Government of **Western Australia**
Department of **Transport**

Empowering a thriving community

Electric Rideable Device Storage and Charging

A Guide for Government Tenancies

Electric Rideable Device Storing and Charging

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Definitions

Charging: Supplying electric charge to power up the battery.

Charging cabinet: A fireproof cabinet or box specifically provided for charging of batteries that are removed from an electric rideable device. Considered more applicable for storing and charging multiple fleet batteries, not recommended for individual private device batteries.

Electric rideable device (ERD): Electrically powered personal transport devices which require charging via a battery and includes eScooters, used for recreation or commuting purposes. This excludes road registered electric vehicles, wheelchairs, motorised mobility scooters or other devices necessary to aid mobility for people with disabilities or mobility impairments.

Electric bicycle (eBike): A bicycle equipped with an electric motor that provides assistance to the rider while pedalling.

End-of-trip facilities (EoTF): Dedicated spaces for staff to store bikes and other wheeled active transport devices, plus other amenities such as lockers, changing rooms and showers.

Reputable brands: Device or battery, with a brand name, bought from an Australian business and where the charger bears the Regulatory Compliance Mark on the charger to show that it has met the relevant Australian Standards under the Electrical Equipment Safety System (EESS).[1] There are no standards for eScooters to meet at present.

Safe charging practices: The practices of riders when plugging in their battery and charger, including:

a) Only using chargers supplied with the device, or certified third-party charging equipment compatible with the battery specifications.
b) Disconnecting the charger once a device or battery has been charged.
c) Not using Lithium-ion batteries or devices that show signs of swelling, discolouration, leaking, overheating, signs of damage, or that don’t keep a charge.
d) Charging in a suitable location (designated area).
e) Not blocking access or emergency exits at any time.
f) Not charging when batteries are warm or hot.

Storing: Parking of an ERD, including battery, with or without charging.

[1] www.eess.gov.au

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1. Managing electrical and fire safety of electric rideable devices

1.1 Background and rationale for guidelines

Electric rideable devices (ERDs) such as eScooters are increasingly popular as modes of active transport and part of the solution in supporting mode shift to more active, healthy, environmentally friendly options. ERDs make active transport a viable option for a greater range of commuters. eBikes, particularly, which are also powered by Lithium-ion (Li-ion) batteries and are included in scope of these guidelines, have increased the distance that individuals can comfortably commute to work versus traditional bikes.

Since 2022, the use of privately-owned ERDs has grown by an estimated 10 per cent per annum on the cycling network around Perth.[2] eBike sales also continue to climb with an estimated 9,000 sold in Australia in 2017 rising to around 200,000 in 2022.[3] No sales data are available for eScooters.

When used for commuting, these devices require secure storage facilities at the workplace, usually in end-of-trip facilities (EoTF) originally designed to store only bicycles. Users often expect to be able to also charge their devices in the storage facility.

ERDs are powered by Lithium-ion batteries which have significant utility value across many applications. However, they do create fire risks: especially during charging. There are risk factors that contribute to the potential for battery fires. These factors include:

- Malfunction of the battery system caused by manufacturing defects (material defects, poor construction or contamination).
- Physical damage (crash, exposure to water, shipping, handling, crushing or puncture by waste collectors).
- Electrical damage (battery management system failure, overcharging, over discharging, using the wrong charger, overloading or short circuit).
- Thermal damage (exposure to high temperatures).

One or more of these factors can cause reactions within the battery accompanied by increases in its temperature. If the temperature keeps increasing in an uncontrolled way, it can result in a 'thermal runaway': a process that can result in the battery expelling its contents and potentially resulting in ignition and fire. Thermal runaway incidents, following battery failure, have caused fires and explosions in Australia and overseas that have led to property damage, serious injuries and deaths.

Li-ion battery fires produce toxic gases and unlike other, more common fires, have self-sustaining attributes because chemical reactions within the batteries make these fires extremely difficult to extinguish. Traditional suppressants like water are therefore best deployed chiefly to limit the spread of the fire.

eScooter batteries may have a higher risk of failure than those on eBikes. This is due to the location of the eScooter battery, which is lower to the ground than an eBike battery, exposing it more to water and physical damage.

[2] Bicycle Network Super Tuesday Count, DoT, March 2024
[3] Bicycle Industries Australia, presentation to DoT, 12 June 2024.

A safe systems risk-management approach, to identify the risks and implement suitable controls, is sensible given the increasing popularity of devices with Li-ion batteries and the severity of these incidents. This approach should also apply to the storage and charging of ERDs in EoTF, which have not traditionally been designed to accommodate these devices.

1.2 Intent of the guidelines

The Department of Transport (DoT) encourages active transport use, leads state-wide active transport planning and delivers programs for infrastructure provision and travel behaviour change. Our policy approach to ERDs is to enable their use, as an affordable and sustainable transport option for a thriving community, while mitigating the risks to life and property associated with their Li-ion batteries.

These guidelines were developed following stakeholder consultation, literature review and input from the Departments of Fire and Emergency Services (DFES), Energy, Mines, Industry Regulation and Safety, Finance, Main Roads WA, the Public Transport Authority, ChemCentre, Bicycle Industry Alliance and WestCycle. Applying the guidelines should:

- Mitigate the risks posed by the storage and charging of ERDs to the health and safety of staff and visitors, and to the integrity of facilities by implementing safety controls at state government workplaces.
- Help avoid reactive or disproportionate restrictions on the use and storage of ERDs used for commuting for work purposes by state government employees.

Reflecting a safe systems approach, these guidelines include controls to:

1. Facilitate safer storage and charging of ERDs in EoTF and buildings.
2. Mitigate the risk to the safety of people within buildings where devices and batteries are stored and charged.
3. Mitigate the risk of battery fires occurring.
4. Mitigate the risk to property and people in the event of a fire occurring.

The guidelines do not address other design considerations for EoTF, which can be found in other industry guidelines and standards. It is desirable that the designated area for ERDs be a safe storage and charging location providing quality facilities that include ease of access, quality security, passive surveillance, safe surfaces and other factors that support use.

Facilities managers will need to make their own decisions about the quantity of recharging points to supply, considering where these are located within the EoTF and patterns of demand particular to their premises. Landlords will have final discretion on storage and charging devices within their buildings and consulting with them is strongly recommended.

1.3 Use of the guidelines

The guidelines are targeted at the facilities managers of state government-owned buildings. Where state government agencies are tenants, the guidelines may be provided to the building's owner or delegated management authority for reference.

The guidelines provide options and considerations around key management tools that the facilities managers can adapt to their specific context and circumstances acknowledging that generally, ERDs will be accommodated in existing EoTF of different sizes, standards and amenities. The guidelines include two attachments – a checklist and a factsheet – for agencies to tailor to their needs.

The guidelines are organised into five sections, each with a set of recommended controls and measures:

1. Providing a safe designated area and suitable environment for storage and charging.
2. Managing the electrical system.
3. Promoting safer ERDs and charging practices.
4. Maintaining the safer charging environment.
5. Appropriate disposal of Li-ion batteries.

1.4 Further information

Useful resources	Link
Lithium-ion batteries and consumer product safety report (2023)	accc.gov.au/about-us/publications/lithium-ion-batteries-and-consumer-product-safety
DFES information on fires in the home – lithium-ion batteries	dfes.wa.gov.au/hazard-information/fire-in-the-home/lithium-ion-batteries
The Regulatory Compliance Mark	eess.gov.au/rcm/regulatory-compliance-mark-rcm-general/
Waste Authority Household Hazardous Waste Program	wasteauthority.wa.gov.au/programs/view/household-hazardous-waste
B-cycle drop off point search	bcycle.com.au/drop-off
WestCycle lithium-ion battery safety guide	westcycle.org.au/e-bikes

2. Guidelines

2.1 Risk management-based approach to applying control measures

These guidelines identify a range of risk mitigation measures that can be adopted by managers of EoTF that store or charge devices powered by Li-ion batteries. The measures provide a 'recommended level' and an alternative 'higher level' of mitigation. The 'recommended' measures are generally easier to implement and less costly than 'higher level' measures.

Not all the measures will be relevant, appropriate or possible for individual buildings but can be applied depending on the physical limitations and characteristics of the facility plus other considerations that may apply. It remains the responsibility of each facilities manager to conduct an appropriate, thorough, risk assessment.

Should an assessment find that EoTF cannot be made sufficiently safe for the charging of Li-ion batteries now, an interim or transitional position could be to only authorise the storage of the devices without charging. Additional care should be taken to ensure that batteries are not charged in other areas of the building.

A checklist is provided to assist facilities managers with application of the guidelines (Attachment 1).

The guidelines are live and will be reviewed biennially from July 2026 and updated as new information becomes available.

2.2 Provide a designated area that is a suitable environment for the storage and charging of ERDs

This section covers controls that aim for EoTF to be designed and maintained to provide a safe and suitable environment for the storage and charging of ERDs, and to minimise the exposure to fire and smoke hazards should an incident occur.

Control	Recommended level of risk management	Higher levels of risk management
Engage with the Government Office Accommodation	Agencies must engage with Government Office Accommodation within the Department of Finance when considering their ERD charging and storage needs within leased office accommodation or Finance owned premises.	Not applicable.

Control	Recommended level of risk management	Higher levels of risk management
Set aside a single, designated area for the parking and charging of ERDs to allow for containment and limit the area at risk.	The designated area may be all or part of an EoTF bicycle parking area. No storing and charging of ERDs should occur outside this designated area.	Provide a separate room/facility or physical separation not under the main roof of the building.
Signage and directions for ERD users to only park in the designated area.	Provide signage and markings, such as painted colour coding or floor markings, to identify where ERD parking or charging may occur. Install signage prohibiting ERDs in any places that may become informal parking areas such as stairwell space or spare offices. Provide advice that removable batteries are not to be taken out of the designated area and taken into workspace for either storing or charging. Include wayfinding directions in rider safety and induction materials.	Not applicable.
The designated area should be in a cool, dry area away from direct heat and water sources to reduce risk of overheating due to external sources or water damage.	Ensure protection from the elements - rain and direct sun - is provided and the designated area is not next to high heat generating equipment such as air-conditioning compressors and furnaces.	Not applicable.
The designated area should be separated from workspace/office space or other sensitive areas of the building such as server rooms, archives or laboratories to reduce risk of fire spreading to other areas or affecting other users or critical functions or assets of the organisation.	Provide the parking area on a different floor to office space (e.g. basement). Where that is not possible, provide solid, fireproof walls between work areas and the designated charging area. Avoid the doors used to access the parking area opening directly into office or other workspaces. Instead, they should open to the outside or shared spaces such as a garage, locker rooms or passageways.	Where there is proximity to employee workspace, engage a fire engineer to consider additional measures such as sprinkler protection, fire safety doors, smoke detection sensors and so on if not already provided.

Control	Recommended level of risk management	Higher levels of risk management
The designated area should be ventilated to reduce the risk of toxic smoke and gases accumulating and affecting the health and safety of the users, building occupants or emergency personnel.	Allow air flow with other non-office areas such as a car park and/or storage areas to allow smoke and gases to dissipate. If the area is a confined and sealed space, consider installing an Automatically Openable Vent linked to the fire and smoke detector systems. Consider venting and air conditioning ducting in relation to direction of smoke travel, avoid venting directly to internal workspaces such as windows to offices.	Provide for natural airflow via permeable walls to the outside.
The designated area should be free of flammable materials to reduce the risk of fire spreading or escalating.	Locate towel storage or drying lines in a separate room or at a distance from the designated area such as the other end of the room to any charging points. Provide storage of cleaning supplies in a separate area ensuring that doors do not open into the designated area. Store other flammable materials such as fuel supplies in a separate area. Provide fire-rated walls and a hard surface, non-slip flooring, avoiding carpet.	Not applicable.
Have fire detection, suppression and isolation systems installed to enable early detection of and response to incidents and to reduce risk of fire spreading.	Install fire and smoke sensors connected to alarms. Install a sprinkler system in the designated area and adjacent areas. The sprinkler system will assist in reducing the likelihood of the fire spreading and damage to the building structure. Provide access to a hydrant/water supply for emergency services, as this can be used to cool the building structure and other materials in the vicinity to reduce damage and the likelihood of the fire spreading. Where a sprinkler system is installed, ensure the triggering of alarms provides automatic power isolation (cut-out) to the ERD charge points before sprinklers activate to prevent electrocution.	Install gas-detection alarms. Gas detection alarms may identify toxic vapour cloud chemicals such as carbon monoxide and hydrogen cyanide before a fire occurs. Provide extinguisher/s appropriate for Li-ion fires (for example F-500 EA) for use by emergency services.

Control	Recommended level of risk management	Higher levels of risk management
		Note: advice on suitable extinguishers may be updated as industry gains more experience with Li-ion fires. Expert advice should be sought for up to date extinguisher information.
Ensure the parking of ERDs in the designated area does not block emergency exits/access so users and building occupants can evacuate safety and quickly in case of a fire or incident, and emergency services can easily access the area.	Ensure that the layout of the designated area allows access to all exits and access remains unimpeded if a parked ERD catches fire. Impeding access to any exit may breach occupancy permit/building code.	Not applicable.
Provide directional wayfinding and signage for emergency personnel so they can quickly locate and respond to a Li-ion battery fire.	Provide directional wayfinding signage to guide emergency services to the designated area in case of an incident and provide any other important information such as identifying a charging cabinet if installed, for example for fleet ERDs or emergency power isolation switch.	Not applicable.

2.3 Manage the electrical charging system

There is growing evidence that most Li-ion battery fires start when batteries are being charged or overcharged. Management controls on the electrical environment can reduce the risk of overcharging and overheating and avoid the incident escalating.

Control	Recommended level of risk management	Higher levels of risk management
Establish a charging environment that can restrict the amount of time on charge to minimise the risk of the battery overheating.	Install charging points that have an automatic cut-out at times outside of typical business hours to avoid ERDs being left plugged in and charging overnight or over the weekend.	Install timers that cut out after a defined period, such as three or four hours, enabling sufficient charging time for commuters but mitigating risks of overcharging. Install delayed power supply for charging, which will only commence after a battery has had time to cool (e.g. 30 minutes). Alternatively, power to the chargers may be timed to come on at a defined time after typical commuter arrivals: e.g. 10 am.
Provide electrical isolation of the area where charging points are provided so that if there is an incident, power points will not continue to contribute to heat generation.	Ensure each general power outlet has its own switch.	Install an emergency isolation switch in the EoTF that deactivates all general power outlets. Automatically isolate power in the designated area if a general fire alarm is activated.
Use only the power points provided.	Ensure power points are installed so as they do not require extension cords to be used: i.e. do not provide a single bank of power points in larger areas. Prohibit use of extension cords and power boards to extend the charging capability.	No applicable.

2.4 Promote safer ERDs and charging practices

Device quality and condition play very important roles in overall safety. Facilities managers can implement various measures to support ERDs and batteries to be of a suitable type, standard and condition for riders to undertake safer storage and charging practices.

Control	Recommended level of risk management	Higher levels of risk management
Undertake awareness raising of ERD Li-ion fire risks and safety by providing information to riders and building tenants to support good purchasing and charging practices and ongoing self-monitoring by riders.	Provide a safety brochure or factsheet (Attachment 2) with simple, easy-to-read safety and risk mitigation information to riders. This information could be shared as part of employee inductions or when employees register interest for use of EoTF (e.g., the rider receives the information with access privileges and/or locker keys). Information should include: • Li-ion battery fire risks • Advice on purchasing a reputable quality device • Only using the charger and battery combination provided at purchase • Identifying signs of battery damage • The risks of modifications • Safe charging practices such as not leaving devices plugged in for extended periods or overnight • Safe disposal of a battery. Prohibit, via signage, promotional material, induction and/or corporate policy, batteries being removed from the designated area and taken into workspaces for storing or charging.	Implement broader awareness raising based on the safety factsheet (Attachment 2). Ideas include information on the organisation's intranet and posters in the EoTF and at strategic locations in the building. Provide a specific and thorough induction to safe storage and charging practices and use of the EoTF. The induction may include: • A tour of the EoTF highlighting the designated area and safety equipment. • Information and education on the risks and hazards of Li-ion batteries. • The signs and symptoms of battery damage. • Proper use and care of the device, battery and charger. • Appropriate use of the facilities. • No removal of batteries from designated area. • No flammable materials, such as bags or jackets, to be left on batteries when charging. • The location of access points and emergency exits. • Emergency procedures in case of an incident.

Control	Recommended level of risk management	Higher levels of risk management
		• Safe disposal of Li-ion batteries. • The right and responsibility of the facilities managers to remove devices when problems are identified.
Support batteries being of a suitable standard and condition to be charged to minimise the risk of a battery catching fire while charging.	Promote suitable battery standards and conditions via awareness raising campaigns, signage, promotional material, induction and/or corporate policy: • The battery charger meets the national EESS standard. • The battery and its housing must be in good condition with no visible damage. Warning signs of damage include: – excessive heat (hot to touch) – change in colour – change in shape (swelling) – emitting any smoke, odour or leakage – not keeping a charge. • The charger is the one provided specifically for that battery. • The device and battery have not been modified. • The device and battery are a reputable brand and/or purchased from a reputable supplier.	Develop a corporate policy consistent with these guidelines that required employees who use the EoTF must comply with. Provide tags for the ERDs of riders who have received safety information through the factsheet or completed induction. This does not provide any guarantee of the safety but does mean that the rider is aware of the risks and safe charging practices. Implement a testing and tagging procedure of acceptable batteries and chargers, either as a one-off test for authorisation to charge at the EoTF or a regular (annual) testing and tagging of 'safe' device batteries and chargers by a qualified technician. The procedure would require consideration of: • A system of identifying currently approved devices to support compliance monitoring; for example, colour coded tags. • Who will be responsible for paying for testing of individual units – building managers or individual riders. • How to deal with new ERDs and riders between scheduled tests or expiring tags when riders are not able to attend testing.

2.5 Maintain the safer charging environment

Facilities managers can implement processes and controls to support the safer charging environment and practices and to monitor and respond to non-compliance issues.

Control	Recommended level of risk management	Higher levels of risk management
Include the EoTF in cleaning schedules.	Include the EoTF in cleaning schedules to keep the area clear of flammable materials.	Not applicable.
Include the EoTF in maintenance schedules to ensure that equipment including the electrical system and the fire detection system are operating safely and are fit for purpose.	Ensure the fire detection and suppressions systems maintenance schedules include all equipment. Undertake regular testing of the electrical system including isolation switches.	Not applicable.
Establish processes for monitoring compliance with the safer charging practices established by the organisation and rectifying issues and non-compliances identified.	Include regular inspection of the EoTF in the facilities management role. This would include checking that: • Only ERDs of riders who have received safety information or induction are parked or charging (if a tagging regime is in use allowing this to be discerned). • There are no extension cords or power boards in use. • Flammable materials are not in the vicinity in accordance with section 2.2. • ERDs are not parked outside the designated areas such as in passageways and stairwells. Rectification actions for identified issues would need to be determined including: • If additional educational action is required. • Removal of materials that reduce safety such as flammable materials or extension cords.	Not applicable.

Control	Recommended level of risk management	Higher levels of risk management
	• Removal processes for ERDs for serious non-compliances such as being parked outside the designated areas or blocking emergency access. • If other penalties are required such as temporary or permanent banning from areas.	
Include a section for battery fires in the building's Emergency Response Plan to ensure the most effective and rapid response to an incident maximising the safety of building tenants and emergency services.	The building's Emergency Response Plan should be updated to include any information specific to the designated area and charging facilities including: • Any action a responsible person, such as the facilities manager, should take like using the isolation switch to cut off power to the chargers if this is not done automatically. • When to undertake emergency evacuation of personnel if that differs from the standard. • Directions and information to be provided to emergency services.	Not applicable.

2.6 Facilitate appropriate disposal of Li-ion batteries

The disposal of Li-ion batteries into the standard waste collection system risks the crushing and puncturing of the battery cells or subjecting the cells to high temperatures, thereby risking a thermal runaway event. Batteries that are being disposed of are already more likely to be damaged or otherwise compromised exacerbating the risk. The following websites provide information on appropriate disposal locations:

- B-Cycle drop off: bcycle.com.au/drop-off
- Waste Authority Household Hazardous Waste Program: wasteauthority.wa.gov.au/programs/view/household-hazardous-waste

Control	Recommended level of risk management	Higher levels of risk management
Prohibit the disposal of Li-ion batteries in the building's waste disposal or recycling system to prevent waste fires.	Provide disposal information in awareness raising materials. Provide suitable information, including prohibition signage at the central waste collection point or bins near the designated area.	Not applicable.