Impacts of Heavy Vehicle Reform

A Submission to the Productivity Commission

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Introduction

The Australian Logistics Council (ALC) represents the nation's largest end-to-end freight and logistics businesses, spanning road, rail, air, sea, warehousing, fuel, retail, and infrastructure. Collectively, our members move a substantial portion of Australia's freight task, ensuring the supply of goods critical to households, businesses, and industries. Road freight continues to underpin domestic supply chains, emphasising the importance of regulatory, operational, and infrastructure frameworks that shape and govern heavy vehicle operations. These frameworks directly influence productivity, safety, decarbonisation, and supply chain resilience.

Australia's national freight system faces multiple, interconnected challenges: fragmented regulatory frameworks, inconsistent planning and access arrangements, ageing or insufficient infrastructure, workforce constraints, and slow adoption of emerging technologies. The Productivity Commission's inquiry presents an opportunity to examine these systemic barriers and recommend reforms that enhance efficiency, safety, and low-emissions freight operations. Drawing on operational evidence, policy analysis, and Australian case studies, this submission demonstrates that integrated reforms can deliver economic, environmental, and social benefits without compromising safety or community amenity.

Heavy-vehicle reform should be framed within a broader multimodal context. On a number of long-haul, high-volume freight corridors where services and infrastructure are already in place, rail can offer one of the lower-emissions, more energy-efficient options. At the same time, high-productivity road vehicles remain critical to overall network efficiency and decarbonisation, particularly on routes not well served by rail and for first/last-mile and time-sensitive distribution. Positioning heavy-vehicle reform within a multimodal productivity and emissions framework recognises these complementary strengths and helps keep policy settings broadly mode-neutral.

1. Heavy Vehicle Road Access and Productivity

Australia's freight productivity challenge stems from the cumulative effects of fragmented access rules, inconsistent asset data, variable local government capability, gaps in driver training, and misaligned infrastructure and energy settings. These constraints interact in complex ways. Operators cannot fully utilise Higher Mass Limits (HML) or High Productivity Freight Vehicles (HPFVs) when local roads remain unassessed; the National Automated Access System (NAAS) cannot deliver automated access decisions without reliable data; emerging vehicle technologies cannot be deployed safely without updated competency frameworks; and the productivity and emissions benefits of zero-emission trucks depend on charging and refuelling infrastructure aligned with freight corridors and operational windows.

Heavy-vehicle access is a central productivity lever, yet inconsistent mass limits, route declarations, and technology requirements undermine its effectiveness. Under the HML regime, operators must comply with National Heavy Vehicle Accreditation Scheme (NHVAS) Mass Management accreditation, use certified road-friendly suspension[1], and operate only on gazetted routes[2]. However, many local roads remain undeclared for HML, forcing operators to pursue individual permits. The resulting cost, delay, and uncertainty reduce HML's appeal, particularly for smaller operators or mixed-fleet businesses.

HPFVs, regulated under the Performance-Based Standards (PBS) framework, offer significant additional productivity potential, yet jurisdictional inconsistencies and technical requirements — including integration with Intelligent Access Program (IAP), ABS, and NHVAS accreditation — restrict access, particularly in first- and last-mile contexts.

> **EXAMPLE:** operating a PBS Class 2 A-double in Victoria requires strict adherence to criteria including integrated OBM (On-Board Mass) with IAP, anti-lock braking on all axles, road-friendly suspension, and NHVAS accreditation. Failure to meet these standards can lead to conditional access or restricted mass limits. For many operators — especially smaller ones — the cost of building and certifying such technical systems is prohibitive. Even if high-productivity routes exist, local roads often impose severe restrictions.

Many council-managed roads, bridges, and culverts are either unrated for HPFVs or lack recent assessments. Without reliable structural data, local road managers may refuse access or impose stringent conditions. This forces operators to revert to smaller combinations for depot access or customer sites, fragmenting freight tasks, increasing operating costs, and undermining the emissions and productivity benefits that HPFVs are intended to deliver. Consequently, many operators adopt mixed-fleet strategies — using HML or PBS vehicles on declared routes but smaller trucks for local pickup and delivery.

The cumulative effect is reduced utilisation of high-productivity combinations, limited emissions reduction, and constrained network efficiency due to increased vehicle-kilometres travelled. While the policy intent of HML and PBS frameworks remains sound, realising their full value requires better alignment of access pathways, standardised data, and enhanced capability across state and local governments. Tools such as Freight PASS[3] and the Pavement Impact Comparison Calculator[4] can support consistent, evidence-based decision-making when embedded in assessment processes. For this reason, the Commission should encourage further investment in the Strategic Local Government Asset Assessment Project, discussed in section 2.

Any future road user pricing reforms must recognise the unique operating environment of regional and remote freight operators, who travel longer distances and rely heavily on high-productivity combinations. Sequencing will be critical: transitional pricing arrangements — particularly for high zero-emission vehicles (HZEVs) — should avoid disproportionate impacts on regional operators, small fleets, and essential supply chain movements. A nationally consistent transition pathway will ensure pricing reform supports, rather than constrains, freight productivity and network equity.

In addition to access and asset constraints, safety and congestion at level crossings and shared road–rail approaches into intermodal terminals should be treated as core assessment criteria. These interfaces often generate delays, safety risks, and operational bottlenecks. The Commission should, where possible, quantify congestion and safety costs associated with rail interfaces to prioritise network upgrades effectively.

[1] https://www.vicroads.vic.gov.au/-/media/files/documents/business-and-industry/heavy-vehicle-maps/victorias-hpfv-networks-for-855-tonne-adoubles-master-jan-2019.ashx?la=en&hash=95D7D07ADF41DA6B5E3605BF3ECDCC3C

[2] https://www.nhvr.gov.au/road-access/mass-and-dimension/mass-limits/higher-mass-limits

[3] https://www.nhvr.gov.au/consultation/2024/01/17/freight-pass-beta-release

[4] https://www.nhvr.gov.au/consultation/2024/04/05/pavement-impact-comparison-calculator-beta-release

2. National Automated Access System (NAAS)

The National Automated Access System (NAAS) has the potential to be a strategic enabler of reform. It promises to streamline heavy-vehicle access by integrating route rules, vehicle credentials, and infrastructure data into a single, automated platform that can significantly reduce administrative overhead and inconsistency — especially for cross-jurisdictional or complex vehicle movements. However, there are significant implementation challenges. Local government asset data is highly variable, with many councils lacking engineering assessments of critical assets. Without this type of data, NAAS cannot operate in the manner envisaged.

Recognising this, the National Heavy Vehicle Regulator (NHVR) initiated the Strategic Local Government Asset Assessment Project (SLGAAP) [5], which works with councils to collect engineering data on local infrastructure. By the end of October 2024, SLGAAP Phase 2 had completed 698 bridge and culvert assessments. This engineering data underpins NAAS's capacity to make risk-based access decisions, moving away from overly conservative, manual permit approvals. To support local authorities, the NHVR has also developed tools like the Vehicle Comparison Tool for Bridges (VCB), allowing road managers to compare the safety and suitability of different heavy-vehicle types against assessed structures. Importantly, SLGAAP also includes a training component: the "Access Essentials" e-learning modules are designed specifically for local government road managers, covering bridge and culvert fundamentals, vehicle-structure interactions, and decision-making frameworks. These initiatives aim to increase technical capability, consistency, and harmonisation in access decisions across councils.

The transition to NAAS also requires careful systems integration[6] with existing state-based permit systems, such as the Heavy Vehicle Access Management System (HVAMS) and Victoria's HV-SAPS, alongside the NHVR Portal (NHVR Go)[7] . Without proper integration, resourcing, and governance, there is a risk of duplicate processes, operator confusion, and reduced confidence among road managers. In its current form, NAAS remains in a 'proof of concept' stage[8], and its introduction has been delayed. Identifying dedicated funding and establishing a clear timetable for project completion, endorsed by Australian governments, would support its timely delivery.

Improving transparency and accessibility of infrastructure data is also critical. Operators require open-access information on asset condition, access rules, and comparative vehicle impacts to enable better planning and reduce unnecessary regulatory interactions. Ensuring NAAS provides authoritative, accessible data will give industry confidence to optimise fleet deployment and access decisions.

NAAS should explicitly account for constraints at level crossings, terminal precincts, and parallel road–rail alignments. Established rail access practices provide useful precedents in areas such as condition reporting, transparency around constrained sections, and structured communication during disruptions. These elements could be incorporated into NAAS to support clearer, risk-based access decisions.

Finally, road user pricing reform should be coordinated with access frameworks, including NAAS, SLGAAP, PBS, and HML, to ensure cost signals align with improved access, asset assessments, and vehicle productivity. A fragmented approach, where pricing evolves independently of access improvements, risks sending mixed signals to industry and undermining the adoption of high-productivity and low-emission vehicles. Coordinated reform will ensure pricing, access, and infrastructure incentives work together to deliver genuine productivity gains.

3. Driver Competency & Workforce

The National Heavy Vehicle Driver Competency Framework (NHVDCF) provides a national baseline, combining online theory, classroom learning, practical assessment, and in-cab training. In practice, regional disparities persist: many Registered Training Organisations (RTOs) lack the capacity or resources to deliver consistent, technology-enabled training, particularly in remote areas[9].

[5] https://www.nhvr.gov.au/road-access/local-government-road-managers/strategic-local-government-asset-assessment-project

[6] https://www.nhvr.gov.au/news/2024/06/13/nhvr-continues-to-support-development-of-naas

[7] https://www.nhvr.gov.au/go

[8] https://www.infrastructure.gov.au/sites/default/files/documents/may-2025-statement-update-on-national-automated-access-system.pdf

[9] https://www.adta.com.au/static/uploads/files/nhvdcf-consultation-ris-august2022-wfcuthllzelr.pdf

Harmonised licensing arrangements across jurisdictions are critical. Consistent licence classes and training expectations will improve driver mobility, reduce hiring bottlenecks, and allow employers access to a broader talent pool, strengthening operational flexibility and productivity. Governance over assessors and training providers also requires strengthening, as variability in assessment quality can undermine safety and efficiency[10].

Workforce supply is further constrained by demographic challenges. The sector skews older, with limited representation of women, First Nations Australians, young people, and migrants. Training costs, limited cadetship or apprenticeship pathways, and fragmented national certification exacerbate shortages. In 2024, around 28,000 truck driver positions remained unfilled, and 21% of current drivers are expected to retire by 2029.[11] The World Road Transport Report also suggests that 47% of truck drivers can be characterised as being an 'older driver'.

The NHVDCF must also evolve to keep pace with emerging vehicle technologies. As HZEVs and HPFVs proliferate, drivers require training in on-board management, telematics, and battery or hydrogen system monitoring. Consistent emergency response training for breakdowns, incidents, and roadside risks is essential to ensure safe and confident operation of modern technologies.

4. HZEV Infrastructure, Operational Flexibility & Integration

The adoption of hydrogen and battery zero-emission heavy vehicles (HZEVs) presents a transformational opportunity for Australia's freight sector. These vehicles offer significantly lower emissions, quieter operation, and new performance dynamics. Realising their full potential, however, requires deliberate alignment of infrastructure, regulation, and operational practices.

4.1 CHARGING INFRASTRUCTURE & PHYSICAL NETWORK CONSTRAINTS

Deploying HZEV charging or hydrogen refuelling infrastructure extends beyond installation. It involves navigating complex local planning regimes, coordinating with electricity network operators for substation capacity and upgrades, and managing commercial risk associated with uncertain early fleet volumes. Many councils lack the technical expertise or regulatory clarity to approve high-capacity chargers or network augmentation, creating uncertainty that deters investment, particularly for nascent[12] fleets and smaller operators.

Corridor alignment is frequently poor: chargers may not be located at intermodal terminals, distribution hubs, or along key heavy-vehicle routes. Existing road structures, including bridges and culverts, may not be rated for HZEV mass, limiting where these vehicles can travel[13]. This creates a "chicken-and-egg" problem: infrastructure is delayed due to low fleet demand, and fleet uptake is constrained by insufficient infrastructure. A national maintenance ecosystem, including technician training and service networks, is essential to support uptime and reliability.

Interoperability is another barrier. Where practical, major HZEV charging and hydrogen refuelling hubs should be located at or near intermodal terminals and rail-served logistics precincts, as this can reduce duplication and support efficient multimodal operations. However, many freight tasks will continue to require depot-based or corridor-based charging independent of rail infrastructure, and these locations will remain essential in a balanced national charging network. Fragmented charging standards — in connector types, battery chemistries, or hydrogen refuelling protocols — raise costs for operators who may need to support multiple technologies. Unless standardisation is advanced, fleet operators will face higher capital costs and reduced flexibility. Government should ensure HZEV infrastructure rollout supports mode-neutral outcomes and avoids creating pricing or infrastructure signals that unintentionally shift freight for reasons unrelated to efficiency, safety, or emissions performance.

4.2 ELECTRICITY TARIFF STRUCTURE & COST SIGNALS

A further challenge is the misalignment between electricity pricing structures and the load profile of HZEV charging. Although these vehicles may draw large loads — particularly during off-peak hours such as at night when fleet charging is most cost-efficient — standard commercial or industrial tariffs often penalise this usage by applying demand or capacity charges. In the Australian context, major EV charging operators have argued that these charges are poorly suited to EV charging sites: their demand-based tariffs are calculated on the highest half-hour (or hour) usage over a long billing period, but because charging depots have only a few high-power users, the cost is "amortised over a small number of users,"

[10] https://gallery.truck.net.au/wp-content/uploads/2025/05/13_TA25_Dr-Geoff-Allan.pdf

[11] https://www.iru.org/news-resources/newsroom/widening-age-chasm-compounds-truck-driver-shortage-crisis-new-iru-report.

[12] https://austlogistics.com.au/wp-content/uploads/2023/02/White-Paper-230123-Budget-Submission-ALC.pdf

[13] https://www.infrastructureaustralia.gov.au/evaluations/enabling-infrastructure-zero-emissions-and-high-productivity-freight-vehicles-victoria

making the electricity cost extremely high[14]. Industry analysis also supports this. ACAPMAg[15] highlights that lightly used fast-charging stations face especially steep demand-charge burdens, because their usage is intermittent, and their peaks are not aligned with traditional commercial consumption patterns. Meanwhile, modelling conducted by Energeia for Queensland's network operator shows that demand-based tariff structures significantly distort the business case for DC-fast charging sites, and that hybrid or energy-only tariffs — possibly combined with on-site battery storage — would better align with the charging profiles of heavy and fast-charging vehicles[16].

As governments consider future road user charging for zero-emission heavy vehicles, it is essential that early adopters are not penalised by disproportionate costs. Nationally consistent interim charging mechanisms, combined with electricity tariff reform, are needed to support early fleet trials, and maintain operator confidence. Freight-specific pricing models — such as off-peak energy-only tariffs, load-based incentives, or technology-specific network charges — should be aligned with broader road and rail pricing frameworks to ensure cost signals remain mode-neutral. Reforming tariffs to reflect HZEV operational realities will lower total ownership costs, enable economically viable charging infrastructure deployment, and accelerate fleet decarbonisation.

4.3 CURFEW & REGULATORY CONSTRAINTS

Many urban jurisdictions maintain heavy vehicle curfews, originally designed to limit engine noise and local emissions from diesel trucks operating at night. However, contemporary evidence shows that much of the disturbance reported by communities arises from ancillary operational noise – particularly tonal reversing alarms[17], loading-dock machinery and other equipment used during deliveries – rather than propulsion systems alone. HZEVs are significantly quieter in transit and produce negligible local emissions, yet current curfew frameworks do not distinguish between conventional diesel vehicles and HZEVs. In practice, this limits operators' ability to shift appropriate freight tasks to off-peak periods, despite quieter vehicle technologies and the availability of lower-impact safety systems such as broadband reversing alarms.

Variation processes for night-time access also differ across states, adding uncertainty for operators seeking to schedule HZEV movements. A nationally consistent approach that reflects modern noise profiles and operational characteristics would help ensure curfews are proportionate, evidence-based, and able to support efficient deployment of zero-emission fleets.

4.4 TECHNOLOGY & OPERATIONAL INTEGRATION

Transitioning to HZEVs also demands deep integration of digital systems. Drivers, fleet managers, and maintenance teams all need tools to monitor battery or hydrogen systems, regenerative braking, telematics, and predictive maintenance. For example, predictive maintenance systems may monitor state-of-health of battery packs or fuel-cell systems and alert operators before failure, reducing downtime and lifecycle costs. Operators must also coordinate route planning with infrastructure constraints, so that charging is scheduled around depot capacity, bridge weight limits, and operational windows (e.g., curfew). This requires investment, both in systems and capability, and smaller operators may struggle without targeted support to adopt these technologies.

4.5 VEHICLE COST, PAYLOAD & RANGE CONSTRAINTS

Heavy Zero-Emission Vehicles present significant upfront capital costs compared with conventional diesel trucks, which creates a barrier for operators, particularly smaller and medium-sized enterprises. These costs are compounded by the limited availability of supporting infrastructure and the need for specialised maintenance capability, which can increase the total cost of ownership and lengthen payback periods.

Payload limitations remain a critical consideration. Current battery or hydrogen storage technologies reduce allowable payload compared with equivalent diesel vehicles, forcing operators to either reduce loads or increase fleet size to maintain productivity. This trade-off directly impacts freight efficiency and cost-per-tonne, particularly on long-haul and metropolitan distribution routes.

Range constraints also influence operational planning. Battery and hydrogen HZEVs typically require more frequent refuelling or recharging stops, and current corridor infrastructure is insufficient to reliably support continuous operations over long distances. These limitations affect route selection, fleet scheduling, and depot location decisions, and create operational risk if vehicles are deployed without clear alignment of energy infrastructure and charging capacity.

[14] https://www.aer.gov.au/system/files/Evie%20Networks%20-%20Submission%20and%20attachment%20-%202024-29%20Electricity%20Determination%20-%20NSW%20-%20May%202023_1.pdf

[15] https://acapmag.com.au/2024/02/why-is-public-high-power-ev-charging-so-much-more-expensive-than-charging-at-home

[16] https://energeia.au/optimizing-dc-fast-charging-tariff-structures

[17] https://www.epa.vic.gov.au/sites/default/files/epa/publications/1890.pdf

Mitigating these challenges requires integrated policy and commercial solutions. Strategic investment in high-capacity, corridor-aligned refuelling, and charging, combined with innovative financing models to reduce capital barriers, will be essential. Operators may also benefit from government-supported payload incentives or subsidies to offset early operational limitations, enabling fleet trials that demonstrate operational viability and support wider HZEV adoption.

5. Strategic Implications & Policy Recommendations

To harness the productivity, safety, and decarbonisation benefits of high-productivity and zero-emission heavy vehicles, ALC recommends a comprehensive, nationally coordinated reform agenda:

1. **National Multimodal Freight Charging and Infrastructure Framework**
   Harmonise freight-centric planning rules and approval processes across local and state governments to support deployment of high-capacity chargers and hydrogen refuelling stations. Incentivise investment into critical freight corridors and intermodal hubs and ensure interoperability of charging technologies. Where practical, major HZEV charging and hydrogen refuelling hubs should be located at or near intermodal terminals and rail-served logistics precincts to reduce duplication and support efficient multimodal operations, while continuing to enable depot-based and corridor charging where operational needs require it.

2. **Electricity Tariff Reform**
   Introduce freight-specific electricity pricing models, including off-peak discounts, load-based incentives, or time-variable tariffs tailored to HZEV operating patterns, to reduce the total cost of ownership and support infrastructure investment.

   Electricity tariff reform should be considered alongside future road user charging arrangements and the influence of rail access pricing to help ensure price signals remain broadly mode-neutral across the freight system.

3. **Regulatory Reform for Curfews, Access, and Network Interfaces**
   Revise curfew regulations to reflect the low noise and emissions of HZEVs, enabling night-time operations. Establish a nationally consistent permitting framework that provides certainty for operators and local road managers.

   Assessment and permitting frameworks should also incorporate safety and congestion at level crossings and shared road–rail terminal approaches, recognising these areas as critical bottlenecks and points of increased trauma and delay. Quantifying these costs would support more consistent national prioritisation.

4. **Data, Digital Systems & Technology Adoption**
   Support operators (especially SMEs) with grants, cost-sharing, or low-interest financing to adopt telematics, OBM, intelligent access systems, and predictive maintenance tools. Develop a national data governance framework to ensure secure, trusted sharing of operational data among operators, regulators, and road managers.

   Design of the National Automated Access System should incorporate constraints associated with level crossings, terminal precincts, and parallel road–rail alignments. Relevant elements of rail access practice—including structured condition reporting, transparency around constrained sections, and established communication protocols—should inform NAAS development to support clearer, risk-based access decisions.

5. **Workforce & Training Reform**
   Expand and standardise the NHVDCF framework to ensure driver training aligns with emerging vehicle technologies. Invest in RTO capacity, assessor governance, and nationally consistent certification. Create structured cadetships, apprenticeships, and scholarship programs to build a diverse, skilled workforce ready for HZEV and HPFV operations.

6. **Multimodal Policy Coordination and Governance**
   Establish cross-industry working groups (industry, regulators, infrastructure owners, local government) to oversee the rollout of NAAS, infrastructure deployment, training frameworks, and standardisation. Align road-user pricing reform with reinvestment into low-emission infrastructure and data platforms.

   Future heavy-vehicle reforms—including access, pricing, infrastructure deployment, and decarbonisation initiatives—should be developed within a multimodal framework that considers productivity and emissions across both road and rail, ensuring policy settings remain mode-neutral.

7. **Bridge and Local Road Assessment Acceleration**
   Expand and sustain funding for SLGAAP or a successor program to accelerate assessments of council-owned bridges and culverts, particularly on priority freight routes. Use the engineering data to support risk-based NAAS decisions and ensure that first- and last-mile constraints can be addressed proactively.

8. **Skilled Driver Availability Through the Migration Program**

   Given persistent shortages of qualified heavy-vehicle drivers, the Australian Government should also ensure that the Migration Program includes an appropriately targeted pathway for the admission of experienced drivers with recognised qualifications[18]. Incorporating freight-critical occupations within the skilled intake would support network productivity, complement domestic training initiatives, and help ensure that infrastructure investments deliver their intended operational outcomes.

9. **Appropriate funding for NAAS**

   Ensure investment is made to ensure NAAS has the functionality expected by industry. Australian governments should establish a timetable by which the project is to be completed.

Conclusion

Australia's freight sector is well-positioned to decarbonise, enhance productivity, and improve resilience — but only if policy settings are coherent and coordinated. Fragmented access rules, limited asset data, underinvestment in infrastructure, training gaps, and regulatory barriers currently restrict the full deployment of HPFVs and HZEVs. These challenges, however, are not insurmountable.

By aligning digital access systems (NAAS), infrastructure data collection (via SLGAAP), workforce capability, road user pricing, and infrastructure deployment, Australia can achieve a step-change in heavy-vehicle productivity, emissions reduction, and network efficiency. Such reforms will strengthen the nation's 24-hour freight capability, lower cost per tonne-kilometre, and enhance the long-term resilience of national supply chains.

The ALC is committed to partnering with governments, regulators, local authorities, and members to deliver this transformation. Drawing on practical experience and operational insights, we offer a long-term commitment to building a safe, efficient, and future-ready heavy-vehicle network that supports Australia's economic and environmental objectives.

[18] https://immi.homeaffairs.gov.au/what-we-do/migration-program-planning-levels