Cooperative Intelligent Transport Systems (C-ITS) combine information and mobile communication technologies to enable valuable interactions between vehicles, roadside infrastructure, mobile devices and back-office systems. Also known as Connected and Automated Vehicles (CAVs), C-ITS delivers a safer and more efficient transport network.

One of the major challenges for road managers, regulators, policymakers and road users is the collaboration and coordination of the international C-ITS environment. Finding solutions to this challenge is the critical task of Harmonisation Task Groups (HTGs): joint European Commission and United States Department of Transportation collaborations that TCA has co-led on two occasions, including HTG7 during 2016-17.

International harmonisation enables the coordination of safety and sustainability issues, technical and policy standards, and the identification and removal of regional and international differences that potentially limit the public policy outcomes of C-ITS.

TCA applied its expertise in delivering commercially viable and secure environments on behalf of governments (like that which will be required for C-ITS) and its operational knowledge in assuring public policy outcomes to advance Australia’s adoption of C-ITS in a manner consistent with international standards.

The key work areas of HTG7 included:

- Strengthening & promoting security
- Standards analyses
- Gap analyses
- Global identifiers

Image courtesy of the U.S. Department of Transportation
Through this engagement, TCA contributed the following key reports to Austroads for the benefit of Australian stakeholders:

- Security Standards and Options for Compliance Assurance
- System Requirements for a Security Credential Management System
- System Architecture for a Security Credential Management System

As part of the Roads Australia 2017 International Study Visit delegation, TCA experienced first-hand how international jurisdictions are preparing to manage and administer CAVs on their public road networks. CAVs represent a fundamental shift that will continue to disrupt policy, technical, operational and commercial perspectives. Contributions from all parts of Australian government and industry are required to collectively achieve a national, coordinated and consistent framework to manage CAVs in Australia.

TCA has demonstrated its capability and experience to contribute to this framework in the areas of advice, accreditation and administration pertaining to connected vehicle standards, security and conformance of connected and cooperative systems.

TCA contributed to Austroads’ Connected and Automated Vehicles Program

TCA contributed to Austroads’ Connected and Automated Vehicles (CAVs) program, specifically in security credential management, a key component in ensuring CAVs are able to trust other participants within the connected transport network (intelligent transport systems, non-vehicle road users, and other CAVs).

This included translating large quantities of European Commission and United States research and engaging with international experts to distil and pose enabling policy questions to be addressed for AU/NZ, and to outline the standards, system requirements and architecture necessary to achieve the desired C-ITS operational outcomes.

Workshops were held across four leading global cities – San Francisco, Pittsburgh, London and Stockholm – to engage with transport, automotive, technology, researchers and government leaders.

Philip Lloyd, TCA General Manager Implementation, with a driverless vehicle from Waymo.
Cooperative Intelligent Transport Systems

In September 2016, TCA released a discussion paper on the future security in the adoption and development of Cooperative Intelligent Transport Systems (C-ITS).

C-ITS enable real-time wireless communication between vehicles, roadside infrastructure, mobile devices and back-office systems. The paper was aimed at governments, policy makers, industry stakeholders and anyone interested in the future shape of the automotive and transport sectors, to contribute towards a C-ITS environment that works safely, securely and seamlessly.

C-ITS are a critical part of the transformation occurring to our vehicles, roads, cities and technologies – including automated vehicles, smart cities and the Internet of Things (IoT).

As we move into a world where vehicles become computers on wheels, we need to devise new ways for ‘trust’ to be established between vehicles and all road users – not just drivers.

This is especially important for key, safety-critical applications – a warning about an impending crash hazard that does not work in real-time is useless. Similarly, a ‘fake’ warning is potentially just as dangerous as receiving no warning at all.

TCA made a submission to the Australian Communications and Media Authority on the proposed regulatory measures on the 5.9Ghz spectrum.

TCA’s submission aimed to articulate risks associated with potential implementation of the Class Licence in its proposed form, and sought clarification regarding regulatory arrangements to ensure safety and public purpose outcomes are given priority.

TCA hosted the Connected Vehicle Security and Standards industry event in Melbourne during May 2017, with seventy attendees representing a range of organisations including national, state and local government agencies, vehicle manufacturers, industry peak bodies, telematics service providers and consultants.

The keynote address was given by Peter Todd (Deputy Chief Executive, VicRoads), with presentations also provided by the CITI Cooperative Intelligent Transport Initiative (NSW), CAVI Cooperative and Automated Vehicle Initiative (QLD), and the University of Melbourne Connected Transport Living Lab (VIC). Experts from the visiting HTG7 team presented on international deployments of CAVs, the Harmonised Architecture Reference for Technical Standards, and the Security Credential Management System.
INTELLIGENT TRANSPORT SYSTEMS AND HEAVE GOODS VEHICLE REGULATION

TCA is the Australian lead on the OECD (Organisation for Economic Cooperation and Development)/ITF (International Transport Forum) project on ITS Applications for Heavy Goods Vehicle (HGV) Regulation.

The project builds upon Sweden’s strong, collaborative relationship with Australia on High Capacity Transports (HCT)/High Capacity Vehicles (HCV) initiatives, and is:

- Enabling exchange of knowledge on current best-practice approaches to HCT, including the use of intelligent systems (with specific reference IAP)
- Comparing regulatory frameworks, strategies and road maps for HCT in different countries
- Providing guidance to policymakers on fundamental principles for HCT frameworks.

The C-ITS and automated vehicle environment continues to evolve rapidly.

Following its co-leadership of Harmonisation Task Group (HTG) 6, which developed a Security Policy Framework for C-ITS, TCA is the co-lead on HTG 7 (together with the European Commission and the United States Department of Transport).

As the only organisation ensuring Australia’s interests are captured in international harmonisation efforts, this work has allowed TCA to bring first-hand HTG knowledge to bear in local work, including Austroads and Member organisations inclusive of Transport and Main Roads Queensland activities.

In both cases, TCA’s contribution has centred on advice for procuring, implementing and developing the requirements for the C-ITS security solution being adopted by, and emerging from, regions participating in HTGs, namely a Cooperative Credential Management System.

With pre-deployments and pilots underway or being planned across all participating regions, HTG7 is working with stakeholders to incorporate the learnings that enhance the standards analysis. Australia is already benefiting from this engagement by providing consistency with international standards and, most importantly, ensuring they capture our needs as far as possible – this reduces the cost and complexity for Australian deployments.
TCA was the Official Demonstrations Partner for the 23rd Intelligent Transport Systems (ITS) World Congress, held in Melbourne in October 2016.

The ITS World Congress is the world’s largest ITS-related international conference. The congress invites Governments, research bodies and commercial enterprises from a wide range of countries and regions to showcase their latest ITS research findings and products through information sessions and exhibitions.

TCA worked collaboratively with some of the world’s leading providers of intelligent transport systems, and VicRoads, to produce a world first demonstration of interoperability in action on Australian roads.

The technical demonstrations and tours showed applications of the latest ITS technology, including connected, driverless and automated vehicles.
The focus on interoperability allowed – not only for the first time at an ITS World Congress, but the first time anywhere in the Southern Hemisphere – individual demonstrators to ‘talk to each other’ and the roadside using an open, agreed language.

TCA worked closely with VicRoads to organise the demonstrations, equipping seven sets of traffic signals along Clarendon Street. Delegates were able to experience first-hand interoperable Vehicle-to-Infrastructure (V2I) applications, by travelling through these intersections in a connected vehicle.

This was the first time many of these technologies have been tested outside of a simulated or tightly controlled environment. Interoperability doesn’t occur by accident. The collaborative development, testing and application of standards is essential. But making sure they work in the real world is the real test.

In addition to the Demonstrations, TCA presented a variety of papers and facilitated discussion throughout the week of the Congress. This included a Stakeholder Workshop on security for C-ITS and a Special Interest Session on Innovative Applications of ITS for Road Freight Productivity and Safety.