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The Impacts of Heavy Vehicle Reform

Response to the Commission's Interim Report

ENERGY FUTURES FOUNDATION

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Dear Commissioners,

The Energy Futures Foundation (EFF) welcomes the Productivity Commission's interim report on heavy vehicle reform. EFF is a non-profit, independent, non-partisan foundation focused on finding and solving commercial and policy hurdles that could unlock zero-emissions transport and energy at scale.

The interim report produced by the Productivity Commission correctly frames the set of challenges facing road freight:

- Heavy vehicle productivity growth has flatlined for fifteen years.
- The continued growth of the road freight task, combined with the stalling productivity of the sector, means that Australia will not be able to meet its 2050 net zero goal without significant changes to the fleet and the way it accesses the road network.
- Zero emissions heavy vehicles have significantly lower operating costs that have the potential to fundamentally improve productivity in the sector - but face barriers in regulatory settings that were designed with internal combustion engines in mind.
- Reasonably minor changes to harmonise mass limits, road access, land use and curfews will unlock significant uptake of zero emissions heavy vehicles if made soon - with the potential to increase productivity, lower prices, and improve emissions outcomes.

EFF has commissioned modelling from Mandala Partners to assess the potential impact of many of the proposed reforms. We estimate that if implemented this year, changes to mass limits, road access, and curfew restrictions will deliver an additional 467,000 electric trucks by 2050.

The focus of this submission is on the policy choices that will determine whether those gains are realised. In particular, our view is that the Commission’s interim report doesn't sufficiently emphasise the urgency of reform in the context of a market that is dominated by low-margin SMEs facing increasing commercial fragility - even prior to the current diesel fuel crisis.

Section 1 provides our views on the distributional impacts of proposed reforms - highlighting, in particular, the need to engage with SME needs to see large-scale adoption. Without targeted support for SMEs the transition to electric trucking will be dominated by larger fleets and lead to greater market consolidation, less competition, and greater financial pressure on owner-drivers. With reference to recent University of Melbourne analysis, this section also proposes health costs should be considered when estimating the second-order productivity gains of transitioning the freight sector.

Section 2 supplies modelling on the proposed mass and dimension reforms, specifically the need to calibrate mass limits to adequately address the payload penalty of heavy zero emissions vehicles, harmonise with international standards to bring more models to the Australian market at a lower cost, and ensure that these limits are nationally consistent to avoid operational complexity. We support an immediate move to 8.5 tonnes for steer axle and 19.0 tonnes drive axle with an overall mass concession of 2 tonnes.

Section 3 highlights the cost-benefit ratio achieved by the Heavy Vehicle Access Management System in Tasmania, and the need to fund Phase 4 of the Strategic Local Government Asset Assessment Project to bring the system to scale.

Section 4 underscores the importance of ensuring that charging infrastructure build out begins *imminently* to support uptake of heavy zero emissions vehicles, now and in the future. Charging, alongside road access, is the key constraint for fleets that are ready to transition. There is a significant need for greater coordination across federal, state and local governments to ensure that public infrastructure is in place to support the transition. We also offer learnings from the roll out of charging infrastructure in Europe - both in the types of charging, the distribution of chargers, and the timelines required for an infrastructure program at this scale.

These are important recommendations that come at an unusual moment for the sector. Not only is the transport industry facing headwinds in the form of increased fuel prices, but the nation's trucking fleet is unusually old. An estimated 43% of the trucking fleet will exceed 15 years of age by 2030. For every upgrade, purchase or lease renewal during that timeframe, operators now face a genuine choice as to whether to move to more efficient, lower emissions vehicles. We should make it as easy as possible for them to make that choice without having to deal with regulatory frameworks and access rules that make it difficult to realise the benefits of doing so.

We commend the Commission on providing a sensible program of proposed reforms - and would urge the government to move quickly to implement, and ensure sufficient funding is made available to the state and local governments who own and administer our roads. The timelines and milestones attached to existing regulatory reform processes in this sector have fallen greatly out of step with the pace of change in the underlying technology and price trajectory of battery electric trucks.

This transition is going to happen much faster than previously anticipated. Policy makers and regulators must now move faster too - or Australian road freight will be pushing against a handbrake while the rest of the developed world seizes the moment.

We would be pleased to discuss any of this material with the Commission.

Yours sincerely,

Bruce Hardy
Executive Director

01 Distributional impacts

Information request 1.1: cohorts, regions and consumers

Australian road freight is a small business industry. Around 70 per cent of road freight businesses operate a single truck, and a further 24 per cent run fleets of two to four vehicles.[1] 56 per cent of trucking businesses are non-employing or owner-drivers, with a further 42 per cent employing fewer than 20 people.[2]

For how vital the road freight sector is to Australia, it is also surprisingly fragile. The average margin is 2%, with a variety of cost pressures causing insolvency rates in transport, postal and warehousing to be among the highest of any sector.[3] This context is emphasised across a variety of sector submissions for two reasons.

1. **It highlights the urgency of the reform process in supporting the move to cheaper operating models with simplified regulation.** The failure of regulators to keep pace with improvements in both technological capacity and the price trajectory of batteries has hampered Australian operators in ways avoided by developed markets that have been faster to adapt. As an example, the milestones set out in the National Competition Policy Federal Funding Agreement target a doubling in the percentage of the road freight task carried by Heavy Zero Emissions Vehicles by 2030 - from a negligible 2024 baseline.[4] With 56% of Australia's truck fleet reaching replacement age within the next five years, regulatory clarity from the government is essential *right now* to maximise confidence for operators who hold the decision on whether we go through another upgrade cycle of diesel.

2. **It underscores the importance - to both workers and consumers - of what might appear on the surface to be incremental reforms.** For truck drivers who only take home 2c out of every dollar, even small shifts toward higher productivity and lower compliance overhead matters enormously. A 1% improvement in cost-efficiency represents a 50% margin increase, or alternatively, because of the fragmented and competitive market - a high level of flow-through to end-consumers.

Regional Impacts

Regions should be prioritised in heavy vehicle reform activities, as regional Australia depends disproportionately on freight-related employment and bears the greatest risk if reform rolls out

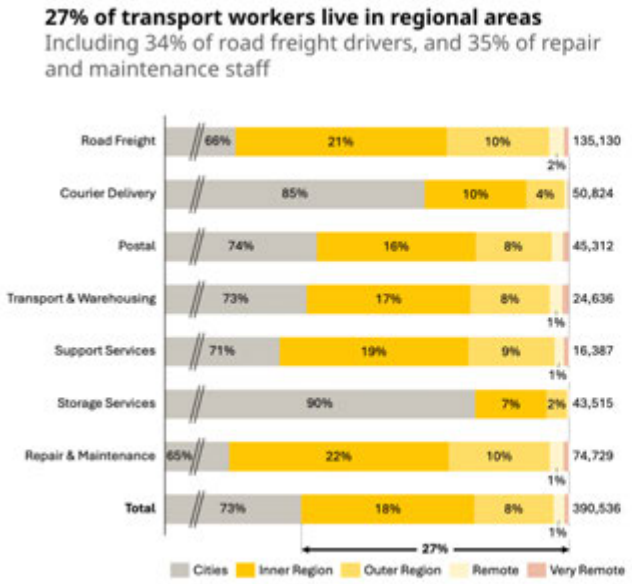
[1] Queensland Department of Transport and Main Roads (2025), Heavy Vehicle National Law Amendment Bill 2025 – Impact Analysis Statement, p. 28.
[2] Jobs and Skills Australia (2025), An Essential Ingredient: The Food Supply Chain Workforce. Figure 3.3 p. 74
[3] NatRoad (2025), *Submission 41 to the Productivity Commission inquiry on Impacts of heavy vehicle reform*, p. 2.
[4] National Competition Policy (2025), Federal Funding Agreement, p 37.

unevenly. Over 34% of road freight, transport and warehousing, and repair and maintenance workers live in regional areas.[5] Freight transported on regional roads grew, over the decade to 2022-23, to 187.7 billion tonne-kilometres, an increase of 33.5 billion tonne-kilometres on 2012-13 levels.[6]

Inner and outer regional areas are also home to 44% of First Nations peoples, with a further 15% living in remote or very remote Australia.[7] The quality and efficiency of our regional road networks directly impacts the supply chains that connect these communities to essential goods and services.

Some specific ways in which regions should remain in focus as the Commission finalises its recommendations:

- Regions will need substantial investment support for electric freight to become feasible - both on charging infrastructure, but also the grid connections, or on-site solar generation and storage to provide enough energy to support high-power truck charging.[8]
- Regions will need disproportionate funding to upgrade and maintain road assets to support heavier vehicles - with the Northern Territory and Queensland having the highest proportion of weaker spray sealed arterial roads and lower population density which can influence the state tax base or allocation of commonwealth funding.
- Regional local governments will need investment in capacity building, data and systems to support consistent assessment and data standards as part of a NAAS.
- Regions will need investment in workforce development to reskill and retool service, maintenance and repair capacities to support electric trucks.



[5] ABS Census 2021 mapped by ANZSIC classification, EFF Analysis
[6] Infrastructure Australia (2026), Infrastructure Priority List p.11
[7] DITRDCA (2024), State of Australia's Regions p.8
[8] AECOM (2025), Electrifying Road Freight, p.38, 42; ALGA (2025), submission

Health Impacts

In finalising their modelling and estimation of the productivity impacts of their proposed reforms - we would encourage the Commission to consider air pollution impacts of heavy vehicles on the health system and the labour force.

Recent analysis by leading health researchers at Melbourne University estimated the attributable health costs of diesel trucks at $6.2 billion per year. This figure is a conservative baseline - that includes 23,855 years of life lost due to premature mortality, over 10,000 cardio-respiratory hospital admissions, ongoing lung cancer treatment costs and 2,342 new cases of childhood asthma every year.[9] A lower health burden results not just in fewer premature deaths, but in far fewer days of lost productivity due to illness.

Of particular concern are findings that demonstrate the impact that exposure to heavy vehicle emissions have on children's health - particularly where major freight corridors run close to schools, and early childhood education centres. In Maribyrnong, in Melbourne's inner west, more than 41 per cent of childcare centres and 36 per cent of schools are within 150 metres of a high-density truck route, and analysis of one childcare site at a major freight intersection found PM2.5 exposure equivalent to 8.4 cigarettes per day.[10]

These costs should be considered when estimating the second-order productivity gains of transitioning the freight sector. While modern diesel trucks are subject to tighter emissions standards that reduce their NO_2 and $PM_{2.5}$ emissions, around 14% of the Australian fleet predates the introduction of emissions controls in 1996, and a further 12 per cent were manufactured between 1996 and 2003 - facing only minimal regulation.[11] Reforms that accelerate HEZV uptake deliver significant benefits to children and urban communities - and to taxpayers and employers - without requiring operators to use less optimal routes.

[9] Walker, C., Lieu, B., Ewald, B., Kuschel, G., Irving, L., Abu-Ghazaleh, F., Stevenson, M. (2026), *The Unpriced Burden: Heavy vehicle emissions and the $6.2 billion health cost*, The University of Melbourne.
[10] Ibid.
[11] Marion Terrill (2023), Truck Pollution Kills, The Grattan Institute, syndicated in the Age.

02 Mass limits for HZEVs

Information request 2.1 & 2.3

Removing regulatory barriers to road access, and harmonising the Australian Design Rules for HZEVs with international markets is arguably the most urgent area for action, as highlighted by multiple industry leaders, including IKEA, Linfox and Primary Connect, at the Freight Forward National Summit in March 2026.

The 1 July 2026 reforms to the Heavy Vehicle (Mass, Dimension and Loading) National Regulation are sensible productivity measures that go *some* of the way towards easing the friction. But the current 0.5-tonne Euro VI concession was calibrated to offset the additional weight of mandated safety and emissions equipment for trucks regardless of drivetrain, and won't provide a significant productivity gain for vehicles that have that equipment installed.

More needs to be done to specifically accommodate the additional battery weight that creates a payload penalty for HZEVs. In that context, Energy Futures Foundation strongly endorses Recommendation 2.2 on providing a nationally-consistent concession mass-limit for electric HZEVs - and welcomes the opportunity to provide advice on the size and impact of that concession.

Sizing the HZEV mass concession

Battery-electric prime movers typically carry a tare weight penalty of 1.5 to 3.0 tonnes against diesel equivalents - although this can go even higher in rare cases. More importantly than their overall mass in the Australian regulatory context is the distribution of that mass. The extra weight comes from the location of the battery pack, typically located on the tractor - creating a much higher steer axle load than is typical for diesel. Australia has far lower steer-axle limits than comparable jurisdictions.

All else being equal, this has two negative impacts on the uptake of HZEVS. First, it can cause engineering and compliance challenges for international OEMs who need to re-spec models for the Australian market, limiting access to the latest models as they become available. Second, when mass constrained, the additional weight of the battery must be offset by a reduced payload.

We would point the Commission to the extensive research done by our colleagues at Transport and Environment in Europe for a mass comparison of late model trucks, as well as an analytical approach for breaking down the nuanced impacts on roads and bridges when considering the regulatory implications of the different concession options under consideration in Europe.[12]

A significant regulatory challenge when considering mass limits is that battery electric trucks are overall far more configurable than their diesel equivalents. Depending on the range needs of the operator, models can be configured with more or fewer battery packs resulting in both a

[12] For a comprehensive breakdown on the impacts of payload on road maintenance, and different regulatory options, see T&E (2025), The infrastructure and payload impacts of different options for regulating gross and axle weights

different weight, and cost profile. The longer range required, the greater the payload penalty that must be absorbed. The International Council on Clean Transportation (ICCT) estimates that at a 500km driving range, a prime mover's payload capacity penalty can be as high as 11%.[13] This is one of the most significant components weighing against HZEVs in total cost of ownership (TCO) comparisons for high productivity vehicles, because just as the fuel cost savings compound for electric trucks the more they are used - so too do payload penalties scale with use. Addressing this in the near term will provide a significant market boost to HZEV adoption.

Transport and Environment undertook modelling for the UK that demonstrated a 2.0t GVM concession is sufficient in most cases to abate the payload loss faced by operators switching to electric from the heaviest diesel prime movers.[14] For modern trucks equipped with load balancing, better suspension, wider tyres, sufficient axle spacing and electronic stability systems - this 2.0t concession could apply in an axle-agnostic way while mitigating concerns around road maintenance and safety. For a current 7t steer axle limit for Euro VI compliant vehicles, this would imply up to a 9t steer axle limit for HZEVs - aligning closely with US single axle limits, and approaching EU standards.

It is important to note that front axles are not uniformly a constraint across different models. Windrose, for example, has electric prime movers with a front axle weight of 5.5t.

Review timeline and sunsetting

One area we would encourage the Commission to consider carefully is the question of sunsetting payload concessions over time as battery energy density improves in later generation models. Second, third and fourth generation chassis designs will also offer weight distribution opportunities and powered trailers are a meaningful emerging commercial product including in Australia today, that have the potential to limit the long term cost impacts.

While the trajectory is clear, in the short term, those energy density improvements will allow operators to extend their range for the same battery weight, rather than decrease their battery weight. We also believe that higher productivity, more profitable vehicles will be better placed to absorb the impact of future road user charge (RUC) and higher levels of road investment.

Road impacts

There are legitimate concerns around road maintenance costs associated with allowing access to heavier vehicles. In particular, Australian studies confirm the higher burden of steer-axle loads on pavement deformation.[15] There are several factors that should nuance the way we consider these costs in the Australian context:

- The increased stress of higher steer axle mass must be weighed against the increased stress of more trips required to deliver the same volume in lower productivity vehicles.

[13] ICCT (2022), Long-haul battery-electric trucks in Europe, p. 8
[14] T&E (2023), Why Great Britain's long-distance, heavy-duty HGVs can go battery electric, p 11.
[15] See Austroads Technical Report (2008), Relative Pavement Wear of an Unbound Granular Pavement due to Dual Tyres and Single Tyres, which validates a load damage exponent of 4 is appropriate when considering the damage associated with increases in axle load on single-tyre steer axles. A 6.3t single-tyre steer axle load was found to cause equivalent damage to a 9.0t load on a dual-tyre standard axle.

- Maximum weight limits don't reflect actual usage - there are many kms undertaken at full volume rather than full weight allowance, and many more undertaken unladen. EFF isn't aware of an Australian data series on the number of trips undertaken at less than the maximum weight allowance, but the now-dated ABS Survey of Motor Vehicle Use puts unladen kms at 28.3% for articulated trucks.[16] Similar data collected in the UK highlights that 70% of all kms travelled occur at less than 80% of the legal mass limit.[17]

- The Commission's insight that the increased demand for road freight lies in non-bulk goods is important, as these loads are less likely to reach their legal mass limits. For articulated configurations (not PBS or road trains), ABS data suggests an average payload of 25,818 kg per laden trip which combined with the tare weight of diesel prime movers indicates that it is common for articulated trucks to operate with full loads that remain well below their overall mass limit.[18]

- Many trucks in Australia serve multiple operational categories. The same trucks that do urban deliveries during the day, might do an interstate trip overnight with a different trailer configuration to increase overall utilisation and productivity. Overly restrictive weight limits may prevent HZEV models from being rated in a way that allows them the same operational flexibility, even if they are never driven at their maximum weight capacity on roads that aren't designed to support them.

We need to think carefully about road infrastructure as a question of shifting and distributing costs, and who bears those costs. Inadequately maintained road assets impose costs on operators via increased truck and tyre maintenance. Increasing road user charges may lead to better maintained roads but we know that - as a consequence of the fragmented market structure - small operators aren't always in a position to pass costs on to the customers who benefit.

Road freight has substantial social and public benefits - underpinning critical supply chains for consumers and businesses alike. We need to ensure we're adequately socialising the costs of a clean, efficient, low-cost transport network as we reap the benefits of one.

Modelled impact of mass concessions

Mandala modelling indicates that the increased payload associated with a national concessional HZEV limit would result in an additional 35,000 electric heavy rigid trucks, and an additional 4,000 electric prime movers over the next decade.[19] It will contribute to 5Mt of additional CO_2 abatement, and conservatively save $700m in air pollution, soil and water externality costs.

This reform comes with very few immediate public sector costs, along with manageable ongoing costs in terms of road maintenance and administration that are far outweighed by the productivity benefits delivered.

[16] ABS (2020), Survey of Motor Vehicle Use, Table 9
[17] See T&E (2025), above n8.
[18] ABS (2020), Survey of Motor Vehicle Use, Table 26
[19] See Mandala, Decarbonising Australia's Road Freight Network, p33. Note: roughly 56% of the uplift in HZEVs achieved to 2035 are attributable to providing a concessional mass limit for electric trucks.

Energy Futures Foundation's recommendations on mass sizing:

1. **Align with the industry long-term ask of a national mass concession, and a revised 8.5 - 9t steer axle limit**. This aligns us with the US market, and meaningfully limits the amount of additional work required to re-spec EU models to be ADR compliant. This is preferable to a staged approach of harmonising at 8.0t in the short term before pursuing 8.5t - as it will provide greater clarity and certainty, fewer limitations on model variety, greater flexibility for the largest battery pack configurations, and a higher productivity boost for models configured with smaller battery packs. This will encourage accelerated uptake in the market segments where TCOs are already favourable.

2. **Harmonise other dimension limits with international laws, allowing truck and trailer widths of up to 2.6m.** This will radically simplify compliance with ADR rules and create flexibility with OEM manufacturing standards in US, EU and Japanese markets - especially as global demand for HZEVs increases, and Australia must compete with other jurisdictions for supply across multiple manufacturers. This also has additional productivity benefits for certain categories of operations like refrigerated delivery, where the additional width allows for greater insulation and less energy expended on cool storage. Support may need to be provided to existing Australian trailer manufacturers to retool to the wider spec limits to enable them to continue to compete once demand for higher volume trailers increases.

3. **Increase federal funding to support road managers, and road and bridge upgrades, along key freight routes and in metropolitan distribution areas.** It is important that this work commences while HZEVs are still relatively low penetration and the impact of heavier vehicles on our roads is limited. This funding is needed both to support road upgrades themselves, as well as the additional training and data maintenance workload to keep current and consistent information about road assets in different jurisdictions.

03 National automated access system

Information request 3.1 & 3.2

EFF strongly endorses Draft Recommendations 3.1 and 3.2 as a mechanism for dealing with the inefficiencies in the number of permits that need to be made and processed by local councils and the National Heavy Vehicle Regulator (NHVR). We agree with the recommendations of the Commission around network-based as-of-right access as the goal, with instantaneous decisions available on demand to industry.

The throughline in a lot of the complexity associated with accelerating and deploying a nationally consistent access system is in the variable data on road quality, road asset assessments and road assets across different state and local jurisdictions. To ensure that the NAAS achieves its stated goals, especially for heavier HZEVs, we recommend increasing the funding made available to state and local governments to collect and share this data.

We would highlight that Australia's federal and state governments have agreed to prioritise heavy vehicle productivity reforms, including those recommended by the Commission, through the National Competition Policy (NCP) reform program.[20] **Approximately $471 million remains unallocated through the National Productivity Fund for these goals.**[21]

Given the current fuel crisis and the urgent need to improve road access in a nationally consistent way, we recommend that a substantial portion of the unallocated funds should be prioritised against the project milestones associated with increasing the uptake of HZEVs.

Recommendations on the National Automated Access System:

1. **Meet the Australian Local Government Association's demand of providing an additional $300m annually to unblock funding and coordination for local road asset owners.** The ALGA has consistently requested an additional $300m in annual commonwealth support to unlock the upgrades, maintenance and administration costs associated with heavier high productivity and HZEVs.[22] Access to this additional funding could be tied to engagement with the federal productivity agenda around mass limits, curfew relaxation, and rolling out consistent assessment standards aligned with the goal of national real-time road access decisions.

2. **Allocate $250m from the unallocated funds in the National Competition Policy Federal Funding Agreement towards immediate measures focused on HZEV uptake.** This will most likely require aligning with state governments on a series of measures on axle mass, curfew reforms, and licensing - with a dramatically more ambitious timetable and outcome targets than the current agreement.

[20] Commonwealth Treasury (2026), 'Revitalising National Competition Policy'
[21] Commonwealth of Australia (2025), National Competition Policy: Federation Funding Agreement
[22] ALGA (2024), Policy Focus - National automated access system for heavy vehicles

04 Administrative & regulatory barriers to charging

Information request 4.2

To deploy HZEVs at sufficient scale, diverse and distributed charging options are essential, with increased charging an enabler of a forecast 70% of the electric trucking fleet by 2050.[23]

To facilitate additional private investment in charging infrastructure requires assisting private capital and charge point operators to solve the chicken-and-egg problem at our stage of the adoption curve, where low numbers of electric vehicles drive stranded asset risk for charging infrastructure - and a lack of charging infrastructure constrains the willingness of operators to move. Energy Futures Foundation has had conversations with multiple fund managers, venture capital funds, and Charging-as-a-Service providers who have signalled a significant appetite to deploy capital in the charging build out, but will either wait for a sufficient demand signal or require government risk-sharing to accelerate the roll-out.

The Commission's recommendations around improving the quality of data on freight movements and exempting charging infrastructure from planning permission are two non-financial steps that directly address this risk calculus.

In addition, we recommend that the Commission include a focus in the final report on two key cost-drivers for heavy vehicle charging.

First, we recommend including reform for network tariffs. Under the current regime, capacity charges can trigger above extremely modest thresholds which drive public-charger costs that have high utilisation rates to a substantial multiple of the underlying energy cost.[24] Early-deployment public charging is likely to be both peaky and low-utilisation, which creates a load profile that is highly at risk of punitive demand charges without contractual guardrails in place. The AER should review demand-charge thresholds for HDV-rated public chargers.

Second, we recommend detailing advancements in mobile charging units. Technology is rapidly improving the cost profile of rolling out chargers that can more simply integrate with existing electrical infrastructure. As one example, the Australian company HubZero's mobile charging units offer to remove two-thirds of the cost of fixed charging installations, and can be deployed in weeks not months.[25]

[23] EFF (2026), Fuel Security Rapid Response Briefing Note
[24] Electric Vehicle Council (2024), State of Electric Vehicles
[25] See Hubzero Energy