HTG7, ISO/TC 204/WG19 AND ISO/TC 204 REGISTRY SELECTION PANEL MEETING REPORT

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ABOUT US

Transport Certification Australia (TCA) is the national government body responsible for providing assurance in the use of telematics and related intelligent technologies.

The term 'telematics' refers to systems which exchange data between vehicles and other locations, including:

- Vehicle to infrastructure (V2I) applications
- Vehicle to vehicle (V2V) applications
- Vehicle to elsewhere (V2X) applications.

OUR MISSION

To support government agencies and regulators by providing outcome-focused, technology neutral, disruption-resilient programs that address:

- Security
- Privacy
- Encourage innovation
- Facilitate an appropriate private sector contribution to the costs of regulation.

WHAT WE DO

Advice founded on a demonstrated capability to design and deploy frameworks and platforms as enablers for reform

Accreditation in the type-approval and certification of telematics and intelligent technologies and services, that give confidence to all stakeholders for their consideration and use

Administration of applications founded on the National Telematics Framework.

THE NATIONAL TELEMATICS FRAMEWORK

TCA is responsible for the management of the National Telematics Framework.

The Framework is a contemporary digital business platform which delivers:

- Public outcomes through an open technology Market, which sustainably delivers upon the needs of government, industry and end-users
- Different assurance levels, based on objectives and risks of each telematics application
- Consistency and certainty to technology providers, so that government positions can be relied upon to make investment decisions
- Competition and choice, with technology providers delivering the latest technological developments at lower costs.

The National Telematics Framework has been adopted as an international standard by the International Standards Organization (ISO).

LINKING PRODUCERS AND CONSUMERS

Similar to other operational frameworks in other portfolios and industry sectors, the National Telematics Framework provides the enabling infrastructure, rules and administrative arrangements which bring together 'producers' and 'consumers'.

The structured interaction of producers and consumers deliver:

- Public outcomes sought by governments, industry sectors and the community (including productivity and safety reforms enabled through the use of telematics)

    together with

- Private interests of individuals and organisations (in pursuing business outcomes through the use of telematics).

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APPENDICES

INTRODUCTION

This report provides an outline of the meetings attended on 21 to 25 January 2019 in Brussels by David Rowe, Senior Engineer, at TCA.

It is assumed that the reader has a basic knowledge of cooperative intelligent transport systems / connected and automated vehicles, and knowledge of TCA and its involvement in CAV activities.

Participation in these meetings is part of TCA's responsibilities as a joint party to the Harmonisation Action Plan between the USDOT and European Commission and co-lead of Harmonisation Task Group 7 (HTG7). The meetings included:

a. HTG7 update and strategy meeting (21st and 22nd Jan)

b. ISO/TC 204/WG 19 (mobility integration) meeting (23rd and 24th Jan)

c. ISO/TC 204 Registry Selection Panel ad hoc meeting (25th Jan).

BACKGROUND

TCA participates in Harmonisation Task Group 7 between the US, EU, Japan and Australia. See Appendix A for further detail on HTG7.

TCA participates in ISO/TC204 – Intelligent Transport Systems and the Australian mirror committee (SA IT023). This participation achieves three goals:

• Supports HTG7 efforts

• Supports the National Telematics Framework through international promotion and relevance (e.g. ISO 15638 TARV[1] series)

• Maintain a contemporary knowledge base and contribute to international harmonisation and best-practice.

This work is based on a Memorandum of Understanding (MoU) established between the United States Department of Transport (USDOT) and TCA to facilitate cooperation in the field of intelligent transport systems.

The focus of TCA's activities in the CAV environment relate specifically to *Assurance in V2X Data Exchange*, as detailed in the following image:

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[1] The TARV series of standards are specified in ISO 15638-1 through 22 and detail Telematics Applications for Regulated commercial freight Vehicles (TARV), developed based on TCA's National Telematics Framework.

PURPOSE OF MEETINGS

This section provides a summary of the purpose

1. **HTG7 Update and Strategy Meeting**
   AU-EU-US discussion regarding new international collaboration opportunities following on from HTG7, and how they might be achieved – these are the two agenda items identified as potential future work items with a high priority for collaboration: "Architecture for Automation" and "Connected Rules of the Road". The purpose of the meeting is to provide status updates and to discuss what post-HTG7 collaboration would look like, what resource are available, and what scope would be attempted.

2. **ISO/TC 204 Working Group 19 inaugural meeting**
   Chaired by Knut Evensen (q-free, EC) and formed to pick up several of the key standards harmonisation recommendations arising from the HTG7 analysis. This is a technically-oriented standards development organisation / technical committee style workshop. It is a joint meeting between ISO and CEN working groups to develop standards to support the integrated urban mobility paradigm. Attachment C outlines some of the key work areas of the working group.

3. **C-ITS Registry Selection Panel ad hoc meeting**
   There is a need for an international registry for the allocation of unique C-ITS/CAV-related electronic identifiers. ISO 17419-1 and ISO 17419-2 were drafted to describe the role of the C-ITS Registration Authority and the identifier types in scope. This work is analogous to how ICANN maintains identifier registries for the internet and manages authorities that issue identifiers on its behalf. Without ICANN's role, the internet would fail to work; an equivalent registration authority for C-ITS / CAVs is critical as the technology is deployed. Australia, and TCA in particular, have been invited to be part of the Registry Selection Panel who will draft a public call for candidates, and (through subsequent involvement) to recommend to CEN/ISO which candidate should be appointed as the C-ITS Registration Authority. The purpose of this meeting is to participate in this panel and to progress the draft Call for Registration Authority Candidates to be submitted to ISO for consideration at the April meeting.

The following sections contain the key outcomes, and details of what was progressed at each meeting.

KEY OUTCOMES

- HTG7 reports to be released following review – Australian deployers, implementers and policy makers should review the reports when available.

- Policy makers should follow the progress of the EC ITS directive and seek to align.

- A work item to develop standards for electronic traffic regulations is to be progressed by WG19. Australia should have contribution to this standard.

- An Australian representative should participate in development of standards related to Architecture for Automation which will affect all automated vehicles.

- Work on the ITS Wide Reference Data Model is relevant to Australia and particularly Austroads NIA/F. Monitoring of this initiative and potential participation is beneficial.

- The call for a global registration authority for issuing C-ITS and CAV identifiers will be finalised prior to the ISO/TC 204 meeting in April and submitted to the plenary. This will start the tender process for selection of a global C-ITS / CAV identifier registration authority.

Australian implementors of CAV technology should note international developments and standardisation efforts, in particular, having awareness and input to design of core services and integration.

DETAILS WHAT WAS PROGRESSED AT EACH MEETING

HTG 7 UPDATE AND STRATEGY MEETING

Background

The HTG7 update and strategy meeting reviewed progress of the HTG7 reports, discussed ongoing and future harmonisation tasks and discussed work being done to support WG 19.

The reporting from HTG7 will release a series of reports detailing the analysis conducted and providing information relevant to different stakeholders. The reports cover areas including: executive summary report; analysis methodology; issues and proposed resolutions; regional perspectives of all outputs; website overview; reference compendium and toolset overview. The other key output is the website itself: HTG7.org.

The current drafts of the reports are currently being reviewed by the USDOT office, and are scheduled for release during Q1 2019.

Potential political issues were discussed, including the effects of the current US administration and (at the time) ongoing government shutdown, and the election of a new European Commission.

Two key work items were discussed for potential collaboration:

   a. Management for Electronic Traffic Regulations (METR) / Connected Rules of the Road (CROR)
   b. Architecture for automation.

The METR concept is important to all regions, although may be referred to by different names (such as the tentative CROR in the US). It concerns the distribution of authoritative traffic rules and regulations to CAVs so that they can make decisions based on reliable, up-to-date information. The work on METR is still in its formative stages through ISO and CEN/ETSI, the potential benefit of international collaboration outside of those groups was discussed and is a potential work item depending on resolutions from WG 19 in its April meeting.

Architecture for automation was discussed as a potential future collaboration topic that will also be essential for all regions. It concerns the mapping of common interfaces and information flows that will be essential in an automated transport ecosystem. Current work in this area is formative and likely to benefit from pooling international resources and experts in a bilateral working group. When raised in WG 19 as an output of this discussion, the was broadly supported but required development of a work item description.

Whether these items are a work area for the standing group (e.g. continued HTG efforts – maybe under a different name) or completed under ISO/TC 204/WG 19 will partly depend on regional funding and the willingness of WG 19 to address these topics.

The European Commission as part of DG Move will vote in Autumn 2019 (Southern hemisphere Spring) on a rule for connected vehicle technology in Europe. This ruling will relate to V-X communication and is likely to nominate ITS-G5 as a mandatory technology for ITS-equipped vehicles. As Australia has nominated to adopt European standards this decision will be important for Australia to note. It effectively will deprecate ITS-M5 and sets a firm decision to have government support for DSRC over 5.9 for V-X safety related communications, rather than C-V2X.

Material and presentation slides were prepared for the WG 19 meeting, including:

   a. Material for WG 19's first work item – gap and overlap analysis – with the suggestion to leverage the previously completed HTG7 work
   b. METR / Connected rules of the road presentation
   c. Architecture for Automation presentation.

Note that due to late travel restrictions placed on the US team members, not all HTG7 members attended the meeting in person, with only members also participating in the ISO meetings present. Teleconferences with the entire leadership group were arranged to facilitate discussions as needed.

Outcomes of meeting, and relevance to Australia

- HTG7 reports to be released following review – Australian deployers, implementers and policy makers should review the reports when available

- Potential for international collaboration on METR / CROR and Architecture for Automation in addition to WG 19
- Policy makers should follow the progress of the EC ITS directive and seek to align.

ISO/TC 204/WG 19 MEETING

Background

ISO/TC 204/WG 19 – Mobility Integration – is a joint working group with CEN/TC 278/WG 17. This was the inception meeting for WG 19 (which will operate within ISO/TC 204) where ISO will join the efforts of CEN in standardising urban mobility and mobility integration.

Liaison reports were provided by CEN/TC 278/WG 17 on its liaison activities with other Standards Development Organisations (SDOs) and other committees.

Updates on existing work items by the WG 17 were given, outlined in Appendix B.

Items discussed related specifically to WG 19 are detailed below:

First new work item: "gap and overlap analysis of ISO/TC 204 work programme for mobility integration"

    a. Update given on the analysis HTG7 has already performed and how it can be made applicable to this work item

    b. Suggestion to start with the HARTS[2] database and extract/update what is necessary

    c. This work will progress as a joint work item with TCA to contribute to the work item as part of its participation in WG 19. The work item will be led by Tom Lusco (ITERIS).

Second new work item: "CROR / METR"

    a. METR concerns regulations by authorities being able to be published to a trusted electronic regulation access point (likely national) then provided to service aggregators, map providers etc. to distribute to vehicles

    b. The UK are working on a similar project called the TRO Discovery Project[3]

    c. A resolution was made for a discussion on scope and globalisation of METR to become a new work item.

Third new work item: "Architecture for Automation"

    a. The high-level concepts were discussed and agreed to be useful work to pursue.

    b. This area has significant overlap with other working groups and other ISO committees, including ISO/TC 22.

    c. WG 19 work should focus on the integration and core support necessary for automation.

    d. The US will soon release comments on its CAV information sessions held at TRB[4] and Federal Highway Administration (FHWA).

    e. A more detailed work item proposal will be prepared for the April meeting.

Other proposals:

    a. Ken Vaughn discussed the potential for an "ITS Wide reference data model". This would be useful where, instead of having harmonisation across all standards, an abstract data model could provide a translation mechanism between similar standards. This would we a three-tier model with:

        i. ITS-wide reference data model

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[2] HARTS is the Harmonized Architecture Reference for Technical Standards developed by HTG7 and published at HTG7.org
[3] Traffic Regulation Orders (TROs) in the UK blanket term and equivalent to METR. Information is available at https://www.geoplace.co.uk/trodiscovery
[4] The Transport Research Board is a US transportation research initiative: https://highways.dot.gov/opportunities-and-partnerships/partnerships/transportation-research-board

  ii. Physical object reference data model

  iii. Protocol reference data model.

 a. It was discussed and acknowledged that this work is useful but will be complex and difficult to maintain. Additionally, some use cases may not translate into the reference data model. However, this is an internationally relevant work item with potential implications or inputs to Austroads NIA/F[5] project.

 b. Japan discussed the potential of using TARV's reference model as a starting point for many of WG 19's work on mobility integration. More detail is to be prepared before a proposal is made. This is of particular interest to TCA, due to its development of the initial TARV standards and stewardship of the National Telematics Framework.

ISO/TC 204/WG 19 will join several of CEN's ongoing work items, including:

 a. Control zones

 b. Location referencing

 c. Traffic management

 d. Models and definitions for new modes.

Further meetings of WG 19 will be held:

 a. 07-12 April 19, USA, Florida

 b. 13-18 October 19, Malaysia, Kuala Lumpur.

TCA will need to determine if it participates in these meetings. Sufficient funding is available in the 'CAV Strategic Analysis, Advice and Harmonisation' project.

Minutes of the meeting are yet to be completed. Action items from the meeting are tentatively:

 a. PWI[6] research automation with focus on infrastructure lead

 b. PWI standards and gap analysis for mobility integration

 c. PWI for METR work

 d. Update on TARV proposal for usage in next meeting

 e. Present an update on ITS-wide reference data model at next meeting.

Outcomes of meeting and relevance to Australia

- TCA to contribute to a gap and overlap analysis of ISO/TC 204 standards related to urban mobility

- A work item to develop standards for electronic traffic regulations is to be progressed by WG19. Australia should have contribution to this standard. As the only current Australian participant in WG19, TCA is best placed to contribute for Australia.

- An Australian representative should participate in development of standards related to Architecture for Automation which will affect all automated vehicles. As the only current Australian participant in WG19, TCA is best placed to contribute for Australia.

- Work on the ITS Wide Reference Data Model is relevant to Australia and particularly Austroads NIA/F. Monitoring of this initiative and potential participation is beneficial.

- Control Zones are an innovative solution to specifying restricted access to certain areas; there is also significant overlap with some of the features of IAP. TCA is very well placed to contribute as an expert to this internationally relevant work.

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[5] The National ITS Architecture / Framework project is described here: https://austroads.com.au/network-operations/network-management/national-its-architecture

[6] Preliminary Work Items (PWI) are an ISO process for starting standards development work

- A proposal to use some of the TARV principles in WG 19 standards and initiatives may be raised at the next meeting. It would be advantageous for TCA to be able to contribute to this discussion.

- Due to the significant amount of content and importance of WG 19 work items, it is recommended that TCA register and participate in the April meeting of WG 19 in Florida with the approval of the Standards Australia mirror committee.

ISO/TC 204 REGISTRY SELECTION PANEL MEETING

Background

The meeting reviewed and resolved comments arising from the drafting of tender document seeking a global registration authority for C-ITS / CAV.

TCA has participated in the work on developing a standard for an ITS registry since its inception, arising from work initiatives out of HTG7. This is detailed in ISO 17419-1 and ISO 17419-2 (draft). This process is now in the stage of seeking a registration authority to complete issuing of identifiers and assignments. From Australia, TMR and TCA have had input into this process. This contribution is important due to the global nature of the identifiers and registration authority.

The registry selection panel was established to develop a tender and formalise the requirements for the registration authority. Each region has a vote on the selection of the registration authority; it is important that Australia is represented and maintains its vote.

The nomination of experts for the panel nominated individuals rather than organisations. Phillip Lloyd was previously nominated as the Australia expert, but since his resignation from TCA, David Rowe was permitted to be his representative on the panel, endorsed by the head of the panel and head of Australian delegation for TC204. The formalities of changing the representative are still a work in progress.

Participants from all key regions attended the meeting.

The call for registry draft (RFP) was reviewed in detail and all comments submitted by the committee were resolved in preparation for ISO approval.

The scheduling issues and plan for completing the registry selection panel tasks was reviewed and refined.

A teleconference was held with interested SDOs. This outlined the review process and timeline prior to submitting to the technical committee for approval. No issues were raised during the teleconference.

The RAA template will be sent to IEE and SAE.

The draft RFP will be circulated to ISO prior to the next meeting so that comments can be received prior to the meeting and resolved by the panel to facilitate endorsement by the TC at the plenary.

A meeting will likely be scheduled 2-3 weeks prior to the next ISO meeting to accommodate comment resolution.

Outcomes of meeting and relevance to Australia

- The call for registration authority will be finalised prior to the ISO/TC 204 meeting in April and submitted to the plenary. This will start the tender process for selection of a global C-ITS / CAV identifier registration authority.

NEXT STEPS

1. All relevant Australian stakeholders should be aware of the outcomes of the HTG7, ISO/TC 204/WG 19 and Registry Selection Panel meetings, detailed in this report.

2. Update to be given at next AS/IT-023 working group meeting (mirror committee for ISO/TC-204)

3. TCA should uphold its commitment to contribute to the WG 19 work item: gap and overlap analysis of ISO/TC 204 standards related to mobility integration.

4. In addition to WG 19 meetings, HTG7 activities and registry selection panel activities will likely occur during the ISO/TC 204 meetings (due to the overlap of experts).
   Attendance at ISO/TC 204 meetings to attend WG 19 workshops would be beneficial to Australia's CAV programme so that Australian stakeholders have input to important global initiatives including

METR, urban mobility and selection of a global registration authority for C-ITS / CAV identifiers. The next meetings are scheduled for:

a. 07-12 April 2019, USA, Florida

b. 13-18 October 2019, Malaysia, Kuala Lumpur.

Meetings scheduled outside of the ISO weeks above are likely to include teleconferencing facilities and are yet to be scheduled.

A   HTG 7 PURPOSE AND INCEPTION

A.1   BACKGROUND

With this background, the EC-JRC, USDOT, TCA and (somewhat later) Japan committed time and resources to a collaborative effort to develop a C-ITS standards gap analysis. The timing was appropriate because:

- An EU-US Memorandum of Agreement (MOU) established in 2009 provided the organisational mechanism to support harmonisation efforts. In January of 2016 when HTG7 was launched:

  ○ HTG1 and HTG3 had concluded – similar (but not identical) standards had emerged for the broadcast safety messages (the Cooperative Awareness Message, or CAM in the EU and the Basic Safety Message, or BSM, in the US) and for the communications security certificate

  ○ HTG4 and HTG5 were underway to develop, collaboratively, key infrastructure standards

  ○ HTG6 had successfully delivered a policy framework that identified key areas for C-ITS security policy harmonisation across jurisdictional boundaries.

- Pilot deployments of C-ITS environments along corridors and urban and rural areas had been initiated in the EU, US, Japan, and Australia. Original equipment manufacturers (OEMs) and transportation agencies were planning to deploy foundational technologies in the very near-term. To meet the timeline of these activities and envision connected vehicle deployments, the standards gap analysis needed to be performed.

- Given the global nature of and need for cooperative transportation system standards, it was desirable to leverage expertise and funding to guide the development of relevant, harmonised standards. It was also highly beneficial to do this collectively as a means of:

  ○ ensuring interoperability across borders for safety purposes and in support of commerce

  ○ reducing development and deployment costs by sharing research results and work

  ○ facilitating common hardware and software across regions, which produces a more global marketplace for suppliers, and

  ○ accelerating deployment of ITS technologies and applications.

A.2   PURPOSE

HTG7 is being co-led by representatives of the EC-JRC, USDOT and TCA. The members of HTG7 are policy analysts and technical experts with hands-on experience in C-ITS implementation and security, from transport and related fields.

The HTG program was identified by the government agencies to whom it is accountable as the most effective and efficient instrument for this work, because:

- The group advanced work that the private sector could, or otherwise would not

- The work ensured public-purpose outcomes and community expectations (such as safety, security and interoperability) are achieved internationally

- It ensured that policy and regulatory needs – or future needs – are embedded in, or are possible, in the operational environment as it develops

- The format of the group exchanged and built expertise and experience between international parties

- It reduced the cost and effort that would otherwise be required of single country or region

- It was an effective and authoritative mechanism to engage industry and SDOs.

A.3   OBJECTIVES

HTG7's objectives are to:

- Consolidate previous HTG approaches to security for C-ITS – namely to incorporate, evolve and extend awareness and consensus on the work of HTG6

- Explore and find consensus on gaps – differences in technical and/or policy requirements or capabilities – in standards for local, regional and international C-ITS environments

- Develop a cooperative and prioritised plan based on common needs

- Address the need for globally unique identifiers for C-ITS

- Identify the C-ITS standards that overlap with and support those relating to connected vehicle automated systems

- Identify the immediate and future relevance and utility of C-ITS work streams for Smart Cities initiatives.

HTG7's results will be focussed on standards to enable first stage deployments of C-ITS, but will also have a vision for full, global deployment. The final result will be a series of reports intended to inform and be used by C-ITS implementers and policy makers.

A.4   ACTIVITIES:

Define Analysis Framework

- This activity established the overall approach and the structure and methodology of the analysis, identifying supporting tools and resources, and defining the team roles and responsibilities.

Develop Harmonised Reference Architecture:

- This activity consisted of the synthesis of the three regional (AU, EU, and US) reference architectures into the Harmonised Architecture Reference for Technical Standards (HARTS), necessary for providing a comprehensive and harmonised view of similar C-ITS applications, services and participants described in the various regional architectures.

- The harmonised architecture was electronically stored in the HARTS online database.

Construct HARTS Website

- Various technology, operational and presentation options were considered to meet the need for public access, with the team determining that a web portal would be the most appropriate mechanism.

Identify Relevant Standards

- Abstracts of relevant standards were gathered and entered into the HARTS database. This was augmented as necessary during the subsequent analysis efforts. Each standard entry was tagged with metadata to facilitate subsequent access, analysis and reporting.

Develop Standards Communications Profiles

- There are a limited number of standard communications profiles needed for C-ITS environments. These profiles were developed by experts and can be applied as a solution or as options for each of the C-ITS service packages. Each profile entry in the database was tagged with metadata to facilitate subsequent access, analysis and reporting.

Generate Standards-Based Solutions

- A rules-based database engine was used to match standards profiles to information triples (the collection of information source, destination and content) to generate candidate solutions. The matching process was based on the metadata characteristics of the information triple and the standards profile.

- All candidate solutions were subsequently reviewed and adjudicated by the HTG7 analysis team with refinements made, as needed.

Incorporate Previous Standards Analyses

- Based on the results and insights provided by previous standards gap/overlap analyses, the HTG7 analysts entered known issues (gaps and overlaps) into the HARTS database.

Analyse Standards-Based Solutions for Issues

- The HTG7 analyst team methodically went through each information triple on each service package and examined the identified standards-based solutions to identify issues.

- This was accomplished through use of direct knowledge about requirements of each ITS Service Package, examination of the standards abstracts, and consultation with external subject matter experts. As above, each issue was appropriately tagged with metadata characteristics to support subsequent access, analysis and reporting.

Populate HARTS Website

- As the analysis progressed and internal milestones were reached, the HARTS website was updated iteratively to incorporate new content.

Develop and Characterise Recommendations

- Both during and after the iterative analysis of solutions, the HTG7 analyst team developed a set of recommendations based on the identified issues (i.e., gaps or overlaps) found during the analysis of the standards-based solutions.

- The recommendations developed by the HTG7 analysts were not intended to state, or even suggest, technical solutions or approaches to resolving the associated issues. Instead, the focus of the analysts' recommendations was on the identification, at a relatively elevated level, of the significant activities that will need to be undertaken to appropriately address one, or more, of the identified gaps and overlaps.

- As such, the analysts' recommendations should assist SDOs in identifying and prioritising the necessary work activities, during which potential technical solutions could be assessed and appropriate standards development actions taken.

Develop Final Reports

- The project will conclude with the development of the final report set, with reports to be made publicly available, and presented at a selection of international and regional forums to increase stakeholder visibility and awareness of their contents and applicability.

B   ISO/TC 204/WG 19 – STATUS REPORTS

This section details the status of the work items underway by CEN/TC 278/WG 17 – Urban ITS.

Note: ISO/TC 204/WG 19 is a joint WG with CEN/TC 278/WG 17.

Update on location referencing:

    a. Mix a variety of data to an integrated service useful to a city engineer

    b. Aim of blending / transforming data from multiple sources in a preferred location referencing model (rather than trying to revise standards)

Traffic management systems:

    c. status fault and quality requirements – includes data model for system status and faults of traffic management systems.

Emissions management in urban areas:

    a. Air quality management – control zones

    b. Air quality management – scheme and principles, policy recommendations

    c. Control zone management (generically) – can limit access to a control zone: e.g. on height, weight, any attribute)

    d. Data dictionary provided

    e. The control zone work item is of particular interest to TCA and its existing programs

Mixed vendor environment:

    a. Methodologies and translators

    b. Regional traffic standards – list / catalogue of which standards are applicable

    c. Guide for implementers / road managers

    d. Mostly applicable to EU

Traffic management systems:

    a. Will become an extension to the DATEX family

    b. DATEX version of Spat/MAP

    c. Extensions dedicated to the urban environment, traffic management plans, rerouting.

Harmonised Multi-Modal Transport Data Model and Information

    a. Modelling of a trip pattern to consider other transport modes

    b. Development of the TRANSMODEL, a data model for the overall public transport domain

    c. Extensions and definitions for new modes, translation of existing standards to common data model

C DETAILS ON CEN TC278 WG 17 FOR URBAN MOBILITY

See separate document.