Session 3
Research and development to integrating current and upcoming technologies to mainstream ITS, CV and AV systems

An Australian perspective

Dennis Walsh, General Manager (Land Transport Safety)
Our values, our diversity

Customers first

Unleash potential

Be courageous

Ideas into action

Empower people

diversity
   inspire  create  innovate
National policy and direction

- National policy framework for land transport technology: action plan
- National road safety strategy 2011-20
- National transport commission (NTC) work program and regulatory review
- Austroads strategic plan 2016-20
- Austroads national intelligent transport system (ITS) architecture – based on European frame
- iMOVE cooperative research centre proposal

<table>
<thead>
<tr>
<th>Number</th>
<th>Action Item</th>
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<tbody>
<tr>
<td>1</td>
<td>Establish a regulatory framework for testing automated vehicles.</td>
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<td>2</td>
<td>Develop national operational guidelines to support the on-road use of automated vehicles.</td>
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<td>3</td>
<td>Undertake priority trials and research of Intelligent Transport Systems.</td>
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<td>4</td>
<td>Develop a connected vehicle (Cooperative ITS) infrastructure road map.</td>
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<td>5</td>
<td>Publish a connected vehicle (Cooperative ITS) statement of intent on standards and deployment models.</td>
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<td>Develop a nationally agreed deployment plan for the security management of connected and automated vehicles.</td>
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<td>7</td>
<td>Investigate options to provide enhanced geo-positioning information to the land transport sector.</td>
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<td>8</td>
<td>Improve the availability of open data in the transport sector.</td>
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<td>9</td>
<td>Explore options to increase the uptake of telematics and other technologies for regulatory and revenue collection.</td>
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<td>10</td>
<td>Evaluate low-cost technologies to improve safety at rail level crossings.</td>
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<td>11</td>
<td>Explore how data from telematics and other intelligent transport systems can be used to optimise operations and planning for port precincts and intermodal terminals.</td>
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<td>12</td>
<td>Develop a national framework for public transport ticketing.</td>
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<td>13</td>
<td>Investigate the costs, benefits and possible deployment models for Automatic Crash Notification.</td>
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<td>14</td>
<td>Explore the merits of adopting new safety and traffic management technologies.</td>
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Work undertaken to date

Australian Communications and Media Authority (ACMA)
• Allocation and management of radiofrequency spectrum, including consideration of proposed C-ITS use of the 5.9 GHz band (commenced 2009).

Geoscience Australia and the National Positioning Infrastructure Advisory Board
• Geoscience Australia coordinates a national approach to positioning infrastructure and services, which will benefit various services including C-ITS and AVs.
## Austroads work to date

<table>
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<tr>
<th>AP-R479-15</th>
<th>Concept of Operations for C-ITS Core Functions</th>
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<tr>
<td>AP-R474-15</td>
<td>Cooperative ITS Standards Assessment</td>
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<td>AP-R458-14</td>
<td>C-ITS Interoperability with Existing ITS Infrastructure</td>
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<td>AP-R432-13</td>
<td>Emerging Digital Mapping Requirements for C-ITS</td>
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<td>AP-R431-13</td>
<td>Vehicle Positioning for C-ITS in Australia (background document)</td>
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<td>AP-R430-13</td>
<td>5.9 GHz Satellite Interference Study – Field Study</td>
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<td>AP-R414-12</td>
<td>C-ITS 5.9 GHz Spectrum Management &amp; Device Licensing Regime</td>
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<td>AP-R413-12</td>
<td>Cooperative ITS Strategic Plan</td>
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<tr>
<td>AP-R383-11</td>
<td>Examination of Major Policy Issues Relating to the Introduction of C-ITS in Australia</td>
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<tr>
<td>AP-R382-11</td>
<td>DSRC Interoperability Study</td>
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<tr>
<td>AP-R375-11</td>
<td>Evaluation of the Potential Safety Benefits of Collision Avoidance Technologies through DSRC in Australia</td>
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Austroads current work program

1. **Cooperative ITS - Operational Framework:**
   - C-ITS standards compliance scheme.
   - Review of Strategic Plan for C-ITS.

2. **Automated Vehicles - Framework for Road Operations:**
   - Detailed Concept of Operations.
   - Strategic Plan for Avs.

3. **Automated Vehicles - Framework for Registration & Licensing:**
   - Gap Analysis and high-level Action Plan to support the introduction of AVs.
Assessment of key road operator actions to support automated vehicles - context

- There are 873,573 total km of roads in Australia.
- The great majority, 640,216 km of these are local roads.
- In 2005 it was estimated that 43.2% of Australia’s roads (377,383 km) were unsealed.
- A significant proportion (65% in 2013) of annual fatalities occurred on regional or remote roads.
- Some highways in remote areas of Australia and New Zealand are not suitable for the range of weather conditions likely to be experienced by AVs. Following heavy rains, they are often closed to traffic.
Assessment of key road operator actions to support automated vehicles

Line marking

- Consistency is vital and noted to be problematic for some vehicle manufacturers at present.
- Line marking should be able to be completely removed to avoid "ghosting" and confusion.

Static and Electronic Road Signs

- Static signs (speed zone, give way, etc.) need to be consistently adopted; variations should be avoided.
- Electronic Signs - consideration needs to be given to the specifications of these signs to ensure that all road users (including AV) can read these signs.
- Care in locating and orienting signs is just as important as the information on the signs.
Assessment of key road operator actions to support automated vehicles

• Road pavement and structure
  - Loads on existing and new bridges and pavements will need to be considered.

• Road rating may be required
  - Requirements will include clear road markings, appropriate and consistent signage on the network and communication to users regarding what vehicles can operate on that roadway.
Assessment of key road operator actions to support automated vehicles

• Limitations with image processing include:
  – bitumen used to seal cabling or drainage.
  – faded indistinct line on asphalt surfaces.
  – slightly faded lines on concrete road surfaces.
  – discontinuous markings.

• Maintenance
  – Need for regular and consistent maintenance are particularly important to AVs given their reliance on delineation and signs.

• Roadworks
  – There is a need for consistency in the treatment of these environments. Austroads has a strategic priority to improve consistency across jurisdictions.
Automated vehicles, a framework for registration, licensing and compulsory 3rd party insurance

- Impacts Vehicle Registration
  - Vehicle standards.
  - Compliance at market entry.
  - Compliance in-service.
  - Vehicle ownership.

- Impacts on Driver Licensing
  - Driver training, testing and licensing.

- Impacts on CTP insurance
  - CTP impact on no-fault and at-fault schemes.
  - Impact of no driver being in the vehicle if a crash occurs.
  - Changing vehicle ownership models.
  - Insurance premiums and determination of risk.

- Registration and driver licensing rules and processes put in place overseas and locally to facilitate testing and deployment are generally suitable for adoption here.

- Guidance has been subsequently developed for registration and licensing issues.
Assessment of key road operator actions to support automated vehicles

Cellular services will play a critical role with AVs in future. While cellular coverage is available for approximately 99 per cent of the Australian population this statistic is somewhat misleading as it leaves a large proportion of the Australian land mass without coverage, and within coverage areas there are black spots with no or limited coverage.
Other integration activities

- Managing entry of new technologies
  - ITS Specifications & Product Acceptance Harmonisation.

- Managing change to legacy systems
  - C-ITS interoperability with existing infrastructure.

- Adapting international standards
  - European FRAME Architecture & C-ITS standards.

- Membership of Harmonisation Task Group 6 and 7
  - Security, harmonisation of architecture, standards.

- State-led pilots and demos for automated vehicles (AVs) and cooperative intelligent transport systems (C-ITS).
State-led Initiatives – AVs and C-ITS

Queensland
- Cooperative and Automated Vehicle Initiative (CAVI)
- Automated vehicle model for Southeast Qld
- Legislative review

New South Wales
- C-ITS Initiative (CITI)
- Sydney freight priority trial
- Smart Rest Areas, FleetCAT, SAFET1

Victoria
- Fit in Time
- On-road testing guide for OEMs
- ITS Grants Program

Western Australia
- Automated shuttle bus trial (Perth Foreshore)

South Australia
- Level X AV demonstration on X Freeway
- Legislation for on-road trials

Australia Capital Territory
- Legislation for on-road trials
Integration challenges

Installation to current ITS

ITS station

Network data

GPS data (for positioning augmentation)

ICT managed services

Pilot evaluation

Security management data

Adapted from: http://www.etsi.org/deliver/etsi_en/302600_302699/302665/01.01.01_60/en_302665v010101p.pdf
Thank you