

English Version

**Electronic fee collection - Charging performance - Part 2:
Examination framework (ISO/TS 17444-2:2017)**

Perception du télépéage - Performance d'imputation -
Partie 2: Cadre d'examen (ISO/TS 17444-2:2017)

Elektronische Gebührenerhebung -
Abbuchungsdurchführung - Teil 2:
Rahmenbedingungen für Prüfungen (ISO/TS 17444-
2:2017)

This Technical Specification (CEN/TS) was approved by CEN on 27 August 2017 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	3

European foreword

This document (CEN ISO/TS 17444-2:2017) has been prepared by Technical Committee ISO/TC 204 “Intelligent transport systems” in collaboration with Technical Committee CEN/TC 278 “Intelligent transport systems” the secretariat of which is held by NEN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN ISO/TS 17444-2:2013.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO/TS 17444-2:2017 has been approved by CEN as CEN ISO/TS 17444-2:2017 without any modification.

Electronic fee collection — Charging performance —

Part 2: Examination framework

*Perception du télépéage — Performance d'imputation —
Partie 2: Cadre d'examen*





COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	vi
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols and abbreviated terms	6
5 Examination Framework	7
5.1 General	7
5.2 Method for defining a Specific Examination Framework	8
5.2.1 General	8
5.2.2 Selection of metrics to be evaluated	9
5.2.3 Definition of environmental conditions and associated performance requirements	9
5.2.4 Determination of Required Sample Sizes	9
5.2.5 Selection of methods for generating Charging Input and Reference Data	10
5.2.6 Determination of Test Routes/Subset of Charged Network for generating representative trips	10
5.2.7 Documentation of the Specific Examination Framework	10
5.3 Sources of data	10
5.4 Methods of generating charging input	13
5.4.1 General	13
5.4.2 Predefined routes (identifier: "PVP")	14
5.4.3 Reference System (used in combination with identifiers: "PVR" and "UVR")	15
5.4.4 Simulated OBE/FE (identifier: "SO")	16
5.4.5 Dedicated OBE Testing (identifier: "DO")	17
5.5 Applicability of metrics scheme types	17
5.6 Charging Metric Selection Tables	22
5.6.1 General	22
5.6.2 DSRC Discrete	22
5.6.3 Autonomous Discrete	23
5.6.4 Autonomous Continuous	24
6 Examination Tests	26
6.1 Common (and DSRC Discrete) Examination Tests	26
6.1.1 General	26
6.1.2 ET-CM-E2E-1 E2E — Correct Charging Rate	26
6.1.3 ET-CM-E2E-2 E2E — Overcharging Rate	27
6.1.4 ET-CM-E2E-3 E2E — Undercharging Rate	27
6.1.5 ET-CM-E2E-4 E2E — Late Charging Rate	28
6.1.6 ET-CM-UA-1 UA — Correct Charging Rate	29
6.1.7 ET-CM-UA-2 UA — Overcharging Rate	29
6.1.8 ET-CM-UA-3 UA — Undercharging Rate	30
6.1.9 ET-CM-UA-4 UA — Accurate application of Payments and Refunds	31
6.1.10 ET-CM-UA-5 UA — Accurate Personalisation of OBUs	31
6.1.11 ET-CM-PC-1 PC — Correct Charging Rate	32
6.1.12 ET-CM-PC-2 PC — Overcharging Rate	32
6.1.13 ET-CM-PC-3 PC — Undercharging Rate	33
6.1.14 ET-CM-PC-4 PC — Latency — TC	34
6.1.15 ET-CM-PC-5 PC — Late Payment Claims Rate	34
6.1.16 ET-CM-PC-6 PC — Rejected Payment Claim Rate	35
6.1.17 ET-CM-BD-1 BD — Correct Charging Rate	35
6.1.18 ET-CM-BD-2 BD — Overcharging Rate	36
6.1.19 ET-CM-BD-3 BD — Undercharging Rate	37

6.1.20	ET-CM-BD-4 BD — Incorrect Charging Rate	37
6.1.21	ET-CM-BD-5 BD — Latency — TC	38
6.1.22	ET-CM-BD-6 BD — Late Billing Details Rate	38
6.1.23	ET-CM-BD-7 BD — Rejected Billing Details Rate	39
6.1.24	ET-CM-BD-8 BD — Incorrectly rejected Billing Details Rate	39
6.1.25	ET-CM-BD-9 BD — Inferred Billing Details Rate	40
6.2	DSRC Discrete — Optional DSRC Toll Declaration Metrics	40
6.2.1	General	40
6.2.2	ET-CM-TD-1 TD — Correct Toll Declaration Generation Rate	40
6.2.3	ET-CM-TD-2 TD — Incorrect Toll Declaration Generation Rate	41
6.2.4	ET-CM-TD-3 TD — Late Toll Declarations Rate	41
6.2.5	ET-CM-TD-4 TD — TSP Charge Parameter Change Rate	42
6.2.6	ET-CM-TD-5 TD — TSP False Positive Rate	42
6.3	Autonomous Discrete Specific Examination Tests	43
6.3.1	General	43
6.3.2	ET-CM-TD-1 TD — Correct Toll Declaration Generation Rate	43
6.3.3	ET-CM-TD-2 TD — Incorrect Toll Declaration Generation Rate	43
6.3.4	ET-CM-TD-3 TD — Late Toll Declarations Rate	44
6.3.5	ET-CM-TD-4 TD — TSP Charge Parameter Change Rate	44
6.3.6	ET-CM-TD-5 TD — TSP False Positive Rate	45
6.3.7	ET-CM-DTD-1 DTD — Correct Charging Rate (charge object detections)	45
6.3.8	ET-CM-DTD-2 DTD — Incorrect Charge Event Recognition Rate	46
6.3.9	ET-CM-DTD-3 DTD — Missed Charge Object Detection Rate	46
6.3.10	ET-CM-DTD-4 DTD Overcharging Rate	47
6.3.11	ET-CM-CR-1 CR — Correct Charge Report Generation Rate	47
6.3.12	ET-CM-CR-2 CR — Incorrect Charge Report Generation Rate	48
6.3.13	ET-CM-CR-3 CR — Charge Report Latency	48
6.3.14	ET-CM-CR-4 CR — TSP Front End Charge Parameter Change Rate	49
6.3.15	ET-CM-CR-5 CR — TSP Front End False Positive Rate	49
6.3.16	ET-CM-DCR-1 DCR — Correct Charging Rate (charge object detections)	50
6.3.17	ET-CM-DCR-2 DCR — Incorrect Charge Event Recognition Rate	50
6.3.18	ET-CM-DCR-3 DCR — Missed Charge Object Detection Rate	51
6.3.19	ET-CM-DCR-4 DCR — Overcharging rate (Incorrect false positive Charge Event Recognition)	51
6.4	Autonomous Continuous Specific Examination Tests	52
6.4.1	General	52
6.4.2	ET-CM-TD-1 TD — Correct Toll Declaration Generation Rate	52
6.4.3	ET-CM-TD-2 TD — Incorrect Toll Declaration Generation Rate	52
6.4.4	ET-CM-TD-3 TD — Late Toll Declarations Rate	53
6.4.5	ET-CM-TD-4 TD — TSP Charge Parameter Change Rate	53
6.4.6	ET-CM-TD-5 TD — TSP False Positive Rate	54
6.4.7	ET-CM-CTD-1 CTD Correct Charging Rate	54
6.4.8	ET-CM-CTD-2 CTD Overcharging Rate	55
6.4.9	ET-CM-CTD-3 CTD Accuracy of Distance/Time Measurement	55
6.4.10	ET-CM-CR-1 CR — Correct Charge Report Generation Rate	56
6.4.11	ET-CM-CR-2 CR — Incorrect Charge Report Generation Rate	56
6.4.12	ET-CM-CR-3 CR — Charge Report Latency	57
6.4.13	ET-CM-CR-4 CR — TSP Front End Charge Parameter Change Rate	57
6.4.14	ET-CM-CR-5 CR — TSP Front End False Positive Rate	58
6.4.15	ET-CM-CCR-1 CCR — Correct Charging Rate	58
6.4.16	ET-CM-CCR-2 CCR — Overcharging Rate	59
6.4.17	ET-CM-CCR-3 CCR — Accuracy of Distance/Time Measurement	59
	Annex A (informative) Examination Test documentation template	61
	Annex B (informative) Examination Framework considerations	62
	Annex C (informative) Statistical considerations	66