NSW Transport and Infrastructure Inquiry into Existing and Future Infrastructure for Electric and Alternative Energy Source Vehicles

Friday, 2nd May 2025

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Introduction

The Australian Logistics Council (ALC) welcomes the opportunity to respond to the Legislative Assembly Committee on Transport and Infrastructure's *Inquiry into Existing and Future Infrastructure Needed to Support Electric and Alternative Energy Source Vehicles across New South Wales*.

ALC is the national peak industry body representing Australia's largest end-to-end supply chain and freight logistics companies. Our members operate across all modes of transport—road, rail, air, and sea—and manage the movement of both bulk and non-bulk freight. This includes intermodal, containerised, and commodity-based freight across metropolitan, regional, and long-distance supply chains.

Many ALC members are actively progressing towards net-zero emissions by investing in and trialling zero-emission heavy vehicles (ZEVs) and the supporting infrastructure. However, the transition is uneven across the freight sector. Regional and long-distance freight operators—and particularly small-to-medium enterprises—face higher costs and a range of operational challenges. These include limited vehicle range, long charging durations, payload reductions, and infrastructure or regulatory barriers. State and territory road authorities, local governments, and infrastructure owners restrict some ZEVs from accessing critical freight routes, tunnels, and bridges due to mass, height, axle configuration and clearance constraints. Inconsistencies in road access rules and vehicle standards across state and territory borders also hinder national uptake and network efficiency.

This submission draws on the direct, practical experience of ALC members to make targeted, evidence-based recommendations. It outlines the infrastructure reforms and investment priorities required in New South Wales to support a safe, cost-effective, and scalable decarbonisation of the freight transport sector.

The Freight Sector's Decarbonisation Challenge

Freight transport is integral to Australia's economy, facilitating the movement of goods across sectors such as agriculture, manufacturing, mining, construction, health and pharmaceuticals, energy, and retail. However, it significantly contributes to greenhouse gas emissions. In 2022–23, road vehicles accounted for 84% of emissions from domestic transport modes[1]. Projections indicate that, without intervention, the transport sector will become Australia's largest source of emissions by 2030[2].

Addressing freight emissions is critical to meeting national climate goals and ensuring the sector's long-term viability. The Australian Logistics Council advocates for a technology-neutral, infrastructure-first approach to freight decarbonisation. Such a strategy must reflect the operational complexity of the freight task — including 24/7 operations, long-haul routes, and significant energy demands — and be underpinned by coordinated planning across transport, energy, and land-use portfolios.

Long-haul freight poses unique challenges for ZEVs adoption. These operations involve high payloads, extended duty cycles, and limited opportunities for en-route charging, making them less suited to early electrification. This reinforces the need for freight-specific infrastructure planning that accommodates both depot- and corridor-based refuelling, while accounting for the energy density and spatial requirements of emerging fuel technologies. In the near term, alternative fuels such as hydrogen and renewable diesel are likely to play a more prominent role in decarbonising long-distance freight.

Greater use of rail freight presents a clear and immediate opportunity to reduce transport sector emissions. To unlock its full potential, infrastructure strategies must address the key barriers limiting rail's growth. With its lower emissions intensity per tonne-kilometre, rail freight is essential for decarbonising transport. However, its underutilisation stems from outdated infrastructure, limited network capacity, and fragmented regulatory frameworks.

A targeted strategy must focus on modernising rail terminals, upgrading critical freight corridors, and developing intermodal hubs to ensure seamless integration between rail and road. Streamlining access to rail networks and harmonising regulations across jurisdictions will improve efficiency and facilitate a shift from road to rail. To achieve this shift at scale, rail services must be reliable and commercially viable for freight operators. By bolstering rail's capacity and competitiveness, these measures will alleviate congestion, reduce emissions, and contribute significantly to Australia's decarbonisation goals. A coordinated approach to rail infrastructure investment is vital to establishing rail freight as a cornerstone of a sustainable transport system.

Recommendations:

- Integrate freight decarbonisation into the NSW Net Zero Transport Strategy[3].
- Establish emissions reduction targets and policies that address freight-specific challenges.
- Adopt a technology-neutral stance, supporting both battery-electric and hydrogen fuel cell vehicles, and low-carbon liquid fuels.
- Recognise and enable rail's role in freight decarbonisation by supporting modal shift initiatives, prioritising terminal infrastructure, and addressing regulatory or planning barriers to rail access.
- Implement ongoing consultation mechanisms with the freight industry for energy and infrastructure planning.
- Prioritise investment in freight-specific Infrastructure.

Zero-Emission Freight Infrastructure Planning

The current charging and refuelling network in New South Wales is not equipped to support the operational needs of zero-emission freight vehicles. Infrastructure development has to date focused on passenger vehicles, leading to critical gaps in the freight network.

[1] https://www.bitre.gov.au/publications/2023/australian-infrastructure-and-transport-statistics-yearbook-2023/transport-energy-environment

[2] https://www.dcceew.gov.au/energy/transport

[3] https://www.transport.nsw.gov.au/system/files/media/documents/2023/net-zero-and-climate-change-policy.pdf

Heavy vehicles require high-capacity charging and hydrogen refuelling at key freight nodes — including depots, intermodal terminals, logistics hubs, and rest areas on Tier 1 freight corridors. While ports are frequently cited as strategic locations, limited land availability and short dwell times reduce their suitability for large-scale vehicle charging.

Infrastructure deployment should instead be concentrated at off-port freight precincts and industrial areas, where longer dwell times, available land, and proximity to the grid support scalable investment. Inland rail terminals and major intermodal hubs are particularly well-placed to host high-capacity facilities, especially where these can be integrated with renewable energy sources and grid upgrades.

Public charging infrastructure must also be designed to meet the future technical requirements of heavy freight. Next-generation electric trucks may rely on batteries exceeding 500kWh in capacity, necessitating charging infrastructure of at least 200kW per bay, with megawatt-scale capacity required at high-throughput sites.

Government coordination is essential to enable early deployment. Without public sector support to de-risk investment and align infrastructure roll-out with freight movements, progress will remain uneven — especially in regional areas that risk being left behind.

Recommendations:

- Establish a statewide network of freight-dedicated charging and hydrogen refuelling facilities.
- Set a minimum standard of 200kW per charging bay for public use, with provision for 1MW+ charging at high-volume freight locations.
- Prioritise infrastructure delivery at intermodal terminals, logistics hubs, depots, and along Tier 1 freight corridors.
- Expand existing grants and co-funding programs to include dedicated support for heavy vehicle ZEV infrastructure.

Energy System and Regulatory Enablement for Freight ZEVs

The decarbonisation of Australia's freight task depends on an integrated approach across energy infrastructure, regulatory reform, and financial mechanisms. Without systemic alignment, freight operators face escalating barriers to adopting ZEVs at scale.

Energy System Requirements

The deployment of high-capacity charging and hydrogen refuelling infrastructure is contingent on reliable, high-throughput access to energy. In freight-intensive areas—particularly outer metropolitan and regional precincts—grid capacity is already insufficient to meet emerging demand. These constraints are impeding project delivery and deterring private investment.

Designating key freight precincts as energy priority zones would enable proactive network upgrades and ensure that investment in charging infrastructure is matched by corresponding improvements to grid capacity. Co-locating renewable energy generation and storage with freight infrastructure will be essential to manage peak demand, reduce operational energy costs, and enhance network resilience.

Planning for energy access must be embedded in industrial land release and rezoning processes. Early integration of energy readiness assessments will reduce delivery risk, improve timeframes, and support long-term network efficiency.

Regulatory Alignment and Investment Confidence

Despite growing interest and investment readiness within the freight sector, the regulatory environment is not yet fit for purpose. Inconsistent and outdated regulatory settings continue to undermine commercial viability for ZEVs.

A critical barrier is the absence of nationally harmonised mass and dimension limits for zero-emission heavy vehicles. Battery-electric and hydrogen trucks are often heavier than diesel equivalents due to drivetrain weight, but many are unable to access critical routes, tunnels or bridges due to rigid weight restrictions. This creates significant operational inefficiencies and further disincentivises early adoption.

In addition, fragmentation across jurisdictions in road user charging, vehicle incentives, and infrastructure approval pathways generates unnecessary complexity. This misalignment hinders long-term investment planning and slows infrastructure deployment.

Governments must act to establish a nationally consistent regulatory framework for freight ZEVs. This includes harmonising vehicle access conditions, streamlining approvals for infrastructure development, and coordinating incentives that reduce the up-front cost burden.

Nationally consistent safety standards, including for refuelling and charging protocols and workforce training, are also needed to support the safe and efficient rollout of modern technologies.

Urban Access and Last-Mile Logistics

Electric freight vehicles, particularly light commercial vehicles (LCVs), present significant opportunities to reduce urban emissions and improve last-mile efficiency. Their lower noise and emissions profile supports a review of delivery curfews and access restrictions in urban and mixed-use areas, enabling more efficient off-peak operations. This would ease congestion, improve fleet utilisation, and accelerate progress towards broader transport emissions targets.

Despite these benefits, the uptake of electric LCVs remains constrained by a persistent 'green premium.' Higher capital costs, limited model availability, and payload trade-offs due to battery mass continue to limit investment by freight operators — especially small-to-medium enterprises.

Targeted financial support measures are essential to address these challenges. This should include tailored grants, purchase incentives, and concessional finance offerings designed to support the specific needs of last-mile and urban freight operators.

Recommendations:

- Prioritise grid capacity upgrades in freight-intensive zones, including regional and outer metropolitan areas.
- Support co-location of renewable energy generation and storage with freight infrastructure to reduce energy costs and improve reliability.
- Integrate infrastructure readiness assessments into industrial land release and rezoning processes.
- Establish cross-agency coordination mechanisms for freight, energy, and land-use planning in priority precincts.
- Harmonise mass and dimension allowances for zero-emission heavy vehicles across jurisdictions.
- Align road user charges, registration concessions, and purchase incentives nationally for freight ZEVs.
- Streamline planning and environmental approvals for charging and hydrogen refuelling infrastructure in industrial and freight zones.
- Develop nationally consistent safety standards and training frameworks for emerging fuels and vehicle technologies.
- Review delivery curfews to enable flexible operating windows for electric freight vehicles in urban and mixed-use areas.
- Introduce targeted incentives to reduce the green premium for electric light commercial vehicles, with a focus on last-mile logistics operators.

Low-Carbon Liquid Fuels

Low-carbon liquid fuels—including renewable diesel and biofuels—offer practical, scalable solutions for hard-to-electrify freight segments. These fuels deliver immediate emissions reductions with minimal infrastructure upgrades and should be embedded in a balanced transition strategy as electrification and hydrogen technologies continue to mature.

They are particularly relevant for: long-haul and regional heavy vehicle operations; equipment at ports, terminals, and intermodal hubs; and remote and energy-constrained freight corridors.

Inclusion of low-carbon fuels in an NSW EV Strategy will enable early progress toward emissions targets, support energy diversity, and provide transition certainty for freight operators. These fuels can also be deployed using existing engine and refuelling assets, reducing cost and complexity.

To remain internationally competitive and align with emerging maritime regulations, Australia must also support the certification and distribution of low- and zero-carbon fuels based on full lifecycle emissions (well-to-wake[4]). This requires

[4] https://www.imo.org/en/OurWork/Environment/Pages/Lifecycle-GHG---carbon-intensity-guidelines.aspx

infrastructure that facilitates traceability, safe handling, and emissions verification—key to accessing global clean fuel markets.

Australia holds a comparative advantage in producing certified clean fuels such as sustainable aviation fuel (SAF), green methanol, and green ammonia. Infrastructure planning in NSW should reflect this by ensuring that ports and freight precincts can manage, verify, and distribute these fuels to meet both domestic decarbonisation goals and growing export demand.

Recommendations:

- Formally integrate low-carbon liquid fuels in any future ZEVs strategies.
- Provide policy and investment support for certified fuel uptake and infrastructure.
- Prioritise deployment in high-impact freight segments.
- Integrate well-to-wake lifecycle certification and emissions standards into planning and regulatory frameworks.

Marine Electrification

Current infrastructure planning for electric and alternative energy source vehicles frequently omits the specific requirements of marine freight operations—particularly Domestic Commercial Vessels (DCVs). These vessels are essential to harbour-based and coastal freight and passenger transport. Their transition to zero-emission operations will require access to high-capacity shore power and alternative fuel infrastructure that differs significantly from land transport needs due to higher voltage demands and extended duty cycles.

Planning frameworks must therefore accommodate bespoke infrastructure solutions at ports and waterfront terminals. The absence of marine-specific charging and refuelling infrastructure risks creating long-term gaps in New South Wales's decarbonisation efforts. Given the long asset lifecycles and extended lead times associated with marine fleet upgrades, early integration of marine requirements is essential. This includes forecasting power demand specific to maritime operations; allocating port-side land for energy infrastructure; and aligning port investment with whole-of-government energy and emissions strategies.

Ports should be recognised as critical nodes in the state's zero-emission freight network. Infrastructure planning must explicitly include quayside charging, shore power systems, and bunkering options for alternative fuels such as hydrogen, renewable diesel, biofuels, and green ammonia. Clean energy precincts, such as those under development near the Port of Newcastle, present opportunities to support shared infrastructure that services both land and marine freight operations.

Recommendations:

- Include ports and marine freight infrastructure in NSW zero-emission transport planning.
- Support early deployment of shore power and alternative fuel bunkering at major ports.
- Align clean energy precincts with port infrastructure development to maximise investment impact.
- Recognise low-carbon liquid fuels as a near-term decarbonisation option, particularly for hard-to-electrify freight modes. Support for low-carbon fuels should include clear policy recognition, fuel quality standards, and incentives to drive market uptake and investment in local production and distribution infrastructure.

Planning and Land Use Considerations for Freight Infrastructure

Decarbonising freight is as much a land use challenge as it is an energy challenge. Zero-emission vehicle infrastructure — including megawatt-scale charging systems and hydrogen refuelling stations — requires not only substantial electrical capacity and grid connectivity, but also significant physical space and long-term land use certainty. However, in many jurisdictions, strategic industrial lands are being eroded through rezoning, encroachment by incompatible uses, or fragmented into smaller lots that are unsuitable for infrastructure deployment at scale.

These pressures are particularly acute in freight-intensive regions experiencing urban growth, where industrial zones face competing residential or commercial redevelopment interests. Inadequate planning for the spatial and energy needs of

freight operations risks embedding long-term inefficiencies into the network, resulting in land-use conflict, higher retrofit costs, and underutilised infrastructure.

Future freight precincts must be safeguarded through robust planning instruments that recognise the sector's energy and spatial requirements. This includes zoning protections, minimum lot sizes, access to high-voltage infrastructure, and proximity to major freight corridors. Strategic planning frameworks must integrate freight decarbonisation requirements from the outset, ensuring land availability and infrastructure readiness in emerging industrial precincts. Without such foresight, the delivery of a zero-emission freight network in NSW will be delayed by avoidable planning and land access constraints.

Recommendations:

- Embed energy infrastructure requirements in industrial and freight zoning codes across NSW.
- Fast-track planning approvals for high-capacity charging and hydrogen refuelling infrastructure in freight-intensive areas.
- Identify and protect sites for future energy infrastructure as part of regional and metropolitan industrial strategies.
- Support the development of integrated logistics-energy precincts combining freight operations with energy generation and storage.

Investment Models to Accelerate Deployment

The transition to zero-emission freight requires coordinated infrastructure investment across the supply chain. Industry is already committing significant capital towards zero-emission vehicle deployment and operational innovation. However, the broader enabling infrastructure — including energy grid upgrades, charging, and refuelling facilities, and appropriate industrial land — requires coordinated, strategic investment that only government can effectively lead.

To accelerate the roll-out of freight decarbonisation infrastructure, the ALC recommends the establishment of a dedicated NSW Freight Infrastructure Fund. This mechanism would enable matched investment in strategically significant charging and refuelling projects, prioritising those aligned with the NSW Net Zero Plan[5], regional development strategies, and nationally significant freight corridors. The fund should incorporate open-access principles from the outset to ensure infrastructure is efficiently used and accessible across operators and technology types.

Recommendations:

- Establish a dedicated NSW Freight Infrastructure Fund to co-invest in zero-emission heavy vehicle charging and refuelling projects.
- Prioritise support for industry consortia, shared-use models, and public–private partnerships to optimise utilisation and reduce duplication.
- Align freight infrastructure funding with the NSW Net Zero Plan, Regional Transport Plans[6][7], and National Freight Supply Chain Strategy[8] priorities.
- Require open-access design, technology neutrality, and commercial fairness in all co-funded infrastructure projects.

Regional Freight and Workforce Transition

The transition to zero-emission freight vehicles and supporting infrastructure will require a parallel transformation of the freight and logistics workforce. It presents a strategic opportunity to address existing skills shortages while enabling the redeployment of experienced workers from declining sectors, such as coal and traditional energy industries. Structured

[5] https://www.energy.nsw.gov.au/sites/default/files/2022-08/net-zero-plan-2020-2030-200057.pdf

[6] https://www.future.transport.nsw.gov.au/documents/regional-nsw-services-and-infrastructure-plan

[7] https://www.transport.nsw.gov.au/projects/strategy/strategic-regional-integrated-transport-plans

[8] https://www.infrastructure.gov.au/infrastructure-transport-vehicles/transport-strategy-policy/freight-supply-chains/national-freight-supply-chain-strategy

workforce transition programs should be established to support upskilling, credential recognition, and job matching across the logistics, EV maintenance, infrastructure, and energy sectors.

New technical skill sets — including high-voltage electrical work, hydrogen safety, digital energy management, and advanced diagnostics — are not yet widely embedded across Australia's vocational education and accreditation systems. Without coordinated national planning and investment, workforce capacity risks becoming a critical constraint on the roll-out of zero-emission freight infrastructure, particularly in regional areas where recruitment challenges are already acute.

The transition presents both a challenge and an opportunity to reposition freight and logistics as a future-oriented, technology-driven industry. To seize this opportunity, workforce strategies must be industry-led and delivered in partnership with training providers, equipment manufacturers, and governments.

Licensing frameworks, safety standards, and regulatory settings must also be modernised to reflect the evolving technical requirements of zero-emission technologies.

Recommendations:

- Develop a nationally coordinated Zero-Emission Freight Workforce Transition Plan in partnership with industry and training providers.
- Fund the development of new and updated accredited training programs for ZEV maintenance, hydrogen safety, charging operations, and depot energy systems.
- Support partnerships between TAFE, OEMs, and logistics providers to deliver practical, industry-aligned training and upskilling across freight modes.
- Provide targeted support for small and medium freight operators to access subsidised workforce training, toolkits, and digital onboarding materials.
- Modernise licensing and regulatory frameworks to reflect ZEV-specific risks, including high-voltage systems and hydrogen handling.
- Promote freight decarbonisation careers to attract a diverse and future-ready workforce, particularly in regional areas and emerging infrastructure hubs.

Conclusion

Decarbonising freight transport is critical to achieving New South Wales's net zero ambitions. However, this transition cannot be delivered at scale without targeted infrastructure investment, cross-sector coordination, and regulatory reform. Freight cannot be expected to retrofit into systems designed for passenger vehicles — it requires a dedicated, freight-first approach that acknowledges the sector's scale, operational complexity, and strategic economic role.

The pathway to zero-emission freight is a long-term undertaking that must accommodate a wide diversity of freight tasks, legacy asset lifecycles, and varying levels of industry readiness. To succeed, it must be underpinned by a clear policy roadmap, commercial certainty for investors, and equitable support for operators at different starting points.

The Australian Logistics Council urges the NSW Government to embed freight at the core of its clean transport strategy and to work collaboratively with industry to deliver the infrastructure, energy systems, and enabling policy settings required. NSW's efforts must also align with the National Electric Vehicle Strategy (NEVS) and broader Commonwealth frameworks to ensure consistent, nationally integrated outcomes. ALC encourages the NSW Government to advocate for freight-specific inclusion in the NEVS implementation roadmap and to support harmonised EV infrastructure investment along key interstate freight corridors.

With the right foundations, NSW can position itself to deliver a zero-emission freight system that is sustainable, efficient, and fit for purpose.