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Intelligent Transport Systems

SHAPING
FUTURE
TRANSPORT

2023 YEARBOOK

**A PERSPECTIVE ON C-ITS AND THE CLOUD**

THE MANY FACES OF TRANSPORT SUSTAINABILITY

INTELLIGENT TRANSPORTATION OF THE FUTURE

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BY GEOFF JAMIESON, MANAGING DIRECTOR, ORCODA

The intelligent transportation of the future requires electrification networks, smart highways and smart vehicles, all interconnected with intelligent transport management platforms and smart infrastructure devices.
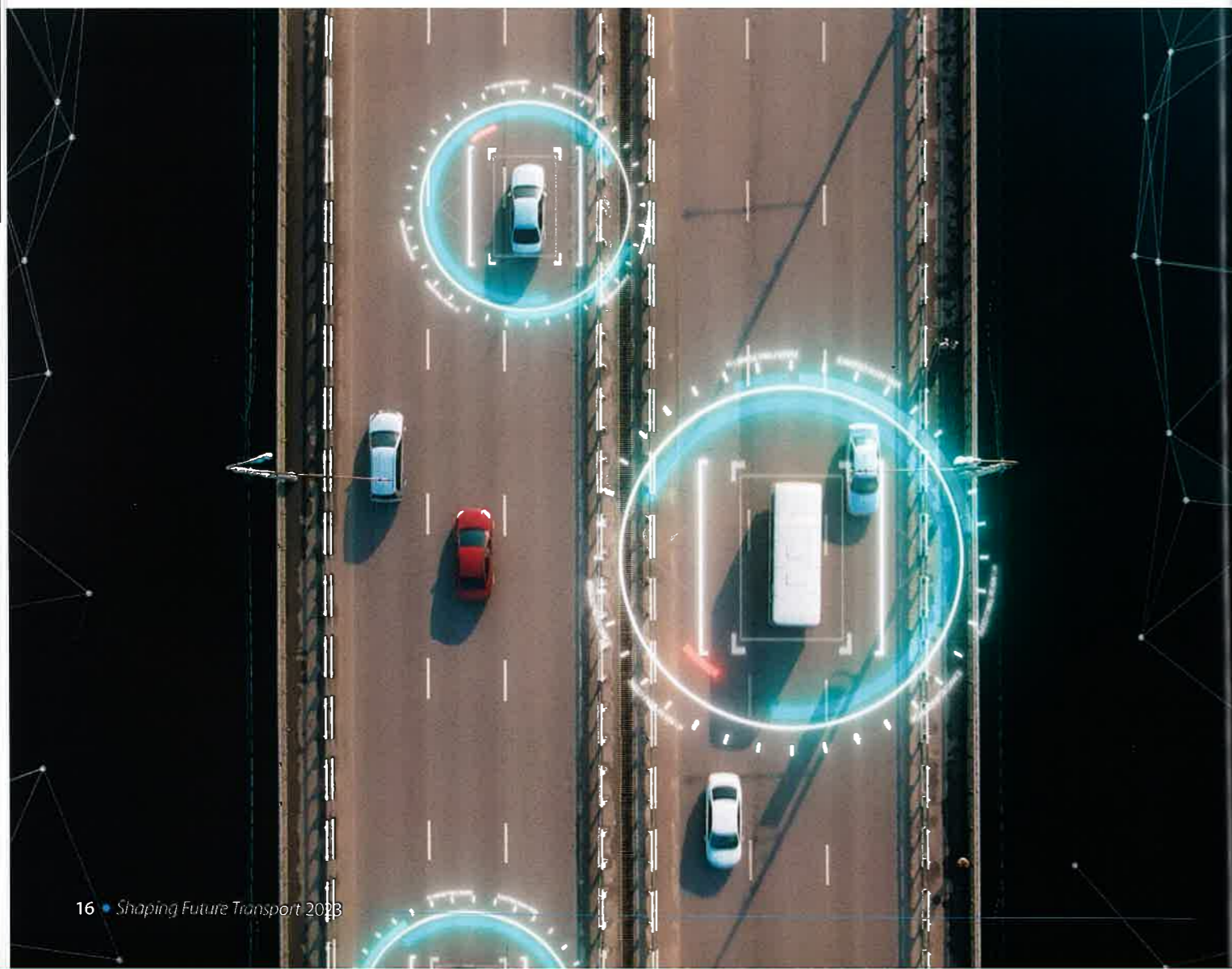
The future of intelligent transportation is here. With Sydney in the top 10 global cities for digital capability (*The Economist*, 2022), and each Australian city following their own smart city strategy, it's only a matter of time before we reach our national directives for digital capability. As announced by the Australian Government's 2021 Federal Budget, almost $1.2 billion will be invested into making our country more digitally connected. Connectivity that's powered by intelligent transport management systems will be built right into every smart device around us and among the Internet of Things (IoT), like autonomous electric cars and trucks, smart highways, smart poles, and drones.

Smart cities, smart roads, smart rail and smart air (i.e., drones) – they all enable modern functionalities like sustainable energy and electrified transportation networks, and focus on the information and communication technologies to improve operational efficiency of future cities. Projected smart city revenue in Australia is expected to increase by 57 per cent by 2025 (Statistica.com), which demonstrates the domestic markets' drive for electrification and digital transformation.

For a city to be considered 'smart,' it must have three core components: electrification, connectivity and data analytics.

Electrification is necessary for powering a smart city, as it provides the energy needed to run essential services and to power the multitude of smart devices and smart technology, IoT, smart lighting, augmented reality (AR), virtual reality, machine learning (ML), artificial intelligence (AI), and assets (e.g., electric vehicles and drones) within the cities we live, work, and play.

Connectivity refers to the infrastructure that supports data communications between devices, transportation platforms and data delivery systems (6G, satellite, NBN, etc.).

Data analytics utilising AI will be used to examine large datasets to identify trends and patterns to optimise our cities as new technologies emerge in our interconnected world.

Together, these three components make up the backbone of a smart city.

Smart electrification, powered by intelligent transport management systems (ITMS), will be the platform that propels us towards our smart city vision for the future. It enables many modern functionalities that connect the assets people travel in or on, through wireless mesh networks that will deliver incredible speed and accuracy, achieving sustainable energy and an electrified, digitalised and connected transportation network. Smart electrification can help cities save money, reduce emissions and improve quality of life for residents. For example, electrified transportation networks can reduce traffic congestion and pollution, while also providing cleaner, quieter and more efficient transportation options.

The electric vehicle market is projected to grow significantly in the next few years. The global market is projected to triple by 2027, with the biggest change

happening in light commercial vehicles (LCVs). LCVs are projected to be 28 per cent electrified by 2027, up from two per cent in 2020 (Mordor Intelligence). This growth is due to a number of factors, including falling battery prices, improving range and charging infrastructure, and government incentives. As battery prices continue to fall and electric vehicles become more competitive with traditional gasoline-powered cars, we anticipate that the electric vehicle market will continue to grow at a rapid pace.

Geoff Jamieson

5G is the fifth generation of mobile connectivity and is expected to be a major driver of market growth for the IoT in the coming years. 5G offers higher data speeds, ultra-low latency and increased availability, making it ideal for connecting machines and devices. According to Ericsson, the number of mobile 5G subscriptions in the Asia-Pacific region is expected to increase by 700 per cent by 2027. Connected cars form the largest installed base of 5G IoT end points worldwide, with more than 19 million installed end points. Outdoor surveillance cameras and fleet telematics devices are also major 5G IoT end point markets. 5G will enable a new level of connectivity and automation that will have a profound impact on many industries.

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ITMS are set to revolutionise the transport industry. By integrating with smart devices that utilise AR, ML and AI, they will provide a seamless travel experience for passengers while also reducing congestion and improving safety. ITMS will be able to constantly monitor conditions on the ground, and dynamically adjust routes and schedules in real-time. This will greatly reduce the need for infrastructure upgrades, as the system will be able to adapt to changing conditions with minimal disruption. In addition, passengers will be able to use their

smart devices to access real-time information about their journey, including estimated arrival times and alternative routes. With ITMS, the transport industry is set to enter a new era of efficiency and customer service.
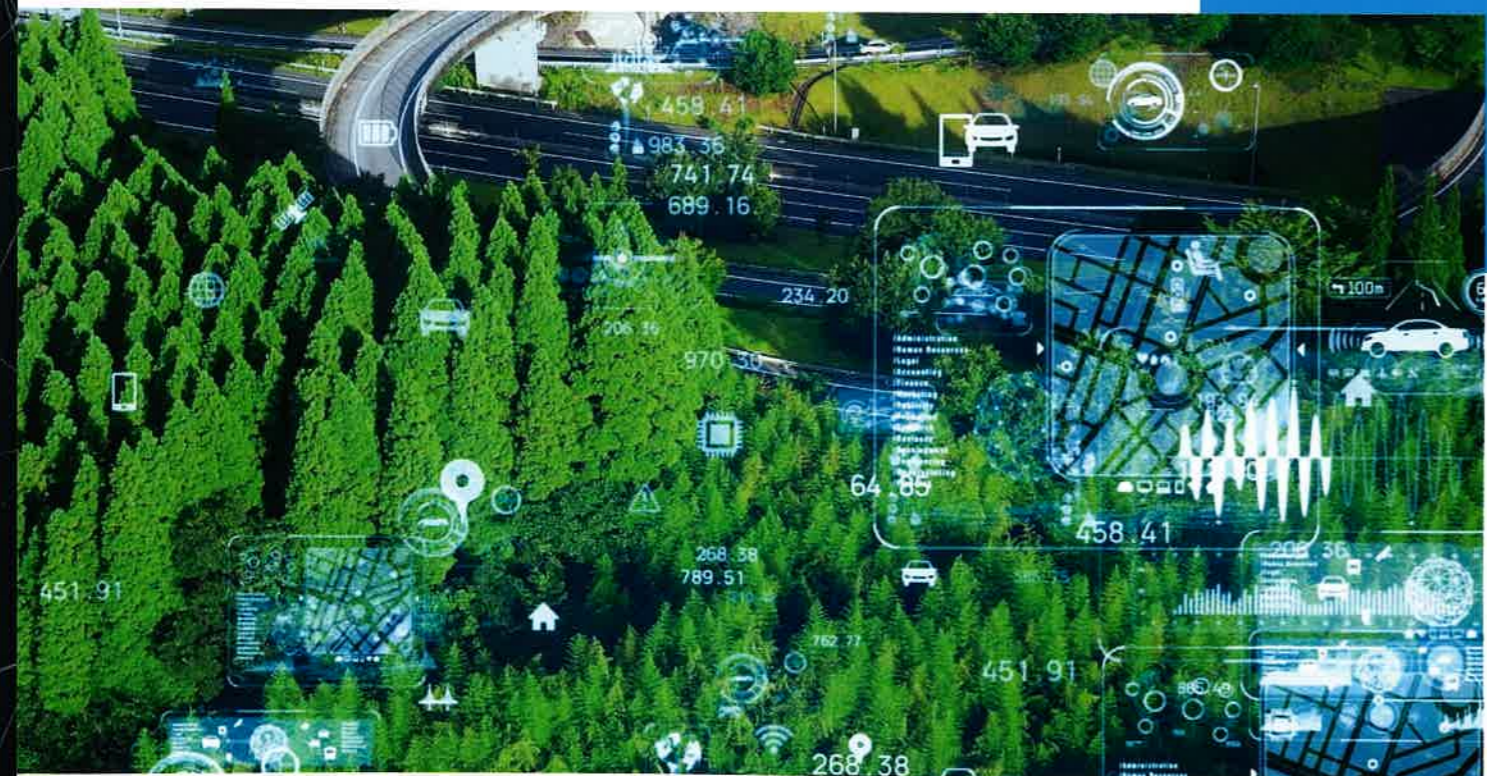
Smart Infrastructure, enabled by technology like the ITMS, offer a wide range of advantages such as cost savings, increased efficiency and the ability to make data-driven decisions. IoT is an expansive ecosystem where interconnected devices and services collect, exchange and process data in order to adapt dynamically to a context. IoT allows us to take advantage of the ever-growing prevalence of interconnected devices and use them to create a more efficient and cost-effective world. These interconnected ecosystems are fuelled by smart devices and electrified networks, which allow for a more adaptive and responsive experience. For example, smart infrastructure can help to reduce traffic congestion and improve public safety. Additionally, smart infrastructure can lead to cost savings by reducing the need for traditional infrastructure maintenance.

Smart highways (road, rail and air) are another area where electrification will be embraced to create a more efficient and sustainable future. Electric vehicles and drones will make running a transport system much more complex, as it's not just about planning your route – you also need to consider charging, range and the price of electricity during the day. So, connectivity and digitalisation are essential. Smart highways will use ITMS to manage traffic flow and reduce congestion. And ITMS will use smart sensors and cameras to collect data about traffic patterns, which is

then used to optimise traffic flow. By reducing congestion, an ITMS can help reduce emissions from idling vehicles. Electrification is an integral part of creating smarter cities and smarter highways that can help us move towards a more sustainable future.

The next step is then integrating all the above with digital twins of smart cities and smart highways, to gain an accelerated holistic understanding and optimised decision-making. This integration with digital twins will allow transport technologies utilising AI and blockchain to make use of real-time and historical data to simulate predicted futures. This would allow us to make decisions that are motivated by outcomes rather than by data alone. Additionally, digital twins could be tailored to specific use cases, making them even more useful for transport and infrastructure planning, ultimately leading to the efficient and effective smarter cities and smarter highways of the future. ✳

ORCODA Limited (ASX: ODA) is an integrated technology company that provides smart software solutions for transport logistics and transport infrastructure services. Our proprietary cloud-based, open ended, end-to-end software technology platforms have true optimisation capabilities, enabling clients to generate real time, fast, accurate and reliable information to make data-led decisions for the movement of people, parcels and goods, the assets they travel in and the infrastructure they travel on. Our transport infrastructure services (via Betta Group) deliver electrification optimisation solutions primarily in major road, rail and air infrastructure projects and is an integral part of achieving our Smart City Vision – 'A total ecosystem of interconnected technology providing big data to drive continual optimisation.'