



# **Interface test specification for central systems – EasyGo HUB**

**Annex 2.7 to  
Joint Venture Agreement  
Toll Service Provider Agreement**

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## Document Revision History

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2.0	2013.02.27	SC	Approved at steering committee meeting
2.1	2014.06.22	MHS	Aligning to revised test strategy (Annex 2.6)
2.3	2014.08.22	SR	Minor changes to version 2.1
3.0	2014.09.04		Approved by ESC

# 1. Introduction

## 1.1 Scope

This document provides the detailed test procedures and documentation requirements complement to the test EasyGo strategy defined in Annex 2.6. Thus it delivers the operational test guidelines and documents to perform any tests required:

1. before a new TC or TSP connects to the EasyGo services
2. when an existing TSP introduces new OBEs
3. when there is a change in the back office data exchange interfaces defined in Annex 2.3 or its procedures defined in Annex 2.1
4. when there is a general update to the EasyGo services

Each test needs to be performed in a certain way and needs to be properly documented to ensure a sufficient quality when introducing any change in EasyGo.

The required test steps and the amount of testing needed may vary depending on the actual situation of the imposed change. It is possible that certain test steps may be limited or even omitted if decided by the EM when there is no additional value seen in them.

The document does not provide details regarding file formats/specification or details of the validations the actor (TC/TSP) and the EasyGo HUB should exercise during the file exchange. These details are described in Annex 2.1 and 2.3.

The tests described in this document do not include internal FAT or SAT testing performed by an actor (TC/TSP) on his equipment (e.g. RSE, CS or OBEs ...) prior to the INT1 test. It is a pre-condition prior to start of tests with EasyGo that an actor (TC/TSP) has a stable implementation of the required functionality on his test or production system depending on the test to be performed.

Therefore this document does not go into any details regarding the work that leads up to these tests – but only concludes on the ability to fulfil the test requirements.

The document provides a section that describes the prerequisites that have to be established before testing can commence and later on a section that chronologically takes the participants through the testing process.

This document will not provide any tests related to the test of invoicing.

## 1.2 Roles and responsibilities

The roles and responsibilities of the various actors and entities in EasyGo are described in chapter 1.2 of Annex 2.6.

## 1.3 Back office data exchange

The procedures of the back office data exchange are described in Annex 2.1 in detail.

The formats used in the back office exchange are described in Annex 2.3.

The information required to establish a connection to the EasyGo HUB is described in Annex 2.8.

#### **1.4 How to use this document**

A table with all applicable test steps and test cases can be found for each file type in chapter 0. This is a compilation of the business processes defined in chapter 3 of Annex 2.1 and the functions to be tested in chapter 3 of Annex 2.6.

The test manager has to select the appropriate test steps and test cases from these tables for his test plan to be performed by each actor (TC/TSP) and the EasyGo HUB. The test plan shall contain a list of selected test steps and test cases for each file type according to the rules defined in Annex 2.6. The test plan stating the selected test steps shall also be defined as a test setup in the test tracking and bug tracking tool (see chapter 4.1 of Annex 2.6). While a detailed test of each interface is required during the integration test phase, the level of detail may be reduced during subsequent tests.

The test coordinator shall organise that each of the selected test cases are executed and documented in a test report by his test engineer. A summary of the results of all test cases within a test step shall be documented in the test tracking and bug tracking tool (see chapter 4.1 of Annex 2.6) for approval by the test manager.

#### **1.5 Test strategy**

Annex 2.6 provides an overview of the test structure and introduces the required test steps to be selected from by WG2. These shall be defined in a test plan for any new actors, new functionality or new or changed equipment.

It provides furthermore the test organisation with defined responsibilities and reporting rules for the involved test personnel.

Finally it describes the test process to be applied to each test within the test steps 9 to 16 according to chapter 2.2.1 in Annex 2.6.

## **2. List of test steps and test cases**

The following tables provide a list of all relevant test steps and test cases for each file type as a repository for the test manager to select from during the definition of the test plan.

A test step is stated in bold and identified by a number (e.g. 1), a description of the test step (e.g. Generate ACT data), an actor who is responsible to perform this test step if selected by the test manager in the test plan and a comment field providing additional information for the test step, when needed. Each selected test step shall also be stated in the test tracking and bug tracking tool for the documentation of the performed tests.

Below each test step a list of test cases is given which are identified by the number of the test step followed by a number or literal identifying the function to be tested according to chapter 3 of Annex 2.6 (e.g. 1.a), a description of the test case (e.g. collect actor information as output data), a file type (e.g. N/A or ACT), an actor who is responsible to perform this test case if selected by the test manager in the test plan and a comment field

providing additional information for the test case, when needed. The detailed test cases shall not be stated in the test tracking and bug tracking tool.

It is important that each test step and each test case within the test scope are carried out in the proper order. Therefore each selected test step and each selected test case within the test scope shall be processed chronologically if a file type is to be tested. Failure to follow the proper order could result in specific test cases or even test steps to fail or lead to unpredictable results during testing.

The results of each selected test case shall be documented by the responsible test engineer in a test report (see chapter 4.2 of Annex 2.6) before continuing with the next selected test case. This documentation shall remain with the test coordinator of the actor who performs the test and shall be provided to the test manager upon request. A summary of the results of the performed test cases shall be documented in the test tracking and bug tracking tool for a test step when all selected test cases within a test step have been tested and no deviations of type A or B are recorded (see chapter 4.3 of Annex 2.6).

If a file type is not to be tested, the associated test steps and test cases may be omitted. This has to be clearly stated in the test plan according to step 7 in chapter 2.2.1 of Annex 2.6.

It is important to perform tests for any file version (generation of files) that is allowed in the EasyGo service if they are applicable to the local actor.

## **2.1. ACT**

The purpose of the ACTor Table is to have a common description of all the actors participating in the EasyGo service(s). The content is also the basis for establishing the ledger accounts for TCs and TSPs and invoicing of the use of the EasyGo services(s) to the Service Users.

### **2.1.1. Context of the ACT**

The content of the ACT is the first table in the EasyGo HUB that must be in place in order to process any information. The ACT contains necessary data needed when processing other file types.

Distribution of the ACT is not scheduled – meaning that it will only be sent when changes are reported to the EasyGo HUB. This process will normally be initiated by a TC or TSP.

Each TC/TSP shall provide his information to the EasyGo HUB either by email or by sending a “local” ACT. The EasyGo HUB shall then generate the “global” or filtered ACT and distribute it to all TC/TSP.

### **2.1.2. List of test steps and test cases**

The following table lists the necessary test steps and test cases to be performed when testing the distribution of a “global” or filtered ACT after new data has been delivered to the EasyGo HUB either by email or by a “local” ACT.

Step/case	Description	File type	Actor	Comment
<b>1</b>	<b>Generate “local” output data</b>		<b>TC/TSP</b>	
1.a	collect actor information as output data	N/A	TC/TSP	perform negative and positive tests with wrong and correct data
1.b	validation of output data	N/A	TC/TSP	
1.c	generation of output data	email	TC/TSP	for sending by email
1.f	send output data to EasyGo HUB	email	TC/TSP	for sending by email
1.c	generation of output data	ACT	TC/TSP	for sending by “local” ACT
1.d	generation of output file with correct sequence information	ACT	TC/TP	for sending by “local” ACT
1.e	connection to the EasyGo HUB	N/A	TC/TSP	for sending by “local” ACT
1.f	upload output file to the In\Temp folder on the EasyGo HUB	ACT	TC/TSP	for sending by “local” ACT
1.f	move uploaded output file to the In\New folder on the EasyGo HUB	ACT	TC/TSP	for sending by “local” ACT
<b>2</b>	<b>Receive and validate input data</b>		<b>EasyGo HUB</b>	
2.A	process received data and verify file name	ACT	EasyGo HUB	for sending by “local” ACT
2.B	manually enter actor data received by email into EasyGo HUB	N/A	EasyGo HUB	for sending by email
2.C	validation of received data according to general validation rules	N/A ACT	EasyGo HUB	see chapter 3.1.1 of Annex 2.1
2.E	generation of alarm if general validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	ACT	EasyGo HUB	for sending by “local” ACT
2.E	move received data to In\Completed folder if no errors were detected	ACT	EasyGo HUB	for sending by “local” ACT
2.D	validation of received data according to specific validation rules	N/A ACT	EasyGo HUB	see chapter 3.2.1.1 of Annex 2.1
2.E	generation of alarm if specific validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	ACT	EasyGo HUB	for sending by “local” ACT
2.E	move received data to In\Completed folder if no errors were detected	ACT	EasyGo HUB	for sending by “local” ACT
<b>3</b>	<b>Generate confirmation file</b>			<b>not applicable</b>
<b>4</b>	<b>Download and validate confirmation file</b>			<b>not applicable</b>
<b>5</b>	<b>Update tables</b>		<b>EasyGo HUB</b>	
5.H	update tables on the EasyGo HUB with received data after validation	N/A	EasyGo HUB	
<b>6</b>	<b>Generate output file</b>		<b>EasyGo HUB</b>	
6.I	generate data for KPI 12 and KI 14	N/A	EasyGo HUB	
6.J	generate output file and apply correct filtering if agreed	ACT	EasyGo HUB	filtering of data if agreed with the recipient(s) according to chapter 3.1.3 of Annex 2.1
6.K	provide output file in the Out\New folder of all TCs and TSPs	ACT	EasyGo HUB	
<b>7</b>	<b>Download and validate own data in received file</b>		<b>TC/TSP</b>	
7.A	connection to the EasyGo HUB	ACT	TC/TSP	
7.B	download file from the Out\New folder on the EasyGo HUB	ACT	TC/TSP	
7.B	delete file from the Out\New folder on the EasyGo HUB after download	ACT	TC/TSP	
7.C	verification of file name and syntax of received file	ACT	TC/TSP	
7.D	verification of correctness of own data	ACT	TC/TSP	



Step/case	Description	File type	Actor	Comment
7.E	generation of an alarm if the validation rules were violated	N/A	TC/TSP	
<b>8</b>	<b>Download and validate received file</b>		<b>TC/TSP</b>	
8.A	connection to the EasyGo HUB	N/A	TC/TSP	
8.B	download file from the Out\New folder on the EasyGo HUB	ACT	TC/TSP	
8.B	delete file from the Out\New folder on the EasyGo HUB after download	ACT	TC/TSP	
8.C	verification of file name and syntax of received file	ACT	TC/TSP	
8.E	generation of an alarm if the validation rules were violated	N/A	TC/TSP	
<b>9</b>	<b>Process received file</b>		<b>TC/TSP</b>	
9.I	process and update received data in central system	N/A	TC/TSP	
<b>10</b>	<b>Validate processes</b>		<b>TC/TSP</b>	
10.J	validation of use of updated data during invoicing to SU	N/A	TSP	use of delivered actor data during invoicing of tolls
10.L	validation of use of updated data during invoicing to TC	N/A	TSP	use of delivered actor data during invoicing of issuer fees
10.M	validation of use of updated data during payment to TC	N/A	TSP	with or without netting of toll payment and issuer fee payment
10.N	validation of use of updated data during payment collection from TC	N/A	TSP	for payment of issuer fees
10.O	validation of use of updated data on single transaction lists	N/A	TSP	use of delivered actor data on single transaction lists
10.K	Verification of toll invoices to SU	N/A	TC	Verify the formal correctness of the invoices
10.L	Verification of issuer fee invoices to TC	N/A	TC	Verify the formal correctness of the invoices
10.M	validation of payment for issuer fees to TSP	N/A	TC	for payment of issuer fees
10.N	validation of toll payment collection from TSP	N/A	TC	with or without netting of toll payment and issuer fee payment

## 2.2. AIT

The Accepted Issuer Table contains a list of issued OBE from each TSP with a possible limitation to certain ranges of them. Any OBE listed in the AIT shall be accepted at all EasyGo TCs.

The AIT may only contain OBE which are conformant to the specifications listed in Annex 2.2 and have successfully passed the suitability for use tests in the lab. This is a precondition to the following test steps and test cases.

### 2.2.1. Context of the AIT

The AIT contains all necessary information for the TC to accept the TSP's OBE on his RSE.

Distribution of the AIT is not scheduled – meaning it will only be sent when changes are reported to the EasyGo HUB. This process shall be initiated by a TSP.

Each TSP shall deliver a “local” AIT to EasyGo HUB listing all OBE issued by him. The EasyGo HUB shall generate a “global” AIT and distribute it to all TCs.

## 2.2.2. List of test steps and test cases

The following table lists the necessary test steps and test cases to be performed when testing the distribution of a “global” or filtered AIT after a “local” AIT has been delivered to the EasyGo HUB.

Step/case	Description	File type	Actor	Comment
<b>1</b>	<b>Generate “local” output data</b>		<b>TSP</b>	
1.a	collect information about issued OBEs as output data	N/A	TSP	perform negative and positive tests with wrong and correct data
1.b	validation of output data	N/A	TSP	
1.c	generation of output data	AIT	TSP	
1.d	generation of output file with correct sequence information	AIT	TSP	
1.e	connection to the EasyGo HUB	N/A	TSP	
1.f	upload output file to the In\Temp folder on the EasyGo HUB	AIT	TSP	
1.f	move uploaded output file to the In\New folder on the EasyGo HUB	AIT	TSP	
<b>2</b>	<b>Receive and validate input data</b>		<b>EasyGo HUB</b>	
2.A	process received data and verify file name	AIT	EasyGo HUB	
2.C	validation of received data according to general validation rules	AIT	EasyGo HUB	see chapter 3.1.1 of Annex 2.1
2.E	generation of alarm if general validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	AIT	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	AIT	EasyGo HUB	
2.D	validation of received data according to specific validation rules	AIT	EasyGo HUB	see chapter 3.2.1.2 of Annex 2.1
2.E	generation of alarm if specific validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	AIT	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	AIT	EasyGo HUB	
<b>3</b>	<b>Generate confirmation data</b>			<b>not applicable</b>
<b>4</b>	<b>Download and validate confirmation file</b>			<b>not applicable</b>
<b>5</b>	<b>Update tables</b>		<b>EasyGo HUB</b>	
5.H	update tables on the EasyGo HUB with received data after validation	N/A	EasyGo HUB	
<b>6</b>	<b>Generate output file</b>		<b>EasyGo HUB</b>	
6.I	generate data for KPI 12 and KI 14	N/A	EasyGo HUB	
6.J	generate output file and apply correct filtering if agreed	AIT	EasyGo HUB	filtering of data if agreed with the recipient(s) according to chapter 3.1.3 of Annex 2.1
6.K	provide output file in the Out\New folder of all TCs and the TSP who initiated the update	AIT	EasyGo HUB	
<b>7</b>	<b>Download and validate own data in received file</b>		<b>TSP</b>	
7.A	connection to the EasyGo HUB	AIT	TSP	only TSP who initiated update
7.B	download file from the Out\New folder on the EasyGo HUB	AIT	TSP	only TSP who initiated update
7.B	delete file from the Out\New folder on the EasyGo HUB after download	AIT	TSP	

Step/case	Description	File type	Actor	Comment
7.C	verification of file name and syntax of received file	AIT	TSP	only TSP who initiated update
7.D	verification of correctness of own data	AIT	TSP	only TSP who initiated update
7.E	generation of an alarm if the validation rules were violated	N/A	TSP	only TSP who initiated update
<b>8</b>	<b>Download and validate received file</b>		<b>TC</b>	
8.A	connection to the EasyGo HUB	N/A	TC	
8.B	download file from the Out\New folder on the EasyGo HUB	AIT	TC	
8.B	delete file from the Out\New folder on the EasyGo HUB after download	AIT	TC	
8.C	verification of file name and syntax of received file	AIT	TC	
8.E	generation of an alarm if the validation rules were violated	N/A	TC	
<b>9</b>	<b>Process received file</b>		<b>TC</b>	
9.I	process and update received data in central system	N/A	TC	
9.J	distribution of changed EFC Context marks to RSE	N/A	TC	
<b>10</b>	<b>Validate processes</b>		<b>TC</b>	
10.1	verification of distribution of added, changed or deleted EFC Context marks to RSE	N/A	TC	entries are added to, changed at or removed from RSE
10.2	validation of acceptance of OBEs listed in the AIT	N/A	TC	at least for all added, changed or removed OBE

### 2.3. TST

The Toll Station Table contains a description of the charging points of all TCs and is used as information for human readable billing details provided to the Service User and for verification that the transactions come from a valid location.

The TC generates a “local” TST and uploads it to the EasyGo HUB for distribution to relevant TSPs and TCs.

#### 2.3.1. Context of the TST

The “global” or filtered TST is kept and maintained by the EasyGo HUB. The TC shall deliver his “local” TST to the EasyGo HUB. The EasyGo HUB shall generate a “global” or filtered TST that contains the changes made by the TC together with all other (unchanged) “local” TST data from other TCs and distribute it to all TSPs.

Distribution of the TST is not scheduled – meaning it will only be sent when changes are reported to the EasyGo HUB. This process shall be initiated by a TC.

#### 2.3.2. List of test steps and test cases

The following table lists the necessary test steps and test cases to be performed when testing the distribution of a “global” or filtered TST after a “local” TST has been delivered to the EasyGo HUB.

Step/case	Description	File type	Actor	Comment
<b>1</b>	<b>Generate "local" output data</b>		<b>TC</b>	
1.a	collect information about charging points as output data	N/A	TC	perform negative and positive tests with wrong and correct data
1.b	validation of output data	N/A	TC	
1.c	generation of output data	TST	TC	
1.d	generation of output file with correct sequence information	TST	TC	
1.e	connection to the EasyGo HUB	N/A	TC	
1.f	upload output file to the In\Temp folder on the EasyGo HUB	TST	TC	
1.f	move uploaded output file to the In\New folder on the EasyGo HUB	TST	TC	
<b>2</b>	<b>Receive and validate input data</b>		<b>EasyGo HUB</b>	
2.A	process received data and verify file name	TST	EasyGo HUB	
2.C	validation of received data according to general validation rules	TST	EasyGo HUB	see chapter 3.1.1 of Annex 2.1
2.E	generation of alarm if general validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	TST	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	TST	EasyGo HUB	
2.D	validation of received data according to specific validation rules	TST	EasyGo HUB	see chapter 3.2.1.3 of Annex 2.1
2.E	generation of alarm if specific validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	TST	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	TST	EasyGo HUB	
<b>3</b>	<b>Generate confirmation data</b>			<b>not applicable</b>
<b>4</b>	<b>Download and validate confirmation file</b>			<b>not applicable</b>
<b>5</b>	<b>Update tables</b>		<b>EasyGo HUB</b>	
5.H	update tables on the EasyGo HUB with received data after validation	N/A	EasyGo HUB	
<b>6</b>	<b>Generate output file</b>		<b>EasyGo HUB</b>	
6.I	generate data for KPI 12 and KI 14	N/A	EasyGo HUB	
6.J	generate output file and apply correct filtering if agreed	TST	EasyGo HUB	filtering of data if agreed with the recipient(s) according to chapter 3.1.3 of Annex 2.1
6.K	provide output file in the Out\New folder of all TSPs and the TC who initiated the update	TST	EasyGo HUB	
<b>7</b>	<b>Download and validate own data in received file</b>		<b>TC</b>	
7.A	connection to the EasyGo HUB	TST	TC	only TC who initiated update
7.B	download file from the Out\New folder on the EasyGo HUB	TST	TC	only TC who initiated update
7.B	delete file from the Out\New folder on the EasyGo HUB after download	TST	TC	
7.C	verification of file name and syntax of received file	TST	TC	only TC who initiated update
7.D	verification of correctness of own data	TST	TC	only TC who initiated update
7.E	generation of an alarm if the validation rules were violated	N/A	TC	only TC who initiated update
<b>8</b>	<b>Download and validate received file</b>		<b>TSP</b>	
8.A	connection to the EasyGo HUB	N/A	TSP	

Step/case	Description	File type	Actor	Comment
8.B	download file from the Out\New folder on the EasyGo HUB	TST	TSP	
8.B	delete file from the Out\New folder on the EasyGo HUB after download	TST	TSP	
8.C	verification of file name and syntax of received file	TST	TSP	
8.E	generation of an alarm if the validation rules were violated	N/A	TSP	
<b>9</b>	<b>Process received file</b>		<b>TSP</b>	
9.I	process and update received data in central system	N/A	TSP	
<b>10</b>	<b>Validate processes</b>		<b>TSP</b>	
10.J	validation of use of updated data during invoicing to SU	N/A	TSP	Use of delivered toll station descriptions during invoicing
10.O	validation of use of updated data for single transaction lists	N/A	TSP	Use of delivered toll station descriptions on single transaction lists

## 2.4. NAT

The NAT (or non-accepted table) contains the list of the contract identifiers of OBEs issued by a specific TSP which shall not be accepted at a TC.

Each contract is identified by a Personal Account Number (PAN) and OBU ID for EN15509 OBUs security level 1.

### 2.4.1. Context of the NAT

The NAT shall be used by a TSP to limit the acceptance of OBEs issued by him.

Distribution of the NAT is scheduled – meaning it will be distributed every day by the EasyGo HUB.

Each TSP shall deliver a “local” NAT to the EasyGo HUB listing all contract identifiers not to be accepted. The EasyGo HUB shall generate a “global” or filtered NAT and distribute it to all TCs.

### 2.4.2. List of test steps and test cases

The following table lists the necessary test steps and test cases to be performed when testing the distribution of a “global” or filtered NAT after one or more “local” NAT has been delivered to the EasyGo HUB.

Step/case	Description	File type	Actor	Comment
<b>1</b>	<b>Generate “local” output data</b>		<b>TSP</b>	
1.a	collect all contract identifiers for non-accepted OBEs as output data	N/A	TSP	perform negative and positive tests with wrong and correct data
1.b	validation of output data	N/A	TSP	
1.c	generation of output data	NAT	TSP	
1.d	generation of output file with correct sequence information	NAT	TSP	
1.e	connection to the EasyGo HUB	N/A	TSP	
1.f	upload output file to the In\Temp folder on the EasyGo HUB	NAT	TSP	
1.f	move uploaded output file to the In\New folder on the EasyGo HUB	NAT	TSP	
<b>2</b>	<b>Receive and validate input data</b>		<b>EasyGo HUB</b>	

Step/case	Description	File type	Actor	Comment
2.A	process received data and verify file name	NAT	EasyGo HUB	
2.C	validation of received data according to general validation rules	NAT	EasyGo HUB	see chapter 3.1.1 of Annex 2.1
2.E	generation of alarm if general validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	NAT	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	NAT	EasyGo HUB	
2.D	validation of received data according to specific validation rules	NAT	EasyGo HUB	see chapter 3.3.1 of Annex 2.1
2.E	generation of alarm if specific validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	NAT	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	NAT	EasyGo HUB	
<b>3</b>	<b>Generate confirmation file</b>		<b>EasyGo HUB</b>	
3.F	generate confirmation file	NAC	EasyGo HUB	
3.G	provide confirmation file in the Out\New folder of all TSPs	NAC	EasyGo HUB	
<b>4</b>	<b>Download and validate confirmation file</b>		<b>TSP</b>	
4.A	connection to the EasyGo HUB	NAC	TSP	
4.F	download confirmation file from the Out\New folder on the EasyGo HUB	NAC	TSP	
4.F	delete file from the Out\New folder on the EasyGo HUB after download	NAC	TSP	
4.G	verification of file name and syntax of received confirmation file	NAC	TSP	
4.H	correction of errors received in the confirmation file	N/A	TSP	
<b>5</b>	<b>Update tables</b>		<b>EasyGo HUB</b>	
5.H	update tables on the EasyGo HUB with received data after validation	N/A	EasyGo HUB	
<b>6</b>	<b>Generate output file</b>		<b>EasyGo HUB</b>	
6.I	generate data for KPI 12 and KI 13	N/A	EasyGo HUB	
6.J	generate output file and apply correct filtering if agreed	NAT	EasyGo HUB	filtering of data if agreed with the recipient(s) according to chapter 3.1.3 of Annex 2.1
6.K	provide output file in the Out\New folder of all TCs	NAT	EasyGo HUB	
<b>7</b>	<b>Download and validate own data in received file</b>			<b>not applicable</b>
<b>8</b>	<b>Download and validate received file</b>		<b>TC</b>	
8.A	connection to the EasyGo HUB	N/A	TC	
8.B	download file from the Out\New folder on the EasyGo HUB	NAT	TC	
8.B	delete file from the Out\New folder on the EasyGo HUB after download	NAT	TC	
8.C	verification of file name and syntax of received file	NAT	TC	
8.E	generation of an alarm if the validation rules were violated	N/A	TC	
<b>9</b>	<b>Process received file</b>		<b>TC</b>	
9.I	process and update received data in central system	N/A	TC	
<b>10</b>	<b>Validate processes</b>		<b>TC/TSP</b>	

Step/case	Description	File type	Actor	Comment
10.5	validation of blocking of OBE on RSE	N/A	TC	delivered entries arrive at RSE
10.2	validation of electronic reading of OBE on RSE	N/A	TC	negative test with blocked OBE and positive test with non-blocked OBE
10.3	validation of use of blocking during degraded mode handling	N/A	TC	negative test with blocked OBE and positive test with unblocked OBE during conversion of video to transactions or manual reading of vehicle declaration/OBE
10.7	signalling on RSE	N/A	TC	light in lane for blocked and non-blocked OBE
10.1	signalling on OBE	N/A	TSP	sound-signals for blocked and non-blocked OBE
10.8	validation of use of updated data during enforcement	N/A	TC	negative test with blocked OBE and positive test with unblocked OBE triggers enforcement
10.6	validation of unblocking of OBE on RSE	N/A	TC	entries are removed from RSE
10.2	validation of electronic reading of OBE on RSE	N/A	TC	negative test with blocked OBE and positive test with unblocked OBE
10.3	validation of use of blocking during degraded mode handling	N/A	TC	negative test with blocked OBE and positive test with unblocked OBE during conversion of video to transactions or manual reading of vehicle declaration/OBE
10.7	signalling on RSE	N/A	TC	light in lane for blocked and unblocked OBE
10.1	signalling on OBE	N/A	TSP	sound-signals for blocked and unblocked OBE
10.8	validation of use of updated data during enforcement	N/A	TC	negative test with blocked OBE and positive test with unblocked OBE triggers enforcement

## 2.5. HGV

(Ref Annex D)

The HGV contains identification criteria for all heavy vehicles that are equipped with an OBE from a TSP. The HGV may also contain identification criteria for passenger vehicles.

### 2.5.1. Context of the HGV

The HGV can be used in cases where the OBU has not been read and there is a picture of the passage.

Distribution of the HGV is scheduled – meaning it will be distributed every day by the EasyGo HUB.

Each TSP shall deliver a “local” HGV to the EasyGo HUB listing all identification criteria for vehicles for which an OBE has been issued. The EasyGo HUB shall generate a “global” or filtered HGV and distribute it to all TCs.

## 2.5.2. List of test steps and test cases

The following table lists the necessary test steps and test cases to be performed when testing the distribution of a “global” or filtered HGV after one or more “local” HGV has been delivered to the EasyGo HUB.

Step/case	Description	File type	Actor	Comment
<b>1</b>	<b>Generate “local” output data</b>		<b>TSP</b>	
1.a	collect identification criteria about all vehicles with an OBE as output data	N/A	TSP	perform negative and positive tests with wrong and correct data
1.b	validation of output data	N/A	TSP	
1.c	generation of output data	HGV	TSP	
1.d	generation of output file with correct sequence information	HGV	TSP	
1.e	connection to the EasyGo HUB	N/A	TSP	
1.f	upload output file to the In\Temp folder on the EasyGo HUB	HGV	TSP	
1.f	move uploaded output file to the In\New folder on the EasyGo HUB	HGV	TSP	
<b>2</b>	<b>Receive and validate input data</b>		<b>EasyGo HUB</b>	
2.A	process received data and verify file name	HGV	EasyGo HUB	
2.C	validation of received data according to general validation rules	HGV	EasyGo HUB	see chapter 3.1.1 of Annex 2.1
2.E	generation of alarm if general validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	HGV	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	HGV	EasyGo HUB	
2.D	validation of received data according to specific validation rules	HGV	EasyGo HUB	see chapter 3.3.3 of Annex 2.1
2.E	generation of alarm if specific validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	HGV	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	HGV	EasyGo HUB	
<b>3</b>	<b>Generate confirmation file</b>		<b>EasyGo HUB</b>	
3.F	generate confirmation file	HGC	EasyGo HUB	
3.G	provide confirmation file in the Out\New folder of all TSPs	HGC	EasyGo HUB	
<b>4</b>	<b>Download and validate confirmation file</b>		<b>TSP</b>	
4.A	connection to the EasyGo HUB	HGC	TSP	
4.F	download confirmation file from the Out\New folder on the EasyGo HUB	HGC	TSP	
4.F	delete file from the Out\New folder on the EasyGo HUB after download	HGC	TSP	
4.G	verification of file name and syntax of received confirmation file	HGC	TSP	
4.H	correction of errors received in the confirmation file	N/A	TSP	
<b>5</b>	<b>Update tables</b>		<b>EasyGo HUB</b>	
5.H	update tables on the EasyGo HUB with received data after validation	N/A	EasyGo HUB	
<b>6</b>	<b>Generate output file</b>		<b>EasyGo HUB</b>	
6.I	generate data for KPI 12 and KI 13	N/A	EasyGo HUB	



Step/case	Description	File type	Actor	Comment
6.J	generate output file and apply correct filtering if agreed	HGV	EasyGo HUB	filtering of data if agreed with the recipient(s) according to chapter 3.1.3 of Annex 2.1
6.K	provide output file in the Out\New folder of all TCs	HGV	EasyGo HUB	
<b>7</b>	<b>Download and validate own data in received file</b>			<b>not applicable</b>
<b>8</b>	<b>Download and validate received file</b>		<b>TC</b>	
8.A	connection to the EasyGo HUB	N/A	TC	
8.B	download file from the Out\New folder on the EasyGo HUB	HGV	TC	
8.B	delete file from the Out\New folder on the EasyGo HUB after download	HGV	TC	
8.C	verification of file name and syntax of received file	HGV	TC	
8.E	generation of an alarm if the validation rules were violated	N/A	TC	
<b>9</b>	<b>Process received file</b>		<b>TC</b>	
9.I	process and update received data in central system	N/A	TC	
<b>10</b>	<b>Validate processes</b>		<b>TC</b>	
10.3	validation of use of updated data during degraded mode handling	N/A	TC	conversion of pictures to transactions
10.8	validation of use of updated data during enforcement	N/A	TC	identification of responsible TSP

## 2.6. TIF

The Transit Information File contains all toll transactions from the OBE issued to the Service User by the TC.

### 2.6.1. Context of the TIF

This information forms the basis for the invoicing to the Service User for his passage/usage in the toll domains of the TCs.

Distribution of the TIF is scheduled – meaning it will be sent from the TC to the EasyGo HUB who forwards it to the addressed TSP.

Each TC shall deliver a TIF to the EasyGo HUB when transactions have been performed. It is possible to send several TIFs per day. This allows the TC to send smaller files at a higher frequency. The EasyGo HUB imports the TIF to validate the formal correctness, re-generates a new TIF file and distributes it to the addressed TSP.

### 2.6.2. List of test steps and test cases

The following table lists the necessary test steps and test cases to be performed when testing the distribution of a TIF from TC via the EasyGo HUB to the TSP.

Step/case	Description	File type	Actor	Comment
<b>1</b>	<b>Generate output data</b>		<b>TC</b>	
1.2	capture electronic transactions from OBE on RSE	N/A	TC	perform negative and positive tests at different speeds, mounting positions and angles
1.3	capture degraded mode transactions	N/A	TC	perform negative and positive tests with and without a contract
1.4	perform passages with a shielded OBE	N/A	TC	negative test

Step/case	Description	File type	Actor	Comment
1.9	Transfer captured transactions from RSE to central system	N/A	TC	verify if all correctly performed transactions arrive in central system
1.a	collect passage7usage information about all vehicles with a contract from a TSP as output data	N/A	TC	perform negative and positive tests with wrong and correct data
1.b	validation of output data	N/A	TC	check transactions against black list in negative and positive tests with and without a blocked OBE
1.b	validation of output data	N/A	TC	check all other fields
1.c	generation of output data	TIF	TC	
1.d	generation of output file with correct sequence information	TIF	TC	
1.e	connection to the EasyGo HUB	N/A	TC	
1.f	upload output file to the In\Temp folder on the EasyGo HUB	TIF	TC	
1.f	move uploaded output file to the In\New folder on the EasyGo HUB	TIF	TC	
<b>2</b>	<b>Receive and validate input data</b>		<b>EasyGo HUB</b>	
2.A	process received data and verify file name	TIF	EasyGo HUB	
2.C	validation of received data according to general validation rules	TIF	EasyGo HUB	see chapter 3.1.1 of Annex 2.1
2.E	generation of alarm if general validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	TIF	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	TIF	EasyGo HUB	
2.D	validation of received data according to specific validation rules	TIF	EasyGo HUB	see chapter 3.4.1 of Annex 2.1
2.E	generation of alarm if specific validation rules were violated	N/A	EasyGo HUB	
2.E	move received data to In\Rejected folder if errors were detected	TIF	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	TIF	EasyGo HUB	
<b>3</b>	<b>Generate confirmation file</b>			<b>not applicable</b>
<b>4</b>	<b>Download and validate confirmation file</b>			<b>not applicable</b>
<b>5</b>	<b>Update tables</b>		<b>EasyGo HUB</b>	
5.H	update tables on the EasyGo HUB with received data after validation	N/A	EasyGo HUB	
5.J	generate data for KPI 1, KPI 2, KPI 3, KPI 4, KPI 5, KPI 6, KPI 7 and KPI 11	N/A	EasyGo HUB	
<b>6</b>	<b>Generate output file</b>		<b>EasyGo HUB</b>	
6.I	generate data for KPI 12	N/A	EasyGo HUB	
6.J	generate output file	TIF	EasyGo HUB	
6.K	provide output file in the Out\New folder of the addressed TSP	TIF	EasyGo HUB	
<b>7</b>	<b>Download and validate own data in received file</b>			<b>not applicable</b>
<b>8</b>	<b>Download and validate received file</b>		<b>TSP</b>	
8.A	connection to the EasyGo HUB	N/A	TSP	
8.B	download file from the Out\New folder on the EasyGo HUB	TIF	TSP	
8.B	delete file from the Out\New folder on the EasyGo HUB after download	TIF	TSP	

Step/case	Description	File type	Actor	Comment
8.C	verification of file name and syntax of received file	TIF	TSP	
8.E	generation of an alarm if the validation rules were violated	N/A	TSP	
<b>9</b>	<b>Process received file</b>		<b>TSP</b>	
9.I	process and update received data in central system	N/A	TSP	
<b>10</b>	<b>Validate processes</b>			<b>not applicable</b>

## 2.7. TIC

The Transit Information Confirmation contains the confirmation of reception of a TIF and any records the TSP declined during processing of the TIF.

### 2.7.1. Context of the TIC

The TIC has two main objectives. One is to acknowledge the reception of a TIF, the other is to return possible transaction lines from the TIF that contain errors with respect to the transaction information in the body record.

If no lines from the TIF are rejected by the TSP, the TSP will return a TIC to the TC that only contains a header and a footer record.

Only non-rejected body records are considered in the invoicing to the Service User for his passage/usage in the toll domains of the TCs.

Distribution of the TIC is scheduled – meaning that each TIF received by a TSP shall be answered with a TIC within a timeframe defined in chapter 5 of Annex 2.1.

### 2.7.2. List of test steps and test cases

The following table lists the necessary test steps and test cases to be performed when testing the confirmation of a received TIF by a TIC sent from the TSP via the EasyGo HUB to the TC.

Step/case	Description	File type	Actor	Comment
<b>1</b>	<b>Generate output data</b>		<b>TSP</b>	
1.g	collect all declined body records in a TIF received from a TC as output data	N/A	TSP	perform negative and positive tests with wrong and correct data
1.h	validation of output data	N/A	TSP	
1.i	generation of output data	TIC	TSP	
1.j	generation of output file with correct sequence information	TIC	TSP	
1.e	connection to the EasyGo HUB	N/A	TSP	
1.k	upload output file to the In\Temp folder on the EasyGo HUB	TIC	TSP	
1.k	move uploaded output file to the In\New folder on the EasyGo HUB	TIC	TSP	
<b>2</b>	<b>Receive and validate input data</b>		<b>EasyGo HUB</b>	
2.A	process received data and verify file name	TIC	EasyGo HUB	
2.C	validation of received data according to general validation rules	TIC	EasyGo HUB	see chapter 3.1.1 of Annex 2.1
2.E	generation of alarm if general validation rules were violated	N/A	EasyGo HUB	

Step/case	Description	File type	Actor	Comment
2.E	move received data to In\Rejected folder if errors were detected	TIC	EasyGo HUB	
2.E	move received data to In\Completed folder if no errors were detected	TIC	EasyGo HUB	
<b>3</b>	<b>Generate confirmation file</b>			<b>not applicable</b>
<b>4</b>	<b>Download and validate confirmation file</b>			<b>not applicable</b>
<b>5</b>	<b>Update tables</b>		<b>EasyGo HUB</b>	
5.H	update tables on the EasyGo HUB with received data after validation	N/A	EasyGo HUB	
5.J	generate data for KPI 9	N/A	EasyGo HUB	
<b>6</b>	<b>Generate output file</b>		<b>EasyGo HUB</b>	
6.I	generate data for KPI 12	N/A	EasyGo HUB	
6.J	generate output file	TIC	EasyGo HUB	
6.K	provide output file in the Out\New folder of the addressed TC	TIC	EasyGo HUB	
<b>7</b>	<b>Download and validate own data in received file</b>			<b>not applicable</b>
<b>8</b>	<b>Download and validate received file</b>		<b>TC</b>	
8.A	connection to the EasyGo HUB	N/A	TC	
8.F	download file from the Out\New folder on the EasyGo HUB	TIF	TC	
8.F	delete file from the Out\New folder on the EasyGo HUB after download	TIF	TC	
8.G	verification of file name and syntax of received file	TIF	TC	
8.H	generation of an alarm if the validation rules were violated	N/A	TC	
<b>9</b>	<b>Process received file</b>		<b>TC</b>	
9.I	process and update received data in central system	N/A	TC	
<b>10</b>	<b>Validate processes</b>		<b>TC/TSP</b>	
10.J	validation of invoicing tolls to SU	N/A	TSP	use of delivered toll transactions during invoicing
10.K	Validation of toll payment by SU	N/A	TSP	check payment of SU in time and too late and a successful and failed payment collection from SU
10.L	validation of invoicing issuer fees to TC	N/A	TSP	use of delivered toll transactions during invoicing of issuer fees
10.M	validation of toll payment to TC	N/A	TSP	with or without netting of toll payment and issuer fee payment
10.N	validation of payment collection for issuer fees from TC	N/A	TSP	for payment of issuer fees
10.O	validation of single transaction lists	N/A	TSP	use of delivered toll transactions on single transaction lists
10.K	Verification of toll invoices to SU	N/A	TC	Verify the formal correctness of the invoices
10.L	Verification of issuer fee invoices to TC	N/A	TC	Verify the formal correctness of the invoices
10.M	validation of payment for issuer fees to TSP	N/A	TC	for payment of issuer fees
10.N	validation of toll payment collection from TSP	N/A	TC	with or without netting of toll payment and issuer fee payment

## **2.8. KDF**

Description of the KDF file and the workflow related to the file, shall be described when it has been decided when (and how) key distribution in the EasyGo community shall be implemented.

### **2.8.1. Context of the KDF**

### **2.8.2. Validation and requirements**

## **2.9. KDC**

Description of the KDC file and the workflow related to the file shall be described when it has been decided when (and how) key distribution in the EasyGo community shall be implemented.

### **2.9.1. Context of the KDC**

### **2.9.2. Validation and requirements**

## **2.10. Exchange of an OBE**

This test is not directly linked to an exchange of files but needs to be tested by the TSP for the functionality of the process. The exchanged OBE shall then be tested according to chapters 2.6 and 2.7 to verify the proper functionality

## **2.11. Re-personalization of an OBE**

This test is not directly linked to an exchange of files but needs to be tested by the TSP for the functionality of the process. The re-personalised OBE shall then be tested according to chapters 2.6 and 2.7 to verify the proper functionality