

Automated Vehicles and Traffic Regulations



These slides and attached documents are made available as information to GRVA / WP29, to show how this subject is being addressed by other parties. They are not submitted for consideration or adoption

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ISO TC 204 / CEN TC 278

A vehicle has to follow Traffic Regulations

The driver was required to obey the regulations -

-That meant that the driver had to know the Regulations in force where he/she was driving.

Regulations were supplemented by dynamic traffic control, initially traffic officers waving their arms about,

followed by manually controlled traffic lights and then more mechanised and automated traffic control systems,



An automated vehicle will have to follow and comply to Traffic Regulations at all times

- How does it know the regulation on a particular road?
- At a particular location on the road
- On a particular day
- At a specific time
- For a particular vehicle category

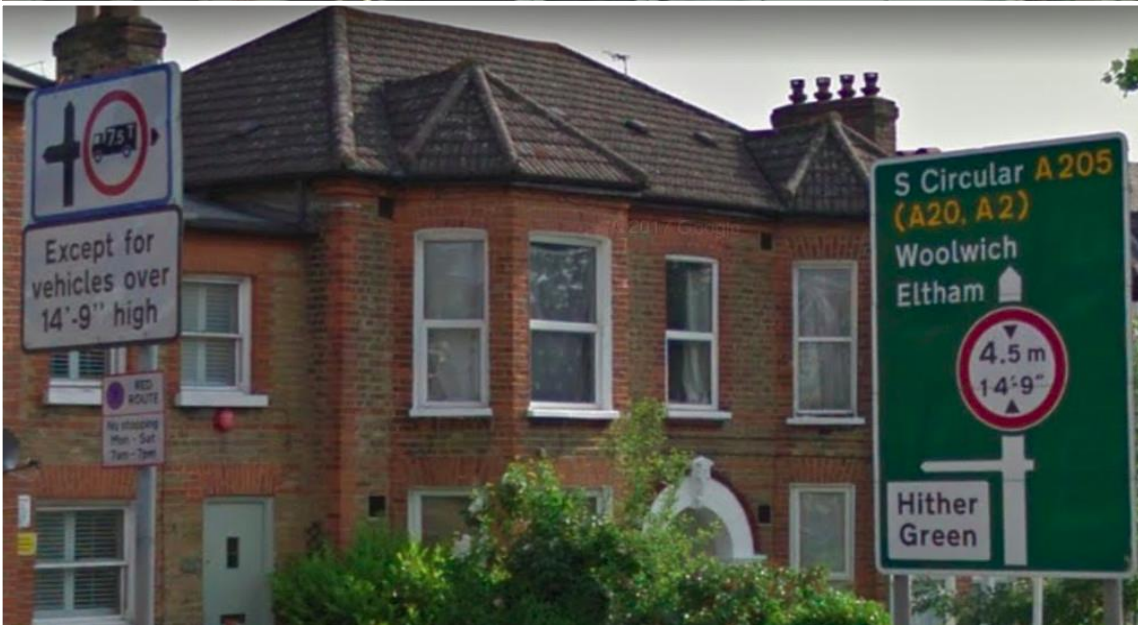
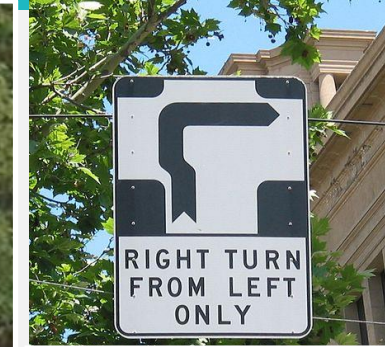
An automated vehicle will have to follow and comply to Traffic Regulations at all times

- Early prototype AV s use cameras to read road signs
- But, no matter how good the camera and the software, this is problematic
- UK Ordnance Survey, who have been undertaking vehicle based mapping of roads for a quarter of a century, believe that the achievable read rate of signs, in practise is in the 60 -80% range

UVAR – Urban Vehicle Access Regulations

- Simultaneously, initiatives with respect to making urban restrictions available (commonly known as UVARs) have been developed in Europe (CEN TS 17380 - Controlled Zone management for UVARs using C-ITS) and is being adapted for global use by ISO TC204.
- A working draft of ISO 24311 (Intelligent transport systems – Mobility integration - 'Controlled Zone' management for UVARs using C-ITS) is attached for information (and as this is a working draft, comments are welcome (Doc *3))

Vehicle/Mobility Detection Challenges



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Google



A typical day – a journey to work- multiple regulations must be complied to simultaneously, and are location specific



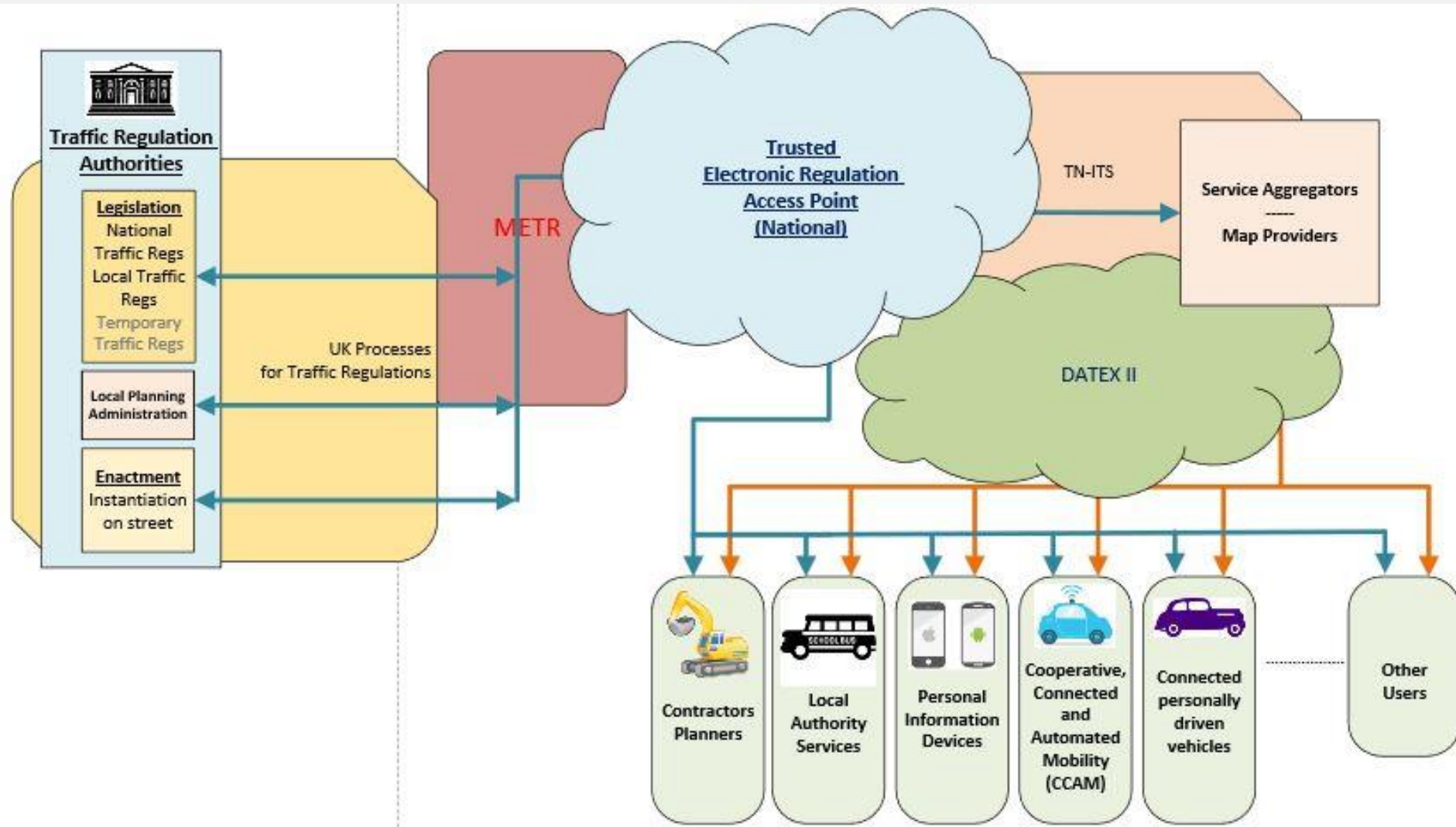
But the AV must obey the regulations at all times

- A number of road administrations have reached the conclusion that in order to make this possible, the traffic regulations must be made electronically available.
- UK recently undertook a preliminary feasibility study
 - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1064085/tro-data-model-alpha-report.pdf
- Norway NPRA has recently announced an ambitious METR project and we would invite Norway to present information about it to WP29 and GRVA
- Similar projects are in progress in other countries
- ISO TC 204 / CEN TC 278 address these as METR (docs attached *1 and *2)

Management of Electronic Traffic Regulations (METR)

- In 'simple' terms, regulations:
 - General rules of the road embedded in national/regional laws, generally aligned to international conventions
 - E.g. default speed limits; driving side of the road
 - These are often unsigned, or partially signed
 - Traffic signs, signals and road marking – communicating obligations, warning or information
 - Impacting: moving “traffic” (i.e. typified road users), non-moving traffic
 - Both “static” and “dynamic” (e.g. road works, road closures, temporary and time-limited restrictions (E.G. Market day), dynamic speed limits, etc.)

TR initiatives (UK example)



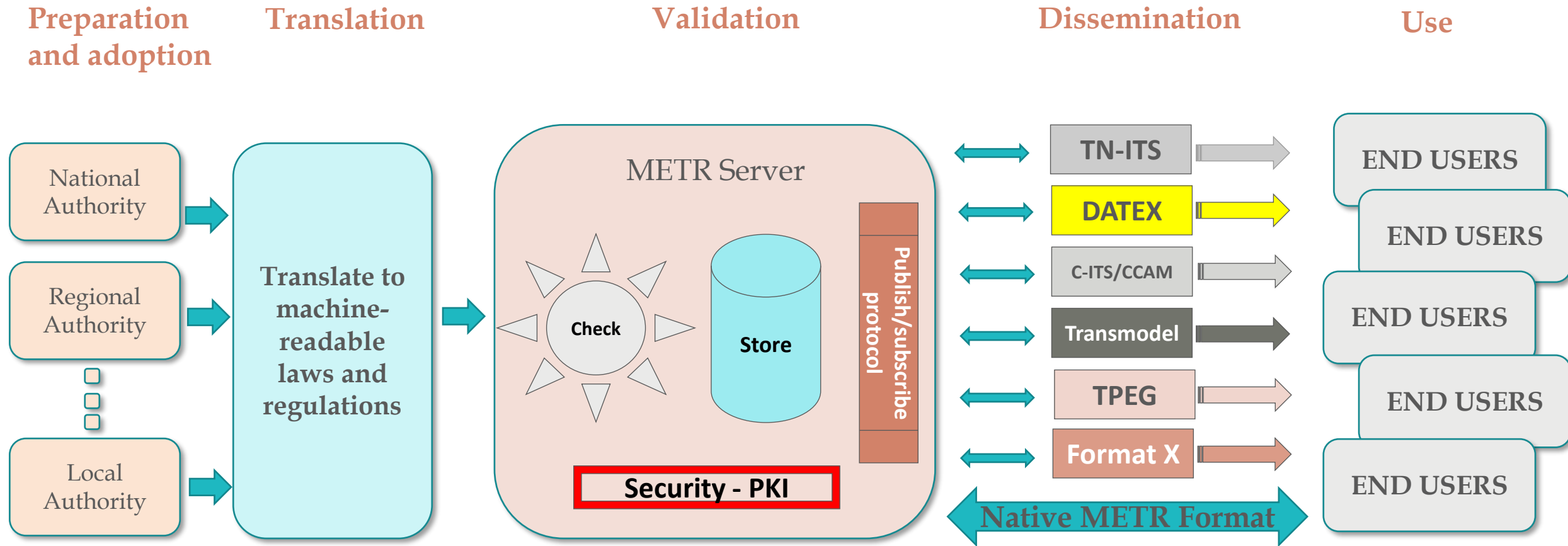
METR – Key Concepts

- A means to encode traffic regulations electronically to be machine read, processed and correctly interpreted
 - This is challenging!! Means to encode traffic regulations (noting the challenge given the variety we have even nationally, and the huge variation that will exist across nations). These specifications will be to be very specific on matters of location – then think of map edge matching
- A means to securely, exchange data in a traceable manner
 - Security, authentication, certification – essential to *Trust* in the solution

Related links

- Link to ISO website <https://iso-tc204.github.io/iso24315p1/>
- Link to official USDOT architecture with METR (<https://www.arc-it.net/html/servicepackages/servicepackages-areaspsort.html>)
- The new METR deliverable ISO 24315-1

The METR main processes



Parties addressing these issues

- ISO TC204 METR (See attached METR Vision Doc *1)
- DATEX II
 - METR seen as a data source
 - Designed for TM/TI information exchange
 - Describes dynamic characteristic (events or attribution) using various Loc. Ref. methods against no-specific reference network (but dynamic features might never change!)
 - Extension work on-going
- TN-ITS
 - METR seen as a data source
 - Designed to pass road network attribute changes to map suppliers
 - Uses various Loc. Ref. methods against no-specific reference network – but perhaps INSPIRE networks are a fall back
 - Extension work on-going
- UVAR – Urban Vehicle Access Regulations
- GDF INSPIRE/TC211
- National initiatives

For clarifications or further
information

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