# Executive Summary

Emerging technologies present opportunities to improve the way we live and work, and to boost NSW's productivity. Planes, cars and computers, to name a few examples, were once novel, disruptive technologies. Now they are an essential part of our lives—enhancing our productivity and standards of living in the process.

Where regulation of these new technologies is needed, it should be shaped in a way that maximises these opportunities while managing risks to society. Regulations that are based on particular technologies or business models are bound, eventually, to impede the benefits of dynamism and innovation as new technologies emerge.

A modern approach to regulating emerging technologies is required, underpinned by the following core principles:

**Outcome-focused, tech-neutral regulation**

- Focuses on underlying objectives that the regulation is designed to achieve e.g. high safety standards.
- Does not prescribe how these objectives are met—leaves it open for businesses to decide the technology or business models to be used.

**Regular review of regulations**

- Involves identifying barriers to the adoption of emerging technologies in current legislation.
- RegTech and other regulatory tools can assist in this task.

**A culture of regulatory experimentation**

- Involves trialing new rules in a real word setting, to obtain evidence on what works and what could be improved.
- Addresses some of the uncertainty in regulating emerging technologies.

Mobility involves the movement of individuals and goods from point A to point B. It presents a significant opportunity to apply the above principles, due to the rapid emergence of new mobility technologies and business models. This includes drones, autonomous vehicles, personal mobility devices (PMDs) and mobility as a service.

Applying the principles to three mobility technologies—drones, PMDs, and e-bikes—could transform the way we work, travel, and move goods, and unlock considerable economic benefits.

## APPLYING THE PRINCIPLES TO DRONES, BEGINNING WITH AGRICULTURE

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| **PROBLEM** | Current regulations make it costly and time-consuming to operate drones beyond the line of visual sight and to fly drones at night. This creates a barrier for uptake in low-risk settings, such as agriculture, forestry and fishing, reducing the potential of drones where they could replace less productive and often less safe ways of working. |
| **OPPORTUNITY** | Across Australia, the economic benefit of drones has been forecast to grow GDP by $14.5 billion by 2040, with some of the largest benefits ($3.5 billion) obtained from use in agriculture, forestry and fishing (Deloitte Access Economics, 2020). |
| **BENEFITS FROM REGULATORY CHANGES** | Simplifying the regulations for drone use in an agriculture setting could save an average farmer up to $11,000 in upfront regulatory and training fees, as well as other significant time and cost savings (CIE, 2021a).<br><br>Overall, relaxing the regulatory environment for drones in agriculture could unlock up to **$500 million** in net benefits for NSW in today's dollars by 2041 (CIE, 2021a) from:<br><br>  **Reduced farm injuries and fatalities**, as high-risk farming activities such as equipment and livestock inspections are substituted by drones.<br><br>  **Increased efficiency of routine farm work** as drones perform tasks that would otherwise be labour-intensive. Examples include checking water troughs and locating livestock.<br><br>  **Improved yield** from enhanced crop monitoring and crop spraying efficiencies. |
| **NEXT STEPS—APPLYING THE PRINCIPLES** | **Outcomes-focused regulatory experimentation**<br>The NSW Government should engage with the Civil Aviation Safety Authority (CASA), industry, and the community to trial risk-based, simplified drone rules in priority low-risk sectors, starting with agriculture.<br><br>This should involve clearly defining the desired outcomes from the trials, developing rules to meet the outcomes, and setting regular dates to evaluate effectiveness.<br><br>**Regular review**<br>Task a minister with policy responsibility for drones and other emerging aviation technology to help NSW capitalise on opportunities from emerging uses of these technologies. |

## APPLYING THE PRINCIPLES TO PERSONAL MOBILITY DEVICES

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| **PROBLEM** | Many Australian and international jurisdictions regulate PMDs such as e-scooters and permit their use in public areas, while NSW laws restrict the use of all PMDs to private property. Regardless, innovation in PMDs is continuing and consumers are using them in public spaces in NSW. Devices capable of speeds of up to 100km/hr are now available in shops and online in NSW, presenting safety risks in the absence of appropriate regulation. |
| **OPPORTUNITY** |  **Travel time savings**, where they replace short car or walking trips. |
| |  **Better access to public transport** through reducing first and last mile transport problems. |
| |  **Reduced urban congestion:** reduced congestion and demands on transport infrastructure where PMDs replace car trips. |
| |  **Lower environmental impacts** where they replace moped, motorcycle, or car trips with tailpipe emissions. |
| **BENEFITS FROM REGULATORY CHANGES** | Revising laws to support the use of PMDs in NSW could unlock up to $87 million in net economic benefits in today's dollars by 2041 (CIE, 2021b). An appropriate regulatory framework could enable uptake of PMDs of between eight and ten million trips per year by 2041 (compared to 600,000 trips per year if regulations remain at their current settings).<br><br>The greatest benefits of increased uptake arise from travel time savings, followed by vehicle operating cost savings. These benefits outweigh negative impacts on active transport, safety, and enforcement costs. |
| **NEXT STEPS—APPLYING THE PRINCIPLES** | **Regulatory experimentation**<br>Implementing recent revisions to the Australian Road Rules to allow use of PMDs in public spaces in NSW could provide an opportunity to:<br>• test the appropriateness of the regulatory framework in a local setting<br>• collect and evaluate data on the risks and benefits<br>• refine the final regulatory approach, such as speed limits, to maximise benefits while ensuring good safety outcomes are achieved.<br>**Technology-neutral regulation**<br>The technology-neutral definition of PMDs adopted in the Australian Road Rules would enable future innovation beyond e-scooters and shared e-scooter schemes seen today. |

## APPLYING THE PRINCIPLES TO E-BIKES AND E-CARGO BIKES

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| **PROBLEM** | **e-bikes:** Restrictions on the speed of e-bikes are not keeping pace with increased consumer demand for faster e-bikes in NSW and Australia. The online availability of high-speed e-bikes and conversion kits has created growing safety concerns for riders and pedestrians in the absence of appropriate regulation.<br>**e-cargo bikes:** Australia and NSW apply the same power limits to e-cargo bikes for commercial uses as private use. This power limit is limiting their potential to carry heavier loads at a time where e-commerce delivery is booming. |
| **OPPORTUNITY** | **e-bikes:** Many international jurisdictions permit the use of e-bikes with faster maximum speeds and power outputs. Expanding the range of e-bikes available could encourage more people to use e-bikes, and to use them more regularly and for greater distances. Just five per cent of NSW bike rides were estimated to be undertaken by e-bike in 2021 (CIE, 2021b), whereas 40 to 50 per cent of bikes sold in Germany and Netherlands are e-bikes (Kennedy, 2021).<br>**e-cargo bikes:** e-cargo bikes are already being used commercially by the freight and food delivery sectors. Australia Post uses a fleet of 2,500 e-cargo bikes to make more than 2.5 million deliveries of mail and small parcels to customers per day. The bikes offer a higher load capacity than postie motorcycles and there have been no serious accidents or deaths in the last decade (We Ride, 2020). This is an area of rapid innovation with new devices emerging. Starting the conversation about the right regulatory settings now will position us to benefit from future innovation. |
| **BENEFITS FROM REGULATORY CHANGES** |  **Reduced delivery costs:** e-cargo bikes can be up to 60 per cent faster than vans for last mile deliveries in urban areas (Verlinghieri, 2021)—offering potential for significant cost savings given that over half of freight costs come from the last mile (McKinsey, 2016).<br>  **Reduced urban congestion:** e-cargo bikes take up less room than delivery vans on roads and some are cycle-way compatible.<br>  **Lower environmental impacts** where they replace delivery van, moped, motorcycle or car trips.<br>  **Active health benefits** from overcoming barriers to bicycle use, such as physical fitness or terrain, as opposed to sedentary use of mopeds, motorcycles, or cars.<br>  **Travel time savings**, where they replace conventional bicycle and walking trips. |
| **NEXT STEPS—APPLYING THE PRINCIPLES** | **Regular review**<br>National review of regulatory options to safely support faster e-bikes and more powerful e-cargo bikes.<br>**Technology-neutral regulation**<br>Develop a technology-neutral regulatory framework for e-cargo bikes and other similar vehicles. |