

# ETSI TS 102 636-2 V1.1.1 (2010-03)

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*Technical Specification*

## **Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 2: Scenarios**

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# Contents

Intellectual Property Rights .....	4
Foreword.....	4
1 Scope .....	5
2 References .....	5
2.1 Normative references .....	5
2.2 Informative references.....	5
3 Definitions and abbreviations.....	5
3.1 Definitions.....	5
3.2 Abbreviations .....	5
4 Classification of communication scenarios .....	6
5 Communication scenarios .....	7
5.1 A: V2V scenarios .....	7
5.1.1 General.....	7
5.1.2 A1: V2V point-to-point .....	7
5.1.3 A2: V2V point-to-multipoint .....	7
5.1.4 A3: V2V GeoAnycast.....	7
5.1.5 A4: V2V GeoBroadcast .....	7
5.2 B: R2V scenarios.....	7
5.2.1 General.....	7
5.2.2 B1: R2V point-to-point .....	7
5.2.3 B2: R2V point-to-multipoint.....	7
5.2.4 B3: R2V GeoAnycast .....	7
5.2.5 B4: R2V GeoBroadcast .....	7
5.3 C: V2R scenarios.....	8
5.3.1 General.....	8
5.3.2 C1: V2R point-to-point .....	8
5.3.3 C2: V2R point-to-multipoint.....	8
5.3.4 C2: V2R GeoAnycast .....	8
5.3.5 C4: V2R GeoBroadcast .....	8
History .....	9

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## Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport System (ITS).

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.1].

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# 1 Scope

The present document classifies and specifies all communication scenarios that shall be supported by GeoNetworking.

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## 2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
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### 2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] ETSI TS 102 636-3: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 3: Network architecture".

### 2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [i.1] ETSI TS 102 636-1: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 1: Requirements".

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in [1] apply.

### 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

R2R                      Roadside-to-Roadside

R2V	Roadside-to-Vehicle
V2R	Vehicle-to-Roadside
V2V	Vehicle-to-Vehicle

## 4 Classification of communication scenarios

The basic communication scenarios are classified in the following way:

- Scenarios according to the type of communication endpoints:
  - A. Vehicle-to-Vehicle (V2V) communication: communication from an ITS vehicle station to other ITS vehicle stations;
  - B. Roadside-to-Vehicle (R2V) communication: communication from an ITS roadside station to ITS vehicle stations;
  - C. Vehicle-to-Roadside (V2R) communication: communication from an ITS vehicle station to ITS roadside stations.

NOTE 1: The ITS roadside station is not necessarily connected with other networks, such as the Internet.

NOTE 2: R2R communication is out of scope of GeoNetworking, however it is basically enabled. In complex scenarios, the concatenation of basic scenarios is possible, for example, V2R + R2V.

- Communication between different communication endpoints may be realised by the following types of connection:
  1. point-to-point: communication from an ITS station to another;
  2. point-to-multipoint: communication from an ITS station to multiple ITS stations;
  3. GeoAnycast: communication from an ITS station to an arbitrary ITS station within a geographical target area;
  4. GeoBroadcast: communication from an ITS station to all ITS stations within a geographical target area.

Point-to-point and point-to-multipoint communication are legacy communication scenarios. GeoAnycast and GeoBroadcast are special scenarios in GeoNetworking.

- Scenarios according to the way how to access the ITS network and transport layer:
  - direct mode: applications access directly the ITS network and transport layer, e.g. safety and traffic efficiency applications;
  - indirect mode: applications indirectly access the ITS network and transport layer, i.e. applications access the ITS network and transport layer via an intermediate layer such as IPv6.

NOTE 3: Number of hops, e.g. single hop or multi-hop is not distinguished in the scenarios. Communication is assumed to be n-hop communication, and single-hop communication may be considered as one-hop communication, thus, a special case of multi-hop communication.

NOTE 4: Performance requirements, e.g. latency and reliability etc. are also not considered in the classification.

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## 5 Communication scenarios

### 5.1 A: V2V scenarios

#### 5.1.1 General

V2V scenarios cover the communication among ITS vehicle stations without support from a communication infrastructure. For each scenario list below, both direct and indirect modes shall be supported.

#### 5.1.2 A1: V2V point-to-point

Communication starts from a single ITS vehicle station and ends at another ITS vehicle station.

#### 5.1.3 A2: V2V point-to-multipoint

Communication starts from a single ITS vehicle station and ends at multiple ITS vehicle stations.

#### 5.1.4 A3: V2V GeoAnycast

Communication starts from a single ITS vehicle stations and ends at an arbitrary ITS vehicle station within a geographical area.

#### 5.1.5 A4: V2V GeoBroadcast

Communication starts from a single ITS vehicle station and ends at multiple ITS vehicle stations within a geographical area.

### 5.2 B: R2V scenarios

#### 5.2.1 General

R2V scenarios cover communication starting from an ITS roadside station and ending at ITS vehicle stations. For each scenario list below, both direct and indirect modes shall be supported.

#### 5.2.2 B1: R2V point-to-point

Communication starts from a single ITS roadside station and ends at a single ITS vehicle station.

#### 5.2.3 B2: R2V point-to-multipoint

Communication starts from a single ITS roadside station and ends at multiple ITS vehicle stations.

#### 5.2.4 B3: R2V GeoAnycast

Communication starts from a single ITS roadside station and ends at an arbitrary ITS vehicle station within a geographical area.

#### 5.2.5 B4: R2V GeoBroadcast

Communication starts from a single ITS roadside station and ends at multiple ITS vehicle stations within a geographical area.

## 5.3 C: V2R scenarios

### 5.3.1 General

V2R scenarios cover communication starting from an ITS vehicle stations and ending at ITS roadside stations. For each scenario list below, both direct and indirect modes shall be supported.

### 5.3.2 C1: V2R point-to-point

Communication starts from a single ITS vehicle station and ends at a single ITS roadside station.

### 5.3.3 C2: V2R point-to-multipoint

Communication starts from a single ITS vehicle station and ends at one or multiple ITS roadside stations.

### 5.3.4 C2: V2R GeoAnycast

Communication starts from a single ITS vehicle station and ends at an arbitrary ITS roadside station within a geographical area.

### 5.3.5 C4: V2R GeoBroadcast

Communication starts from a single ITS vehicle station and ends at one or multiple ITS roadside stations within a geographical area.

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