

ETSI TS 102 871-2 V2.1.1 (2026-01)



TECHNICAL SPECIFICATION

**Intelligent Transport Systems (ITS);  
Testing;  
Conformance test specifications for GeoNetworking;  
Part 2: Test Suite Structure and Test Purposes (TSS & TP);  
Release 2**

---

**Reference**

RTS/ITS-00103

---

**Keywords**

ITS, network, testing, TSS&amp;TP

**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° w061004871

---

**Important notice**

The present document can be downloaded from the  
[ETSI Search & Browse Standards](#) application.

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format on [ETSI deliver](#) repository.

Users should be aware that the present document may be revised or have its status changed,  
this information is available in the [Milestones listing](#).

If you find errors in the present document, please send your comments to  
the relevant service listed under [Committee Support Staff](#).

If you find a security vulnerability in the present document, please report it through our  
[Coordinated Vulnerability Disclosure \(CVD\)](#) program.

---

**Notice of disclaimer & limitation of liability**

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

---

**Copyright Notification**

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2026.  
All rights reserved.

# Contents

Intellectual Property Rights .....	5
Foreword.....	5
Modal verbs terminology.....	5
1 Scope .....	6
2 References .....	6
2.1 Normative references .....	6
2.2 Informative references.....	6
3 Definition of terms, symbols and abbreviations.....	7
3.1 Terms.....	7
3.2 Symbols.....	7
3.3 Abbreviations .....	7
4 Test Configuration.....	9
4.1 Test Configuration Overview .....	9
4.2 Configuration 1: CF01.....	9
4.3 Configuration 2: CF02.....	10
4.4 Configuration 3: CF03.....	11
4.5 Configuration 4: CF04.....	12
4.6 Configuration 5: CF05.....	13
4.7 Configuration 6: CF06.....	14
4.8 Configuration 7: CF07.....	15
5 Test Suite Structure (TSS).....	16
5.1 Structure for GeoNetworking (GEONW) tests.....	16
5.2 Test groups .....	16
5.2.1 Root .....	16
5.2.2 Test group .....	16
5.2.3 Test sub-group .....	16
5.2.4 Categories .....	16
6 Test Purposes (TP) .....	17
6.1 Introduction .....	17
6.1.1 TP definition conventions.....	17
6.1.2 TP Identifier naming conventions.....	18
6.1.3 Rules for the behaviour description .....	18
6.1.4 Sources of TP definitions.....	18
6.1.5 Mnemonics for PICS reference.....	18
6.2 Test purposes for GEONW .....	19
6.2.1 Formatting and Data Validity .....	19
6.2.1.1 Basic Header .....	19
6.2.1.2 Common Header .....	20
6.2.1.3 Beacon.....	22
6.2.1.4 GeoUnicast.....	25
6.2.1.5 GeoBroadcast .....	25
6.2.1.6 GeoAnycast.....	26
6.2.1.7 Single-Hop Broadcast .....	26
6.2.1.8 Topologically Scoped Broadcast.....	28
6.2.2 Protocol Operation.....	29
6.2.2.1 Location table.....	29
6.2.2.2 Local Position Vector.....	36
6.2.2.3 Sequence Number .....	36
6.2.2.4 Location Service .....	38
6.2.2.5 Forwarding Packet Buffer .....	47
6.2.2.6 GeoNetworking Address .....	55
6.2.2.7 Beaconsing.....	56
6.2.2.8 GeoUnicast.....	57

6.2.2.8.1	All forwarding algorithms.....	57
6.2.2.8.2	Greedy forwarding.....	60
6.2.2.8.3	Contention-based forwarding .....	61
6.2.2.9	GeoBroadcast.....	65
6.2.2.9.1	Non-Area Forwarding .....	65
6.2.2.9.2	Area Forwarding.....	73
6.2.2.10	Topologically Scoped Broadcast.....	86
6.2.2.11	Single-Hop Broadcast .....	89
6.2.2.12	GeoAnycast.....	91
6.2.2.12.1	Non-Area Forwarding .....	91
6.2.2.12.2	Area Forwarding.....	99
6.2.3	Buffer Capacities .....	101
6.2.3.1	Location Service .....	101
6.2.3.2	Forwarding Packet Buffer .....	102
History .....		104

---

# Intellectual Property Rights

## Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the [ETSI IPR online database](#).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

## Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**, **LTE™** and **5G™** logo are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

---

# Foreword

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

The present document is part 2 of a multi-part deliverable covering Conformance test specifications for ITS GeoNetworking, as identified below:

Part 1: "Test requirements and Protocol Implementation Conformance Statement (PICS) pro forma";

**Part 2: "Test Suite Structure and Test Purposes (TSS & TP)";**

Part 3: "Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".

---

# Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

---

# 1 Scope

The present document provides the Test Suite Structure and Test Purposes (TSS & TP) for ITS GeoNetworking as defined in ETSI EN 302 636-4-1 [1] and ETSI TS 103 836-4-1 [5] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [i.4].

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [i.2] and ISO/IEC 9646-2 [i.3]) as well as the ETSI rules for conformance testing (ETSI ETS 300 406 [i.5]) are used as a basis for the test methodology.

---

## 2 References

### 2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found in the [ETSI docbox](#).

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

- [1] [ETSI EN 302 636-4-1 \(V1.4.1\)](#): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media-Independent Functionality".
- [2] [ETSI TS 102 636-4-2 \(V1.4.1\)](#): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 2: Media-dependent functionalities for ITS-G5".
- [3] [ETSI TS 102 636-4-3 \(V1.1.1\)](#): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 3: Media-dependent functionalities for LTE-V2X".
- [4] [ETSI TS 102 871-1 \(V2.1.1\)](#): "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking; Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) pro forma; Release 2".
- [5] [ETSI TS 103 836-4-1 \(V2.1.1\)](#): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media-Independent Functionality; Release 2".
- [6] [ETSI TS 103 836-4-2 \(V2.1.1\)](#): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 2: Media-dependent functionalities for ITS-G5; Release 2".
- [7] [ETSI TS 103 836-4-3 \(V2.1.1\)](#): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 3: Media-dependent functionalities for NR-V2X PC5 and LTE-V2X PC5; Release 2".

### 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents may be useful in implementing an ETSI deliverable or add to the reader's understanding, but are not required for conformance to the present document.

- [i.1] ETSI EG 202 798: "Intelligent Transport Systems (ITS); Testing; Framework for conformance and interoperability testing".
- [i.2] ISO/IEC 9646-1 (1994): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework - Part 1: General concepts".
- [i.3] ISO/IEC 9646-2 (1994): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 2: Abstract Test Suite specification".
- [i.4] ISO/IEC 9646-7 (1995): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".
- [i.5] ETSI ETS 300 406 (1995): "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

---

## 3 Definition of terms, symbols and abbreviations

### 3.1 Terms

For the purposes of the present document, the terms given in ETSI EN 302 636-4-1 [1], ISO/IEC 9646-1 [i.2], ISO/IEC 9646-7 [i.4] and the following apply:

**ItsNode:** node that implements GeoAdhoc router functionality by ETSI EN 302 636-4-1 [1]

**neighbour:** ItsNode is in direct (single-hop) communication range

**"to be in direction of X":** to be a valid candidate for a forwarding algorithm to forward the packet to the destination X

NOTE: This means that the candidate ItsNode is geographically closer to X than the IUT.

**to broadcast a packet:** to send a packet as a link-layer broadcast frame to all surrounding neighbours

**to forward a packet:** to send a packet as a link-layer unicast frame to the selected node

**to retransmit a packet:** to forward or broadcast a received packet

### 3.2 Symbols

Void.

### 3.3 Abbreviations

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




ATS	Abstract Test Suite
BAA	GeoBroadcast Advanced Algorithm
BAH	Basic Header
BC	BroadCast
BCA	GeoBroadcast CBF Algorithm
BEA	BEAcon
BI	Invalid test events for Behaviour tests
BO	Inopportune test events for Behaviour tests
BV	Valid test events for Behaviour tests

CAP	Buffer Capacities
CBF	Contention Based Forwarding
COH	Common Header
CTC	Compact Time Confidence
DCC	Decentralized Congestion Control
DEPV	Destination Position Vector
EN	European Norm
FDV	Formatting and Data Validity
FIFO	Firt In First Out
FPB	Forwarding Packet Buffer
FSR	Forwarder, Sender, local geoadhoc Router
GAC	Geographically-scoped AnyCast
GBC	Geographically-scoped BroadCast
GEONW	GEONetWorking
GNA	GeoNetworking Address
GUC	Geographically-scoped UniCast
HST	Header SubType
HT	Header Type
ID	Identity
ISO	International Organization for Standardization
ITS	Intelligent Transportation Systems
IUT	Implementation Under Test
LOS	LOcation Service
LOT	LOcation Table
LPV	Local Position Vector
LS	Location Service
LT	LifeTime
LTE	Long Term Evolution
MAC	Medium Access Control
MCO	Multi-Channel Operation
MHL	Maximum Hop Limit
MIB	Management Information Base
MID	MAC ID
NH	Next Header
PAI	Position Accuracy Indicator
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PL	Payload Length
PON	Protocol Operation
PV	Position Vector
RHL	Remaining Hop Limit
SAP	Service Access Point
SCF	Store Carry & Forward
SHB	Single Hop Broadcast
SN	Sequence Number
SOPV	Source Position Vector
SQN	Sequence Number
ST	Station Type
TH	Threshold
TI	Timer tests
TIC	Transmission Interval Control
TP	Test Purposes
TS	Test Suite
TSB	Topologically-Scoped Broadcast
TSS	Test Suite Structure
TST	TimeSTamp
UC	UniCast
V2X	Vehicle to any

## 4 Test Configuration

### 4.1 Test Configuration Overview

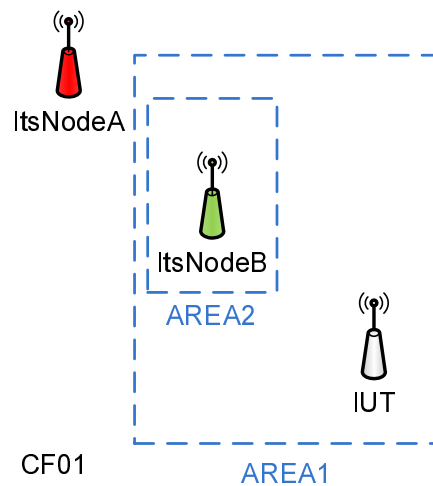
This clause introduces the test configurations that have been used for the definition of test purposes. The test configurations cover the various scenarios of the GeoNetworking tests. The test configurations show:

-  green ItsNode: ItsNode is in the communication range of the IUT.
-  red ItsNode: ItsNode is not in the communication range of the IUT.
-  dashed rectangle: definition of a specific geographical area (see note).

NOTE: A geographical area is defined in the GeoBroadcast or GeoAnycast packet by HST field of Common Header and GeoAreaPos Latitude, GeoAreaPos Longitude, DistanceA, DistanceB and Angle fields of the Extended Header.

Seven test configurations are defined below.

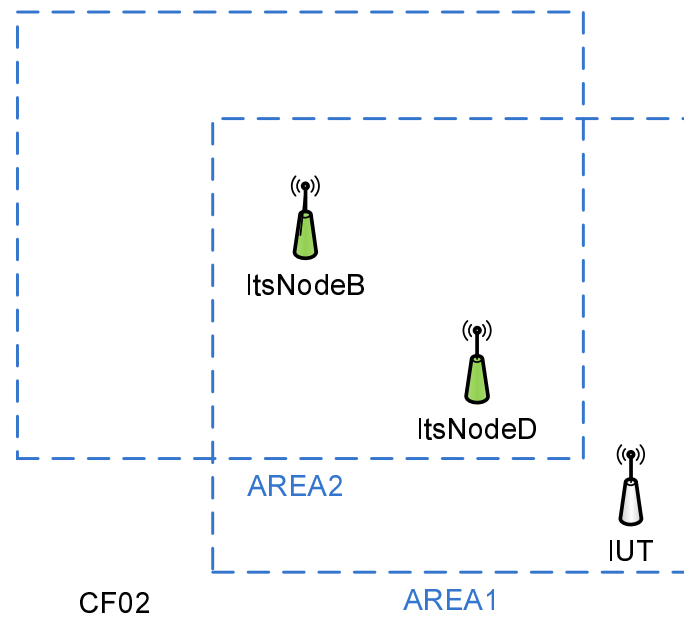
### 4.2 Configuration 1: CF01



ItsNodeA	is not in IUT's communication range
ItsNodeB	is in IUT's communication range is in direction of ItsNodeA is in AREA1 is in AREA2
IUT	is in AREA1

Figure 1: CF01

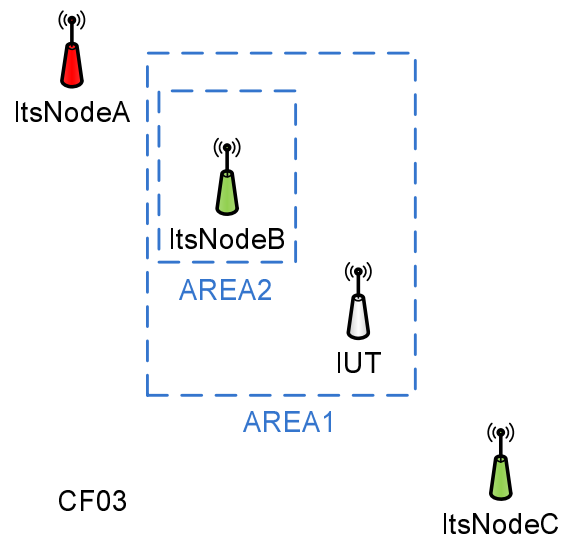
### 4.3 Configuration 2: CF02



ItsNodeB	<ul style="list-style-type: none"> <li>is in IUT's communication range</li> <li>is close to the centre of AREA2</li> <li>is in AREA1</li> <li>is in AREA2</li> </ul>
ItsNodeD	<ul style="list-style-type: none"> <li>is in IUT's communication range</li> <li>is in direction of ItsNodeB</li> <li>is in AREA1</li> <li>is in AREA2</li> </ul>
IUT	<ul style="list-style-type: none"> <li>is in AREA1</li> </ul>

**Figure 2: CF02**

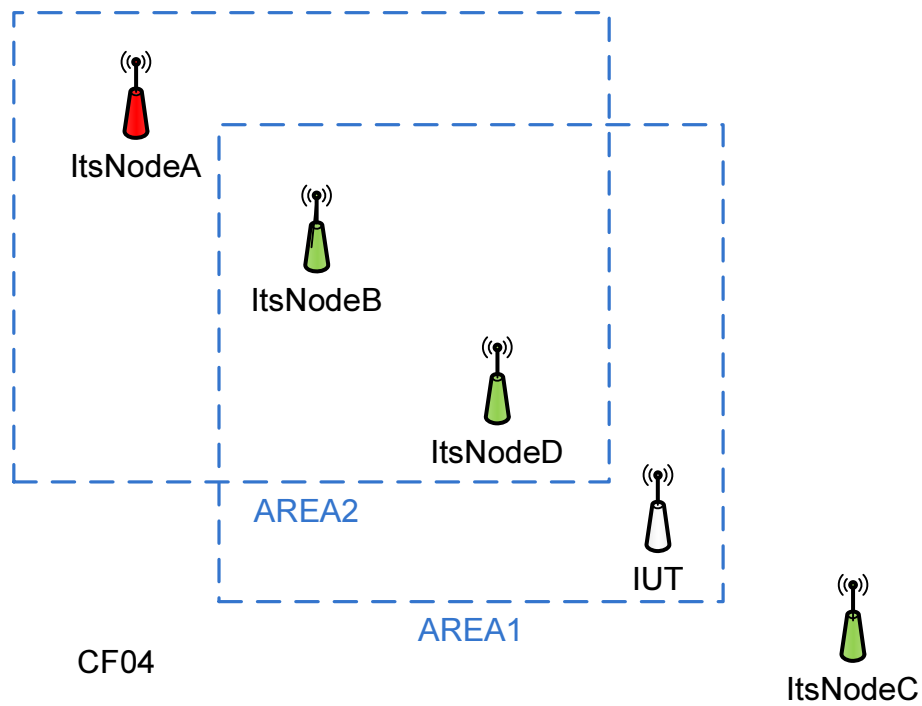
## 4.4 Configuration 3: CF03



ItsNodeA	is not in IUT's communication range
ItsNodeB	is in IUT's communication range is in direction of ItsNodeA is in AREA1 is in AREA2
ItsNodeC	is in IUT's communication range is not in direction of ItsNodeA
IUT	is in AREA1

**Figure 3: CF03**

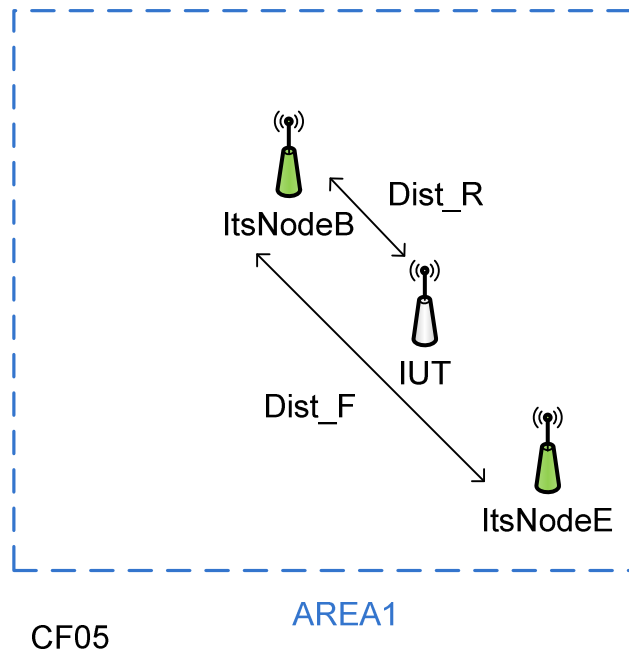
## 4.5 Configuration 4: CF04



ItsNodeA	is not in IUT's communication range
ItsNodeB	is in IUT's communication range is in direction of ItsNodeA is closer to ItsNodeA than ItsNodeD is in AREA1 is in AREA2. is close to the centre of AREA2
ItsNodeC	is in IUT's communication range is not in direction of ItsNodeA
ItsNodeD	is in IUT's communication range is in direction of ItsNodeA is in AREA1 is in AREA2
IUT	is in AREA1

Figure 4: CF04

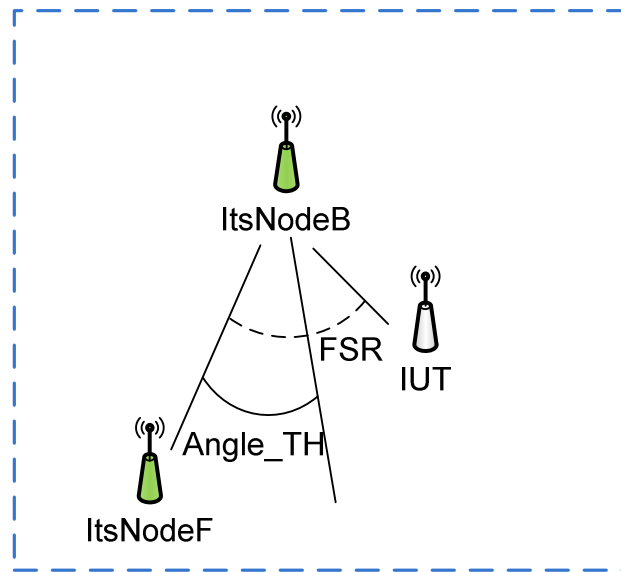
## 4.6 Configuration 5: CF05



ItsNodeB	is in IUT's communication range is in AREA1 is close to the centre of AREA1
ItsNodeE	is in IUT's communication range is in AREA1
IUT	is in AREA1 is closer to ItsNodeB than ItsNodeE ( $\text{Dist\_R} < \text{Dist\_F}$ ) Angle_FSR formed by ItsNodeE, ItsNodeB and IUT is less than Angle_TH

Figure 5: CF05

## 4.7 Configuration 6: CF06



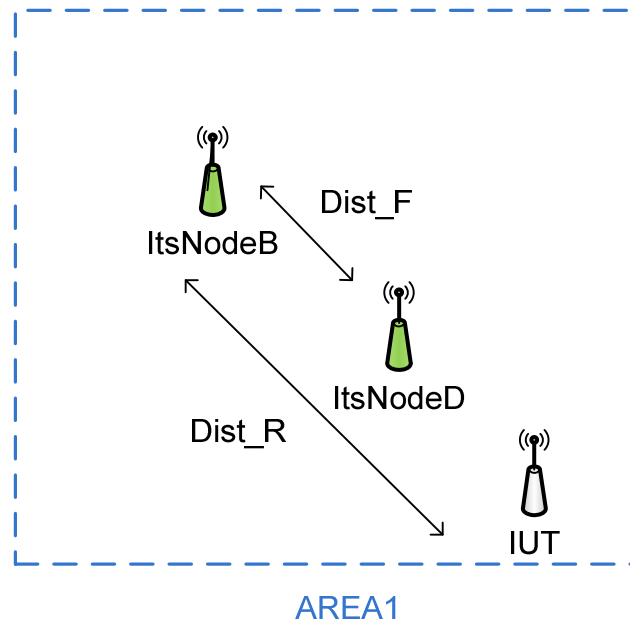
CF06

AREA1

ItsNodeB	is in IUT's communication range is in AREA1 is close to the centre of AREA1
ItsNodeF	is in IUT's communication range is in AREA1
IUT	is in AREA1 is closer to ItsNodeB than ItsNodeE ( $Dist_R < Dist_F$ ) Angle_FSR formed by ItsNodeF, ItsNodeB and IUT is greater than Angle_TH

Figure 6: CF06

## 4.8 Configuration 7: CF07



CF07

ItsNodeB	is in IUT's communication range is in AREA1 is close to the centre of AREA1
ItsNodeD	is in IUT's communication range is in AREA1 is closer to ItsNodeB than IUT ( $\text{Dist}_R > \text{Dist}_F$ ) Angle_FSR formed by ItsNodeD, ItsNodeB and IUT is less than Angle_TH
IUT	is in AREA1

Figure 7:CF07

## 5 Test Suite Structure (TSS)

### 5.1 Structure for GeoNetworking (GEONW) tests

Table 1 shows the GeoNetworking Test Suite Structure (TSS) including its subgroups defined for conformance testing.

**Table 1: TSS for GEONW**

Root	Group	Sub-group	Category
GEONW	Formatting and data validity	Basic Header	Valid and Invalid
		Common Header	Valid and Inopportune
		Beacon	Valid
		GeoUnicast	Valid
		GeoBroadcast	Valid
		GeoAnycast	Valid
		Single-Hop Broadcast	Valid
		Topologically Scoped Broadcast	Valid
	Protocol operation	Location Table	Valid
		Local Position Vector	Valid
		Sequence Number	Valid
		Location Service	Valid, Inopportune and Timer
		Forwarding Packet Buffer	Valid
		GeoNetworking Address	Valid
		Beacon	Valid and Timer
		GeoUnicast	Valid and Inopportune
		GeoBroadcast	Valid and Inopportune
		GeoAnycast	Valid behaviour
		Single-Hop Broadcast	Valid
		Topologically Scoped Broadcast	Valid and Inopportune
		GeoBroadcast CBF algorithm	Valid and Inopportune
		GeoBroadcast Advanced Algorithm	Valid and Inopportune
	Buffer Capacities	Location Service	Valid
		Forwarding Packet Buffer	Valid

The test suite is structured as a tree with the root defined as GEONW. The tree is of rank 3 with the first rank a Group, the second a sub-group and the third a category. The third rank is the standard ISO conformance test categories.

## 5.2 Test groups

### 5.2.1 Root

The root identifies the GeoNetworking protocol given in ETSI EN 302 636-4-1 [1] and ETSI TS 103 836-4-1 [5].

### 5.2.2 Test group

This level contains three major areas identified as: tests of formatting and data validity, tests of protocol operation, tests of buffer capacities.

### 5.2.3 Test sub-group

This level identifies the sub categories of each Group.

### 5.2.4 Categories

This level contains the standard ISO conformance test categories: behaviour for valid, invalid, inopportune events and timers.

## 6 Test Purposes (TP)

### 6.1 Introduction

#### 6.1.1 TP definition conventions

The TPs are defined by the rules shown in table 2.

**Table 2: TP definition rules**

<b>TP Header</b>	
TP ID	The TP ID is a unique identifier. It shall be specified according to the TP naming conventions defined in the above clause.
Test objective	Short description of test purpose objective according to the requirements from the base standard.
Reference	The reference indicates the sub-clauses of the reference standard specifications in which the conformance requirement is expressed.
Config Id	The Config Id references the GeoNetworking configuration selected for this TP.
PICS Selection	Reference to the PICS statement involved for selection of the TP. Contains a Boolean expression.
<b>TP Behaviour</b>	
Initial conditions	The initial conditions define in which initial state the IUT has to be to apply the actual TP. In the corresponding Test Case, when the execution of the initial condition does not succeed, it leads to the assignment of an Inconclusive verdict.
Expected behaviour (TP body)	Definition of the events, which are parts of the TP objective, and the IUT are expected to perform in order to conform to the base specification. In the corresponding Test Case, Pass or Fail verdicts can be assigned there.
Final conditions	Definition of the events that the IUT is expected to perform or shall not perform, according to the base standard and following the correct execution of the actions in the expected behaviour above. In the corresponding Test Case, the execution of the final conditions is evaluated for the assignment of the final verdict.

## 6.1.2 TP Identifier naming conventions

The identifier of the TP is built according to table 3.

**Table 3: TP naming convention**

Identifier:	TP/<root>/<gr>/<sgr>/<x>/<nn>		
	<root> = root	GEONW	
	<gr> = group	FDV	Formatting and Data Validity
		PON	Protocol Operation
		CAP	Buffer Capacities
	<sgr> =sub-group	BAH	Basic Header
		COH	Common Header
		BEA	Beacon
		GUC	GeoUnicast
		GBC	GeoBroadcast
		GAC	GeoAnycast
		SHB	Single-Hop Broadcast
		TSB	Topologically Scoped Broadcast
		LOT	Location Table
		LPV	Local Position Vector
		SQN	Sequence Number
		LOS	Location Service
		FPB	Forwarding Packet Buffer
		GNA	GeoNetworking Address
		LT/TIC	Transmission Interval Control
		BCA	GeoBroadcast CBF Algorithm
		BAA	GeoBroadcast Advanced Algorithm
	<x> = type of testing	BV	Behaviour tests to valid test events
		BI	Behaviour tests to invalid test events
		BO	Behaviour tests to inopportune test events
		TI	Timer tests
	<nn> = sequential number		01 to 99

## 6.1.3 Rules for the behaviour description

The description of the TP is built according to ETSI EG 202 798 [i.1].

In the TP the following wordings are used:

- "The IUT is **requested to send**": an upper layer requests the geonetworking layer to send a packet.
- "The IUT **generates**": for internal events generation, i.e. Beacon packets.
- "The IUT **receives**": for packets coming from the network and given by the lower layer.
- "The packet is **originated by** ItsNodeX": the source of the packet is ItsNodeX.
- "The packet is received **from** ItsNodeX": the sender of the packet is ItsNodeX.
- "The packet is **addressed to** ItsNodeX": the destination of the packet is ItsNodeX.

## 6.1.4 Sources of TP definitions

All TPs have been specified according to ETSI EN 302 636-4-1 [1] and ETSI TS 103 836-4-1 [5].

## 6.1.5 Mnemonics for PICS reference

The present document makes use of PICS mnemonics defined in ETSI TS 102 871-1 [4], table 1.

## 6.2 Test purposes for GEONW

### 6.2.1 Formatting and Data Validity

#### 6.2.1.1 Basic Header

<b>TP Id</b>	TP/GEONW/FDV/BAH/BV-01
<b>Test objective</b>	Check defined values of default Gn parameters in the basic header
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.2, 9.6.2 and Annex H ETSI TS 103 836-4-1 [5], clauses 9.6.2 and 10.3.2 and Annex H
<b>Config Id</b>	CF01
<b>PICS Selection</b>	
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GBC packet } then { the IUT sends a GBC packet containing a correctly formatted Basic Header containing version field set to itsGnProtocolVersion MIB parameter containing RHL field set to itsGnDefaultHopLimit MIB parameter } }	

<b>TP Id</b>	TP/GEONW/FDV/BAH/BI-02
<b>Test objective</b>	Check discard of packet having incorrect version
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.3 ETSI TS 103 836-4-1 [5], clause 10.3.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received a SHB packet from ItsNodeB containing a correctly formatted Basic Header containing version field set to value equal to itsGnProtocolVersion MIB parameter and the IUT having passed the received SHB packet to the Upper Layer} }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the SHB packet from ItsNodeB containing a correctly formatted Basic Header containing version field set to value not equal to itsGnProtocolVersion MIB parameter } then { the IUT discards the received SHB packet } }	

## 6.2.1.2 Common Header

<b>TP Id</b>	TP/GEONW/FDV/COH/BV-01
<b>Test objective</b>	Common GeoNetworking header validity test (PL field) - Beacon
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.7.2, 9.7.4, 9.8.6 and 10.3.6 ETSI TS 103 836-4-1 [5], clauses 9.7.2 and 10.3.6
<b>Config Id</b>	CF01
<b>PICS Selection</b>	
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT generates a Beacon packet } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '1' (BEACON) containing HST field set to '0' (UNSPECIFIED) containing PL field set to '0' } }	

<b>TP Id</b>	TP/GEONW/FDV/COH/BV-02
<b>Test objective</b>	Common GeoNetworking header validity test (PL field) - SHB
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.7.2, 9.7.4, 9.8.4, 10.3.4 and 10.3.10 ETSI TS 103 836-4-1 [5], clause 9.7.2, 10.3.4 and 10.3.10
<b>Config Id</b>	CF01
<b>PICS Selection</b>	
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a SHB packet } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '5' (TSB) containing HST field set to '0' (SINGLE_HOP) containing MHL field set to '1' containing PL field set to the length of the included payload containing a payload } }	

<b>TP Id</b>	TP/GEONW/FDV/COH/BV-03
<b>Test objective</b>	Check defined values of default Gn parameters in the common header
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.7.2, 9.8.5, 10.3.4 and Annex H ETSI TS 103 836-4-1 [5], clauses 9.7.2, 10.3.4 and Annex H
<b>Config Id</b>	CF01
<b>PICS Selection</b>	
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GBC packet } then { the IUT sends a GBC packet containing a correctly formatted Common Header containing Flags field indicating value equalling the itsGnIsMobile MIB parameter containing MHL field set to itsGnDefaultHopLimit MIB parameter } }	

<b>TP Id</b>	TP/GEONW/FDV/COH/BO-04
<b>Test objective</b>	Check that a received TSB packet is discarded if received with RHL > MHL
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.5 ETSI TS 103 836-4-1 [5], clause 10.5.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a TSB packet containing Basic Header containing RHL field indicating HL1 higher than MHL1 containing Common Header containing MHL field indicating MHL1 } then { the IUT discards the TSB packet } }	

## 6.2.1.3 Beacon

<b>TP Id</b>	TP/GEONW/FDV/BEA/BV-01
<b>Test objective</b>	Beacon header validity test
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.7.2, 9.8.6 and 10.3.6 ETSI TS 103 836-4-1 [5], clause 9.7.2, 9.8.6 and 10.3.6
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_BEACON_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT generates a Beacon packet } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '1' (BEACON) containing HST field set to '0' (UNSPECIFIED) containing NH field set to '0' (UNSPECIFIED) containing Extended Header containing SOPV indicating LPV of the IUT } }	

<b>TP Id</b>	TP/GEONW/FDV/BEA/BV-02
<b>Test objective</b>	GeoNetworking address validity test
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 6.3 and 9.8.6.2 ETSI TS 103 836-4-1 [5], clauses 6.3 and 9.8.6.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_BEACON_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT generates a Beacon packet } then { the IUT sends a GeoNetworking packet containing SOPV field containing GN_ADDR field containing ST field indicating the ITS Station type } }	
NOTE: Correct Source GeoNetworking address value== itsGnLocalGnAddr MIB parameter value.	

<b>TP Id</b>	TP/GEONW/FDV/BEA/BV-03
<b>Test objective</b>	Local Position Vector validity test, involving position comparison against sensor input data
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.5.2.2 and 9.8.6.2 ETSI TS 103 836-4-1 [5], clauses 9.5.2.2 and 9.8.6.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_BEACON_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT generates a Beacon packet } then { the IUT sends a GeoNetworking packet containing a correct SOPV field indicating the latest position of the IUT } }	

<b>TP Id</b>	TP/GEONW/FDV/BEA/BV-04
<b>Test objective</b>	Local Position Vector validity test, involving timestamp comparison against sensor input data
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.5.2.2 and 9.8.6.2 ETSI TS 103 836-4-1 [5], clause 9.5.2.2 and 9.8.6.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_BEACON_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT generates a Beacon packet } then { the IUT sends a GeoNetworking packet containing a correct SOPV field indicating the timestamp value corresponding to the sensor acquisition time of position data } }	

<b>TP Id</b>	TP/GEONW/FDV/BEA/BV-05
<b>Test objective</b>	GeoNetworking address validity test for ITS-G5 media dependent functionality
<b>Reference</b>	ETSI TS 102 636-4-2 [2], clause 6.1 ETSI TS 103 836-4-2 [6], clause 6.1
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_BEACON_SRC AND PICS_GN_IF_TYPE == 1 (ITS-G5)
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT generates a Beacon packet } then { the IUT sends a GeoNetworking packet containing SOPV field containing GN_ADDR field containing MID field indicating the the 48-bit MAC address of the ITS-G5 } }	

<b>TP Id</b>	TP/GEONW/FDV/BEA/BV-06
<b>Test objective</b>	GeoNetworking address validity test for LTE C-V2X media dependent functionality
<b>Reference</b>	ETSI TS 102 636-4-3 [3], clause 5.2 ETSI TS 103 836-4-3 [7], clause 5.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_BEACON_SRC AND PICS_GN_IF_TYPE == 2 (LTE C-V2X)
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT generates a Beacon packet } then { the IUT sends a GeoNetworking packet containing SOPV field containing GN_ADDR field containing MID field indicating the Source or Destination Layer 2 ID in octets 2-4 and indicating 0 in octets 5-7 } }	

## 6.2.1.4 GeoUnicast

<b>TP Id</b>	TP/GEONW/FDV/GUC/BV-01
<b>Test objective</b>	GUC header validity
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.7.2, 9.7.4, 9.8.2.2 and 10.3.8 ETSI TS 103 836-4-1 [5], clauses 9.7.2, 9.7.4, 9.8.2.2 and 10.3.8
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GUC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GUC packet to ItsNodeB } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '2' (GEOUNICAST) containing HST field set to '0' (UNSPECIFIED) containing GUC Extended Header containing DEPV field indicating position of the ItsNodeB containing SOPV field indicating position of the IUT } }	

## 6.2.1.5 GeoBroadcast

<b>TP Id</b>	TP/GEONW/FDV/GBC/BV-01
<b>Test objective</b>	GBC header validity
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.7.2, 9.7.4, 9.8.5.2 and 10.3.11 ETSI TS 103 836-4-1 [5], clauses 9.7.2, 9.7.4, 9.8.5.2 and 10.3.11
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GBC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from the ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GBC packet } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '4' (GEOBROADCAST) containing GBC Extended Header containing SOPV field indicating position of the IUT } }	

## 6.2.1.6 GeoAnycast

<b>TP Id</b>	TP/GEONW/FDV/GAC/BV-01
<b>Test objective</b>	GAC header validity
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.7.2, 9.7.4, 9.8.5.2 and 10.3.12 ETSI TS 103 836-4-1 [5], clauses 9.7.2, 9.7.4, 9.8.5.2 and 10.3.12
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GAC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from the ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GeoAnycast packet } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '3' (GEOANYCAST) containing GeoAnycast Extended Header containing SOPV field indicating position of IUT } }	

## 6.2.1.7 Single-Hop Broadcast

<b>TP Id</b>	TP/GEONW/FDV/SHB/BV-01
<b>Test objective</b>	SHB header validity
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.7.2, 9.7.4, 10.3.4, 9.8.4.2 and 10.3.10 ETSI TS 103 836-4-1 [5], clauses 9.7.2, 9.7.4, 10.3.4, 9.8.4.2 and 10.3.10
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_SHB_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from the ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a SHB packet } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '5' (TSB) containing HST field set to '0' (SINGLE_HOP) containing MHL field set to '1' containing Extended Header containing SOPV indicating LPV of the IUT } }	

<b>TP Id</b>	TP/GEONW/FDV/SHB/BV-02
<b>Test objective</b>	SHB header validity for ITS G5 media dependent functionality
<b>Reference</b>	ETSI TS 102 636-4-2 [2], clauses 5.3.3 and 5.3.4 ETSI TS 103 836-4-2 [6], clauses 5.3, 5.4 and 7.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_SHB_SRC AND PICS_DCC AND PICS_GN_IF_TYPE=1(ITS-G5)
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from the ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a SHB packet } then { the IUT sends a GeoNetworking packet containing Extended Header containing DCC-MCO containing CBR_L_0_Hop and containing CBR_L_1_Hop and containing Transmit Power } }	

<b>TP Id</b>	TP/GEONW/FDV/SHB/BV-03
<b>Test objective</b>	SHB header validity for LTE C-V2X media dependent functionality
<b>Reference</b>	ETSI TS 102 636-4-3 [3], clauses 5.3.3 and 5.3.4 ETSI TS 103 836-4-3 [7], clauses 5.3.3 and 5.3.4
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_SHB_SRC AND PICS_GN_IF_TYPE == 2 (LTE C-V2X) AND PICS_GN_LTE_TIME_SYNCH
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from the ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a SHB packet } then { the IUT sends a GeoNetworking packet containing Extended Header containing Media Dependent Data containing version indicating 1 (Time synchronization is supported) and containing Compact Time Confidence (CTC) } }	

## 6.2.1.8 Topologically Scoped Broadcast

<b>TP Id</b>	TP/GEONW/FDV/TSB/BV-01
<b>Test objective</b>	TSB header validity
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 9.7.2, 9.7.4, 9.8.3.2 and 10.3.9 ETSI TS 103 836-4-1 [5], clauses 9.7.2, 9.7.4, 9.8.3.2 and 10.3.9
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_TSB_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from the ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a TSB packet } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '5' (TSB) containing HST field set to '1' (MULTI_HOP) containing TSB Extended Header containing SOPV field indicating position of the IUT } }	

## 6.2.2 Protocol Operation

### 6.2.2.1 Location table

<b>TP Id</b>	TP/GEONW/PON/LOT/BV-01
<b>Test objective</b>	Check insertion of new entries into location table from Beacon header
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.10.3, 10.3.6.2 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 10.3.10.3, 10.3.6.2 and 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GUC_SRC AND PICS_GN_BEACON_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from the ItsNodeB and the lifetime of the ItsNodeB Location Table entry not being expired }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GUC packet to ItsNodeB } then { the IUT does not send a GeoNetworking packet containing a LS_REQUEST containing Request field containing GN_ADDR containing M_ID indicating ItsNodeB the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '2' (GEOUNICAST) containing GUC Extended Header containing DEPV field indicating same position as the SOPV value of the Beacon information received from ItsNodeB } }	

<b>TP Id</b>	TP/GEONW/PON/LOT/BV-02
<b>Test objective</b>	Check insertion of new entries into location table from LS Reply data
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.7.1.4, 10.3.7.1.2 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 10.3.7.1.4, 10.3.7.1.2 and 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC AND PICS_GN_LS_REP_DST
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT having been requested to send a first GUC packet to ItsNodeA and   the IUT having sent a LS_REQUEST packet     containing Request field       containing GN_ADDR       containing M_ID       indicating ItsNodeA     containing the other bits       indicating value 0   the IUT having received a LS_REPLY packet from ItsNodeA     containing SOPV field and   the IUT having sent the GUC packet to ItsNodeA and   the lifetime of the ItsNodeA Location Table entry not being expired } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT is requested to send a second GUC packet to ItsNodeA   }   then {     the IUT does not send a GeoNetworking packet       containing a LS_REQUEST         containing Request field           containing GN_ADDR           containing M_ID           indicating ItsNodeA     the IUT sends a GeoNetworking packet       containing a correctly formatted Common Header         containing HT field           set to '2' (GEOUNICAST)       containing GUC Extended Header         containing DEPV field           indicating same position as the SOPV value of the LS_REPLY packet received from ItsNodeA     } } </pre>	

<b>TP Id</b>	TP/GEONW/PON/LOT/BV-03-X
<b>Test objective</b>	Check insertion of new entries into location table from extended header processing (e.g. GUC header)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.8.4, 10.3.12.3, 10.3.11.3, 10.3.9.3, 10.3.10.3, 10.3.7.3 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 10.3.8.4, 10.3.12.3, 10.3.11.3, 10.3.9.3, 10.3.10.3, 10.3.7.3 and 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	<b>SELECTION</b>
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT not having received any beacon from <b>NODE</b> the IUT having received a <b>MESSAGE</b> originated by <b>NODE</b> }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GUC packet to <b>NODE</b> } then { the IUT does not send a GeoNetworking packet containing a LS_REQUEST Extended Header containing Request field containing GN_ADDR containing M_ID indicating <b>NODE</b> the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '2' (GEOUNICAST) containing GUC Extended Header containing DEPV field indicating same position as the SOPV of the <b>MESSAGE</b> received from <b>NODE</b> } }	

<b>Variants</b>			
<b>#</b>	<b>MESSAGE</b>	<b>NODE</b>	<b>SELECTION</b>
01	Beacon packet	ItsNodeB	PICS_GN_BEACON_DST
02	GUC packet	ItsNodeA	PICS_GN_GUC_DST
03	GAC packet	ItsNodeA	PICS_GN_GAC_DST
04	GBC packet	ItsNodeA	PICS_GN_GBC_DST
05	TSB packet	ItsNodeA	PICS_GN_TSB_DST
06	SHB packet	ItsNodeB	PICS_GN_SHB_DST
07	LS Request packet	ItsNodeA	PICS_GN_LS_REQ_DST
08	LS Reply packet	ItsNodeA	PICS_GN_LS_REP_DST

<b>TP Id</b>	TP/GEONW/PON/LOT/BV-04
<b>Test objective</b>	Check location table entry expiration
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.1.3, 10.3.8.2, 10.3.7.1.2 and Annex H ETSI TS 103 836-4-1 [5], clauses 8.2.3, 10.3.8.2, 10.3.7.1.2 and Annex H
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT not having received beacons from ItsNodeB for the duration of itsGnLifetimeLocTE parameter }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GUC packet to ItsNodeB } then { the IUT sends a GeoNetworking packet containing a LS_REQUEST containing Request field containing GN_ADDR containing M_ID indicating ItsNodeB containing the other bits indicating value 0 } }	

<b>TP Id</b>	TP/GEONW/PON/LOT/BV-05-X
<b>Test objective</b>	Check update of entries in location table with most up-to-date position data extracted from common header processing (including timestamp comparison before updating)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.8.4, 10.3.12.3, 10.3.11.3, 10.3.9.3, 10.3.10.3, 10.3.7.3, 10.3.8.2 and C.2 ETSI TS 103 836-4-1 [5], clauses 10.3.8.4, 10.3.12.3, 10.3.11.3, 10.3.9.3, 10.3.10.3, 10.3.7.3, 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	<b>SELECTION</b>
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received a <b>MESSAGE</b> from ItsNodeB containing Extended Header containing SOPV field indicating an older timestamp than the last Beacon packet and indicating a different position than the position of the last Beacon packet }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GUC packet to ItsNodeB } then { the IUT does not send a GeoNetworking packet containing a LS_REQUEST Extended Header containing Request field containing GN_ADDR containing M_ID indicating ItsNodeB the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '2' (GEOUNICAST) containing GUC Extended Header containing DEPV field indicating same position as the SOPV value of the Beacon information received } }	

<b>Variants</b>		
<b>#</b>	<b>MESSAGE</b>	<b>SELECTION</b>
01	GUC packet	PICS_GN_GUC_DST
02	GAC packet	PICS_GN_GAC_DST
03	GBC packet	PICS_GN_GBC_DST
04	TSB packet	PICS_GN_TSB_DST
05	SHB packet	PICS_GN_SHB_DST
06	LS Request packet	PICS_GN_LS_REQ_DST
07	LS Reply packet	PICS_GN_LS_REP_DST

<b>TP Id</b>	TP/GEONW/PON/LOT/BV-06
<b>Test objective</b>	Check update of entries in location table with most up-to-date MCC-MCO data extracted from SHB extended header processing
<b>Reference</b>	ETSI TS 102 636-4-2 [2], clauses 6.2.2 ETSI TS 103 836-4-2 [6], clause 6.3.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_SHB_DST AND PICS_DCC_NET AND PICS_GN_IF_TYPE == 1 (ITS-G5)
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT having received Beacon information from ItsNodeB and   the IUT having received a <b>MESSAGE</b> from ItsNodeB     containing a correctly formatted Common Header       containing HT field         set to '0' (SINGLE_HOP)     containing Extended Header       containing SOPV field         indicating an older timestamp than the last Beacon packet and         indicating a different position than the position of the last Beacon packet       and containing MCC-MCO field } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT is requested to send a SHB packet to ItsNodeB   }   then {     the IUT does not send a GeoNetworking packet       containing a LS_REQUEST Extended Header         containing Request field           containing GN_ADDR           containing M_ID           indicating ItsNodeB     the IUT sends a GeoNetworking packet       containing a correctly formatted Common Header         containing HT field           set to '0' (SINGLE_HOP)       containing Extended Header         containing SOPV field           indicating same position as the SOPV value of the <b>MESSAGE</b> received         and containing MCC-MCO field           indicating same value as the MCC-MCO value of the <b>MESSAGE</b> received   } } </pre>	

<b>TP Id</b>	TP/GEONW/PON/LOT/BV-07
<b>Test objective</b>	Check update of entries in location table with value 0 for MCC-MCO when the IUT does not support DCC-NET
<b>Reference</b>	ETSI TS 102 636-4-2 [2], clauses 6.2.2 ETSI TS 103 836-4-2 [6], clause 6.3.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_SHB_DST AND NOT PICS_DCC_NET AND PICS_GN_IF_TYPE == 1 (ITS-G5)
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT having received Beacon information from ItsNodeB and   the IUT having received a <b>MESSAGE</b> from ItsNodeB     containing a correctly formatted Common Header       containing HT field         set to '0' (SINGLE_HOP)     containing Extended Header       containing SOPV field         indicating an older timestamp than the last Beacon packet and         indicating a different position than the position of the last Beacon packet       and containing MCC-MCO field } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT is requested to send a SHB packet to ItsNodeB   }   then {     the IUT does not send a GeoNetworking packet       containing a LS_REQUEST Extended Header         containing Request field           containing GN_ADDR           containing M_ID           indicating ItsNodeB     the IUT sends a GeoNetworking packet       containing a correctly formatted Common Header         containing HT field           set to '0' (SINGLE_HOP)       containing Extended Header         containing SOPV field           indicating same position as the SOPV value of the <b>MESSAGE</b> received         and containing MCC-MCO field           containing CBR_L_0_Hop             indicating value 0           and containing CBR_L_1_Hop             indicating value 0           and containing Transmit Power             indicating value 0   } } </pre>	

## 6.2.2.2 Local Position Vector

<b>TP Id</b>	TP/GEONW/PON/LPV/BV-01
<b>Test objective</b>	Check update of the Local position vector
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.2.3, 10.2.2.2, 10.3.6.1 and Annex H ETSI TS 103 836-4-1 [5], clauses 8.3.3, 10.2.2.2, 10.3.6.1 and Annex H
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_BEACON_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having changed its position }	
<b>Expected behaviour</b>	
ensure that { when { the IUT generates eventually a Beacon packet } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '1' (BEACON) containing HST field set to '0' (UNSPECIFIED) containing extended header containing SOPV field indicating the new position } }	

## 6.2.2.3 Sequence Number

<b>TP Id</b>	TP/GEONW/PON/SQN/BV-01
<b>Test objective</b>	Check initial sequence number assignment
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.3.2 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 8.4.2 and 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GBC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT not having sent any GBC and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GBC packet to AREA1 } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '4' (GEOBROADCAST)  containing GBC Extended Header containing SN field indicating value '0' } }	

<b>TP Id</b>	TP/GEONW/PON/SQN/BV-02
<b>Test objective</b>	Check the local sequence number incrementation
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.3.2 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 8.4.2 and 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GBC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having sent a GBC packet to AREA1 containing the Sequence Number field indicating value SN1 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GBC packet to AREA1 } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '4' (GEOBROADCAST) containing GBC Extended Header containing SN field indicating value SN1 + 1 } }	

## 6.2.2.4 Location Service

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-01
<b>Test objective</b>	Check first LS invocation for unknown Destination nodes
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.8.2, 10.2.4, 6.3 and 10.3.7.1.2 ETSI TS 103 836-4-1 [5], clauses 10.3.8.2, 10.2.4, 6.3 and 10.3.7.1.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GUC packet to ItsNodeA } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '6' (LS) containing HST field set to '0' (LS_REQUEST) containing NH field set to '0' (UNSPECIFIED) containing LS_REQUEST Extended Header containing Request field containing GN_ADDR containing M_ID indicating ItsNodeA containing the other bits indicating value 0 } }	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-02
<b>Test objective</b>	Check absence of LS invocation for unknown Destination nodes when LS procedure is already active
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.8.2, 10.2.4 and 10.3.7.1.2 ETSI TS 103 836-4-1 [5], clauses 10.3.8.2, 10.2.4 and 10.3.7.1.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having been requested to send a first GUC packet to ItsNodeA and the IUT having sent a GeoNetworking packet containing a LS_REQUEST containing Request field containing GN_ADDR containing M_ID indicating ItsNodeA containing the other bits indicating value 0 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a new GUC packet to ItsNodeA } then { the IUT does not send a second LS_REQUEST packet (see note) } }	
NOTE: At least not before the LS_REQUEST retransmission timer expires.	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-03
<b>Test objective</b>	Check packet buffering into LS buffer during Location service procedure, including handling of LT fields in the LT packet buffer
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.4.3, 10.3.7.1.4, 10.3.7.1.2,9.3.8.2 and 10.2.4 ETSI TS 103 836-4-1 [5], clauses 8.5.3, 10.3.7.1.4, 10.3.7.1.2,9.3.8.2 and 10.2.4
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC AND PICS_GN_LS_REP_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having been requested to send a GUC packet to ItsNodeA containing TrafficClass.SCF set to 1 and the IUT having sent a LS_REQUEST packet }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the LS_REPLY packet from ItsNodeA } then { the IUT sends the GUC packet addressed to ItsNodeA containing GUC Extended Header containing LT field indicating value (default LT value - WaitingTime (see note)) } }	
NOTE: WaitingTime == time difference between LS_REQUEST sending and LS_REPLY reception.	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-04
<b>Test objective</b>	Check LS buffer characteristics: FIFO type
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.4.3, 10.2.4, 10.3.7.1.2 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 8.5.3, 10.2.4, 10.3.7.1.2 and 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC AND PICS_GN_LS_REP_DST
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT having no Location Table Entry for ItsNodeA and   the IUT having been requested to send a GUC packet to ItsNodeA     containing TrafficClass.SCF set to 1     containing LT field       indicating value LT1     containing payload field       indicating value PL1 and   the IUT having sent a LS_REQUEST packet and   the IUT having been requested to send a second GUC packet to ItsNodeA     containing TrafficClass.SCF set to 1     containing LT field       indicating LT2     containing payload field       indicating value PL2 } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT receives the LS_REPLY packet from ItsNodeA and     before expiry of LT1 and LT2   }   then {     the IUT sends GUC packet addressed to ItsNodeA       containing payload field         indicating value PL1 and     the IUT sends GUC packet addressed to ItsNodeA       containing payload field         indicating value PL2   } } </pre>	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-05
<b>Test objective</b>	Check LS buffer characteristics: discarding upon LT expiration
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.4.3, 10.2.4, 10.3.7.1.2 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 8.5.3, 10.2.4, 10.3.7.1.2 and 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT having no Location Table Entry for ItsNodeA and   the IUT having been requested to send multiple GUC packets to ItsNodeA     containing TrafficClass.SCF set to 1     containing LT field       indicating values LTx and   the IUT having sent a LS_REQUEST packet } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT receives the LS_REPLY packet from ItsNodeA after expiry of LTs   }   then {     the IUT does not send any packet to ItsNodeA   } } </pre>	

<b>TP Id</b>	TP/GEONW/PON/LOS/TI-06
<b>Test objective</b>	Check LS Request retransmission if no answer is received
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.7.1.2, 10.3.7.1.3 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 10.3.7.1.2, 10.3.7.1.3 and 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_RETRANSMISSION
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having been requested to send a GUC packet to ItsNodeA containing TrafficClass.SCF set to 1 containing LT field indicating value LT1 higher than itsGnLocationServiceRetransmitTimer and the IUT having sent a LS_REQUEST packet }	
<b>Expected behaviour</b>	
ensure that { when { the IUT does not receive LS_REPLY packet from ItsNodeA and before expiration of LT1 } then { the IUT retransmits the LS_REQUEST packet upon expiry of itsGnLocationServiceRetransmitTimer } }	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-07
<b>Test objective</b>	Check LS Request retransmission if no answer is received
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.7.1.2, 10.3.7.1.3, 10.3.8.2 and Annex H ETSI TS 103 836-4-1 [5], clauses 10.3.7.1.2, 10.3.7.1.3, 10.3.8.2 and Annex H
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_RETRANSMISSION
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having been requested to send a GUC packet to ItsNodeA containing TrafficClass.SCF set to 1 containing LT field indicating value LT1 higher than (itsGnLocationServiceTimer * itsGnLocationServiceMaxRetrans) and the IUT having sent a LS_REQUEST packet }	
<b>Expected behaviour</b>	
ensure that { when { the IUT does not receive LS_REPLY packet from ItsNodeA before expiration of LT1 } then { the IUT retransmits the LS_REQUEST packet itsGnLocationServiceMaxRetrans times } }	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-08
<b>Test objective</b>	Check LS Reply generation by destination node
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.7.3 and 10.3.5 ETSI TS 103 836-4-1 [5], clauses 10.3.7.3 and 10.3.5
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a LS_REQUEST packet containing Request field indicating the IUT's GN_ADDR } then { the IUT replies with a LS_REPLY packet containing Common Header containing NH field set to '0' (UNSPECIFIED) containing LS_REPLY Extended Header containing DEPV field indicating same position as the SOPV value of the received LS_REQUEST } }	

<b>TP Id</b>	TP/GEONW/PON/LOS/BO-09
<b>Test objective</b>	Check absence of LS Reply generation for already answered LS Request packets
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.7.3 and 10.3.5 ETSI TS 103 836-4-1 [5], clauses 10.3.7.3 and 10.3.5
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_LS_REQ_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received a LS_REQUEST packet generated by ItsNodeB from ItsNodeB the IUT having sent a LS_REPLY packet to ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same LS_REQUEST packet from ItsNodeD } then { the IUT does not reply with a LS_REPLY packet } }	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-10
<b>Test objective</b>	Check LS Request forwarding
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.7.2 and 10.3.8.3 ETSI TS 103 836-4-1 [5], clauses 10.3.7.2 and 10.3.8.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_LS_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a LS_REQUEST packet from ItsNodeC containing Basic Header containing RHL field indicating value greater than 1 containing LS_REQUEST Extended Header containing Request field containing GN_ADDR containing M_ID indicating value differing from the M_ID part of the GN_ADDR of the IUT' } then { the IUT re-broadcasts the received LS_REQUEST packet containing Basic Header containing RHL field indicating value decreased by 1 } }	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-11
<b>Test objective</b>	Check LS Reply forwarding
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.7.2 and 10.3.8.3 ETSI TS 103 836-4-1 [5], clauses 10.3.7.2 and 10.3.8.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_LS_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a LS_REPLY packet from ItsNodeC addressed to ItsNodeB containing Basic Header containing RHL field indicating value greater than 1 } then { the IUT forwards the received LS_REPLY packet to ItsNodeB containing Basic Header containing RHL field indicating value decreased by 1 } }	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-12
<b>Test objective</b>	Check flushing of the LS buffer, initiated by the processing of a common header from the target destination
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.8.4, 10.3.7.1.2 and 8.4.3 ETSI TS 103 836-4-1 [5], clauses 8.5.3, 10.3.8.4, 10.3.7.1.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having been requested to send a GUC packet ItsNodeA containing LT field indicating LT1 and the IUT having sent a LS_REQUEST packet }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to it from ItsNodeA before expiry of LT1 } then { the IUT sends the waiting GUC packet to ItsNodeA } }	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-13
<b>Test objective</b>	Check LS buffer characteristics: FIFO type and Lifetime
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.4.3 and 10.3.7.1.2 ETSI TS 103 836-4-1 [5], clauses 8.5.3 and 10.3.7.1.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having been requested to send a GUC packet to ItsNodeA containing TrafficClass.SCF set to 1 containing LT field indicating value LT1 containing payload field indicating value PL1 and the IUT having sent a LS_REQUEST packet and the IUT having been requested to send a second GUC packet to ItsNodeA containing TrafficClass.SCF set to 1 containing LT field indicating LT2 lower than LT1 containing payload field indicating value PL2 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the LS_REPLY packet from ItsNodeA after expiry of LT2 before expiry of LT1 } then { the IUT sends GUC packet addressed to ItsNodeA containing payload field indicating value PL1 } }	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-14
<b>Test objective</b>	Check that GeoNetworking packets in LS buffer are discarded when LS does not complete
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 8.4.3 ETSI TS 103 836-4-1 [5], clause 8.5.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having been requested to send a GUC packet to ItsNodeA containing TrafficClass.SCF set to 1 containing LT field indicating value LT1 higher than (itsGnLocationServiceTimer * itsGnLocationServiceMaxRetrans) and the IUT having sent a LS_REQUEST packet itsGnLocationServiceMaxRetrans times }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet from ItsNodeA before expiry of LT1 } then { the IUT does not send any packet to ItsNodeA (see note) } }	
NOTE: Stored GUC packets have been discarded upon LS failure.	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-15
<b>Test objective</b>	Check flushing of the LS buffer, initiated by the processing of a common header from the target destination
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.8.3, 10.3.7.1.2 and 8.4.2 ETSI TS 103 836-4-1 [5], clauses 8.5.2, 10.3.8.3 and 10.3.7.1.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having been requested to send a GUC packet ItsNodeA containing LT field indicating LT1 and the IUT having sent a LS_REQUEST packet }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to ItsNodeB from ItsNodeA before expiry of LT1 } then { the IUT sends the waiting GUC packet to ItsNodeA } }	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-16
<b>Test objective</b>	Check LS Request retransmission termination when indirect response is received
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.8.4, 10.3.7.1.2, 10.3.7.1.3 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 10.3.8.4, 10.3.7.1.2, 10.3.7.1.3 and 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having been requested to send a GUC packet to ItsNodeA containing TrafficClass.SCF set to 1 containing LT field indicating value LT1 higher than (itsGnLocationServiceTimer * itsGnLocationServiceMaxRetrans) and the IUT having sent a LS_REQUEST packet the IUT having retransmitted the LS_REQUEST packet less than itsGnLocationServiceMaxRetrans }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to it from ItsNodeA before expiry of LT1 } then { the IUT does not retransmit the LS_REQUEST packet } }	
NOTE: IUT instead transmits the buffered GUC.	

<b>TP Id</b>	TP/GEONW/PON/LOS/BV-17
<b>Test objective</b>	Check LS Request retransmission termination when indirect response is received
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.8.3, 10.3.7.1.2, 10.3.7.1.3 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 10.3.8.3, 10.3.7.1.2, 10.3.7.1.3 and 10.3.8.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having been requested to send a GUC packet to ItsNodeA containing TrafficClass.SCF set to 1 containing LT field indicating value LT1 higher than (itsGnLocationServiceTimer * itsGnLocationServiceMaxRetrans) and the IUT having sent a LS_REQUEST packet the IUT having retransmitted the LS_REQUEST packet less than itsGnLocationServiceMaxRetrans }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to ItsNodeB from ItsNodeA before expiry of LT1 } then { the IUT does not retransmit the LS_REQUEST packet } }	
NOTE: IUT instead transmits the buffered GUC.	

## 6.2.2.5 Forwarding Packet Buffer

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-01
<b>Test objective</b>	Check Source packet buffering into UC forwarding buffer for unreachable Unicast destinations (absence of a suitable next hop candidate)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.5.3, 10.3.6.3, 10.3.8.2 and 10.3.8.3 ETSI TS 103 836-4-1 [5], clauses 8.6.3, 10.3.6.3, 10.3.8.2 and 10.3.8.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT not having received any Beacon information from ItsNodeB and the IUT having a Location Table Entry for ItsNodeA (see note) and the IUT having been requested to send a GUC packet addressed to ItsNodeA containing TrafficClass.SCF set to 1 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a Beacon packet from ItsNodeB } then { the IUT selects the ItsNodeB as the next hop and the IUT sends the buffered GUC packet } }	
NOTE: Location Table Entry is created by sending any GeoNetworking packet, originated by ItsNodeA, from ItsNodeC to IUT.	

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-02
<b>Test objective</b>	Check Forwarder packet buffering into UC forwarding buffer for unreachable Unicast destinations (absence of a suitable next hop candidate)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.8.3, 8.5.3 and 10.3.6.3 ETSI TS 103 836-4-1 [5], clauses 10.3.8.3, 8.5.3 and 10.3.6.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_SRC
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT not having received any Beacon information from ItsNodeB and   the IUT having received GUC packets addressed to ItsNodeA from ItsNodeC   containing TrafficClass.SCF set to 1   containing Basic Header     containing LT field       indicating LT1     containing RHL field       indicating value greater than 1   containing GUC Extended Header     containing SN field       indicating value SN1 } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT receives a Beacon packet from ItsNodeB   }   then {     the IUT selects the ItsNodeB as the next hop and     the IUT forwards the buffered GUC packet       containing Basic Header         containing RHL field           indicating value decreased by 1       containing GUC extended header         containing SN field           indicating value SN1   } } </pre>	

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-03
<b>Test objective</b>	Check UC forwarding buffer characteristics: FIFO type
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.5.3, 10.3.6.3 and 10.3.8.3 ETSI TS 103 836-4-1 [5], clauses 8.6.3, 10.3.6.3 and 10.3.8.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_SRC
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT not having received any Beacon information from ItsNodeB and   the IUT having received a GUC (GEOUNI1) packet addressed to ItsNodeA from ItsNodeC     containing TrafficClass.SCF set to 1     containing Basic Header       containing LT field         indicating value LT1 and       containing RHL field         indicating value greater than 1     containing GUC Extended Header       containing SN field         indicating value SN1   the IUT having received a second GUC (GEOUNI2) packet addressed to ItsNodeA from ItsNodeC     containing TrafficClass.SCF set to 1     containing Basic Header       containing LT field         indicating LT2       containing RHL field         indicating value greater than 1     containing GUC Extended Header       containing SN field         indicating value SN2 } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT receives a Beacon packet from ItsNodeB     before expiry of LT1 and LT2   }   then {     the IUT selects ItsNodeB as the next hop and     the IUT forwards the GEOUNI1 buffered packet       containing GUC Extended Header         containing SN field           indicating value SN1     the IUT forwards the GEOUNI2 buffered packet       containing GUC Extended Header         containing SN field           indicating value SN2   } } </pre>	

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-04
<b>Test objective</b>	Check UC forwarding buffer characteristics: discarding upon LT expiration
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.5.3, 10.3.6.3 and 10.3.8.3 ETSI TS 103 836-4-1 [5], clauses 8.6.3, 10.3.6.3 and 10.3.8.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT not having received any Beacon information from ItsNodeB and the IUT having received a GUC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing LT field indicating LT1 containing RHL field indicating value greater than 1 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a Beacon packet from ItsNodeB after expiry of LT1 } then { the IUT does not forward the buffered GUC packet addressed to ItsNodeA } }	

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-06
<b>Test objective</b>	Check Source packet buffering into BC forwarding buffer for no GBC recipients
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.5, 8.5.3, 10.3.6.3 and 10.3.11.2 ETSI TS 103 836-4-1 [5], clauses 10.3.5, 8.5.3, 10.3.6.3 and 10.3.11.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT not having received Beacon information from ItsNodeD and the IUT not having received Beacon information from ItsNodeB and the IUT having been requested to send a GBC packet to AREA1 containing TrafficClass.SCF set to 1 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a Beacon packet from either ItsNodeB or ItsNodeD } then { the IUT broadcasts the buffered GBC packet } }	

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-07
<b>Test objective</b>	Check BC forwarding buffer characteristics: FIFO type
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.5.3, 10.3.6.3 and 10.3.11.2 ETSI TS 103 836-4-1 [5], clauses 8.6.3, 10.3.6.3 and 10.3.11.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_SRC
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT not having received Beacon information from ItsNodeD and   the IUT not having received Beacon information from ItsNodeB and   the IUT having been requested to send a GBC (GBC1) packet to AREA1     containing TrafficClass.SCF set to 1     containing Basic Header       containing LT field       indicating LT1     containing GBC Extended Header       containing SN field       indicating value SN1   the IUT having been requested to send a GBC (GBC2) packet to AREA1     containing TrafficClass.SCF set to 1     containing Basic Header       containing LT field       indicating LT2     containing TSB Extended Header       containing SN field       indicating value SN2 } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT receives a Beacon packet from either ItsNodeD or ItsNodeB     before expiry of LT1 and LT2   }   then {     the IUT broadcasts GBC1 packet       containing GBC Extended Header       containing SN field       indicating value SN1     the IUT broadcasts GBC2 packet       containing GBC Extended Header       containing SN field       indicating value SN2   } } </pre>	

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-08
<b>Test objective</b>	Check BC forwarding buffer characteristics: discarding upon LT expiration
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.5.3, 10.3.6.3 and 10.3.11.2 ETSI TS 103 836-4-1 [5], clauses 8.6.3, 10.3.6.3 and 10.3.11.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT not having received Beacon information from ItsNodeD and the IUT not having received Beacon information from ItsNodeB and the IUT having been requested to send a GBC (GBC1) packet to AREA1 containing TrafficClass.SCF set to 1 containing Basic Header containing LT field indicating LT1 the IUT having been requested to send a GBC (GBC2) packet to AREA1 containing TrafficClass.SCF set to 1 containing Basic Header containing LT field indicating LT2 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a Beacon packet from either ItsNodeB or ItsNodeD after expiry of LT1 and LT2 } then { the IUT does not broadcast any of the buffered GBC1 and GBC2 } }	

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-09
<b>Test objective</b>	Check Source packet buffering into UC forwarding buffer for handling of LT fields in absence of a suitable next hop candidate
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.5.3, 10.3.6.3 and 10.3.8.2 ETSI TS 103 836-4-1 [5], clauses 8.6.3, 10.3.6.3 and 10.3.8.2
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT not having received any Beacon information from ItsNodeB and the IUT having a Location Table Entry for ItsNodeA and the IUT having been requested to send a GUC packet addressed to ItsNodeA containing TrafficClass.SCF set to 1 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a Beacon packet from ItsNodeB } then { the IUT selects the ItsNodeB as the next hop and the IUT sends the buffered GUC packet containing GUC Extended Header containing LT field indicating (default LT value - WaitingTime (see note)) } }	
NOTE: WaitingTime == time difference between Upper layer packet generation and the neighbour Beacon reception.	

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-10
<b>Test objective</b>	Check Source packet buffering into BC forwarding buffer for handling of LT fields for no recipients
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 8.5.3, 10.3.6.3 and 10.3.11.2 ETSI TS 103 836-4-1 [5], clauses 8.6.3, 10.3.6.3 and 10.3.11.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT not having received Beacon information from ItsNodeD and the IUT not having received Beacon information from ItsNodeB and the IUT having been requested to send a GBC packet to AREA1 containing TrafficClass.SCF set to 1 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a Beacon packet from either ItsNodeB or ItsNodeD } then { the IUT broadcasts the buffered GBC packet containing GBC Extended Header containing LT field indicating (default LT value - WaitingTime (see note)) } }	
NOTE: WaitingTime == time difference between Upper layer packet generation and the Beacon reception.	

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-11-X
<b>Test objective</b>	Check immediate broadcasting in absence of a suitable next hop candidate when SCF is disabled - Source operation
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause D.2 ETSI TS 103 836-4-1 [5], clause D.2
<b>Config Id</b>	CF03
<b>PICS Selection</b>	<b>SELECTION</b>
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT not having received any Beacon information from ItsNodeB and the IUT having a Location Table Entry for ItsNodeA (see note) }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a <b>MESSAGE</b> containing TrafficClass.SCF set to 0 } then { the IUT broadcast the <b>MESSAGE</b> immediately } }	
NOTE: Location Table Entry is created by sending any GeoNetworking packet, originated by ItsNodeA, from ItsNodeC to IUT.	

Variants		
#	MESSAGE	SELECTION
01	GUC packet addressed to ItsNodeA	PICS_GN_GUC_SRC
02	GAC packet containing DestinationArea indicating AREA2	PICS_GN_GAC_SRC
03	GBC packet containing DestinationArea indicating AREA2	PICS_GN_GBC_SRC
04	TSB packet	PICS_GN_TSB_SRC
05	SHB packet	PICS_GN_SHB_SRC

<b>TP Id</b>	TP/GEONW/PON/FPB/BV-12-X
<b>Test objective</b>	Check immediate broadcasting in absence of a suitable next hop candidate when SCF is disabled - Forwarder operation
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause D.2 ETSI TS 103 836-4-1 [5], clause D.2
<b>Config Id</b>	CF03
<b>PICS Selection</b>	<b>SELECTION</b>
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT not having received any Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a <b>MESSAGE</b> containing TrafficClass.SCF set to 0 } then { the IUT broadcast the <b>MESSAGE</b> immediately } }	

Variants		
#	MESSAGE	SELECTION
01	GUC packet addressed to ItsNodeA	PICS_GN_GUC_SRC
02	GAC packet containing DestinationArea indicating AREA2	PICS_GN_GAC_SRC
03	GBC packet containing DestinationArea indicating AREA2	PICS_GN_GBC_SRC
04	TSB packet	PICS_GN_TSB_SRC

## 6.2.2.6 GeoNetworking Address

<b>TP Id</b>	TP/GEONW/PON/GNA/BV-01
<b>Test objective</b>	Check the initial GeoNetworking address assignment by IUT with auto-address configuration
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.2.1.2 and 10.3.6.2 ETSI TS 103 836-4-1 [5], clauses 10.2.1.2 and 10.3.6.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_ADDR_AUTO
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT's itsGnLocalAddrConfMethod MIB parameter is set to AUTO (0) }	
<b>Expected behaviour</b>	
ensure that { when { the IUT generates a Beacon packet } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '1' (BEACON) containing HST field set to '0' (UNSPECIFIED) containing Beacon Extended Header containing SOPV field containing GN_ADDR field indicating itsGnLocalGnAddr MIB parameter } }	

<b>TP Id</b>	TP/GEONW/PON/GNA/BV-02
<b>Test objective</b>	Check the proper functioning of duplicate address detection mechanism
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.2.1.5 ETSI TS 103 836-4-1 [5], clause 10.2.1.5
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_DAD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having sent a SHB packet }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a SHB packet from ItsNodeB containing SHB Extended Header containing SOPV field containing GN_ADDR field indicating same GN_ADDR as the GN_ADDR field in the last SHB packet originated by the IUT } then { the IUT sends subsequent SHBpacket containing SHBExtended Header containing SOPV field containing GN_ADDR field indicating different GN_ADDR as the previous used GN_ADDR } }	

## 6.2.2.7 Beaconing

<b>TP Id</b>	TP/GEONW/PON/BEA/TI-01
<b>Test objective</b>	Check that the IUT transmits Beacons at prescribed periodicity in the absence of other originated packets
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.6.2 ETSI TS 103 836-4-1 [5], clause 10.3.6.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_BEACON_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT generates Beacon packets } then { the IUT sends each Beacon packet after expiry of itsGnBeaconServiceRetransmitTimer and before expiry of itsGnBeaconServiceRetransmitTimer + itsGnBeaconServiceMaxJitter } }	

<b>TP Id</b>	TP/GEONW/PON/BEA/BV-02
<b>Test objective</b>	Check that the IUT resets its timer for next Beacon transmission when originating other packets
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.2.3 and 10.3.10.2 ETSI TS 103 836-4-1 [5], clauses 10.2.3 and 10.3.10.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_BEACON_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a SHB packet } then { the IUT broadcasts a SHB packet and the IUT sends the next Beacon packet after expiry of itsGnBeaconServiceRetransmitTimer and before expiry of itsGnBeaconServiceRetransmitTimer + itsGnBeaconServiceMaxJitter } }	

## 6.2.2.8 GeoUnicast

## 6.2.2.8.1 All forwarding algorithms

<b>TP Id</b>	TP/GEONW/PON/GUC/ALL/BV-03
<b>Test objective</b>	Check that the protocol header fields (RHL, PV) are correctly updated at each forwarding step
<b>Config Id</b>	CF03
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.3 ETSI TS 103 836-4-1 [5], clause 10.3.8.3
<b>PICS Selection</b>	PICS_GN_GUC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the IUT having received a GUC packet (GEOUNI1) originated by ItsNodeA }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet (GEOUNI2) addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 containing Common Header containing MHL field indicating value MHL1 containing GUC Extended Header containing DEPV field indicating position different from the SOPV value of GEOUNI1 containing TST field indicating older value than the TimeStamp value of GEOUNI1 } then { the IUT retransmits GEOUNI2 containing Basic Header containing RHL field indicating value decreased by 1 from the incoming value containing Common Header containing MHL field indicating value MHL1 containing GUC Extended Header containing DEPV field indicating same position as the SOPV value of GEOUNI1 } }	

<b>TP Id</b>	TP/GEONW/PON/GUC/ALL/BO-04
<b>Test objective</b>	Check that the RHL restriction is correctly handled at a forwarding step
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.3 ETSI TS 103 836-4-1 [5], clause 10.3.8.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating 1 } then { the IUT does not retransmit the GUC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GUC/ALL/BV-05
<b>Test objective</b>	Check that a received GUC packet is passed over the Gn SAP to the correct upper protocol if the Destination address matches the IUT address
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.4 ETSI TS 103 836-4-1 [5], clause 10.3.8.4
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GUC_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to it } then { the IUT passes the received GUC packet to the correct Upper Layer } }	

<b>TP Id</b>	TP/GEONW/PON/GUC/ALL/BV-06
<b>Test objective</b>	Check that a received GUC packet is not passed over the Gn SAP if the Destination address does not match the IUT address
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.4 ETSI TS 103 836-4-1 [5], clause 10.3.8.4
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GUC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to ItsNodeB from ItsNodeC } then { the IUT does not pass the received GUC packet to any Upper Layer } }	

<b>TP Id</b>	TP/GEONW/PON/GUC/ALL/BO-08
<b>Test objective</b>	Check that a received GUC packet is not passed over the Gn SAP to the correct upper protocol when the Destination address matches the IUT address if received twice or more
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.9.3 ETSI TS 103 836-4-1 [5], clause 10.3.9.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeC and the IUT having received Beacon information from ItsNodeB and the IUT having received a GUC packet addressed to IUT from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same GUC packet from ItsNodeB containing Basic Header containing RHL field indicating HL1 - 1 } then { the IUT does not pass the received GUC packet to any Upper Layer } }	

## 6.2.2.8.2 Greedy forwarding

<b>TP Id</b>	TP/GEONW/PON/GUC/GRD/BV-01
<b>Test objective</b>	Check that a GUC request over upper Gn SAP triggers the origination of a GUC packet
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.2 and clause E.2 ETSI TS 103 836-4-1 [5], clause 10.3.8.2 and clause E.2
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GUC_SRC AND (PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'GREEDY' OR PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GUC packet to ItsNodeB } then { the IUT sends a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '2' (GEOUNICAST) containing GUC Extended Header containing DEPV field indicating same position as the SOPV value of the received Beacon information } }	

<b>TP Id</b>	TP/GEONW/PON/GUC/GRD/BV-02
<b>Test objective</b>	Check that a received GUC packet is routed to the correct next hop neighbour according to the greedy forwarding rules
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.3 and clause E.2 ETSI TS 103 836-4-1 [5], clause 10.3.8.2 and clause E.2
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GUC_FWD AND (PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'GREEDY' OR PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 } then { the IUT selects ItsNodeB as the next hop and the IUT forwards the GUC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GUC/GRD/BO-07
<b>Test objective</b>	Check that a received GUC packet is not triggering forwarding if received twice or more
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.9.3 and clause E.2 ETSI TS 103 836-4-1 [5], clause 10.3.9.2 and clause E.2
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_FWD AND (PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'GREEDY' OR PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeC and the IUT having received Beacon information from ItsNodeB and the IUT having received a GUC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 and the IUT having forwarded the GUC packet }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same GUC packet from ItsNodeB containing Basic Header containing RHL field indicating HL1 - 1 } then { the IUT does not forward the packet } }	

#### 6.2.2.8.3 Contention-based forwarding

<b>TP Id</b>	TP/GEONW/PON/GUC/CBF/BV-01
<b>Test objective</b>	Check that a GUC request over upper Gn SAP triggers the origination of a GUC packet
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.8.2, 10.3.6.3 and clause E.3 ETSI TS 103 836-4-1 [5], clauses 10.3.8.2, 10.3.6.3 and clause E.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_SRC AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GUC packet to ItsNodeB } then { the IUT broadcasts a GeoNetworking packet containing a correctly formatted Common Header containing HT field set to '2' (GEOUNICAST) containing GUC Extended Header containing DEPV field indicating same position as the SOPV value of the received Beacon information } }	

<b>TP Id</b>	TP/GEONW/PON/GUC/CBF/BV-02
<b>Test objective</b>	Check that a received GUC packet is forwarded at the correct time according to the contention based forwarding rules
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.8.3 and clause E.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the distance between IUT and ItsNodeA being less than itsGnDefaultMaxCommunicationRange MIB attribute }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 } then { the IUT re-broadcasts the received GUC packet upon expiry of calculated CBF delay (see note) } }	
NOTE: The CBF delay timer value is calculated from the itsGnDefaultMaxCommunicationRange, itsGnCbfMinTime, and itsGnCbfMaxTime MIB attributes, and the distance value between IUT and ItsNodeC.	

<b>TP Id</b>	TP/GEONW/PON/GUC/CBF/BV-07
<b>Test objective</b>	Check that GUC packet forwarding correctly avoids packet duplication according to the contention based forwarding rules
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.8.3 and clause E.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the distance between IUT and ItsNodeA being less than the itsGnDefaultMaxCommunicationRange MIB attribute and the IUT having received a GUC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 and the IUT having started a CBF timer for this packet (see note) }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same GUC packet from ItsNodeB before expiration of the CBF timer } then { the IUT does not re-broadcast the GUC packet } }	
NOTE: The CBF delay timer value is calculated from the itsGnDefaultMaxCommunicationRange, itsGnCbfMinTime, and itsGnCbfMaxTime MIB attributes, and the distance value between IUT and ItsNodeC.	

<b>TP Id</b>	TP/GEONW/PON/GUC/CBF/BV-20
<b>Test objective</b>	Check that a received GUC packet forwarding is correctly handling the minimum delay value according to the contention based forwarding rules
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.8.3 and clause E.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the distance between IUT and ItsNodeC being larger than the itsGnDefaultMaxCommunicationRange MIB attribute }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 } then { the IUT re-broadcasts the received GUC packet upon expiry of itsGnCbfMinTime delay } }	

<b>TP Id</b>	TP/GEONW/PON/GUC/CBF/BV-21
<b>Test objective</b>	Check that a received GUC packet is forwarded at the correct time according to the contention based forwarding rules when the sender is unknown
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.8.3 and clause E.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GUC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the IUT not having received any message from ItsNodeD and the distance between IUT and ItsNodeA being less than itsGnDefaultMaxCommunicationRange MIB attribute }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to ItsNodeA generated by ItsNodeC from ItsNodeD containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 } then { the IUT re-broadcasts the received GUC packet upon expiry of CBF_MAX } }	

<b>TP Id</b>	TP/GEONW/PON/GUC/CBF/BV-22
<b>Test objective</b>	Check that a received GUC packet is forwarded at the correct time according to the contention based forwarding rules when the sender is known sender with an uncertain position (PAI = 0)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.8.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.8.3 and clause E.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GUC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT having received Beacon information from ItsNodeB and   the IUT having received Beacon information from ItsNodeD     containing Beacon ExtendedHeader       containing SOPV field         containing PAI           set to '0' } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT receives a GUC packet addressed to ItsNodeA generated by ItsNodeC from ItsNodeD       containing TrafficClass.SCF set to 1       containing Basic Header         containing RHL field           indicating value greater than 1     }   then {     the IUT re-broadcasts the GUC packet       upon expiry of CBF_MAX     } } </pre>	

## 6.2.2.9 GeoBroadcast

## 6.2.2.9.1 Non-Area Forwarding

## 6.2.2.9.1.1 All forwarding algorithms

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/ALL/BV-03
<b>Test objective</b>	Check that the protocol header fields (RHL) are correctly updated during a GBC forwarding step
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GBC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value HL1 higher than 1 containing Common Header containing MHL field indicating value MHL1 containing DestinationArea indicating AREA2 } then { the IUT retransmits the GBC packet containing Basic Header containing RHL field indicating value (HL1 - 1) containing Common Header containing MHL field indicating value MHL1 containing DestinationArea indicating AREA2 } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/ALL/BV-04
<b>Test objective</b>	Check that the RHL restriction is correctly handled at a GBC forwarding step
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GBC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating 1 containing GBC Extended Header containing DestinationArea indicating AREA2 } then { the IUT does not retransmit the GBC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/ALL/BV-06
<b>Test objective</b>	Check that a received GBC packet is not passed over the Gn SAP if it is received for the first time outside the GBC destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GBC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA2 } then { the IUT does not pass the received GBC packet to any Upper Layer } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/ALL/BO-09
<b>Test objective</b>	Check that a received GBC packet is discarded when indicating a too big GeoArea
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause B.3 ETSI TS 103 836-4-1 [5], clause B.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet from ItsNodeC containing TrafficClass.SCF set to 1 containing DestinationArea indicating a geoArea bigger than itsGnMaxGeoAreaSize } then { the IUT does not retransmit the received GBC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/ALL/BO-10
<b>Test objective</b>	Check that a received GBC packet from inside the destination area is discarded if received for the first time from a known sender when IUT is outside the destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], Annex D ETSI TS 103 836-4-1 [5], Annex D
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the IUT having received Beacon information from ItsNodeD }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet from ItsNodeD containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA2 } then { the IUT discards the received GBC packet } }	

## 6.2.2.9.1.2 Greedy forwarding

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/GRD/BV-01
<b>Test objective</b>	Check that GBC request over upper Gn SAP triggers line forwarding if the IUT is outside the Destination Area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.2 and clause E.2 ETSI TS 103 836-4-1 [5], clause 10.3.11.2 and clause E.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_SRC AND (PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'GREEDY' OR PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GBC packet containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA2 } then { the IUT selects ItsNodeB as the next hop and the IUT sends the GBC packet (see note) } }	
NOTE: Next hop ITS Station being identified by the MAC layer address of ItsNodeB.	

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/GRD/BV-02
<b>Test objective</b>	Check that a received GBC packet is triggering line forwarding if received out of its destination area for the first time from a known ITS-Station
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 and clause E.2 ETSI TS 103 836-4-1 [5], clause 10.3.11.3 and clause E.2
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND (PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'GREEDY' OR PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet generated by ItsNodeC containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA2 } then { the IUT selects ItsNodeB as the next hop and the IUT forwards the GBC packet (see note) } }	
NOTE: Next hop ITS Station being identified by the MAC layer address of ItsNodeB.	

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/GRD/BO-07
<b>Test objective</b>	Check that a received GBC packet is not triggering line forwarding if received out of its destination area twice or more
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND (PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'GREEDY' OR PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT having received Beacon information from ItsNodeB and   the IUT having received Beacon information from ItsNodeD   the IUT having received a GBC packet from ItsNodeC     containing TrafficClass.SCF set to 1     containing Basic Header       containing RHL field         indicating value HL1 higher than 1     containing GBC Extended Header       containing SN field         indicating value SN1     containing DestinationArea       indicating AREA2   the IUT having forwarded the received GBC packet } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT receives the same GBC packet from ItsNodeD       containing Basic Header         containing RHL field           indicating value lower than HL1       containing GBC Extended Header         containing SN field           indicating value SN1     }   then {     the IUT does not forward the received GBC packet   } } </pre>	

## 6.2.2.9.1.3 Contention-based forwarding

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/CBF/BV-01
<b>Test objective</b>	Check that a GBC request over upper Gn SAP triggers broadcasting of a GBC packet if the IUT is outside the Destination Area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.2 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.2 and clause E.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_SRC AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GBC packet containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA2 } then { the IUT broadcasts immediately the GBC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/CBF/BV-02
<b>Test objective</b>	Check that a received GBC packet is forwarded at the correct time according to the contention based forwarding rules
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3 and clause E.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the distance between IUT and ItsNodeA being less than itsGnDefaultMaxCommunicationRange MIB attribute }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 } then { the IUT re-broadcasts the received GBC packet upon expiry of calculated CBF delay (see note) } }	
<b>NOTE:</b>	The CBF delay timer value is calculated from the itsGnDefaultMaxCommunicationRange, itsGnGeoCbfMinTime, and itsGnGeoCbfMaxTime MIB attributes, and the distance value between IUT and ItsNodeC.

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/CBF/BV-07
<b>Test objective</b>	Check that GBC packet forwarding correctly avoids packet duplication according to the contention based forwarding rules
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3 and clause E.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the distance between IUT and ItsNodeA being less than the itsGnDefaultMaxCommunicationRange MIB attribute and the IUT having received a GBC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 and the IUT having started a CBF timer for this packet (see note) }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same GBC packet from ItsNodeB before expiration of the CBF timer } then { the IUT does not re-broadcast the GBC packet } }	
NOTE: The CBF delay timer value is calculated from the itsGnDefaultMaxCommunicationRange, itsGnGeoCbfMinTime, and itsGnGeoCbfMaxTime MIB attributes, and the distance value between IUT and ItsNodeC.	

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/CBF/BV-20
<b>Test objective</b>	Check that a received GBC packet forwarding is correctly handling the minimum delay value according to the contention based forwarding rules
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3 and clause E.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the distance between IUT and ItsNodeC being larger than the itsGnDefaultMaxCommunicationRange MIB attribute }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 } then { the IUT re-broadcasts the received GBC packet upon expiry of itsGnGeoCbfMinTime delay } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/CBF/BV-21
<b>Test objective</b>	Check that a received GBC packet is forwarded at the correct time according to the contention based forwarding rules if received for the first time when IUT is outside of the destination area from an unknown sender
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause E.3 ETSI TS 103 836-4-1 [5], clause E.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT not having received any message from ItsNodeD }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet generated by ItsNodeC from ItsNodeD containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA2 } then { the IUT re-broadcasts the GBC packet upon expiry of CBF_MAX } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/NONAREA/CBF/BV-22
<b>Test objective</b>	Check that a received GBC packet is forwarded at the correct time according to the contention based forwarding rules if received for the first time when IUT is outside of the destination area from a known sender having an uncertain position (PAI = 0)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause E.3 ETSI TS 103 836-4-1 [5], clause E.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD containing Beacon ExtendedHeader containing SOPV field containing PAI set to '0' }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet generated by ItsNodeC from ItsNodeD containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA2 } then { the IUT re-broadcasts the GBC packet upon expiry of CBF_MAX } }	

## 6.2.2.9.2 Area Forwarding

## 6.2.2.9.2.1 All forwarding algorithms

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ALL/BV-01
<b>Test objective</b>	Check that a GBC request over upper Gn SAP triggers broadcasting of a GBC packet if the IUT is within the Destination Area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.2 ETSI TS 103 836-4-1 [5], clause 10.3.11.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GBC packet containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA1 } then { the IUT broadcasts immediately the GBC packet containing DestinationArea indicating AREA1 } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ALL/BV-03
<b>Test objective</b>	Check that the protocol header fields (RHL) are correctly updated during a GBC retransmission inside area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value HL1 higher than 1 containing Common Header containing MHL field indicating value MHL1 containing DestinationArea indicating AREA1 } then { the IUT retransmits the GBC packet containing Basic Header containing RHL field indicating value (HL1 -1) containing Common Header containing MHL field indicating value MHL1 } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ALL/BV-04
<b>Test objective</b>	Check that the RHL restriction is correctly handled at a GBC re-broadcasting step
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating 1 containing GBC Extended Header containing DestinationArea indicating AREA1 } then { the IUT does not retransmit the GBC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ALL/BV-05
<b>Test objective</b>	Check that a received GBC packet is passed over the Gn SAP to the correct upper protocol if it is received for the first time within the GBC destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GBC_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA1 } then { the IUT passes the received GBC packet to the correct Upper Layer } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ALL/BO-08
<b>Test objective</b>	Check that a received GBC packet is not passed over the Gn SAP if it is received twice or more
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 ETSI TS 103 836-4-1 [5], clause 10.3.11.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_DST
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT having received Beacon information from ItsNodeD and   the IUT having received Beacon information from ItsNodeB and   the IUT having received a GBC packet from ItsNodeB     containing TrafficClass.SCF set to 1     containing Basic Header       containing RHL field         indicating HL1     containing GBC Extended Header       containing SN field         indicating value SN1     containing DestinationArea       indicating AREA1 and   the IUT having passed the received GBC packet to the correct Upper Layer } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT receives the same GBC packet from ItsNodeD       containing Basic Header         containing RHL field           indicating value lower than HL1       containing GBC Extended Header         containing SN field           indicating value SN1     }   then {     the IUT does not pass the received GBC packet to any Upper Layer   } } </pre>	

## 6.2.2.9.2.2 Simple forwarding

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/SMP/BV-02
<b>Test objective</b>	Check that a received GBC packet is triggering immediately re-broadcasting if received for the first time within its destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 and clause E.2 ETSI TS 103 836-4-1 [5], clause 10.3.11.3 and clause E.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND (PICS_GN_AREA_FORWARDING_ALGORITHM == 'SIMPLE' OR PICS_GN_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA1 } then { the IUT re-broadcasts immediately the GBC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/SMP/BO-07
<b>Test objective</b>	Check that a received GBC packet is not triggering re-broadcasting if received twice or more (duplicate packet detection)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.11.3 and clause A.2 ETSI TS 103 836-4-1 [5], clause 10.3.11.3 and clause A.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND (PICS_GN_AREA_FORWARDING_ALGORITHM == 'SIMPLE' OR PICS_GN_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT having received Beacon information from ItsNodeD and   the IUT having received Beacon information from ItsNodeB and   the IUT having received a GBC packet from ItsNodeB   containing TrafficClass.SCF set to 1   containing Basic Header   containing RHL field   indicating value HL1 higher than 1   containing GBC Extended Header   containing SN field   indicating value SN1   containing DestinationArea   indicating AREA1 and   the IUT having re-broadcast the GBC packet } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT receives the same GBC packet from ItsNodeD     containing Basic Header     containing RHL field     indicating value lower than HL1     containing GBC Extended Header     containing SN field     indicating value SN1   }   then {     the IUT does not re-broadcast the GBC packet   } } </pre>	

## 6.2.2.9.2.3 Contention-based forwarding

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/CBF/BV-02
<b>Test objective</b>	Check that a received GBC packet is triggering contention if received for the first time from a known sender when inside of the destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause E.3 ETSI TS 103 836-4-1 [5], clause E.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND PICS_GN_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet from ItsNodeC containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA1 } then { the IUT saves the GBC packet into the CBF buffer and the IUT starts the contention timer and the IUT re-broadcasts the received GBC packet upon expiry of the contention timer } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/CBF/BV-07
<b>Test objective</b>	Check that a received GBC packet is discarded if received twice or more
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause E.3 ETSI TS 103 836-4-1 [5], clause E.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND PICS_GN_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD the IUT having received a GBC packet from ItsNodeC containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA1 the IUT having saved the packet into CBF buffer }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same GBC packet from ItsNodeD } then { the IUT removes the GBC packet from the CBF buffer the IUT discards the new received GBC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/CBF/BV-21
<b>Test objective</b>	Check that a received GBC packet is triggering contention if received for the first time when IUT is inside of the destination area from an unknown sender
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause E.3 ETSI TS 103 836-4-1 [5], clause E.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND PICS_GN_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT is using the CBF algorithm the IUT having received Beacon information from ItsNodeB and the IUT not having received any message from ItsNodeD }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet generated by ItsNodeC from ItsNodeD containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA1 } then { the IUT saves the GBC packet into the CBF buffer and the IUT starts the contention timer set to CBF_MAX and the IUT broadcasts the received GBC packet upon expiry of the contention timer } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/CBF/BV-22
<b>Test objective</b>	Check that a received GBC packet is triggering contention if received for the first time when IUT is inside of the destination area from a known sender having an uncertain position (PAI = 0)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause E.3 ETSI TS 103 836-4-1 [5], clause E.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND PICS_GN_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT is using the CBF algorithm the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD containing Beacon ExtendedHeader containing SOPV field containing PAI set to '0' }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet generated by ItsNodeC from ItsNodeD containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA1 } then { the IUT saves the GBC packet into the CBF buffer and the IUT starts the contention timer set to CBF_MAX and the IUT re-broadcasts the received GBC packet upon expiry of the contention timer } }	

## 6.2.2.9.2.4 Advanced forwarding

Present clause defines test purposes conformed to ETSI ITS Release 1 GeoNetworking specification, defined in ETSI EN 302 636-4-1 [1]. Implementations, conformed to ETSI TS 103 836-4-1 [5] may not take be conformed to test purposes, defined in the present clause.

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ADV/BV-21
<b>Test objective</b>	Check that a received GBC packet with Broadcast MAC destination is triggering contention if received for the first time from an unknown sender when IUT is inside the destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause F.4
<b>Config Id</b>	CF05
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND NOT PICS_GN_AREA_FORWARDING_ALGORITHM == 'ADVANCED'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT not having received any message from ItsNodeE }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet from ItsNodeE addressed to link-layer broadcast address containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA1 } then { the IUT saves the GBC packet into the CBF buffer and the IUT starts the contention timer set to CBF_MAX and the IUT re-broadcasts the received GBC packet upon expiry of the contention timer } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ADV/BV-23
<b>Test objective</b>	Check that a received GBC packet is discarded if received more than MAX_COUNTER times when IUT is inside the destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause F.4
<b>Config Id</b>	CF06
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND NOT PICS_GN_AREA_FORWARDING_ALGORITHM == 'ADVANCED'
<b>Initial conditions</b>	
<pre>with {   the IUT being in the "initial state" and   the IUT having received Beacon information from ItsNodeB and   the IUT having received Beacon information from ItsNodeF and   the IUT having received a GBC packet GBC1 from ItsNodeF     containing TrafficClass.SCF set to 1     containing GBC Extended Header       containing DestinationArea         indicating AREA1   the IUT having saved the packet into CBF buffer   the IUT having received MAX_COUNTER - 1 times the GBC1 packet }</pre>	
<b>Expected behaviour</b>	
<pre>ensure that {   when {     the IUT receives the same GBC packet GBC1   }   then {     the IUT removes GBC1 from the CBF buffer     the IUT discards the new received GBC packet   } }</pre>	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ADV/BV-24
<b>Test objective</b>	Check that a received GBC packet is discarded if received more than once when IUT is inside the destination area and inside the sectorial area of the GBC packet Sender
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause F.4
<b>Config Id</b>	CF05
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND NOT PICS_GN_AREA_FORWARDING_ALGORITHM == 'ADVANCED'
<b>Initial conditions</b>	
<pre>with {   the IUT being in the "initial state" and   the IUT having received Beacon information from ItsNodeB and   the IUT having received Beacon information from ItsNodeE and   the IUT having received a GBC packet GBC1 from ItsNodeB     containing TrafficClass.SCF set to 1     containing GBC Extended Header       containing DestinationArea         indicating AREA1   the IUT having saved the packet into CBF buffer }</pre>	
<b>Expected behaviour</b>	
<pre>ensure that {   when {     the IUT receives the same GBC packet GBC1 from ItsNodeE     the IUT is inside the sectorial area of ItsNodeB   }   then {     the IUT removes GBC1 from the CBF buffer     the IUT discards the new received GBC packet   } }</pre>	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ADV/BV-25
<b>Test objective</b>	Check that a received GBC packet is triggering contention if received more than once when IUT is inside the destination area and outside the sectorial area of the GBC packet Sender (Angle_FSR > Angle_TH)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause F.4
<b>Config Id</b>	CF06
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND NOT PICS_GN_AREA_FORWARDING_ALGORITHM == 'ADVANCED'
<b>Initial conditions</b>	
<pre>with {   the IUT being in the "initial state" and   the IUT having received Beacon information from ItsNodeB and   the IUT having received Beacon information from ItsNodeF and   the IUT having received a GBC packet GBC1 from ItsNodeB     containing TrafficClass.SCF set to 1     containing GBC Extended Header     containing DestinationArea     indicating AREA1   the IUT having saved the packet into CBF buffer }</pre>	
<b>Expected behaviour</b>	
<pre>ensure that {   when {     the IUT receives the same GBC packet GBC1 from ItsNodeF     the IUT is outside the sectorial area of ItsNodeB   }   then {     the IUT saves the GBC packet into the CBF buffer and     the IUT starts the contention timer and     the IUT re-broadcasts the received GBC packet       upon expiry of the contention timer   } }</pre>	
<b>NOTE:</b> In this configuration IUT is outside sectorial area of ItsNodeB because of the Angle_FSR.	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ADV/BV-26
<b>Test objective</b>	Check that a received GBC packet is triggering contention if received more than once when IUT is inside the destination area and outside the sectorial area of the GBC packet Sender (Dist_R > Dist_F)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause F.4
<b>Config Id</b>	CF07
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND NOT PICS_GN_AREA_FORWARDING_ALGORITHM == 'ADVANCED'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD and the IUT having received a GBC packet GBC1 from ItsNodeB containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA1 the IUT having saved the packet into CBF buffer }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same GBC packet GBC1 from ItsNodeD the IUT is outside the sectorial area of ItsNodeB } then { the IUT saves the GBC packet into the CBF buffer and the IUT starts the contention timer and the IUT re-broadcasts the received GBC packet upon expiry of the contention timer } }	
NOTE: In this configuration IUT is outside sectorial area of ItsNodeB because of dist_R > dist_F.	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ADV/BV-27
<b>Test objective</b>	Check that a received GBC packet with Unicast MAC destination is triggering line forwarding if received for the first time when IUT is inside the destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause F.4
<b>Config Id</b>	CF05
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND NOT PICS_GN_AREA_FORWARDING_ALGORITHM == 'ADVANCED'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeE }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet from ItsNodeE addressed to IUT's link-layer address containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA1 } then { the IUT selects ItsNodeB as the next hop ITS station and the IUT forwards the GBC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ADV/BV-28
<b>Test objective</b>	Check that a received GBC packet with Unicast MAC destination is triggering rebroadcast if received for the first time when IUT is inside the destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause F.4
<b>Config Id</b>	CF05
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND NOT PICS_GN_AREA_FORWARDING_ALGORITHM == 'ADVANCED'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeE }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet from ItsNodeE addressed to IUT's link-layer address containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA1 } then { the IUT saves the GBC packet into the CBF buffer and the IUT starts the contention timer set to CBF_MAX and the IUT re-broadcasts the received GBC packet upon expiry of the contention timer } }	

<b>TP Id</b>	TP/GEONW/PON/GBC/AREA/ADV/BV-29
<b>Test objective</b>	Check that a received GBC packet with Broadcast destination is triggering contention if received for the first time from known sender when IUT is inside the destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause F.4
<b>Config Id</b>	CF05
<b>PICS Selection</b>	PICS_GN_GBC_FWD AND NOT PICS_GN_AREA_FORWARDING_ALGORITHM == 'ADVANCED'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeE }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet from ItsNodeB addressed to broadcast link-layer address containing TrafficClass.SCF set to 1 containing GBC Extended Header containing DestinationArea indicating AREA1 } then { the IUT calculates and starts the contention timer and the IUT re-broadcasts the received GBC packet upon expiry of the contention timer } }	

## 6.2.2.10 Topologically Scoped Broadcast

<b>TP Id</b>	TP/GEONW/PON/TSB/BV-01
<b>Test objective</b>	Check that a TSB request over upper Gn SAP triggers the origination of a TSB packet
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.9.2 ETSI TS 103 836-4-1 [5], clause 10.3.9.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_TSB_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a TSB packet } then { the IUT broadcasts a TSB packet } }	

<b>TP Id</b>	TP/GEONW/PON/TSB/BV-02
<b>Test objective</b>	Check that a received TSB packet is triggering re-broadcasting if received for the first time
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.9.3 ETSI TS 103 836-4-1 [5], clause 10.3.9.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_TSB_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a TSB packet containing Basic Header containing RHL field indicating HL1 higher than 1 } then { the IUT re-broadcasts the TSB packet } }	

<b>TP Id</b>	TP/GEONW/PON/TSB/BV-03
<b>Test objective</b>	Check that the protocol header fields (RHL) are correctly updated during a TSB re-broadcasting step
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.9.3 ETSI TS 103 836-4-1 [5], clause 10.3.9.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_TSB_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a TSB packet containing Basic Header containing RHL field indicating HL1 containing Common Header containing MHL field indicating value MHL1 } then { the IUT re-broadcasts the TSB packet containing Basic Header containing RHL field indicating value (HL1 -1) containing Common Header containing MHL field indicating value MHL1 } }	

<b>TP Id</b>	TP/GEONW/PON/TSB/BO-04
<b>Test objective</b>	Check that the RHL restriction is correctly handled at a TSB re-broadcasting step
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.9.3 ETSI TS 103 836-4-1 [5], clause 10.3.9.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_TSB_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a TSB packet containing Basic Header containing RHL field indicating 1 } then { the IUT does not re-broadcast the TSB packet } }	

<b>TP Id</b>	TP/GEONW/PON/TSB/BV-05
<b>Test objective</b>	Check that a received TSB packet is passed over the Gn SAP to the correct upper protocol if it is received for the first time
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.9.3 ETSI TS 103 836-4-1 [5], clause 10.3.9.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_TSB_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a TSB packet } then { the IUT passes the received TSB packet to the correct Upper Layer } }	

<b>TP Id</b>	TP/GEONW/PON/TSB/BO-07
<b>Test objective</b>	Check that a received TSB packet is not triggering re-broadcasting if received twice or more
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.9.3 ETSI TS 103 836-4-1 [5], clause 10.3.9.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_TSB_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB and the IUT having received a TSB packet from ItsNodeB containing Basic Header containing RHL field indicating HL1 higher than 1 containing TSB Extended Header containing SN field indicating value SN1 and the IUT having re-broadcast the TSB packet }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same TSB packet from ItsNodeD containing Basic Header containing RHL field indicating HL1 - 1 containing TSB Extended Header containing SN field indicating value SN1 } then { the IUT does not re-broadcast the TSB packet } }	

<b>TP Id</b>	TP/GEONW/PON/TSB/BO-08
<b>Test objective</b>	Check that a received TSB packet is not passed over the Gn SAP if it is received twice or more
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.9.3 ETSI TS 103 836-4-1 [5], clause 10.3.9.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_TSB_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received a TSB packet from ItsNodeB containing Basic Header containing RHL field indicating HL1 higher than 1 containing TSB Extended Header containing SN field indicating value SN1 and the IUT having passed the received TSB packet to the correct Upper Layer }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same TSB packet from ItsNodeD containing Basic Header containing RHL field indicating HL1 - 1 containing TSB Extended Header containing SN field indicating value SN1 } then { the IUT does not pass the received TSB packet to any Upper Layer } }	

### 6.2.2.11 Single-Hop Broadcast

<b>TP Id</b>	TP/GEONW/PON/SHB/BV-01
<b>Test objective</b>	Check that a SHB request over upper Gn SAP triggers the origination of a SHB packet
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.10.2 ETSI TS 103 836-4-1 [5], clause 10.3.10.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_SHB_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a SHB packet } then { the IUT broadcasts the SHB packet } }	

<b>TP Id</b>	TP/GEONW/PON/SHB/BV-05
<b>Test objective</b>	Check that a received SHB packet is passed over the Gn SAP to the correct upper protocol if it is received for the first time
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.10.3 ETSI TS 103 836-4-1 [5], clause 10.3.10.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_SHB_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a SHB packet } then { the IUT passes the received SHB packet to the Upper Layer } }	

## 6.2.2.12 GeoAnycast

## 6.2.2.12.1 Non-Area Forwarding

## 6.2.2.12.1.1 All forwarding algorithms

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/ALL/BV-03
<b>Test objective</b>	Check that the protocol header fields (RHL) are correctly updated during a GAC forwarding step
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.6.3 and 10.3.12.3 ETSI TS 103 836-4-1 [5], clauses 10.3.6.3 and 10.3.12.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GAC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value HL1 higher than 1 containing Common Header containing MHL field indicating value MHL1 containing DestinationArea indicating AREA2 } then { the IUT retransmits the GAC packet containing Basic Header containing RHL field indicating value (HL1 - 1) containing Common Header containing MHL field indicating value MHL1 containing DestinationArea indicating AREA2 } }	

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/ALL/BO-04
<b>Test objective</b>	Check that the RHL restriction is correctly handled at a GAC forwarding step
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.12.3 ETSI TS 103 836-4-1 [5], clause 10.3.12.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GAC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB the IUT having received Beacon information from ItsNodeC }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating 1 containing GAC Extended Header containing DestinationArea indicating AREA2 } then { the IUT does not retransmit the GAC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/ALL/BV-06
<b>Test objective</b>	Check that a received GAC packet is not passed over the Gn SAP if it is received for the first time outside the GAC destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.12.3 ETSI TS 103 836-4-1 [5], clause 10.3.12.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GAC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet from ItsNodeB containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA2 } then { the IUT does not pass the received GAC packet to any Upper Layer } }	

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/ALL/BO-09
<b>Test objective</b>	Check that a received GAC packet is discarded when indicating a too big GeoArea
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause B.3 ETSI TS 103 836-4-1 [5], clause B.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GAC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet from ItsNodeC containing TrafficClass.SCF set to 1 containing DestinationArea indicating a geoArea bigger than itsGnMaxGeoAreaSize } then { the IUT does not retransmit the received GAC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/ALL/BV-10
<b>Test objective</b>	Check that a received GAC packet from inside the destination area is discarded if received for the first time from a known sender when IUT is outside the destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], Annex D ETSI TS 103 836-4-1 [5], Annex D
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GBC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the IUT having received Beacon information from ItsNodeD }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet from ItsNodeD containing TrafficClass.SCF set to 1 containing GAC Extended Header containing DestinationArea indicating AREA2 } then { the IUT discards the received GAC packet } }	

## 6.2.2.12.1.2 Greedy forwarding

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/GRD/BV-01
<b>Test objective</b>	Check that a GAC request over upper Gn SAP triggers line forwarding if the IUT is outside the Destination Area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.12.2 and clause E.2 ETSI TS 103 836-4-1 [5], clause 10.3.12.2 and clause E.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GAC_SRC AND (PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'GREEDY' OR PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GAC packet containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA2 } then { the IUT selects ItsNodeB as the next hop and the IUT sends the GAC packet (see note) containing DestinationArea indicating AREA2 } }	
NOTE: Next hop ITS Station being identified by the MAC layer address of ItsNodeB.	

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/GRD/BV-02
<b>Test objective</b>	Check that a received GAC packet is triggering line forwarding if received out of its destination area for the first time
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.12.3 and clause E.2 ETSI TS 103 836-4-1 [5], clause 10.3.12.3 and clause E.2
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GAC_FWD AND (PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'GREEDY' OR PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB the IUT having received Beacon information from ItsNodeD }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet from ItsNodeC containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA2 } then { the IUT selects ItsNodeB as the next hop and the IUT forwards the GAC packet (see note) } }	
NOTE: Next hop ITS Station being identified by the MAC layer address of ItsNodeB.	

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/GRD/BO-07
<b>Test objective</b>	Check that a received GAC packet is not triggering line forwarding if received out of its destination area twice or more
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.12.3 and clause E.2 ETSI TS 103 836-4-1 [5], clause 10.3.12.3 and clause E.2
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GAC_FWD AND (PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'GREEDY' OR PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'UNSPECIFIED')
<b>Initial conditions</b>	
<pre> with {   the IUT being in the "initial state" and   the IUT having received Beacon information from ItsNodeB   the IUT having received Beacon information from ItsNodeD   the IUT having received a GAC packet from ItsNodeC     containing TrafficClass.SCF set to 1     containing Basic Header       containing RHL field         indicating value HL1 higher than 1     containing GAC Extended Header       containing SN field         indicating value SN1 and     containing DestinationArea       indicating AREA2   the IUT having forwarded the GAC packet } </pre>	
<b>Expected behaviour</b>	
<pre> ensure that {   when {     the IUT receives the same GAC packet from other neighbour       containing Basic Header         containing RHL field           indicating value lower than HL1       containing GAC Extended Header         containing SN field           indicating value SN1     }   then {     the IUT does not forward the received GAC packet   } } </pre>	

## 6.2.2.12.1.3 Contention-based forwarding

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/CBF/BV-01
<b>Test objective</b>	Check that a GAC request over upper Gn SAP triggers immediate broadcasting of a GAC packet if the IUT is outside the Destination Area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.12.2 ETSI TS 103 836-4-1 [5], clause 10.3.12.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GAC_SRC AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GAC packet containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA2 } then { the IUT broadcasts immediately the GAC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/CBF/BV-02
<b>Test objective</b>	Check that a received GAC packet is forwarded at the correct time according to the contention based forwarding rules
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.12.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.12.3 and clause E.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GAC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the distance between IUT and ItsNodeA being less than itsGnDefaultMaxCommunicationRange MIB attribute }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 } then { the IUT re-broadcasts the received GAC packet upon expiry of calculated CBF delay (see note) } }	
<b>NOTE:</b>	The CBF delay timer value is calculated from the itsGnDefaultMaxCommunicationRange, itsGnCbfMinTime, and itsGnCbfMaxTime MIB attributes, and the distance value between IUT and ItsNodeC.

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/CBF/BV-07
<b>Test objective</b>	Check that GAC packet forwarding correctly avoids packet duplication according to the contention based forwarding rules
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.12.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.12.3 and clause E.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GAC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the distance between IUT and ItsNodeA being less than the itsGnDefaultMaxCommunicationRange MIB attribute and the IUT having received a GAC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 and the IUT having started a CBF timer for this packet (see note) }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same GAC packet from ItsNodeB before expiration of the CBF timer } then { the IUT does not re-broadcast the GAC packet } }	
NOTE: The CBF delay timer value is calculated from the itsGnDefaultMaxCommunicationRange, itsGnCbfMinTime, and itsGnCbfMaxTime MIB attributes, and the distance value between IUT and ItsNodeC.	

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/CBF/BV-20
<b>Test objective</b>	Check that a received GAC packet forwarding is correctly handling the minimum delay value according to the contention based forwarding rules
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clauses 10.3.12.3 and clause E.3 ETSI TS 103 836-4-1 [5], clause 10.3.12.3 and clause E.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GAC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeC and the distance between IUT and ItsNodeC being larger than the itsGnDefaultMaxCommunicationRange MIB attribute }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating value greater than 1 } then { the IUT re-broadcasts the received GAC packet upon expiry of itsGnCbfMinTime delay } }	

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/CBF/BV-21
<b>Test objective</b>	Check that a received GAC packet is forwarded at the correct time according to the contention based forwarding rules if received for the first time when IUT is outside of the destination area from an unknown sender
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause E.3 ETSI TS 103 836-4-1 [5], clause E.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GAC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT not having received any message from ItsNodeD }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet generated by ItsNodeC from ItsNodeD containing TrafficClass.SCF set to 1 containing GAC Extended Header containing DestinationArea indicating AREA2 } then { the IUT re-broadcasts the GAC packet upon expiry of CBF_MAX } }	

<b>TP Id</b>	TP/GEONW/PON/GAC/NONAREA/CBF/BV-22
<b>Test objective</b>	Check that a received GAC packet is forwarded at the correct time according to the contention based forwarding rules if received for the first time when IUT is outside of the destination area from a known sender having an uncertain position (PAI = 0)
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause E.3 ETSI TS 103 836-4-1 [5], clause E.3
<b>Config Id</b>	CF04
<b>PICS Selection</b>	PICS_GN_GAC_FWD AND PICS_GN_NON_AREA_FORWARDING_ALGORITHM == 'CBF'
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeB and the IUT having received Beacon information from ItsNodeD containing Beacon ExtendedHeader containing SOPV field containing PAI set to '0' }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet generated by ItsNodeC from ItsNodeD containing TrafficClass.SCF set to 1 containing GAC Extended Header containing DestinationArea indicating AREA2 } then { the IUT re-broadcasts the GAC packet upon expiry of CBF_MAX } }	

## 6.2.2.12.2 Area Forwarding

<b>TP Id</b>	TP/GEONW/PON/GAC/AREA/ALL/BV-01
<b>Test objective</b>	Check that indication GAC request over upper Gn SAP triggers broadcasting of a GAC packet if the IUT is within the Destination Area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.12.2 ETSI TS 103 836-4-1 [5], clause 10.3.12.2
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GAC_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GAC packet containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA1 } then { the IUT broadcasts immediately the GAC packet containing DestinationArea indicating AREA1 } }	

<b>TP Id</b>	TP/GEONW/PON/GAC/AREA/ALL/BV-02
<b>Test objective</b>	Check that a received GAC packet is not triggering forwarding or re-broadcasting if the IUT is within the Destination Area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.12.3 ETSI TS 103 836-4-1 [5], clause 10.3.12.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GAC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received Beacon information from ItsNodeD and the IUT having received Beacon information from ItsNodeB }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA1 } then { the IUT does not retransmit the received GAC packet } }	

<b>TP Id</b>	TP/GEONW/PON/GAC/AREA/ALL/BV-05
<b>Test objective</b>	Check that a received GAC packet is passed over the Gn SAP to the correct upper protocol if it is received for the first time within the GAC destination area
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.12.3 ETSI TS 103 836-4-1 [5], clause 10.3.12.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_GAC_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GAC packet from ItsNodeB containing TrafficClass.SCF set to 1 containing DestinationArea indicating AREA1 } then { the IUT passes the received GAC packet to the correct Upper Layer } }	

<b>TP Id</b>	TP/GEONW/PON/GAC/AREA/ALL/BO-08
<b>Test objective</b>	Check that a received GAC packet is not passed over the Gn SAP if it is received twice or more
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 10.3.12.3 ETSI TS 103 836-4-1 [5], clause 10.3.12.3
<b>Config Id</b>	CF02
<b>PICS Selection</b>	PICS_GN_GAC_DST
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having received a GAC packet from ItsNodeD containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating HL1 containing GAC Extended Header containing SN field indicating value SN1 and containing DestinationArea indicating AREA1 and the IUT having passed the received GAC packet to the correct Upper Layer }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives the same GAC packet from ItsNodeB containing Basic Header containing RHL field indicating value lower than HL1 containing GAC Extended Header containing SN field indicating value SN1 } then { the IUT does not pass the received GAC packet to any Upper Layer } }	

## 6.2.3 Buffer Capacities

### 6.2.3.1 Location Service

<b>TP Id</b>	TP/GEONW/CAP/LOS/BV-01
<b>Test objective</b>	Check of LS buffer capacity according to itsGnLocationServicePacketBufferSize parameter and the overflow handling procedure
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 8.4.3 ETSI TS 103 836-4-1 [5], clause 8.5.3
<b>Config Id</b>	CF01
<b>PICS Selection</b>	PICS_GN_LS_REQ_SRC
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeA and the IUT having received Beacon information from ItsNodeB and the IUT having been requested to send multiple GUC packets to ItsNodeA containing TrafficClass.SCF set to 1 and the IUT having sent a LS_REQUEST packet and the IUT not having received a LS_REPLY packet }	
<b>Expected behaviour</b>	
ensure that { when { the IUT is requested to send a GUC packet to ItsNodeA containing TrafficClass.SCF set to 1 and the location service buffer capacity exceeded (see note 1) } then { the IUT removes the older packet(s) in the location service buffer and, the IUT inserts the new received packet at the end of the location service buffer (see note 2) } }	
NOTE 1: The amount of stored data exceeds Location Service buffer capacity defined by the itsGnLocationServicePacketBufferSize MIB parameter.	
NOTE 2: Buffered packets will be delivered upon reception of LS_REPLY message.	

## 6.2.3.2 Forwarding Packet Buffer

<b>TP Id</b>	TP/GEONW/CAP/FPB/BV-01
<b>Test objective</b>	Check of UC forwarding buffer capacity according to itsGnUcForwardingPacketBufferSize parameter and the overflow handling procedure
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 8.5.3 ETSI TS 103 836-4-1 [5], clause 8.6.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GUC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeB and the IUT having received multiple GUC packets addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GUC packet addressed to ItsNodeA from ItsNodeC containing TrafficClass.SCF set to 1 containing Basic Header containing RHL field indicating HL1 higher than 1 the UC forwarding packet buffer capacity exceeded (see note 1) } then { the IUT removes the older packet(s) in the UC forwarding packet buffer and, the IUT inserts the new received GUC packet at the end of the UC forwarding packet buffer (see note 2) } }	
NOTE 1: The amount of stored data exceeds UC forwarding packet capacity defined by the itsGnUcForwardingPacketBufferSize MIB parameter.	
NOTE 2: Buffered packets will be delivered upon reception of Beacon message from ItsNodeB.	

<b>TP Id</b>	TP/GEONW/CAP/FPB/BV-02
<b>Test objective</b>	Check of BC forwarding buffer capacity according to itsGnBcForwardingPacketBufferSize parameter and the overflow handling procedure
<b>Reference</b>	ETSI EN 302 636-4-1 [1], clause 8.5.3 ETSI TS 103 836-4-1 [5], clause 8.6.3
<b>Config Id</b>	CF03
<b>PICS Selection</b>	PICS_GN_GBC_FWD
<b>Initial conditions</b>	
with { the IUT being in the "initial state" and the IUT having no Location Table Entry for ItsNodeB the IUT having received multiple GBC packets containing TrafficClass.SCF set to 1 containing GBC Extended Header containing GBC Destination Area indicating AREA2 }	
<b>Expected behaviour</b>	
ensure that { when { the IUT receives a GBC packet containing TrafficClass.SCF set to 1 containing GBC Extended Header containing GBC Destination Area indicating AREA2 and the BC forwarding packet buffer capacity exceeded (see note 1) } then { the IUT removes the older packet(s) in the BC forwarding packet buffer and, the IUT inserts the new received GBC packet at the end of the BC forwarding packet buffer (see note 2) } }	
NOTE 1: The amount of stored data exceeds BC forwarding buffer capacity defined by the itsGnBcForwardingPacketBufferSize MIB parameter.	
NOTE 2: Buffered packets will be delivered upon reception of Beacon message from ItsNodeB.	

---

## History

<b>Version</b>	<b>Date</b>	<b>Status</b>
V1.1.1	June 2011	Publication
V1.2.1	April 2014	Publication
V1.3.1	June 2015	Publication
V1.4.1	May 2017	Publication
V1.5.1	March 2022	Publication
V2.1.1	January 2026	Publication