

ALL SITE CHECKLIST

LiB & EV Fire Risk for Vicinity Centres

June 2023

Prepared for:

Vicinity Centres

Prepared by:

EV FireSafe

Emma Sutcliffe, Project Director

Dan Fish, Technical Specialist

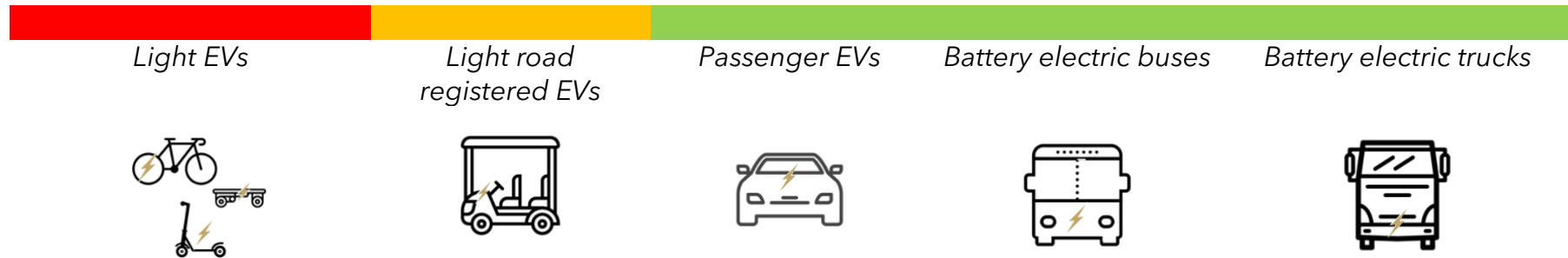
evfiresafe.com



Checklist to accompany LiB & EV Fire Risk for Vicinity Centres final report

Electric vehicle risk profiles

Overall, there is a low risk to Vicinity Centres with road-registered electric vehicles (passenger, bus, truck), but a higher risk of battery fire due to light EVs (LEVs). Current global thinking regarding risk profiles is shown below:



The risk of vapour cloud explosion is increased (but still rare) where the electrified vehicle goes into thermal runaway (battery fire) in an enclosed space.

EVs around the site	At all Vicinity Centres visited we noted passenger electric vehicles being operated, parked or charged by customers &/or tenants; ie. Tesla, with a dedicated charging point at Chadstone. Some sites have retail stores or 'kiosk' style spaces leased to EV manufacturers.
EV charging	All sites have EV charging installed or planned, & our additional considerations & best practice will further enhance safety at those sites.
LEV hire, sale, use & charging	Mobility scooters are available for hire at some sites for the use of customers.



	<p>Many sites have LEVs for sale via retail outlets like JB HiFi, Kmart etc.</p> <p>All sites have tenants selling LEVs & food delivery drivers using electric bikes near or within food court areas.</p> <p>Privately owned LEVs are not allowed to be ridden or charged within centres; enforced by security staff. However, rapid uptake means more will be present. Eg. We found a public listing on PlugShare for e-bike owners to charge at a powerpoint adjacent to an exit at Roselands SC.</p>
BESS	No Vicinity Centres site has battery energy storage systems installed at this stage, however design considerations for emergency response should be incorporated into future planning.
Contractors	The operation & charging of smaller device batteries (such as in power tools) & small vehicles (such as electrified cleaning 'golf buggies') is already occurring & will grow in future.

As the push to decarbonised transport accelerates, over coming years Vicinity Centres can expect to see:

- A greater proportion of private EVs being parked & charged at sites
- A greater proportion of their internal fleet transitioned to EVs
- Electrified public transport buses (battery electric buses or BEBs)
- Electric last mile delivery trucks & vans
- Increased use of smaller electrified vehicles by contractors, such as 'golf cart' style buggies used to transport cleaning products
- A dramatic increase in the stocking, sale & return of light EVs by their tenants
- A dramatic increase in the use of private light EVs by food delivery drivers & customers within sites

Following our site visits, we could not identify any major risks or hazards that are unable to be somewhat mitigated through design or awareness measures.



Risk reduction strategies already installed or planned

All Vicinity Centres sites visited had a high level of risk awareness, fire protection systems & well-run centre management & security teams. All sites had fully operational fire control rooms & well lit, secured & marked car parks.

With respect to the design, placement & installation of EV charging infrastructure, the Warriewood Shopping Centre has excellent consideration for emergency response, including early detection systems, & an open sided carpark with charging located at a distance from the centre entry/exit point. It should be considered a best practice model for other sites in these early days of EV charging take up.

This is combined with plans to provide online awareness sessions & online self- guided training modules for site & tenancy staff, which will assist everyone working around lithium-ion batteries to recognise the signs of a damaged or dangerous battery & therefore provide earlier warning.

We have no doubt the sensible considerations outlined in this document will be implementable to Vicinity Centre's current policies & procedures, as a forward thinking, proactive & safety focused organisation.

Additional sensible considerations & best practice

Across all Vicinity Centre sites, we put forward the following best practice considerations.

These considerations are in addition to site-specific suggestions; these currently relate only to Chadstone Shopping Centre.

They are also in accordance with the newly released Advisory Notice from the Australian Building Code Board, a document supported by the work of EV FireSafe on commission to the ABCB in September 2022.

Disclaimer & further information



It's important to note all considerations, best practices & suggestions are based on our battery fire research, experience as firefighters & collaboration with a global network of fire & battery experts. They are advisory only & should not be considered regulatory or essential in nature. EV FireSafe

This document has been prepared for the use of **Vicinity Centres**. While we've made every attempt to ensure that the information contained here is from reliable sources, EV FireSafe is not responsible for any errors or omissions, or for the results obtained from the use of this information.

All information in this document is provided 'as is' with no guarantee of completeness, accuracy, timeliness or of the results obtained from the use of this information, and without warranty of any kind, express or implied, including, but not limited to fitness for a particular purpose. The information in this document is advisory in nature & should not be taken as regulatory guidance of any kind.

In no event, will EV FireSafe, or it's related partnerships, agents or employees be liable to you or anyone else for any decision made or action taken which relies on the information in this site, or for any consequential, special or similar damages, even if advised of the possibility of such damages.



Overview - Road registered electric vehicle charging (EVSE) design & positioning:

In an emergency involving an EV & charging unit, there is an increased risk to site staff & emergency responders from electrocution. Across all sites, all EV charging equipment should have RCM Tick electrical compliance & be installed to ASNZ3000 App P wiring rules.

We additionally propose the following (in line with the ABCB Advisory Notice):

	All EV charging units to be 'smart'; ie. have an OCPP software connection for remote shut down if required
	All EV charging units to have isolation switches within 2 metres of the unit itself (as per ASNZ3000)
	A second master isolation point/e-stop at distribution board/s should be installed, providing the ability to shut down power to multiple chargers or a whole carpark level at once*
	Isolation/e-stops should be accessible & identifiable, with suitable signage*
	Wall stickers or suitable signage is installed to point responders to distribution board/s, fire hydrants & to point to nearest exits.
	Isolation switches in public spaces be secured with a '003' key
	Those in secure spaces should not be locked
	An EVFSB Charging Hub Fire Safety sign is installed at each site for the information of EV drivers
	All charging units are protected with bollards &/or wheel stops for collision protection
	Additional break glass fire alarms are installed where appropriate at charging sites
	Proximity of EV charging to emergency exit points & flammable items (ie. recycling bins) is considered



	Placarding at site entrance to advise emergency services of point of entry nearest EV charging site/s
	Where an ESIP (Emergency Services Information Pack) is in place, it is updated to reflect location of EV charging & isolation/e-stop points
	Where a PIP (Pre-incident plan) is in place, it is updated to reflect location of EV charging & isolation/e-stop points
	Upon commissioning of EV charging, local brigades are invited to visit the site for a familiarisation walkaround by the site manager
	Site staff undertake online awareness training for EV charging hub & LiB fires

*Refer to Australian Standards for guidance on the installation height of isolation/e-stop switches & the colour of switches & signage so there is contrast for easy identification

Signage may include:	
	EVFSB Charging Hub Fire Safety sign (to be provided by EV FireSafe for Business)
	To nearest Emergency Exits
	To master isolation &/or distribution board
	To Fire Control Room & AFA Panel/s

Clear marking of any impact hazards:	
---------------------------------------------	--



	Review of speed hump design & positioning to ensure not likely to cause EV HV pack damage (height and length, combined with any other angles such as drainage or guttering)
	Installation of markers &/or bollards at any irregular kerbing or median that may cause EV HV pack damage

General & Pre-Incident Plans - EV charging emergency response guidance:

With the rollout of the new technology of EV charging supply equipment, it is vital that emergency services are given suitable, supplier/manufacturer supplied information outlining safe operation & shut-down procedures for charging units.

An easily identifiable document labelled “Emergency Responder Guide – EV Charging” or similar, should be established for each site, printed & in a digital format.

A laminated copy of any technical information should be prominently displayed in any or all of the following locations:

	Security Office
	Fire Control Room (A3 sized copy)
	Electrical isolation/distribution room or cabinet relevant to EVSE shut-down
	Cabinet adjacent to EVSE installation, secured with a “003” key
	Any other location relevant deemed relevant

A digital copy should also be forwarded to the local emergency agency that should be attached to electronic pre-incident plans.

If the site has an ESIP (see below), this information can also be contained within the ESIP documentation.



--

ESIP - EV charging emergency response guidance:

ESIPs are developed in collaboration with local emergency agencies to provide important response information.

Although an ESIP would usually be considered for properties classed as special hazards, it may be prudent to ensure this information is readily available.

Information in an ESIP should include, but not be limited to the following, however please see the relevant document for the state in which the site is located (ie. [Fire Rescue NSW ESIP](#))

	Emergency contacts for site
	Tactical checklists
	Hazardous chemicals or procedures
	Building performance solutions
	Tactical fire plans

For Vicinity Centre sites that already have an ESIP, this should be updated to reflect EVSE information.

For sites that do not have an ESIP, consideration should be given to developing such material to aid in the appropriate response of emergency services.



Familiarisation sessions for local emergency services (optional):

As EV charging infrastructure is rolled out, Vicinity Centres should consider inviting local fire stations to the site for an organised 60 minute tour of charging hubs, including location of distribution board/s & fire control room.

These sessions assist agencies to respond with more confidence, therefore potentially reducing response time.

Opportunistic charging (EV & LEV at power points):

ESIPs are developed in collaboration with local emergency agencies to provide important response information.

Opportunistic charging of EVs does not automatically create a risk or carry additional hazards. However, unsafe practices are possible and will undermine management strategies of charging hub locations & emergency shut-downs of EVSE.

Vicinity Centres should consider:

	Installation of signage that EV charging is only permissible at charging hubs using dedicated hard-wired EVSE, not GPOs, or;
	Establish a dedicated BYO charger area where electrical circuits have been tested and are fitted with emergency stops and AFA stop when AFA system is tripped
	Conduct a car park audit of all GPOs and ensure they are either switched off and locked, or the circuit is isolated at the distribution board
	Schedule a regular review of public charging information (such as PlugShare app) to ensure no opportunistic charging is located within sites
	Ban the charging of LEVs at any powerpoint across all sites, for customers, staff & tenants



EVSE ongoing maintenance:	
	A fortnightly inspection by onsite staff or each EVSE to look for wear & tear should be scheduled
	A 6 monthly test & inspection by a qualified person should be scheduled; testing to be conducted using an EV or diagnostic tool that simulates an EV
	Any damaged EVSE should be taken offline & replaced (in full or part) with electrically compliant 'like for like' units
	Any portable extinguishers installed near EVSE are inspected for location and serviceability as part of regular fire protection checks*

*While currently available portable extinguishers are not suitable for lithium ion battery fires, they can be used on EVs where burning combustibles are present (ie. no battery involvement)

FOR ADDITIONAL CONSIDERATION:



Taking EV charging offline during routine maintenance: If it is noted that a detection or suppression system covering a charging hub location will be offline for servicing, maintenance or a fault, it would be advisable to take any EVSE offline for the same duration, especially in below-ground, enclosed or semi-enclosed locations. Local signage & website information should inform the public of this.*

*Although there are currently no formal obligations for such practices, it would be predictable that such expectations will be held by fire response agencies if asked. It should be considered normal practice to engage the EVSE Charge Point Operator (CPO) to put these systems online or offline and update EV charging app data. For non-smart systems, this may be required to be completed by Vicinity site staff.



EV charging – Display EVs within retail stores:

Where floor-mounted power outlets are fitted in areas with sprinkler systems, electrical circuits should have readily accessible isolation, fitted with appropriate earth leakage detection & circuit breaker. They should additionally be regularly inspected & tested.

LEVs for sale by retail tenants

Develop & implement policies & practices that encourage safe storage, handling & disposal or return of warranty products containing lithium-ion batteries (LiBs) by retail tenants. This may include retail tenants:

Requiring LEV OEM fire safety information prior to stocking their products*

Requiring LEV OEM to ship products at a low state of charge (this may reduce violence of fire behaviour)

Minimising stock held in one area within stores

Ensuring a quarantine area (clear, non-combustible) is available for 'risky' damaged battery packs, either new or returned

Ensuring appropriate warranty return procedure is arranged with OEM

Ensuring damaged LiBs &/or packs are disposed of through certified & established recycling/waste channels

Ensure damaged LiB &/or packs are NOT disposed of in general waste

Ensuring staff can identify 'risky' battery packs & do not do anything to cause further damage

Ensure LiB products sold in stores are certified, with no modified products available



--	--

*This should also include information supplied to the buyer for the lifecycle of the product

FOR ADDITIONAL CONSIDERATION:



In-house LiB recycling program: Vicinity Centres would be well-positioned to establish a centre-wide battery management program in collaboration with an organisation like B-Cycle or the Battery Stewardship Council, that includes safe disposal. This may be cheaper than ad-hoc store-by-store arrangements and increase the likelihood that stores participate in correct practices. These could be established/piloted at sites with less combustible construction & cladding, avoiding sites with high iconic value (eg. QVB, Sydney)

Privately owned & food delivery rider LEV operation & charging	
Privately owned LEVs used by customers, staff or tenants should be:	
	Banned from entering or being ridden at all sites
	Banned from being charged at any site, in any location

FOR ADDITIONAL CONSIDERATION:



Secure storage area for LEVs: Vicinity Centres may consider creating a nearby outdoor ‘secure’ space for delivery riders to leave their LEV while collecting food.

Smaller devices & light ‘golf buggy’ EVs



The policy for the procurement, use & charging of smaller devices & vehicles supplied by contractors should be established &/or reviewed by Vicinity Centres.

This may include procurement of Smaller Devices & Light Delivery Electric Vehicles from a reputable supplier that can:

	Provide electrical compliance & quality standards information
	Provide an emergency response guide (vehicles only)
	Provide battery details, such as chemistry & form type
	Guarantee a local support & maintenance team
	Guarantee replacement of parts & charging equipment to a high standard & with quick turnaround (preferably with locally held parts)

Webinar awareness sessions – Vicinity Centres site staff

	2 x webinars delivered to Vicinity Centres site staff* (as per contract with EV FireSafe); these are to be recorded & made available on Vicinity Centre’s internal sharing platform
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

*As personnel involved in daily operations & heavily relied upon by emergency agencies during an incident, it is vital for site security staff & managers to receive training in LiB and EV hazards, risks & response.

In-person training – centre security & management



	As determined by National Security Manager, training provided to those taking on the roles involved in Hazard & Risk Identification & Management, Emergency Response Plan Development, and contingency planning, these staff are faced with the WHS legislated requirement that they “ <i>must identify reasonably foreseeable hazards that could give rise to risks to health and safety.</i> ”*
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

*In-person training does not form part of the current contract with EV FireSafe, but can be established & rolled out nationally upon agreement.

Online LITE training – tenancy staff	
	Online LITE training should be rolled out to retail & other staff as identified by tenant management, but preferably undertaken by all staff working with or around lithium-ion batteries*.

* As per email to National Security Manager, EV FireSafe for Business has launched LiB & EV Fire Safety LITE online training. To view: Go to: <https://www.evfiresafe.business/course/evfsb-lite>, click on 'Buy \$69', set up an account & at checkout enter the coupon code: VCFREE, enter course & click on 'Start'.



Chadstone Shopping Centre – site specific recommendations

Mobile phone coverage	
Phone coverage was identified as 'patchy' in some car parks. This may affect emergency calls to centre management & emergency services &/or negatively impact the alarm being raised in the early stages of an incident, prior to installed systems being triggered, potentially affecting customer safety.	
	Lack of phone coverage has the potential to negatively impact incident communications and management via; Customer to centre management Customer to emergency services Centre management to emergency services Emergency services personnel to incident management
	It would be advisable to conduct phone coverage mapping across the full site and explore systems to improve phone coverage in areas with insufficient coverage.

Emergency Services radio coverage	
Given the size of the Chadstone Shopping Centre, it would be advisable to liaise with emergency services to ascertain if they are experiencing communications problems at the site using handheld radios or cellular-based devices, especially from the fire control room to the car parks. Emergency services should be able to recommend a suitable communications repeater system compatible with their equipment if there are concerns.	