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IEEE Guide for Wireless Access in Vehicular Environments (WAVE) Architecture

IEEE Vehicular Technology Society

Sponsored by the

Intelligent Transportation Systems Committee

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3 Park Avenue
New York, NY 10016-5997
USA

IEEE Std 1609.0™-2013

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Approved 11 December 2013

IEEE-SA Standards Board

Abstract: The wireless access in vehicular environments (WAVE) architecture and services necessary for WAVE devices to communicate in a mobile vehicular environment are described in this guide. It is meant to be used in conjunction with the family of IEEE 1609 standards as of its publication date. These include IEEE Std 1609.2™, IEEE Standard Security Services for Applications and Management Messages, IEEE Std 1609.3 Networking Services, IEEE Std 1609.4 Multi-Channel Operation, IEEE Std 1609.11 Over-the-Air Electronic Payment Data Exchange Protocol for Intelligent Transportation Systems (ITS), IEEE Std 1609.12 Identifier Allocations, and IEEE Std 802.11 in operation outside the context of a basic service set.

Keywords: dedicated short range communications, DSRC, IEEE 1609.0™, OBU, onboard unit, Provider Service Identifier (PSID), roadside unit (RSU), WAVE, WAVE service advertisement, WAVE Short Message, WAVE Short Message Protocol, wireless access in vehicular environments, WSA, WSM, WSMP

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

PDF: ISBN 978-0-7381-8756-3 STD98459
Print: ISBN 978-0-7381-8757-0 STDPD98459

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IEEE Guide for Wireless Access in Vehicular Environments (WAVE) Architecture

1. Overview

A wireless access in vehicular environments (WAVE) system is a radio communication system intended to provide seamless, interoperable services to transportation. These services include those recognized by the U. S. National Intelligent Transportation Systems (ITS) architecture and many others contemplated by the automotive and transportation infrastructure industries around the world, such as communications between vehicles and infrastructure, and communications among vehicles. This guide provides an overview of the system, its components, and its operation. It is intended to provide a context within which to better understand the content of the related IEEE WAVE standards documents, which include IEEE Std 1609.2™-2013, IEEE Std 1609.3™-2010, IEEE Std 1609.4™-2010, IEEE P1609.6™ [B19],[1, 2] IEEE Std 1609.11™-2010, and IEEE Std 1609.12™, as well as IEEE Std 802.11™-2012 [stations communicating outside the context of a Basic Service Set (BSS), or OCB].[3]

The term dedicated short range communications (DSRC) is sometimes used in the U. S. to refer to radio spectrum or technologies associated with WAVE. For example, U. S. Federal Communications Commission (FCC) documents [B6] allocate spectrum to "mobile service for use by DSRC systems operating in the Intelligent Transportation System (ITS) radio service," and the Society of Automotive Engineers (SAE) has specified messages in SAE J2735 "for use by applications intended to utilize the 5.9 GHz dedicated short range communications for wireless access in vehicular environments." Outside the

[1] The numbers in brackets correspond to those of the bibliography in Annex G.
[2] Numbers preceded by P are IEEE authorized standards projects that were not approved by the IEEE-SA Standards Board at the time this publication went to press.
[3] Information on references can be found in Clause 2.