European University Cyprus
CEN/ISO Mobility Integration

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Introduction
What is the transportation system of the future?

- Connectivity
- Shared Mobility
- Electrification
- Automated Vehicles
- Micro-Mobility
- On-demand

Picture: Astana Times
How will these trends change transportation?
Transportation is increasingly linked to other ICT systems
New paradigm for infrastructure and organisation in the transport sector
Mobility is complex ...

... and the car is not at the centre anymore.
Standardisation
<table>
<thead>
<tr>
<th>WG13 (Architecture)</th>
<th>WG1 (Architecture)</th>
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<tr>
<td>WG12 (Automatic Vehicle &amp; Equipment Identification)</td>
<td>WG4 (Automatic Vehicle &amp; Equipment Identification)</td>
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<td>WG1 (Electronic Fee Collection)</td>
<td>WG5 (Fee and Toll Collection)</td>
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<td>WG3 (Public Transport)</td>
<td>WG7 (General Fleet Management and Commercial/Freight Operations)</td>
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<td>WG8 (Road Traffic Data)</td>
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<td>WG4 (Traffic and Traveler Inform.)</td>
<td>WG9 (Integrated Transport Inform., Management and Control)</td>
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<td>WG14 (After Theft Systems for the Recovery of Stolen Vehicles)</td>
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<td>WG15 (eSafety, eCall)</td>
<td>WG14 (Vehicle/Roadway Warning and Control Systems)</td>
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<td>WG16 (Cooperative ITS)</td>
<td>WG16 (Communications)</td>
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<td>WG17 (Urban ITS)</td>
<td>WG17 (Nomadic Devices)</td>
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<td>WG18 (Cooperative ITS)</td>
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<td>WG19 (Mobility Integration)</td>
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</table>
Act as coordination point for Mobility and Urban ITS standards development, and be the harmonization and consensus forming group for Mobility Urban ITS and liaison with other European groups:

- Other WGs of CEN TC278
- Other CEN TCs
- ETSI TC ITS

Coordinate and support M/546

Act as leader of Project Teams to progress Mobility and Urban ITS work items quickly

Develop relevant Mobility and Urban ITS documents that do not fall under other TC/WG scope and responsibilities

Handle international coordination and harmonization (ISO, IEEE etc)

Joint responsibility for Mobility Integration with ISO TC204/WG19
WG19 Mobility Integration purpose and scope

- Act as **Integration facilitator for Mobility standards development**, including **Urban and Smart City aspects**.

- Be the harmonization and consensus forming group for Mobility in liaison with other ITS standards groups:
  - Other WGs of ISO TC204
  - Other ISO TCs
  - Other SDOs (CEN, IEEE, SAE, ETSI, ITU,...)

- Act as coordinator of external groups (e.g. Govt supported) to progress and integrate relevant work items quickly

- Develop relevant Mobility documents that do not fall under other TC/WG scope and responsibilities

- **Joint work with CEN TC278 WG17 Mobility Integration**
### What we have done so far:

<table>
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<tr>
<th>PT1701</th>
<th>Urban ITS Review (700 page analysis)</th>
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<tr>
<td>PT1703</td>
<td>Location Referencing Harmonisation</td>
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<td>PT1704</td>
<td>Traffic Management - System status, fault and quality standards</td>
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<td>PT1705</td>
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<td>PT1706</td>
<td>Mixed Vendor Environment - Methodologies &amp; Translators</td>
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<td>PT1708</td>
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<td>PT1709</td>
<td>Traffic Management - Data Models</td>
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<td>PT1710</td>
<td>Traffic Management - Interfaces and Information</td>
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<td>PT1711</td>
<td>Models and Definitions for New Modes</td>
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<td>Standard Number</td>
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<tr>
<td>CEN/TS 17378:2019</td>
<td>Intelligent transport systems - Urban ITS – Air quality management in urban areas</td>
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<td>CEN/TR 17143:2017</td>
<td>Intelligent transport systems - Standards and actions necessary to enable urban infrastructure coordination to support Urban-ITS</td>
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<td>CEN/TS 17297-2:2019</td>
<td>Intelligent transport systems - Location Referencing Harmonisation for Urban-ITS - Part 2: Transformation methods</td>
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<td>CEN/TR 17297-1:2019</td>
<td>Intelligent transport systems - Location referencing harmonisation for Urban ITS - Part 1: State of the art and guidelines</td>
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<td>CEN/TS 17241:2019</td>
<td>Intelligent transport systems - Traffic management systems – Status, fault and quality requirements</td>
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<tr>
<td>CEN/TS 17413:2020</td>
<td>Intelligent transport systems - Urban ITS – Models and definitions for new modes</td>
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<td>CEN/TS 17380:2019</td>
<td>Intelligent transport systems - Urban-ITS - 'Controlled Zone' management for UVARs using C-ITS</td>
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<tr>
<td>CEN/TS 16157-9:2020</td>
<td>Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 9: Traffic signal management publications dedicated to the urban environment</td>
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<tr>
<td>CEN/TS 16157-8:2020</td>
<td>Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 8: Traffic management publications and extensions dedicated to the urban environment</td>
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<tr>
<td>CEN/TS 17400:2020</td>
<td>Intelligent transport systems - Urban ITS – Mixed vendor environments, methodologies &amp; translators</td>
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<tr>
<td>FprCEN/TS 17466</td>
<td>Intelligent transport systems - Urban ITS – Communication interfaces and profiles for traffic management</td>
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<td>CEN/TR 17401:2020</td>
<td>Intelligent transport systems - Urban-ITS – Mixed vendor environment guide</td>
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<tr>
<td>CEN/TS 17402:2020</td>
<td>Intelligent transport systems - Urban ITS – Use of regional traffic standards in a mixed vendor environment</td>
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## CEN TC278 WG17 Urban ITS overview

What we are starting now:

<table>
<thead>
<tr>
<th>PT1712</th>
<th>EU-ICIP (European ITS communications and information protocols)</th>
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<tr>
<td>PT17xx</td>
<td>METR (Management for Electronic Traffic Regulations)</td>
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<td>PT17xx</td>
<td>Kerbside Management</td>
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<td>PT17xx</td>
<td>Parking Data Standards</td>
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<td>PT17xx</td>
<td>Mobility Data Management</td>
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<td>PT17xx</td>
<td>Integrated Mobility Architecture and Terminology</td>
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<td>PT17xx</td>
<td>Standardised Data concepts for Cooperative Connected Automated Mobility (CCAM)</td>
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<td>PT17xx</td>
<td>Mobility integration needs for vulnerable users and light modes of transport</td>
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<td>PT17xx</td>
<td>Architecture for automation</td>
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Major Issues from ISO TC204/WG19

- Collaboration with CEN TC278/WG17
- Currently 10 PWIs
  - One approved at start of WG19
  - Five inherited from CEN (two are on hold)
  - Four new ISO PWIs incl Parking
- Three new work item proposals (PWI)
  - TR - Role model of smart city ITS service application – Japan
  - TR - Integrated Mobility Concept – Norway
  - TR - Investigation of the needs for ITS standardisation for kerbside management - Canada
ISO/TC 204 resolution proposal: PWIs

ISO/TC204 resolves to create the following Preliminary Work Items:

- Title: Intelligent transport systems - Mobility Integration - Role model of ITS service application
- Title: Intelligent transport systems — Mobility integration — Integrated mobility concept
- Title: Intelligent transport systems – Mobility integration – Investigation of the needs for ITS standardisation for kerbside management

ISO/TC204 resolves to initiate call for experts on

- ISO/PWI 24315-1: Intelligent transport systems - Management for Electronic Traffic Regulations (METR) - Part 1: General concept and architecture
- ISO/PWI xxx: Intelligent transport systems – Mobility integration – Investigation of the needs for ITS standardisation for kerbside management
ISO Liaison and outreach activities

- The scope of WG19 involves extensive liaisons and outreach to multiple actors
  - Other TC204 WGs and other ISO TCs
  - Other SDOs such as CEN TC/WG, ETSI, IEEE, SAE
  - Government groups (e.g. EC Deployment Platform, CCAM platform, Expert Groups)
  - Special Interest Groups (e.g. DATEX, TN-ITS, TM 2.0)
  - Urban ITS stakeholders and stakeholder groups
  - Smart cities social media groups (create our own?)
Next Meetings

Meeting frequency

- Two separate single day meetings for coordination and cross linkage
  - Single day WG17 meeting before CEN TC278 plenary, also inviting TC204/WG19
  - Single day WG19 meeting Monday during TC204 week, also inviting TC278/WG17
- Two day full tech joint meeting in between, progressing documents, discussing PT results and resolving comments.

Scheduled meetings

- 14 or 15 October 2019 – ISO WG19 meeting. Singapore
- Dec. 11th – 12th (Wed. – Thu.) Washington, USA
- Spring 2020 - ISO WG19 meeting in Tampere, Finland
- Summer 2020 - CEN/ISO WG17/WG19 joint meeting (Tokyo?)
Automation
Machine interpretation of road signs

Challenge for “Autonomous” vehicles

“Autonomous” is the wrong term

SAE J3016:

Level of AUTOMATION
Automation has some other challenges up north...
## Towards Cooperative, Connected and Automated Mobility

<table>
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<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
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<tr>
<td>Awareness starts</td>
<td>Automation starts</td>
<td>Cooperation starts</td>
<td>Future Mobility</td>
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</table>

### Cooperative
- "I share where I am and what I hear"
- Hybrid connectivity 4G + ITS-G5

### Connected
- "I share what I see"
- Hybrid + 5G

### Automated
- "We share our intentions"
- Hybrid + new technologies

### Future Mobility
- "We coordinate all manoeuvres"
- Hybrid + new technologies
- Most Roads NO human backup
- Fully automated

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<tr>
<th>2017</th>
<th>2019</th>
<th>2021</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
<th>2045</th>
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*Indicative timeline*
METR - Management for Electronic Traffic Regulations

(Connected Rules of the Road)
METR – Key Concepts

- A means to encode traffic regulations electronically to be machine read, processed and correctly interpreted
- A means to securely, exchange data in a traceable manner
- Security, authentication, certification – essential to Trust in the solution
- This is challenging!!
- Large variation on current national and regional methods
- Specifications will need to be very specific on matters of location and time
The METR paradigm

(National) Authority Regulation Server

- Time-and-place delimited signed regulation
- Store
- Re-pack and re-sign
- Publish/subscribe protocol

Publish/subscribe interface, e.g. AMQT or MQTT

Existing or new ITS Services

Regulations repackaged in legacy format

Users

- Users
- Users
- Users

The METR paradigm
Progress on METR

- **UK progress:**
  - Publication of data model, as an extension to TN-ITS, as a first straw man
    - Transmitted to TN-ITS for consideration – some Brexit challenges here
  - DfT
    - Have launched an Alpha review of TRO legislation
    - Technical piloting started!

- Manchester/Liverpool/Salford
- Coventry
- Transport for London
- Transport for West Midlands
- Cambridge
- Hull
Thank you!