Technical Specification

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Intelligent transport systems — Management of electronic traffic regulations (METR) —

Part 1: Vocabulary

Systèmes de transport intelligents — Gestion des règles de circulation sous forme électronique —

Partie 1: Vocabulaire

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Intelligent transport systems,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 24315 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 System overview

The ISO 24315 series on the management of electronic traffic regulations (METR) is intended to provide users access to geo-specific, trustworthy, timely, authoritative and machine-interpretable rules relating to traffic and transport, enacted by jurisdictional entities, including those who define rules for campuses (i.e. private grounds). This is conceptually shown in Figure 1.

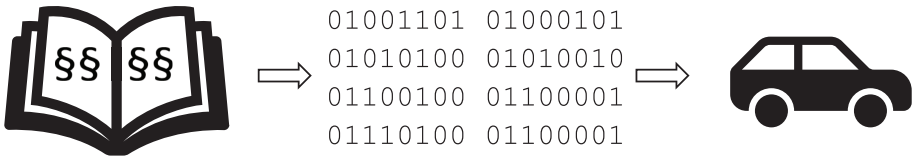


Figure 1 — METR concept

0.2 Purpose

METR is designed to assist developers and manufacturers of driving automation systems (i.e. automation Levels 1 – 5) and driver information systems (including those at automation Level 0) to electronically obtain traffic rules to better enable them to:

a) interact safely with other road users;

b) follow instructions from law enforcement organizations and those authorized to direct traffic;

c) maintain smooth and safe flow of traffic; and

d) comply with other rules enacted to support legislative policies (such as environmental protection, noise, height and weight restrictions, and societal aspects such as market days, fiestas, pedestrian zones, etc.).[1]

METR is designed to provide a reference framework for the trustworthy distribution of electronic versions of legal traffic rules. The content and application of these traffic rules is outside of the scope of standards and specifications on METR.

0.3 Flow of information

The general flow of METR information is illustrated in Figure 2 and is described below the figure.

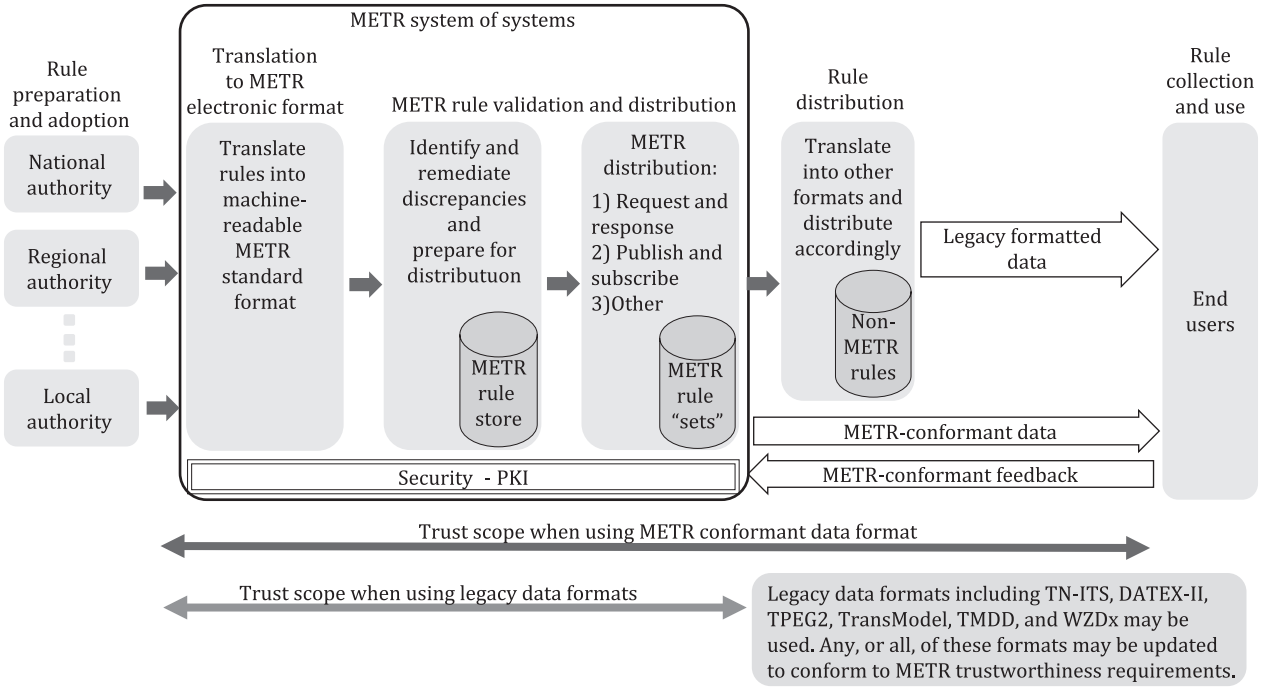


Figure 2 — METR flow of information

a) METR starts with rule makers defining and enacting rules that are relevant to transport users.

b) Each legal rule is translated into a METR rule, which is a secure, standardized electronic representation that includes a digital signature of the rule signing organization.

c) METR rules are collected for a geographic area(s) and specific scope(s).

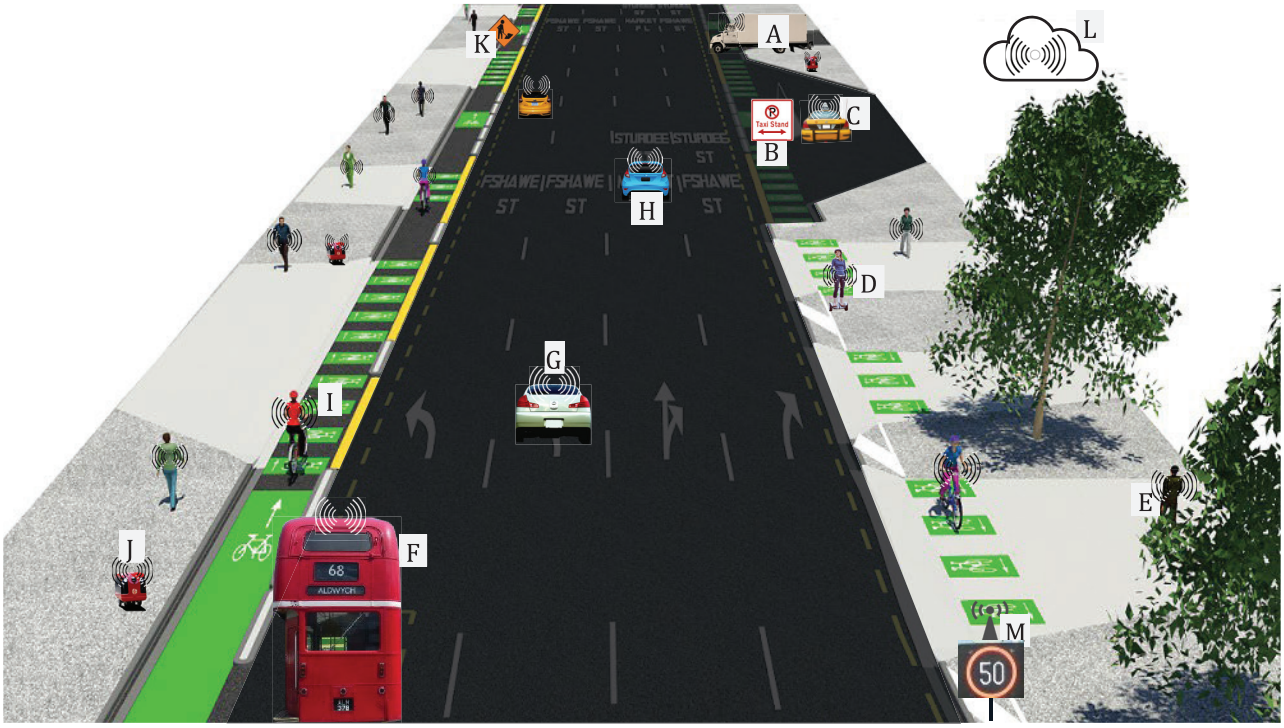
d) Rules are distributed to METR users based on their needs.

e) METR users become aware of the METR rules, verify their authenticity and respond appropriately.

f) As needed, METR users can submit discrepancy reports to a discrepancy handler for investigation and correction.

0.4 Graphical overview

Figure 3 provides an overview of the data and devices included within the scope of the METR environment.



Key

A	freight rules
B	kerbside usage rules
C	ride sharing rules
D	micromobility rules
E	vulnerable road user (VRU) rules
F	public transport rules
G	rules for automated driving systems
H	driving rules
I	lane use rules
J	public-area mobile robot rules
K	road work rules
L	pre-announced rules with subset of emergent rules and/or supporting data
M	emergent rules and/or supporting data
	various communications and networks infrastructure
	roadside communication unit
	METR user system

Figure 3 — METR streetscape

0.5 Rule distribution

Electronic traffic rules and their distribution have three orthogonal characteristics that are often confused with one another.

a) Electronic rules can be pre-announced (i.e. known and publicized well in advance of the user's need) or emergent (i.e. publicized and needed while previously obtained pre-announced rules are still considered fresh).

b) Electronic rules can be distributed through a wide-area distribution mechanism or a local distribution mechanism.

c) Electronic rules can be pulled by users well in advance of their need or pushed to users as special conditions necessitate.

It is expected that the characteristics of METR users and the limitations on data capacities for local distribution mechanisms will lead to virtually all persistent rules being pre-announced and distributed from a wide-area distribution source, likely using a pull mechanism. However, any emergent rule that is activated while previously distributed pre-announced rules are still considered fresh will require a push mechanism, often from a local distribution source.

These two combinations are typical use cases only. METR supports every possible combination of characteristics a) – c) and addresses how discrepancies can be reported and resolved.

In addition, supporting data can provide context to the rules and can be transmitted by wide-area communication systems, roadside units, other vehicles or on-board devices.

The rules cover virtually any rule related to surface transport systems; Figure 3 depicts rules for freight vehicles, kerbside usage, ride sharing, micromobility operations, vulnerable road users (VRUs), public transport usage, driving (i.e. human-in-the-loop, including driver support systems, which represent Levels 1 – 2 of automation), automated driving systems (ADS, i.e. Levels 3 – 5 of automation), lane usage, public-area mobile robots (PMRs), and road works. This information needs to be available and conveyed to all transport users including nomadic devices, PMRs and vehicles equipped with driving automation systems (i.e. Levels 1 – 5 of automation). Although not shown in Figure 3, METR is also intended to be flexible enough to support rules relating to the use of ferries, passenger rail (e.g. trams, subways, and inter-city rail) and off-road environments.

0.6 Framework adaptation

METR is defined through the ISO 24315 series, which provides a comprehensive framework for the interoperable digitalization, distribution and management of electronic traffic regulations. Within the ISO 24315 series, this framework will be defined at a relatively high level and will support both regional adaptation and customization, as well as the use of legacy protocols and data formats, as depicted in Figure 4.

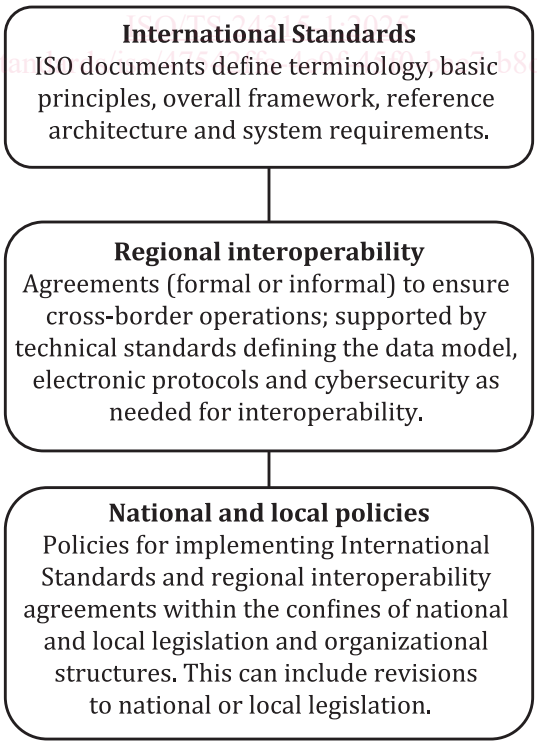


Figure 4 — METR three-tier framework

a) International Standards: ISO documents are developed to address global stakeholder needs. Other international organizations (e.g. UNECE) also play a role in standards development and implementation policies. The first edition of the ISO 24315 series provides a framework based on the ISO-specified systems engineering methodology, as defined by ISO/IEC/IEEE 29148. It consists of a Vocabulary (this document), a concept of operations, a reference architecture and requirements for the METR system of systems (SoS). Subsequent documents in the ISO 24315 series will define requirements for each component system within the METR SoS and other requirements common to all component systems. The ISO 24315 series will promote semantic interoperability, but will need to be interpreted and adapted for regional use to provide complete interoperability (i.e. including syntactic interoperability).

b) Regional interoperability: Each region (e.g. EU, Japan, Republic of Korea) may extend and adapt the ISO 24315 series based on their specific needs and environment to provide cross-border interoperability within their region. The METR reference architecture is refined to provide regional implementation guidance. For example, in the EU, METR can eventually become part of the National Access point (NAP). Furthermore, legacy data formats including TN-ITS,[3] DATEX II,[4] TPEG2,[5] TransModel,[6] TMDD,[7] and WZDx[8] can be refined to support METR requirements or used as-is to deliver METR information to the extent that the data can be supported (i.e. non-METR distribution). The preferred solution is to update these formats to conform to the full set of METR trustworthiness requirements (i.e. the whole ISO 24315 series).

c) National and local policies: Translating and adapting International Standards and regional interoperability agreements is achieved at the national level and can even be handled at local levels. Operations, funding and governance are determined nationally, locally, or both. Legal implications of electronic rules provided through METR are defined nationally or locally. Many locations are starting this digitalization of the rules at an informative supplemental level, rather than at a regulatory level.

0.7 Document overview

The purpose of this document is to define METR-specific terms used throughout the ISO 24315 series. This document has been prepared according to the rules set forth in ISO 704.

This document has been developed by ISO/TC 204, *Intelligent transport systems*, in coordination with many experts from countries around the world. It is designed to be sufficiently generic to be applicable to any national or regional authority that wishes to adopt its processes.

System developers and system operators within authorities that adopt the METR model are advised to become familiar with this document and use it as guidance in their operations.

For additional terms relevant to the ITS domain, which can help in the understanding of this document, see ISO/TS 14812 and ISO/IEC/IEEE 24765.

Intelligent transport systems — Management of electronic traffic regulations (METR) —

Part 1: Vocabulary

1 Scope

The management of electronic transport regulations (METR) provides a means for METR users to obtain trustworthy, authoritative, machine-interpretable, publicly available and transport-related information for the use of the road network, in order to provide safer and more efficient, sustainable, comfortable, and equitable transport services.

The scope of METR includes both rules that are relatively static (e.g. static speed limits) as well as those that are dynamic (e.g. variable speed limits, signalized intersections). Where appropriate, METR incorporates existing documents (e.g. ISO/TS 19091 for signalized intersections).

This document defines terms specific to the ISO 24315 series on the management of electronic transport regulations.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 Jurisdictional terms

3.1.1
campus
private campus
private grounds
jurisdictional area (3.1.5) with a *jurisdictional entity* (3.1.7) who is the owner of the area but excluding *transport facilities* (3.4.4) managed by the local government

EXAMPLE 1 A point of interest (e.g. airport, university, business park, industrial area, shopping centre) that manages its own *transport infrastructure* (3.4.5) separately from that managed by the local government. In this case, the point of interest and its own transport system are a part of the campus.

EXAMPLE 2 A point of interest (e.g. airport, university, business park, industrial area, shopping centre) that includes transport infrastructure that is managed by the local government. In this case, the government-managed transport infrastructure is a *governmental area* (3.1.3) while the campus is represented by the remainder of the area.

Note 1 to entry: The term "private grounds" is used in some countries; however, since campuses can be owned by governmental entities (especially airports, military bases, public universities, etc.), the term "campus" is preferred.