Inquiry into e-mobility safety and use in Queensland

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Submitted by: OKB-42 Pty Ltd (brand Recycles — Sustainable Urban Mobility)Date: 20 June 2025Executive SummaryAs an Australian brand of legal e-bike conversion components and an advocate for responsible e-mobility, we submit this response to address the critical safety challenges facing Queensland's e-mobility landscape. Our submission identifies the fundamental disconnect between current regulations and market realities, proposes evidence-based solutions, and offers our technical expertise to support regulatory reform.Key Recommendations:Implement comprehensive testing standards and component certificationRegulate the sale and importation of high-powered e-mobility componentsModernise power and speed limits based on human performance capabilitiesEstablish graduated classification systems for different e-mobility categoriesStrengthen enforcement through better regulation of supply chainsAbout the SubmitterOKB-42 Pty Ltd operates Recycles (https://okb-42.com.au/recycles), an Australian brand of e-bike conversion kits designed specifically for compliance with Australian regulations. Unlike many competitors who prioritise maximum power output, we deliberately limit our products to safe, legal specifications—demonstrating that responsible design and production is both possible and commercially viable.Our Credentials:Operating Australian Light Electric Propulsion Laboratory with rigorous testing protocols13+ years of cycling experience in Australian conditions across 140,000+ kilometresExtensive experience with both conventional bicycles and e-bikes for sport and daily transportTechnical expertise in motor efficiency, battery systems, and regulatory compliancePractical understanding of user behaviour and real-world e-mobility applicationsThis combination of technical expertise, product development experience, and extensive practical use provides unique insights into both the challenges and opportunities within Queensland's e-mobility sector.The Core Problem: Regulatory-Market Disconnect from the Current Market RealityThe e-mobility market operates in a regulatory vacuum where:Uncontrolled Component Sales: Retailers freely sell conversion kits and components with power outputs of 1,000W, 1,500W, or higher—far exceeding any reasonable definition of "bicycle"Structural Inadequacy: High-powered motors require frame reinforcement, torque arms, and upgraded chains—modifications that inexperienced users typically omitDe facto Motorcycles: Many "e-bikes" on Queensland roads are functionally electric motorcycles operated without licences, insurance, or appropriate safety equipmentRegulatory GapsCurrent legislation focuses on restricting compliant brands whilst failing to address the supply chain of non-compliant components. This creates perverse incentives where:Responsible brands face competitive disadvantageConsumers can easily purchase illegal componentsEnforcement occurs only after incidents, not preventionTechnical specifications lag decades behind available technologyTechnical Analysis: Why Current Limits Are OutdatedHuman Performance BaselineFit cyclists routinely maintain 30-35 km/h on level ground through human power alone. Our testing shows that recreational cyclists can sustain 50-100W of pedal input, whilst competitive cyclists exceed 150W continuously. Current 25 km/h limits with mandatory motor cutoff create artificial barriers below normal (very fit) human capabilities.International ComparisonsEuropean Pedelec Standards:Pedelec25: 250W, 25 km/h (equivalent to current Australian standard)Pedelec45: 500W, 45 km/h (requires registration, insurance, helmet)New Zealand Approach:300W continuous power limitNo mandatory speed cutoffPerformance naturally limited by motor characteristics and rider inputTechnical ObsolescenceModern controllers easily enable sophisticated power management including:Gradual power reduction rather than harsh cutoffs which many users find extemely uncomortableCruise control for consistent speedsProgrammable power curves for different riding

modesTorque sensing for natural pedal assistanceRigid 25 km/h cutoffs ignore these technological advances, creating unnecessarily poor user experience for compliant users.Proposed Solutions1. Component Regulation and CertificationEstablish mandatory certification for e-mobility components sold in Queensland:Power ratings verified through standardised testing protocolsStructural compatibility requirements (torque arms, frame specifications)Import controls preventing sale of non-certified componentsRetailer liability for selling non-compliant equipment2. Graduated Classification SystemImplement tiered e-mobility categories:Class 1 - Pedal Assist E-bikes:Maximum 300W continuous powerAssistance cuts at 32 km/h (human performance equivalent)No licence requiredStandard bicycle infrastructure accessClass 2 - Speed Pedelecs:Maximum 500W continuous powerAssistance to 45 km/hRequire registration, basic licence, insuranceHelmet mandatory, limited infrastructure accessClass 3 - Electric Motorcycles:Above 500W or 45 km/h capabilityFull motorcycle licensing and registrationRoad use only, no bicycle infrastructure access3. Modernised Technical StandardsReplace arbitrary limits with performance-based regulations:Continuous power ratings based on standardised testingNatural speed limitations through motor characteristicsSoft power reduction curves rather than harsh cutoffsIntegration with modern controller capabilities4. Supply Chain ControlsTarget the source of non-compliance:Import restrictions on high-powered componentsRetailer licensing for e-mobility equipmentMandatory component traceabilityPenalties for supplying non-compliant equipmentIndustry Expertise OfferWe offer our technical capabilities to support regulatory development:Testing and Certification ServicesDevelopment and applicaiton of standardised motor performance testing protocolsPower curve characterisationEfficiency and thermal testingReal-world performance validationTechnical AdvisoryComponent specification developmentInternational standards comparisonUser behaviour analysisEnforcement strategy developmentStakeholder EngagementIndustry consultation facilitationConsumer education programme developmentRetailer compliance guidanceInternational best practice researchBenefits of ReformFor Legitimate UsersImproved performance within legal frameworksBetter product reliability and safetyClearer compliance pathwaysEnhanced riding experienceFor Public SafetyAppropriate vehicle classificationReduced infrastructure conflictsBetter emergency response protocolsDecreased accident severityFor IndustryLevel competitive playing fieldProfessional industry development (incentives for domestic production)Export opportunities for compliant products