



**Victoria Department of Transport & Planning – Zero Emission Bus Transition.
Lighter Footprints submission to August 2023 Consultation Paper.**

Lighter Footprints¹ is a community-based group that aims to influence Australian local, state, and national decision makers to take the action necessary to halt global warming as a matter of urgency. For over a decade, we have educated, advocated, and brought people together in Boroondara and surrounding suburbs to inform the community and promote a clean energy future. We have over 3,500 people on our mailing list.

Lighter Footprints welcomes the opportunity to provide feedback on the Government's Zero Emission Bus transition.

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General comments

Lighter Footprints is highly supportive of a rapid transition of bus fleets to battery electric. As stated on page 8 of the consultation paper, many fleets in China and Europe are transitioning with necessary technologies well proven. As such, we believe that we do not need to further trial technologies as success has already been proven locally and overseas; we need to pilot the implementation, inter-operability, transitioning depots, operator capability and local manufacturing – major decision points should be financial and logistics, not technology focusing on how to facilitate and accelerate the transition.

We are strong advocates of battery electric buses and think that hydrogen fuel cells, although they may have a limited role, are a distraction to most fleet transitions. Australia will never be a leader in hydrogen fuel cell vehicles given our small scale and very small role in vehicle manufacture – we will continue to follow overseas trends. We cannot afford to risk the transport and energy transition with unproven technologies and economics when low-risk viable alternatives exist. We find that the technology comparison table on page 20 is reasonably balanced, acknowledging limitations of both BEBs and HFCBs but suggest comparisons further consider short haul vs. long haul services. HFCBs would be shown to be less feasible for short haul while battery swap and pantograph charging (enroute and destination) make BEBs increasingly viable for long haul. Even longer-haul train services are shunning hydrogen fuel cell technology in favour of batteries².

The introduction of BEBs with pantograph charging provides for an interesting opportunity for integration with the Melbourne tram network. Extending the “tram” network footprint beyond the current track/overhead network and providing an alternative to reworking tram stops for disabled access with pantograph BEBs able to pull over to a raised kerb stop (rather than expensive and disruptive traditional disabled-friendly mid-street tram stops).

We feel that the consultation misses the opportunity to discuss Vehicle to Business (V2B) and Vehicle to Grid (V2G). Overseas studies have shown that many trucks and buses return to depots with significant remaining state of charge which could support the grid during the evening peak with subsequent off-peak overnight charging. In fact, school bus fleets have the potential to be the star V2G/V2B use case with morning and afternoon usage, daytime solar charging, evening peak discharge to grid and then overnight off-peak top-up charging. Other fleets with predominantly daytime usage would still contribute to grid stability and provide significant economic opportunity to bus fleet operators participating in electricity market arbitrage and firming services. DTP and DEECA should facilitate the acceleration of fleet and heavy vehicle V2x standardisation, working with local EV charging and electrical standards organisations.

We think that the grid impact outlined on page 27 may be understated. It is likely that even small depots will require significant connection and transformer upgrades. Unfortunately under existing Australian Energy Regulator (AER) rules, distribution network service providers (DNSPs) are not encouraged to proactively work with fleet operators to upgrade capacities in advance of fleet electrification. However, temporary grid constraints should not slow the transition to BEBs. We suggest that DTP and DEECA work together with the electricity network stakeholders to map out a plan for fleet electrification (not just buses) that allows for proactive and economic grid investment and augmentation to support the transition.

We caution Government to not step too far into the commercial bus operator domain. Obviously, Government has a leadership role with direct and indirect Government bus services and needs to provide regulatory frameworks, interwork, and technology standard options for commercial bus operators to work within. However, Government should not be too prescriptive with technologies,

² <https://thedriven.io/2023/08/07/german-state-ditches-world-first-hydrogen-train-network-for-cheaper-electric/>

leaving operators to make their own business investment decisions. Victorian Government grants and subsidies should focus on developing local capability and accelerating pilot implementations and not be made available to speculative technologies with limited roadmap to widespread and sustained adoption. Grants and incentives should be linked to sustainable efficiency improvements.

Feedback Sought		Lighter Footprints feedback
Proposed role for government		
Sequencing depot upgrades for larger operators	Operator feedback on the Government’s proposed sequencing by larger operator group rather than by region or contract, including the extent of flexibility available for cascading, depot sharing and other efficiency gains	Agree. But recognise that short haul fleets have the most immediate benefits and more readily available feasible solutions. Localised electricity grid capability roadmaps may influence sequence.
Depot master planning	Considerations to be included in the depot master planning and design framework	Joint forward planning with grid operators is essential. Government should facilitate but limit detailed involvement.
	Operator and industry experience in managing risks associated with the ‘handshake’ between chargers and buses, ensuring interoperability across the broader public transport bus fleet	<ul style="list-style-type: none"> • V2B/V2G should be included in considerations. DTP and DEECA should provide guidance to bus operators on their potential. • Government should facilitate technology discussions (DNSPs, Energy Safe Victoria, charger companies, bus operators). ARENA funding may be available for bus V2B/V2G pilots.
	Approaches to ensure depot upgrades are efficient and avoid unnecessary rework and minimise service disruptions	Government should highlight issues but leave to operators to make their investment decisions
	Suggestions on approaches (commercial or technical) to adopt interim solutions such as depot and parking capacity uplift, or to adapt the current depot model and leverage charging and stabling facilities in more central locations (enabled by a ‘cleaner and quieter’ fleet)	Government should highlight issues and ensure knowledge sharing (especially around technology implications and inter-operability) but leave to bus operators to make their investment decisions
Energy grid upgrades	Extent to which the Victorian Government can support operators to engage and work with DNSPs to understand collective opportunities / requirements as part of the ZEB transition	<ul style="list-style-type: none"> • Proactive planning and provision of capacity is essential. DTP/DEECA should facilitate joint planning sessions with DNSPs and lead bus operators and if necessary, represent issues to Federal bodies (AER, AEMC). Victorian Government may choose to play a proactive role in seed funding distribution network upgrades.

		<ul style="list-style-type: none"> Operators should be encouraged to maximise “behind the meter” solar and battery capability to improve economics and grid impacts.
Bus manufacturing industry		
Capacity and capability to meet Victoria’s ZEB Transition Plan	Current capacity of the industry to respond to the BEB transition, including fleet, batteries and charging equipment	<ul style="list-style-type: none"> Utilising local design and manufacture is important but not such that international innovation and economics are excluded. Conversion of suitable diesel buses to BEB should also be considered – this capability would be translatable across the trucking industry. Leveraging Victoria’s train/tram manufacturing should be considered.
	Market interest and appetite for local manufacturing of ZEBs, including how the Victorian Government can encourage local industry development	<ul style="list-style-type: none"> DTP could require or incentivise Victorian and Australian local content when renewing operator Government contracts but not to the detriment of innovation and global competitiveness. Local design and manufacture of smart charging infrastructure, especially V2B/V2G, should be in scope. Leveraging and extending current TAFE EV training for mechanics and auto-electricians is logical.
	Market interest for new sectors and auxiliary industries including parts, batteries, truck and other zero emission vehicles manufacturing	We have no experience or views on this
Construction industry		
Construction market capacity and capability	The value of the Victorian Government developing guidance for operators on approaches to working with construction or integrator partners for depot upgrades and facilitating connection with contractors	We have no experience or views on this
	Alternative approaches for construction contractors / integrators to engage in depot upgrades and service provisions	We have limited experience on this. Existing EV charging infrastructure and network players have significant experience in necessary connection dimensioning and approvals.
Other opportunities and innovations		
Other opportunities to explore	Are there any other opportunities the Government should explore to leverage	<ul style="list-style-type: none"> Synergies with Victorian tram and train network transition should

	<p>value from the significant investment in ZEBs?</p>	<p>be considered with demarcation between the three networks potentially blurring. Extension of the electric train network with hybrid battery/pantograph trains should be part of the plan³.</p> <ul style="list-style-type: none"> • Autonomous bus operation should be part of future looking plans. • Some coordination nationally will be required to ensure interoperability for interstate bus companies. • We understand that Queensland has an accelerated program of electrifying their Brisbane bus fleet associated with hosting the Olympics – DTP should liaise to ensure synergies are maximised. • South Australia is incentivising local ZEB manufacture. • As much as Government wish to foster local manufacture and employment, leveraging Australian interstate capability should not be disincentivised.
	<p>Are there opportunities to work with the energy sector to optimise the ZEB transition within the context of the energy and distribution network transition?</p>	<ul style="list-style-type: none"> • DNSPs would welcome the opportunity to work with DTP and bus operators to plan and minimise grid impacts with the possibility of bus fleet Vehicle to Business/Vehicle to Grid(V2B/V2G) positively contributing to grid stability. • Bus operators’ participation in electricity grid Demand Response initiatives would be logical. • Opportunities exist for smart chargers to be developed (local technology companies with global export possibilities) to optimise grid connection utilisation and integrate vehicle to grid/business capabilities.

³ <https://www.railwaygazette.com/traction-and-rolling-stock/battery-train-to-take-caltrain-electric-operation-beyond-the-wires/64754.article>