council focus on assisting the provision of public EV charging?

Summary: respondents were asked to nominate a specific location they would like to see future charging stations installed. Overall, most respondents would like to see EV stations in carparks that are open to the public and on the street. Feedback provided on specific locations will be used, together with technical data, to determine best locations for future charging stations.

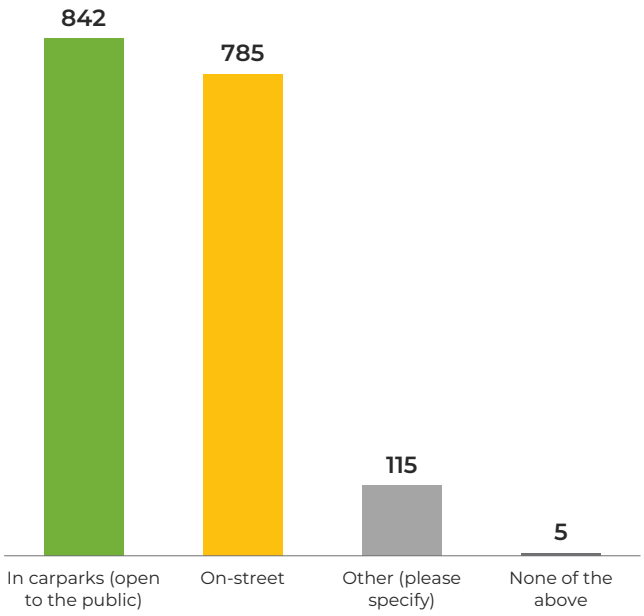


Figure 16: Suggested Charging Station Locations

Should Council provide or facilitate more public electric vehicle charging for the community?

Summary: overwhelmingly, 86% of respondents said Council should facilitate access to public charging stations. 6% of respondents were undecided and 8% were opposed to Council having a role in facilitating this. There were some different perspectives around the total numbers of chargers required as EV uptake increases and council's role in rolling out the charging network across the Eastern Suburbs.

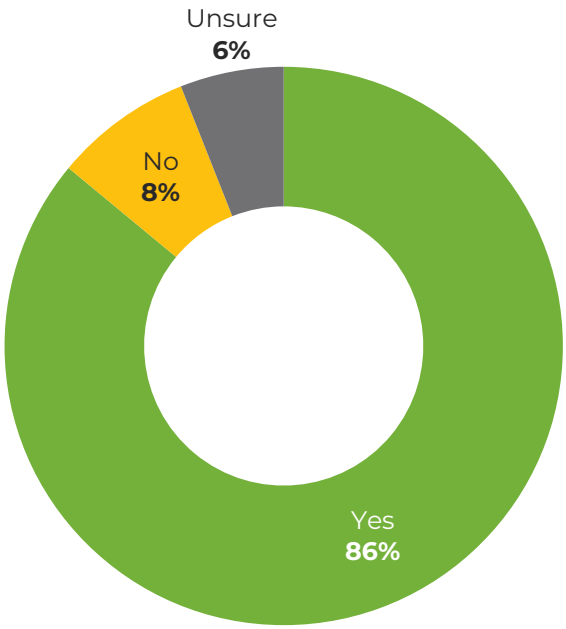


Figure 17: Council's Role in EV Charging

Abbreviations

Term	Definition
3-Councils	Randwick, Waverley, and Woollahra Councils
AC	Alternating Current
BEV	Battery Electric Vehicle
DC	Direct Current
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
kW	Kilowatt
kWh	Kilowatt-hours
PHEV	Plug-in Hybrid Electric Vehicle
REP	Regional Environment Program
V2G	Vehicle to Grid

Randwick City Council
a sense of community

WAVERLEY
COUNCIL

WOOLLAHRA MUNICIPAL COUNCIL