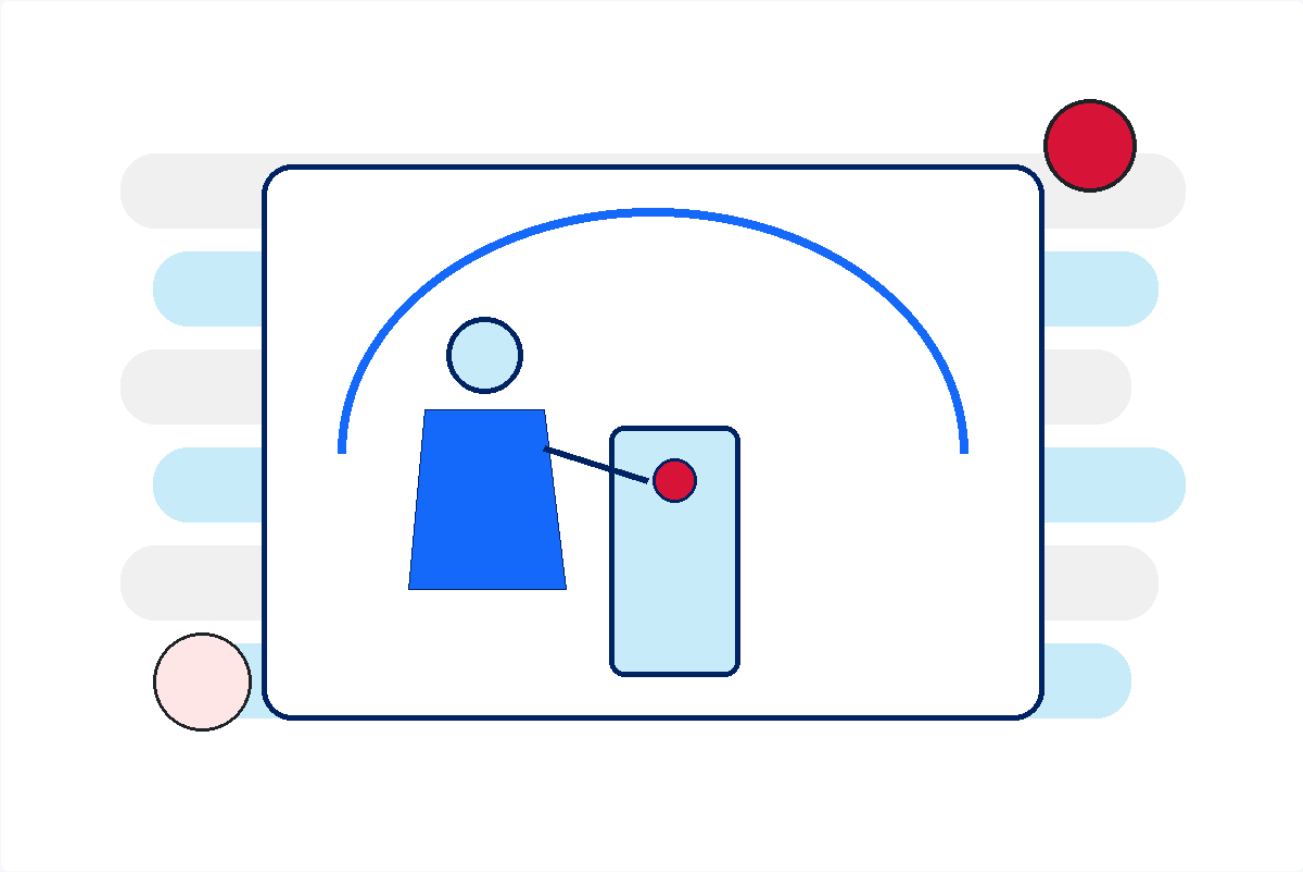
TRANSPORT FOR NSW • ARCHITECT OF TECHNOLOGY INTELLIGENCE DOSSIER • DOC-PDF-02

NSW & Australian Transport Thought Leaders, Academics, CRCs & Scaleups

Complete Directory of TfNSW Platforms, UNSW rCITI, USyd ACFR & ITLS, UTS Robotics, UOW SMART, iMOVE CRC & Sovereign Deep-Tech

02. NSW & Australian Transport Thought Leaders, Academics, CRCs & Deep-Tech Scaleups

Prepared for the Architect of Tech — Transport for NSW (TfNSW)



NSW & Australian Transport Innovation Ecosystem Map

1. Transport for NSW (TfNSW) Core Technology Platforms & Leadership

Leadership Context: **Jason Tuendemann** serves as Group Chief Technology Officer (Group CTO, appointed April 2025, succeeding Kurt Brissett), leading Group Technology across enterprise architecture, cybersecurity, data platforms, and digital delivery.

Platform / Initiative	Core Architectural Scope	Strategic Value for Tech Architect	URL
Future Transport 2056 / 2061 Strategy	NSW's 40-year rolling multimodal blueprint emphasizing 15/30-minute neighborhoods, the *Movement and Place* framework, net-zero resilience, and digital-by-default infrastructure.	Sets the overarching enterprise business architecture to which all IT/OT investments trace.	https://www.future.transport.nsw.gov.au/
Future Transport Technology Roadmap	Customer-focused technology strategy structured around 5 pillars: Customer-obsessed digital experiences, Data-driven network operations, CAVs, MaaS, and Future Fleet.	Primary roadmap governing AI, C-ITS, cloud migration, and automated fleet integration.	https://www.future.transport.nsw.gov.au/technology-roadmap
TfNSW Smart Innovation Centre	Living-lab R&D incubator partnering with universities and startups to trial automated shuttles (Sydney Olympic Park, Coffs Harbour, Armidale), C-ITS (**CITI** heavy vehicle initiative in the Illawarra), and inspection drones.	Pre-commercial sandbox for validating V2X protocols, edge sensors, and safety cases before state-wide rollout.	https://www.transport.nsw.gov.au/projects/programs/smart-innovation-centre
Spatial Digital Twin (Digital Twin NSW)	Built by DCS Spatial Services with **CSIRO Data61** (`TerriaJS`) and TfNSW. 3D/4D federated platform combining BIM/CAD, GIS, underground utilities, and live transport feeds.	Core spatial federation layer for asset lifecycle management, flood/bushfire simulation, and UTM ground-risk layers.	https://www.spatial.nsw.gov.au/digital_twin
SCATS (Sydney Coordinated Adaptive Traffic System)	Invented in NSW and deployed in **180+ cities (>65,000 intersections)** globally. Evolving to **SCATS 7** with open APIs, cloud readiness, and Deep Reinforcement Learning (DRL) probe data fusion.	Sovereign global OT flagship; interfaces directly with C-ITS roadside units (RSUs) and Bus Priority.	https://www.scats.nsw.gov.au/
Sydney Metro (GoA4 Unattended Train Operation)	Australia's first fully automated (Grade of Automation 4) rapid transit spine using **Alstom Urbalis 400 CBTC**, platform screen doors, and 115-second theoretical headways.	Exemplar of SIL-4 mission-critical OT/IT convergence and automated high-capacity transit ($>40,000 ext{ pphpd}$).	https://www.sydneymetro.info/
Opal Next Gen (Opal 2.0)	~$820M upgrade replacing 25,000+ readers across rail, metro, ferry, light rail, and 5,000+ buses using **INIT** (core Account-Based Ticketing) and **Trapeze Group** (5G Intelligent Bus System).	Microservices API transformation enabling open-loop EMV, digital wallets, dynamic fare capping, and live 5G bus telemetry.	https://www.transport.nsw.gov.au/projects/current-projects/opal-next-gen

Platform / Initiative	Core Architectural Scope	Strategic Value for Tech Architect	URL
Zero Emission Buses (ZEB) & Ferries	Transitioning 8,000+ NSW buses to BEV and Hydrogen FCEV (Greater Sydney by 2035, Outer Metro 2040, Regional 2047) alongside low/zero-emission ferries.	Requires smart depot Energy Management Systems (EMS), OCPP 2.0.1 / ISO 15118 V2G orchestration with Ausgrid/Endeavour Energy, and SoC routing.	https://www.transport.nsw.gov.au/projects/programs/zero-emission-buses
TfNSW Open Data Hub	World-leading open data portal publishing GTFS, GTFS-Realtime (vehicle positions & carriage occupancy), SIRI, live traffic, EV chargers, and car park APIs.	External API gateway powering TripView, Google/Apple Maps, AnyTrip, and university research.	https://opendata.transport.nsw.gov.au/

2. Leading NSW Universities, Research Institutes & Key Academics

2.1 UNSW Sydney — rCITI (Research Centre for Integrated Transport Innovation)

- **URL:** https://www.rciti.unsw.edu.au/
- **Key Thought Leaders:**
- **Prof. Vinayak Dixit** (Director, rCITI; IAG Chair of Risk in Smart Cities): Behavioral risk analytics, traffic operations, digital twins for congestion, V2X safety, and bushfire/flood evacuation modeling.
- **Prof. Taha Hossein Rashidi** (Deputy Director, rCITI): Activity-based travel demand modeling, Land-Use and Transport Interaction (LUTI), housing choice, and EV adoption modeling.
- **Prof. S. Travis Waller** (Founding Director of rCITI; global leader in Dynamic Traffic Assignment [DTA], network equilibrium, and equity in emerging mobility).
- **Architect Relevance:** Primary academic partner for TfNSW's Strategic Transport Models (STM), **MATSim** agent-based regional simulations, and real-time incident prediction.

2.2 University of Sydney — ACFR (Australian Centre for Robotics / Field Robotics)

- **URL:** https://www.sydney.edu.au/engineering/our-research/robotics-and-intelligent-systems/australian-centre-for-robotics.html
- **Key Thought Leaders:**
- **Prof. Salah Sukkarieh** (Professor of Robotics & Intelligent Systems): Multi-UAV coordination, probabilistic flight path planning, and field robotics safety assurance.

- **Prof. Eduardo Nebot** (Emeritus Professor; CAV Pioneer): Multi-modal sensor fusion (LiDAR, radar, camera), V2X localization, pedestrian intent prediction, and autonomous vehicle safety validation.
- **Prof. Stefan Williams** (Director, ACFR; Marine Robotics): Autonomous Underwater Vehicles (AUVs) and 3D subsea mapping for submerged bridge pilings and wharf infrastructure.
- **Architect Relevance:** World-class local authority on SLAM, autonomous perception stacks, and robotic inspection of TfNSW land, air, and maritime assets.

2.3 University of Sydney — ITLS (Institute of Transport and Logistics Studies)

- **URL:** https://www.sydney.edu.au/business/our-research/institute-of-transport-and-logistics-studies.html
- **Key Thought Leaders:**
- **Prof. David Hensher** (Founding Director, ITLS; Australia's most cited transport economist): Global pioneer of **Mobility as a Service (MaaS)** bundle design (led the Sydney MaaS trial with IAG), discrete choice modeling, Road User Charging (RUC) reform, Value of Travel Time Savings (VTTS), and bus contracting.
- **Prof. Rico Merkert** (Deputy Director, ITLS): Aviation management, **drone logistics & Urban Air Mobility (UAM) unit economics**, and resilient regional freight supply chains.
- **Prof. Matthew Beck**: Post-pandemic work-from-home structural shifts and commuter demand elasticity.

2.4 University of Technology Sydney (UTS) — Robotics Institute & ISF

- **URL:** https://www.uts.edu.au/research/uts-robotics-institute | https://www.uts.edu.au/isf
- **Key Thought Leaders:**
- **Distinguished Prof. Dikai Liu** (Co-Director, UTS Robotics Institute): Pioneer in infrastructure maintenance robotics—co-developed the autonomous bio-inspired grit-blasting robots (**CROC** and **Crimson**) deployed inside the steel arches of the **Sydney Harbour Bridge**, plus autonomous underwater bridge pile inspection robots.
- **Prof. Stuart White & Dr. Chris Riedy** (Institute for Sustainable Futures - ISF): Transport decarbonization pathways, circular economy for EV batteries, and mode-shift governance.

2.5 University of Wollongong (UOW) — SMART Infrastructure Facility & AURIN

- **URL:** https://www.uow.edu.au/smart/ | https://aurin.org.au/
- **Key Thought Leaders:**
- **Prof. Pascal Perez** (Founding Director of UOW SMART; Director of **AURIN** — Australian Urban Research Infrastructure Network): Complex socio-technical systems modeling, agent-based disaster evacuation, edge LoRaWAN IoT pedestrian/microclimate networks (*Liverpool Smart Pedestrians* project), and heavy rail track geotechnical engineering.

2.6 Western Sydney University (WSU) & Bradfield City Centre (Aerotropolis)

- **URL:** https://www.nsw.gov.au/departments-and-agencies/bradfield-development-authority
- **Focus:** Urban heat island mitigation (cool pavements), smart-city IoT fabrics, modular net-zero infrastructure, and multi-modal integration around the 24/7 **Western Sydney International (Nancy-Bird Walton) Airport** and the **Sydney Metro – Western Sydney Airport** line.

3. Australian National Bodies, Regulators & Cooperative Research Centres (CRCs)

Organization	Key Leadership	Mandate & Technical Outputs	URL
iMOVE Australia CRC	**Ian Christensen** (Managing Director)	Flagship 10-year Commonwealth CRC co-funding applied R&D across ITS, CAVs, SCATS AI, freight telemetry, and MaaS. TfNSW is a cornerstone tier-1 partner.	https://imoveaustralia.com/
National Transport Commission (NTC)	**Michael Hopkins** (CEO)	Leads the **Automated Vehicle Safety Law (AVSL)**, Automated Driving System Entity (ADSE) statutory duties, C-ITS privacy, and national rail interoperability.	https://www.ntc.gov.au/
Austroads	**Dr. Geoff Allan** (Chief Executive)	Peak Australasian road agency body managing **NEVDIS**, the **National C-ITS Security Credential Management System (PKI)**, and road sign/line-marking machine readability.	https://austroads.gov.au/
NTRO (formerly ARRB)	**Michael Caltabiano** (CEO)	National Transport Research Organisation operating high-speed **iPAVE** (Intelligent Pavement Assessment Vehicles) with Doppler lasers and ground-penetrating radar.	https://www.ntro.org.au/
CSIRO Data61	**Prof. Jon Whittle** (Director)	National data science arm; built open-source **TerriaJS** (Digital Twin NSW), **Wildcat SLAM** 3D LiDAR mapping, and privacy-preserving federated ML.	https://www.csiro.au/en/about/people/business-units/data61
SmartCrete CRC	**Clare Tubolets** (CEO)	Based in Macquarie Park, Sydney; researches low-carbon concrete, self-healing concrete, and embedded structural health monitoring (SHM) sensors.	https://smartcretecrc.com.au/
NHVR & TCA	**Sal Petroccitto OAM** (CEO, NHVR)	Administers Heavy Vehicle National Law (HVNL) and **National Telematics Framework (NTF)** (**TMA** & **IAP**) for certified heavy freight mass/route monitoring.	https://www.nhvr.gov.au/

4. Sovereign NSW & Australian Mobility, Drone & Deep-Tech Scaleups

- **Compass IoT (Sydney, NSW)** — *Co-founders: Angus McDonald & David Milano* (`https://www.compassiot.com.au/`)

- Aggregates real-time connected vehicle telematics (1–10 Hz G-force, harsh braking, steering angle, wiper status) and **Pavepoint** International Roughness Index (IRI) road health across NSW without roadside hardware. Widely used by TfNSW.
- **DroneShield (Pyrmont, Sydney, NSW — ASX:DRO)** — *CEO: Oleg Vornik* (`https://www.droneshield.com/`)
- Global sovereign powerhouse in AI-powered multi-sensor C-UAS detection (`DroneSentry` , `RfPatrol Mk2` , `DroneOptID`) and directional electronic warfare (`DroneGun Tactical` , `DroneGun Mk4`).
- **AMSL Aero (Bankstown Airport, Sydney, NSW)** — *Co-founders: Andrew Moore & Siobhan Lyndon; CEO: Max York* (`https://www.amslaero.com/`)
- Creator of **Vertiia**, a world-leading $1,000 ext{ km}$ range, $300 ext{ km/h}$ hydrogen-electric eVTOL aircraft for regional passenger transport, CareFlight aeromedical retrieval, and cargo.
- **Advanced Navigation (Sydney / Botany UTS Tech Lab, NSW)** — *Co-founders: Xavier Orr & Chris Shaw* (`https://www.advancednavigation.com/`)
- Deep-tech leader in photonic/fiber-optic Inertial Navigation Systems (INS), acoustic subsea positioning, and velocity LiDAR for **GNSS-denied environments** (WestConnex tunnels, Sydney Metro tunnels, under bridges).
- **Baraja (Sydney, NSW)** — *Co-founders: Federico Collarte & Cibby Pulikkaseril* (`https://www.baraja.com/`)
- Creator of **Spectrum-Scan™ Solid-State LiDAR**, using wavelength-tunable lasers and prism optics with per-pixel Doppler velocity and extreme shock/vibration durability for rail corridors and heavy trucks.
- **Cohda Wireless (Adelaide, SA — deployed in NSW CITI)** — *Founder/CTO: Prof. Paul Alexander* (`https://www.cohdawireless.com/`)
- Global market leader in V2X (DSRC & C-V2X) On-Board Units (OBUs) and Roadside Units (RSUs), powering TfNSW's **Cooperative Intelligent Transport Initiative (CITI)** in the Illawarra.
- **Greenroom Robotics (Sydney, NSW & Fremantle, WA)** — *Founders: James Packer, Harry Hubbert, Simon Barber* (`https://www.greenroomrobotics.com/`)
- Developer of **GAMA** (Greenroom Advanced Maritime Autonomy) and **Lookout+** AI optical/radar collision avoidance for ferries, naval patrol boats, and uncrewed surface vessels.
- **Seeing Machines (Canberra, ACT — AIM:SEE)** — *CEO: Paul McGlone; Co-founder: Prof. Alex Zelinsky* (`https://www.seeingmachines.com/`)
- World leader in optical Driver Monitoring Systems (DMS) and *Guardian* commercial heavy-vehicle/bus fatigue prevention.
- **Applied EV (Melbourne, VIC)** — *CEO: Julian Broadbent* (`https://www.appliedev.com/`)
- Developer of the **Blanc Robot™** cabless modular electric chassis and **Digital Backbone™** (ISO 26262 ASIL-D safety-certified software-defined vehicle platform).
- **Electro Optic Systems — EOS (Canberra, ACT — ASX:EOS)** (`https://eos-aus.com/defence/`)
- Sovereign Australian creator of the **Slinger** counter-drone 30mm RWS and **Titanis** $35–100 ext{ kW}$ High-Energy Laser C-UAS.
- **Swoop Aero & Wing Australia** (`https://swoopaero.com/` | `https://wing.com/australia/`)
- Pioneers in BVLOS medical/regional drone logistics (Swoop Aero) and high-frequency suburban retail drone delivery (Wing — 400,000+ Australian deliveries).