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# Intelligent transport systems — Interoperability between interoperable fare management (IFM) systems and near field communication (NFC) mobile devices

*Systèmes de transport intelligents — Interopérabilité entre les systèmes de gestion tarifaire interopérables (IFM) et les dispositifs mobiles à communication en champ proche (NFC)*

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# Contents

Page

**Foreword** ..... **iv**
**Introduction** ..... **v**
**1 Scope** ..... **1**
**2 Normative references** ..... **1**
**3 Terms and definitions** ..... **2**
**4 Abbreviated terms** ..... **2**
**5 General considerations** ..... **2**
5.1 Interoperability across different specifications ..... 2
5.2 Need for continuous, synchronized maintenance ..... 3
5.3 Relevance of certification ..... 3
**6 Description of the solution for interoperability** ..... **3**
6.1 Approach ..... 3
6.2 Partners, roles and responsibilities ..... 4
6.3 Implementation of interoperability of the contactless interface ..... 4
6.3.1 Concept for NFC mobile devices ..... 4
6.3.2 Concept for ISO/IEC 14443-conformant PT devices ..... 5
6.3.3 Concept for ISO/IEC 18092-conformant Type F PT devices ..... 5
6.3.4 Concept for EMV Contactless Interface Specification-conformant PT devices ..... 6
6.4 Levels of interoperability ..... 6
**7 Some statements with regard to establishing interoperability in public transport infrastructures** ..... **7**
7.1 General ..... 7
7.2 Ensuring interoperability for ISO/IEC 14443 PT devices ..... 7
7.3 Ensuring interoperability for ISO/IEC 18092-conformant Type F PT devices ..... 8
7.4 Information for EMV Contactless Interface Specification-conformant PT devices ..... 9
**Bibliography** ..... **11**

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# Foreword

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This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

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.


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# Introduction

Globally, the increasing use of mobile devices and mobile services is one of the most visible trends. Public transport can benefit from this development since new products and services, such as multi-modal travel and traveller information, can be addressed more easily if the customer uses his or her mobile device as the interface to his or her service provider.

In order to take advantage of these new opportunities, the public transport industry can integrate customers' mobile devices with existing public transport fare management systems and ensure technical interoperability with the existing public transport infrastructure of contactless readers and media.

Today, the vast majority of mobile devices are equipped with a near field communication (NFC) interface and can in principle communicate with contactless public transport readers and media. However, globally there are several specifications for contactless interfaces in the industry which can deviate in some details from those for mobile devices. If no precautions are in place, such deviations have the potential to lead to interoperability issues.

A joint working group with participants from the global public transport sector, ISO, the NFC Forum, GSMA and CEN has started to address this issue over the past few years. As a result, there are now specifications and certification schemes in place that will make sure that mobile devices which follow the newly developed specifications for the NFC interface will support technical interoperability with the globally relevant standards for contactless interfaces of public transport devices.

This document presents the results of this work and can provide guidance to owners of interoperable fare management systems [interoperable fare management system suppliers, public transport (PT) operators, PT authorities] on how technical interoperability with NFC mobile devices can be achieved.

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# Intelligent transport systems — Interoperability between interoperable fare management (IFM) systems and near field communication (NFC) mobile devices

## 1 Scope

This document presents methods to establish technical interoperability between the contactless interfaces of NFC mobile devices and those of public transport readers and customer media. It provides information on how to apply these for public transport fare management systems which are using ISO/IEC 14443 and/or ISO/IEC 18092 and/or EMV® Contactless Interface Specification[1)] [9] as a basis for contactless communication.

This document deals with the application of standards, specifications and certification schemes from other organizations and standards bodies. These organizations and standards bodies are solely responsible for the content and the maintenance of these standards, specifications and certification schemes.

This document focuses on the technical interoperability of the contactless interfaces of NFC mobile devices and public transport devices. The goal is to reliably support communication and the exchange of data. Syntactic and semantic interoperability, i.e. the support for a particular public transport fare management application, is not covered by this document. However, practical experience shows that if technical interoperability is established successfully, the adoption of a specific public transport application can typically be achieved by loading the fare management system's particular application software onto the NFC mobile device.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 10373-6, *Cards and security devices for personal identification — Test methods — Part 6: Contactless proximity objects*

ISO/IEC 14443 (all parts), *Cards and security devices for personal identification — Contactless proximity objects*

ISO/IEC 18092, *Information technology — Telecommunications and information exchange between systems — Near Field Communication — Interface and Protocol (NFCIP-1)*

ISO/IEC 22536, *Information technology — Telecommunications and information exchange between systems — Near Field Communication Interface and Protocol (NFCIP-1) — RF interface test methods*

ISO/IEC 23917, *Information technology — Telecommunications and information exchange between systems — NFCIP-1 — Protocol Test Methods*

ISO 24014-1, *Public transport — Interoperable fare management system — Part 1: Architecture*

ISO/IEC/TS 24192-1, *Cards and security devices for personal identification — Communication between contactless readers and fare media used in public transport — Part 1: Implementation requirements for ISO/IEC 14443 (all parts)*

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