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Supplement 7 to Annex 1 to the FDF EETS and Fuel Card Providers Ordinance

Trial Operation Specification - Level 3

EUROPEAN ELECTRONIC TOLL SERVICE FOR THE LSVA   VERSION 2.3

CONTENTS

1 Overview

1.1 Purpose of the document

This document provides details concerning the trial operation, which is level 3 in the EETS provider approval procedure for the LSVA toll domain.

The document defines the integration tests, business process tests and the EETS journeys (so-called reference routes) to be carried out by the EETS provider during the trial operation.

1.2 List of changes

Version	Date	Section	Change
2.0	01.03.2020		First published version
2.1	12.06.2020	2.3 3.2.3 3.4 4.2 5.2-5.10 5.10	At least two different samples per OBE type Additionally EETS OBE-ID Specification of the driving behaviour adaptation of TI01 with CSR by the EETS Provider Insertion of expected results TF09/Route 1: drive through Galgenbuck tunnel
2.2	21.08.2020	5.2-5.10 5.10	Expected result (now from border to border) Revision of description Entry, exit and route
2.3	01.01.2022	various	Renaming of the Federal Customs Administration (FCA) to the Federal Office for Customs and Border Security (FOCBS)

1.3 References

Document
[1]   Annex 1   to the FDF EETS and Fuel Card Providers Ordinance: Technical and Operational Requirements for EETS Provider
[2]   Supplement 3   to annex 1: EETS Provider Interface

1.4 Terms and abbreviations

Term/Abbreviation	Meaning
boarder customs office	Permitted border crossings for vehicles subject to the LSVA to be used for entering and leaving LSVA toll domain by these vehicles.
EETS journey	The journey of a vehicle in the LSVA toll domain subject to a charge is recorded via EETS and the charge due is paid via EETS. An EETS journey begins with the entry into the LSVA toll domain and ends with the exit of the vehicle from the LSVA toll domain.
LSVA toll domain	The area in which the LSVA is levied. The LSVA is levied for the use of all public roads in Switzerland and the Principality of Liechtenstein, Büsingen, Campione and the "Flughafenstrasse" in Basel.

2 Overview of trial operation

2.1 Description

Before the actual trial operation begins, the EETS provider first has to carry out the integration tests and the basic business process test cases (see chapter 4).

During the actual trial operation, the EETS provider has to make the EETS journeys defined by the FOCBS. These EETS journeys include a distance check and/or an operating scenario check. In all test cases, the assessed distance is compared with the target values of the FOCBS.

During the trial operation, the FOCBS is the EETS provider's customer, i.e. the EETS user who receives the assessment decision.

The trial operation includes no LSVA collection and thus no financial transactions between the FOCBS (in the roles of toll charger and EETS user) and the EETS provider.

2.2 Objective

The aim of the trial operation is to check that the FOCBS's requirements are properly met by the entire process chain of the EETS provider's system. Both the functionality and the operability of the system have to be proven in real time.

- The integration tests ensure that the FOCBS's system communicates as planned with the EETS provider's system (central system and EETS OBE).

- The aim of the operating scenario check is to prove that the required business processes are running correctly.

- The aim of the distance check is to verify the quality of the position data transmitted to calculate the distance.

2.3 Test environment

FOCBS:

- Operational EETS back office system and operational road side equipment (RSE) at border customs offices/border crossings and enforcement installations (for CH OBEs and EETS OBEs).

EETS provider:

- Test instance of the operational back office system or operational back office system.

- Production models of all EETS OBEs registered for approval with test DSRC contracts (test DSRC keys) of the EETS provider.

- Of the OBU types registered for approval, at least two different samples must be used to cover the different driving scenarios.

Note:

- During the trial operation, the back office interface must be fully implemented and used in accordance with Supplement 3.

3 Testing

3.1 Test plan

The EETS provider shall prepare a test plan for the trial operation and submit it to the FOCBS for approval. The test plan shall first provide for the execution of the "Test cases - integration and business processes" in accordance with chapter 4, as their successful execution is a prerequisite for the "Test cases - driving scenarios" in chapter 5.

For each EETS OBE registered for approval, the EETS provider shall include in the test plan all EETS OBE-specific tests from chapter 4 and all driving scenarios from chapter 5. The EETS provider is responsible for the order in which all driving scenarios from chapter 5 are performed.

The test plan shall contain at least the following for the tests in chapter 4:

- Planned execution date

- Planned date of crossings at border customs offices (if foreseen in the test case)

- Test vehicles used (if required in the test case): vehicle make and model, registration number and country code. In addition, photographs of the interior with the mounted OBE and of the outside with the position of the OBE on the windscreen are to be supplied for the test vehicles.

The test plan shall contain at least the following for the driving scenarios in chapter 5:

- Planned execution date for each driving scenario. For driving scenarios lasting several days, date of start and finish.

- Test vehicle per driving scenario: vehicle make and model, registration number and country code.

To avoid having to constantly adapt the test plan with regard to the execution date, reserve times should be provided where possible for repeat tests.

The test EETS journeys should be completed within a month. If the EETS provider is planning a longer execution period, this shall be explained and justified in the test plan.

The details of the test vehicles used may also be provided immediately before the start of the trial operation.

3.2   Logging of test cases

3.2.1   General information

The following general information is required in each test report:

- Information on the EETS provider, including company name and address.

- Information on the person responsible for conducting the test and preparing the test report.

- Information on those conducting and participating in the test (from the EETS provider and the FOCBS).

- Unique configuration or version designation of all of the EETS provider's subsystems involved (central system and EETS OBE used).

- Unique reference number for the test report.

3.2.2   Integration and business processes

The EETS provider shall prepare a test report for the "Test cases - integration and business processes" in chapter 4. The test report shall document the individual tests in a comprehensible manner for the FOCBS. In addition to the general information per test case, the test report shall contain at least the following:

- Test case ID

- Time the test was carried out
  In the case of tests with crossings at RSE/border customs offices, these crossing times shall be documented

- List of the EETS OBE types used, provided several EETS OBE types are registered for approval and this is relevant for the test case

- Test results for the individual test steps and the test case

- Date and signature(s)

3.2.3   Driving scenarios

The EETS provider shall prepare a test report for each driving scenario in chapter 5 and for each EETS OBE type. The EETS provider shall document the execution of the driving scenarios in a comprehensible manner for the FOCBS. In addition to the general information per driving scenario, the test report shall contain at least the following:

- Test case ID

- EETS OBE type

- EETS OBE-ID

- Vehicle parameters configured/personalised in the EETS OBE (weight, Euro class, registration number, incl. country code, etc.)

- Start and finish of the EETS journey (time and date)

- Test vehicle: vehicle make and model, registration number and country code

- Place where the EETS OBE is mounted on the vehicle (documented by a photograph)

- Stops at service areas, indicating the location (to estimate the possible distance deviation caused by this)

- Result of the review of the assessed distance

- Unforeseen events, such as mandatory alternative routes due to traffic incidents (e.g. accidents)

- Deviations from the test plan

- Date and signature(s)

3.3   Test EFC-ContextMark and test DSRC key

This test level is carried out in the FOCBS's operational system. To make a distinction relative to the productive data from the next approval level or relative to this EETS provider's EETS OBEs that may already be in productive use, the EETS provider shall use a special test EFC-ContextMark and test DSRC key (see Supplement 3) during the trial operation.

3.4   Test vehicles

The EETS provider may not use any vehicles subject to the LSVA for the test EETS journeys. However, due to the DSRC communication behaviour, the vehicles used shall have an angle of windscreen inclination similar to that of a lorry and allow the EETS OBE to be mounted at a similar height from the road. In order to achieve a realistic recording of the position data, the vehicle used shall be steered similar to a lorry in terms of driving speed and lane selection.

In order to generate the CCC transactions necessary for the tests, these vehicles which are not subject to the LSVA actually have to use the lorry lanes at the border customs offices even though they are effectively blocked for them. Consequently, they shall be clearly marked with "LSVA EETS test vehicle". The test vehicles used, vehicle make and model, registration number and country code shall therefore be registered with the FOCBS too before the test EETS journeys (see test plan).

3.5   FOCBS participation

The FOCBS reserves the right to participate in the execution of the test cases and in the driving scenarios/EETS journeys of the EETS provider.

4   Test cases – integration and business processes

4.1   Introduction

The test cases summarised in this chapter serve both to integrate (test cases TIxx) the systems of the FOCBS and EETS provider and to test the basic business processes (test cases TBxx). The sequence of the tests in this chapter follows the logical sequence for integrating the two systems and exchanging data elements required in subsequent tests (DSRC contract data). If the approval procedure is repeated, the FOCBS can specify a different sequence with a reduced number of tests.

During the tests, the operational certificates and their associated private keys must already be used for back office communication, as the operational FOCBS system is used for these tests.

The "test border customs offices", i.e. the border crossing to be used for the test cases in chapter 4 is laid down by the FOCBS.

4.2   TI01 – HTTPS connection establishment

Test case ID – Test title	TI01 – HTTPS connection establishment
Test objective	Successful exchange and import of all required certificates. Verification of a successful HTTPS connection between the FOCBS and the EETS providers.
Description	The FOCBS and the EETS provider exchange the necessary certificates and import them into the corresponding systems. The HTTPS connection is established between the FOCBS and the EETS provider (the FOCBS transmits its HTTPS server certificate). The connection status is verified by the EETS provider by calling up the ListMessages (GET) function.
Prerequisites	The FOCBS has configured the EETS provider ID defined via the EN ISO 14816 register in its system.
Test criteria/ expected result	All certificates were exchanged and imported. The HTTPS connection was established and the EETS provider received the http code 200 (Success) with an empty message list in response to the ListMessage call.
Input data	FOCBS - mTLS server certificate - XML signature certificate EETS Provider - XML signature public key or certificate - CSR for his mTLS client certificate
Trigger	The EETS provider requests the start of the trial operation.
Comments	It was already checked at level 2 of the approval procedure whether the signature algorithms were correct. The next test case will check whether the imported XML signature certificates are correct. The execution of this test case may take several days due delays in the signing process.

Trial Operation Specification - Level 3

Test case ID – Test title	TI01 – HTTPS connection establishment	
Test process		
Step	**Description/action**	**Expected result**
10	The EETS provider requests the start of the trial operation.	The FOCBS starts the trial operation for the EETS provider.
20	The FOCBS confirms the start of the trial operation to the EETS provider.	
30	The EETS provider sends its XML signature certificate and a certificate signing request (for his mTLS client certificate) to the FOCBS.	The FOCBS receives the both files
40	The FOCBS verifies and signs the CSR and returns the certificate to the EETS provider.	
50	The provider verifies that the given certificate matches his private key.	The provider is in possession of a valid certificate signed by the FOCBS for his private key.
60	The FOCBS sends its XML signature certificate to the EETS provider or the EETS provider obtains the FOCBS's XML signature certificate from the FOCBS's website.	
70	The provider confirms the successful import of both certificates to the FOCBS.	
80	The FOCBS confirms the successful import of the certificates for the EETS provider.	
90	The EETS provider tests the connection to the FOCBS's system with a ListMessage call.	The ListMessage call (see Supplement 3 section 3.5.2.1) is answered with an HTTP code 200 (Success) and an empty message list from the FOCBS's system.
100	The EETS provider gives the FOCBS confirmation of the successful connection test.	

4.3   TB01 – Transfer of DSRC data

Test case ID – Test title	TB01 – Transfer of DSRC data
Test objective	Correct transmission of the InfoExchange in terms of content. Verification of the InfoExchange signatures with the exchanged and imported certificates. Verification of the encryption and decryption of the DSRC keys.
Description	The EETS provider sends the test DSRC keys and contract data required for the trial operation to the FOCBS, as well as the EETS OBE type information. The FOCBS confirms receipt of the two messages to the EETS provider. The FOCBS forwards the received data to the RSE and checks the correct decryption of the DSRC keys on the RSE.

Trial Operation Specification - Level 3

Test case ID – Test title	TB01 – Transfer of DSRC data
Prerequisites	Test case TI01 – HTTPS connection establishment successfully executed. The EETS provider has the public RSE key to encrypt the DSRC keys.
Test criteria/ expected result	Correct InfoExchanges in terms of content were transmitted. The exchanged InfoExchanges are signed correctly and the signatures could be verified. The transmitted DSRC keys could be decrypted by the test RSE.
Input data	Test DSRC keys and test contract data. Type information concerning the EETS OBEs registered for approval.
Trigger	The EETS provider transmits the input data.
Comments	If different EETS OBE types registered for approval use different DSRC keys and/or test contract data, steps 10 and 20 must be performed several times. Steps 30 and 40 must be performed for each EETS OBE type registered for approval.

Test process

Step	Description/action	Expected result
10	The EETS provider transmits the test DSRC keys and contract data required for the trial operation.	The FOCBS receives an InfoExchange with 3 TrustObjectADUs in accordance with Supplement 3 section 2.9.1. The InfoExchange signature can be verified.
20	The FOCBS confirms receipt of the DSRC keys and test contract data.	The EETS provider receives an InfoExchange with an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK). The InfoExchange signature can be verified.
30	The EETS provider transmits the EETS OBE type information.	The FOCBS receives an InfoExchange with a ContractIssuerListADU according to Supplement 3 section 2.9.2. The InfoExchange signature can be verified.
40	The FOCBS confirms receipt of the EETS OBE type information.	The EETS provider receives an InfoExchange with an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK). The InfoExchange signature can be verified.
50	The FOCBS forwards the received data to the test RSE.	The test RSE can decrypt the DSRC keys correctly.
60	The FOCBS gives the EETS provider email confirmation that the RSE has correctly decrypted the DSRC keys.	

4.4   TI02 – DSRC communication

Test case ID – Test title	TI02 – DSRC communication
Test objective	Verification of DSRC compliance check communication (CCC) between the RSE and the EETS OBEs registered for approval.

Trial Operation Specification - Level 3

Test case ID – Test title	TI02 – DSRC communication
Description	At the test border customs office, at least one crossing is carried out with each EETS OBE registered for approval and the DSRC communication is evaluated.
Prerequisites	Test case TB01 – Transfer of DSRC data successfully executed.
Test criteria/ expected result	A correct DSRC compliance check communication (CCC) was performed between the RSE and the EETS OBEs registered for approval.
Input data	-
Trigger	The FOCBS and the EETS provider carry out the test together.
Comments	After a successful test, the DSRC keys and contract data, as well as the EETS OBE type information are rolled out to all RSE.
	It was already checked at level 2 whether the transmitted DSRC attributes were correct.
	This test case must be performed for all EETS OBE types registered for approval.

Test process		
Step	**Description/action**	**Expected result**
10	Carry out test crossing on test RSE with EETS OBE.	There is complete DSRC compliance check communication (CCC) between the EETS OBE and test RSE.
20	Checking of the data transmitted to the RSE.	All data was transmitted correctly.

4.5   TB02 – EETS journey declaration and assessment

Test case ID – Test title	TB02 – EETS journey declaration and assessment
Test objective	Verification of the EETS journey declaration, delivery of the holder data and receipt of the assessment by the EETS provider.
Description	The EETS provider makes any one-day EETS journey of around 20km with a test vehicle in Switzerland. During this EETS journey, the test border customs offices permitted for vehicles subject to the LSVA shall be used for entering and leaving Switzerland (LSVA toll domain).
	The EETS provider supplies the EETS journey declaration and, on request, the holder data to the FOCBS. The FOCBS then prepares the assessment and the electronic assessment decision, and transmits them to the EETS provider.
Prerequisites	Test case TI02 – DSRC communication successfully executed.
	The data for the test EETS OBE, the test vehicle and the holder data is available in the EETS provider's system.
Test criteria/ expected result	The EETS journey declaration was transmitted.
	The holder data was transmitted.
	The assessment was transmitted to the EETS provider.
	All communications between the FOCBS and the EETS provider were carried out without errors.
Input data	-
Trigger	The EETS provider transmits the EETS journey declaration.
Comments	The crossing with the test vehicle not subject to the LSVA must be declared for the test border customs office.

Test process		
Step	**Description/action**	**Expected result**
10	The EETS provider carries out an EETS journey of approximately 20km with a test vehicle.	EETS journey data is available. Min. 2 DSRC transactions from border customs offices.
20	The EETS provider transmits the EETS journey declaration.	The FOCBS receives a TollDeclarationADU in accordance with Supplement 3 section 2.3.
30	The FOCBS confirms receipt of the EETS journey declaration.	The EETS provider receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).
40	The FOCBS transmits a holder data request.	The EETS provider receives a RequestADU according to Supplement 3 section 2.4.2.
50	The EETS provider transmits the holder data.	The FOCBS receives a complete ProvideUserDetailsADU promptly in accordance with Supplement 3 section 2.4.3.
60	The FOCBS confirms receipt of the holder data.	The EETS provider receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).
70	The FOCBS transmits the assessment with the electronic assessment decision.	The EETS provider receives a BillingDetailsADU according to Supplement 3 section 2.5.
80	The EETS provider confirms receipt of the assessment.	The FOCBS receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).

4.6   TB03 – Payment request

Test case ID – Test title	TB03 – Payment request
Test objective	Verification of receipt of the payment request by the EETS provider.
Description	The FOCBS transmits the payment request for the EETS journey declared and assessed in TB02 to the EETS provider.
Prerequisites	Test case TB02 – EETS journey declaration and assessment successfully executed.
Test criteria/ expected result	The payment request (PaymentClaimADU) was transmitted to the EETS provider. All communications between the FOCBS and the EETS provider were carried out without errors.
Input data	Assessment from test case TB02 – EETS journey declaration and assessment.
Trigger	The FOCBS transmits a payment request to the EETS provider.
Comments	The payment request is transmitted to the EETS provider every calendar day from the start of the trial operation tests. For test days without EETS journeys, an empty payment request (without billingDetailsList and paymentFeeAmount = 0) is transmitted. This is portrayed in steps 10 and 20 of the test process.

Test process		
Step	**Description/action**	**Expected result**
10	The FOCBS transmits an empty payment request.	The EETS provider receives a PaymentClaimADU according to Supplement 3 section 2.7 without billingDetailsList and paymentFeeAmount = 0.
20	The EETS provider confirms receipt of the payment request.	The EETS provider receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).
30	The FOCBS transmits the payment request for the assessment from TB02.	The EETS provider receives a PaymentClaimADU according to [3] section 2.7 with billingDetailsList and paymentFeeAmount > 0.
40	The EETS provider confirms receipt of the payment request.	The EETS provider receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).

4.7 TB04 – Refund

Test case ID – Test title	TB04 – Refund
Test objective	Verification of the receipt of a refund by the EETS provider.
Description	The EETS journey declaration and assessment from TB02 – EETS journey declaration and assessment are corrected manually by the FOCBS, resulting in a lower assessment than originally calculated. This means that a new electronic assessment decision (BillingDetailsADU) with a negative paymentFeeAmount (refund amount) is transmitted to the EETS provider. The subsequent payment request sent to the EETS provider, containing only the new "Refund" BillingDetailsADU, also has a negative value for paymentFeeAmount.
Prerequisites	Test case TB03 – Payment request successfully executed.
Test criteria/ expected result	The assessment (BillingDetailsADU) was transmitted to the EETS provider. The payment request (PaymentClaimADU) was transmitted to the EETS provider. All communications between the FOCBS and the EETS provider were carried out without errors.
Input data	The EETS journey declaration and assessment from TB02 – EETS journey declaration and assessment.
Trigger	The FOCBS corrects the assessment and transmits new data.
Comments	

Test process		
Step	**Description/action**	**Expected result**
10	The FOCBS manually corrects the assessment from TB02 – EETS journey declaration and assessment.	The data for the refund is in the FOCBS's system.
20	The FOCBS transmits the refund with the corresponding corrected electronic assessment decision.	The EETS provider receives a BillingDetailsADU according to Supplement 3 section 2.6 with relatedBillingDetails from TB02 and billingDetailsAmount < 0.

30	The EETS provider confirms receipt of the refund.	The FOCBS receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).
40	The FOCBS transmits the payment request for the refund.	The EETS provider receives a PaymentClaimADU according to [3] section 2.7 with billingDetailsList and paymentFeeAmount < 0.
50	The EETS provider confirms receipt of the refund.	The EETS provider receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).

4.8 TB05 – Transmission of blacklist

Test case ID – Test title	TB05 – Transmission of blacklist
Test objective	Verification of the blocking and unblocking of EETS OBEs by the EETS provider.
Description	The EETS provider transmits a blacklist with a maximum of 5 entries concerning blocked EETS OBEs/PANs.
	The FOCBS rolls out these blocked entries on all RSEs on the day following the transmission.
	The EETS provider then passes the test border customs office (an RSE) with one or all of the blocked EETS OBEs. The EETS OBE(s) or EETS contract is not accepted as a means of payment. The test driver is notified of this by the Customs staff.
	After the blocking test at the border customs office, the EETS provider must send an empty blacklist to the FOCBS.
	The EETS provider then passes the test border customs office (an RSE) with one or all of the now again unblocked EETS OBEs. The EETS OBE(s) or EETS contract is again accepted as a means of payment. The test driver is notified of this by the customs staff.
Prerequisites	Test case TI02 – DSRC communication successfully executed.
Test criteria/ expected result	During DSRC compliance check communication at the test border customs office, the EETS contract of the blocked test EETS OBE(s) is not accepted.
	All back office communications between the FOCBS and the EETS provider are carried out without errors.
Input data	Blacklist
Trigger	The EETS provider transmits a blacklist and carries out test trips at test border customs office.
Comments	The EETS provider may submit an empty blacklist for each test day of the trial operation (see test process steps 50 and 60).
	The crossing with a test vehicle not subject to the LSVA must be declared for the test border customs office.
Test process	

Step	Description/action	Expected result
10	The EETS provider transmits the blacklist with the blocked EETS OBEs/PANs.	The FOCBS receives an ExceptionListADU in accordance with [3] section 2.8.2.
20	The FOCBS confirms receipt of the blacklist.	The EETS provider receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).

30	Wait for the day following the day of transmission of the blacklist with the blocked EETS OBEs/PANs.	
40	Crossing with the blocked EETS OBE(s) at the test border customs office.	The EETS OBE(s) or EETS contract is not accepted as a means of payment. The EETS OBE signals not ok to the driver.
50	The EETS provider transmits an empty blacklist.	The FOCBS receives an ExceptionListADU in accordance with [3] section 2.8.2.
60	The FOCBS confirms receipt of the blacklist.	The EETS provider receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).
70	Wait for the day following the day of transmission of the empty blacklist.	
80	Crossing with the now unblocked EETS OBE(s) at the test border customs office.	The EETS OBE(s) or EETS contract is once again accepted as a means of payment. The EETS OBE signals ok to the driver.

4.9   TB99 – Deletion of DSRC contracts

As the last test of the entire trial operation (if all other tests were already passed), the EETS provider must delete the DSRC test contracts again.

Test case ID – Test title	TB99 – Deletion of DSRC contracts
Test objective	Verification that all DSRC contracts and EETS OBE type information for the trial operation can be deleted by the EETS provider in the FOCBS's system.
Description	The EETS provider transmits the data records (ContractIssuerListADU and TrustObjectADU) required to delete the EETS OBE type information and the DSRC contract data. The EETS provider then passes the test border customs office (an RSE) with an EETS OBE in earlier test cases accepted as means of payment. The EETS OBE or EETS contract is no longer accepted as a means of payment. The test driver is notified of this by the Customs staff.
Prerequisites	All of the test cases for the trial operation have been successfully executed.
Test criteria/ expected result	During DSRC compliance check communication at the test border customs office, the EETS contract of the test EETS OBE is no longer accepted. All back office communications between the FOCBS and the EETS provider are carried out without errors.
Input data	Data records for deleting the DSRC contract data.
Trigger	The EETS provider deletes the DSRC contract data and carries out a test trip at the test border customs office.
Comments	The crossing with a test vehicle not subject to the LSVA must be declared for the test border customs office. This test case must be executed for all DSRC contract data and EETS OBE type information transmitted in TB01 (see test process steps 10 to 40).

Test case ID – Test title	TB99 – Deletion of DSRC contracts	
Test process		
Step	**Description/action**	**Expected result**
10	The EETS provider transmits the deletion request for the EETS OBE type information.	The FOCBS receives a ContractIssuerListADU in accordance with [3] section 2.9.4.
20	The FOCBS confirms receipt of the request to delete EETS OBE type information.	The EETS provider receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).
30	The EETS provider transmits the deletion request for the DSRC contract data.	The FOCBS receives three TrustObjectADU in accordance with [3] section 2.9.3.
40	The FOCBS confirms receipt of the request to delete DSRC contract data.	The EETS provider receives an AckADU according to Supplement 3 section 2.10.1 with apduAckCode = 2 (apduOK).
50	Wait for the day following the day of transmission to delete the EETS OBE type information and the DSRC contract data.	
60	Crossing with test EETS OBE(s) at the test border customs office.	The test EETS OBE(s) or EETS contract is no longer accepted as a means of payment.

5   Test cases – driving scenarios

The EETS provider shall execute the individual test case driving scenarios without deviation precisely according to their specifications in sections 5.2 to 5.10.

5.1   Overview of test cases TF01 to TF08

The test routes have been designed in such a way that they can be carried out in a linked sequence. The linked and recommended sequence for the trips is:

TF08 →TF07 → TF02 → TF05 → TF03 → TF04 → TF01 → TF06
(→ TF09 not shown)
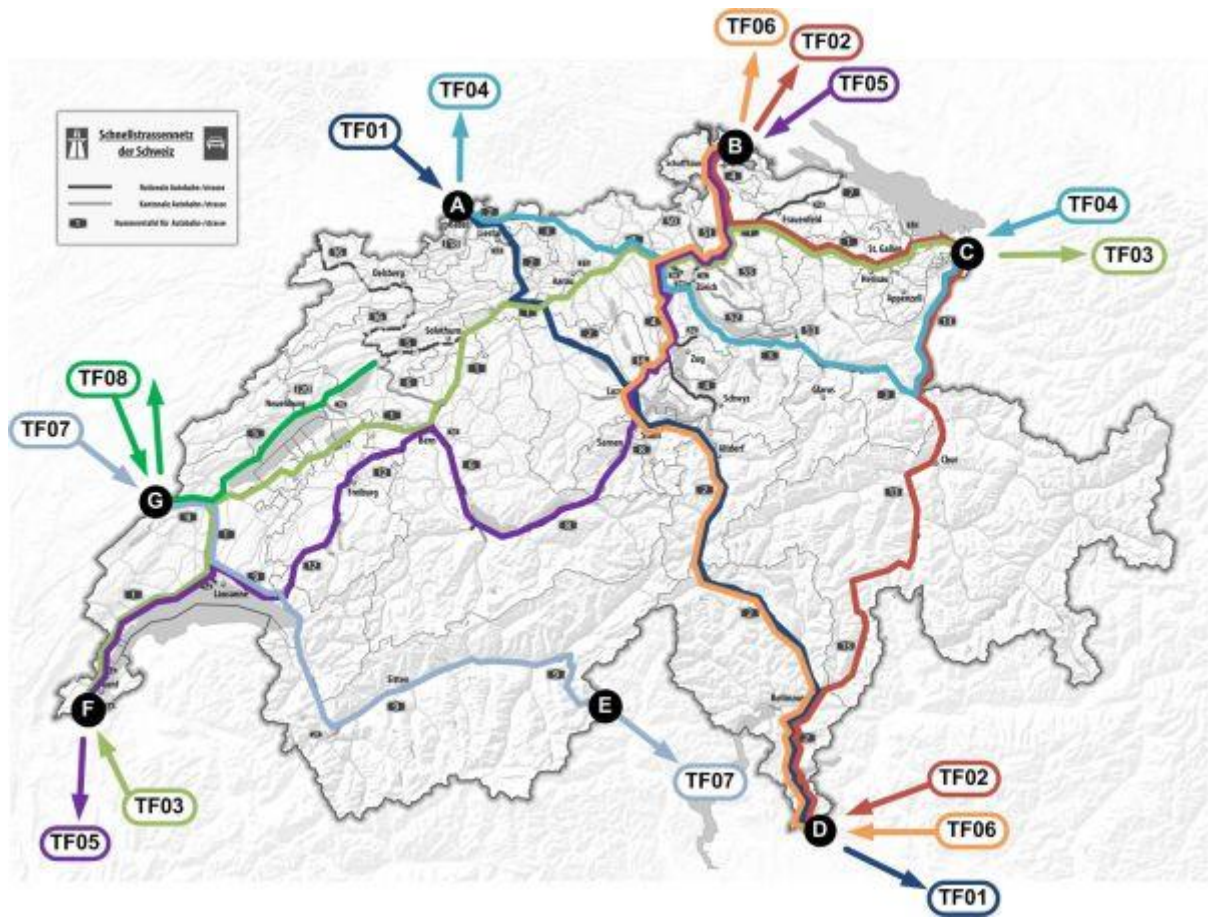
Key:

Abbreviation	Meaning
TF01 – TF09	Test driving scenario / test case 01 – 09
A	Basel-Weil Autobahn border crossing/customs office
B	Thayngen border crossing/customs office
C	St. Margrethen-Strasse border crossing/customs office
D	Chiasso Brogeda Merci border crossing/customs office
E	Gondo border crossing/customs office
F	Bardonnex border crossing/customs office
G	Vallorbe-Route border crossing/customs office

The directions of travel shall be adhered to for two reasons. Some of the stationary enforcement stations are designed for only one direction of travel. Furthermore, a different direction of travel on the same test route can lead to different mileage data.

5.2   TF01 – North/south axis A2

Test case ID		TF01
Description		North/south axis A2
Test route	Entry: Route: Exit:	Basel-Weil Autobahn border crossing/customs office (47.598340, 7.601418) Belchen-Lucerne-Gotthard-Lugano

Trial Operation Specification - Level 3

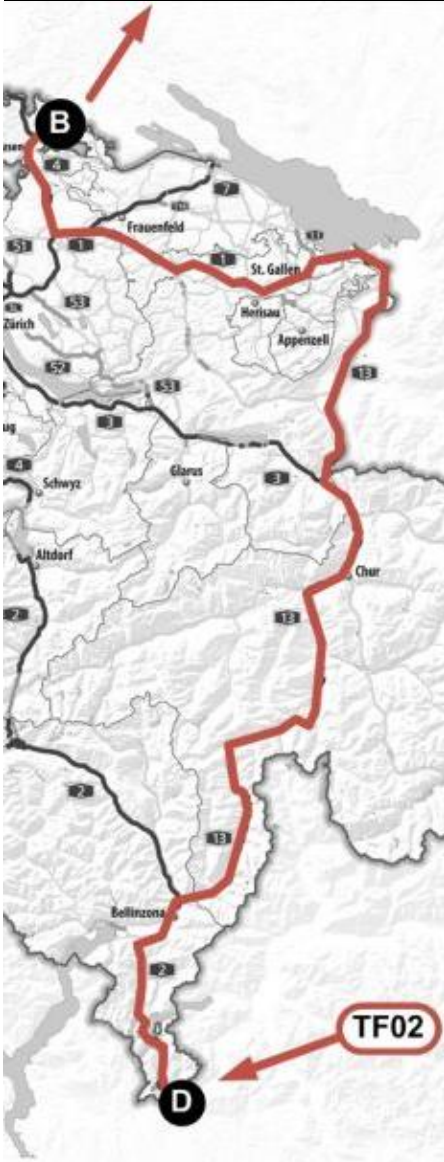|	
	Chiasso Brogeda Merci border crossing/customs office (45.837291, 9.035854)
Distance check	• Route cover transit trip A2 • Route with heavy foreign vehicle traffic • Use of two long tunnels (Selisberg and Gotthard) • Destination/origin traffic Northwestern Switzerland, Central Switzerland and Ticino
Operating scenario check	• One EETS journey on one day
Vehicle configuration	40 tonnes, Euro 5, articulated lorry
Passage enforcement stations	Belchen Süd (BELS), St. Gotthard Süd (GOTS)
Expected result	Distance: 288.9 km (+/- 4% = 277.33 km,..., 300.45 km)
Detailed description test route	If no instructions are given, the route is followed. • Entry into Switzerland from Germany on Bundesautobahn 5 (E35) • After the Basel/Weil border crossing/customs office, take the A2 • At the next junction, turn right towards Gotthard/ Bern/Luzern/Arisdorf (A2/E25/E35) • At the next junction, turn left towards Gotthard/Luzern/Zürich/Rothrist (A1/A2/E35) • At the next junction, turn right towards Gotthard//Luzern/Reiden (A2/E35) • Exit Switzerland via the Chiasso Brodega Merci border crossing/customs office
Comments	None

5.3 TF02 – North/south axis A4/A13

Test case ID	TF02
Description	North/south axis A4/A13
Test route Entry: Route: Exit:	Chiasso Brodega Merci border crossing/customs office (45.837491, 9.036350) Lugano-Chur-St. Gallen Thayngen border crossing/customs office (47.740425, 8.718055)
Distance check	• Route cover transit trip A13 • Alternative route to the Gotthard tunnel via the San Bernardino • Destination/origin traffic Eastern Switzerland
Operating scenario check	• One EETS journey on one day
Vehicle configuration	32 tonnes, Euro 6, articulated lorry
Passage enforcement stations	Bellinzona Nord (BESN), San Bernardino Nord (BERN), Bad Ragaz Nord (RSGN), Goldach West (GOLW)

Trial Operation Specification - Level 3

Test case ID	TF02
Expected result	Distance: 359.34 km (+/- 4% = 344.97 km,..., 373.71 km)
Detailed description test route	If no instructions are given, the route is followed. • Entry into Switzerland from Italy on the A9 (E35) motorway • After the Chiasso Brodega Merci border crossing/customs office, take the A2 • At the next junction, turn right towards Bellinzona Nord/San Bernardino/Chur (E43/A13) • At the next junction, turn right towards St. Gallen/St. Margarethen/München/Feldkrich/Vaduz (E43/A13) • During the course of the route, the A13 motorway becomes the A1 • At the next junction, turn right towards Schaffhausen/Henggart (E41/A4) • At the next junction, turn left towards Stuttgart/Singen/Thayngen/SH-Herblingen (E41/E54) • Exit Switzerland via the Thayngen border crossing/customs office
Comments	None

5.4 TF03 – East/west axis

Test case ID	TF03
Description	East/west axis
Test route Entry: Route: Exit:	Bardonnex border crossing Lausanne-Yverdon-Bern-Aarau-Zurich-St. Gallen St. Margrethen-Strasse border crossing
Distance check	• Route cover transit trip A1 • Destination/origin traffic Zurich, Espace Mittelland and Lake Geneva region
Operating scenario check	• One EETS journey on one day
Vehicle configuration	28 tons, Euro 4, lorry
Passage enforcement stations	St. Prex Est (PREO), Épendes Est (EPEO), Grauholz Ost (GRAO), Oberbuchsiten Ost (OBSO), Effretikon Nord (EFFN)
Expected result	Distance: 391.25 km (+/- 4% = 375.60 km,..., 406.90 km)
Detailed description test route	If no instructions are given, the route is followed. • Entry into Switzerland from France on the A41 motorway • After the Bardonnex border crossing drive by the customs office (46.149474, 6.096396), then take the A1 • At the next junction, turn right towards Bern (A1) • At the next junction, turn left towards Zürich/Basel/Interlaken (A1) • At the next junction, turn left towards Zürich/Basel/Biel (E25/E27/A1) • At the next junction, turn left towards Zürich/Basel/Kilchberg (A1/E35) • At the next junction, turn left towards Zürich/Gotthard/Luzern/Rothrist (A1) • At the next junction, turn left towards Zürich/Aarau (A1) • At the next junction, turn left towards Zürich/Basel/Biel (E25/E27/A1) • At the next junction, turn left towards Zürich/Basel/Kirchberg (A1/E25) • At the next junction, turn left towards Zürich/Gotthard/Luzern/Rothrist (A1) • At the next junction, turn left towards Zürich/Aarau (A1) • At the next junction, turn left towards Zürich/Wettingen-Ost (A1/A3/E60) • At the next junction, turn right towards Flughafen/Nordring-Zürich (A1/A4/E41/E60) • At the next junction, turn left towards St. Gallen/Schaffhausen (A1) • Leave the motorway at exit 96 St. Margrthen in the direction of Bregenz/München/St. Margrethen. • At the roundabout, take the first exit onto Neudorfstrasse. • Turn right onto Grenzstrasse at the next junction • drive by the customs office (47.455374, 9.639173) • Exit Switzerland via the St. Margrethen-Strasse border crossing on the bridge over the old Rhine river/
Comments	None

5.5 TF04 – North/east axis

Test case ID	TF04
Description	North/east axis
Test route Entry: Route: Exit:	St. Margarethen-Strasse border crossing/customs office (47.455538, 9.639114) Vaduz-Zurich-Frick Basel/Weil motorway border crossing/customs office (47.592828, 7.604030)
Distance check	• Route cover transit trip A13 • Alternative route to the Gotthard tunnel via the San Bernardino • Destination/origin traffic Eastern Switzerland
Operating scenario check	• One EETS journey on one day
Vehicle configuration	40 tonnes, Euro 5 (EEV), articulated lorry
Passage enforcement stations	Bözberg West (BOZW)
Expected result	Distance: 233.41 km (+/- 4% = 224.07 km,..., 242.75 km)
Detailed description test route	If no instructions are given, the route is followed. • Entry into Switzerland from Austria on Landstrasse 202 • Turn left onto Neudorfstrasse at the next junction • At the roundabout, take the second exit onto the A13 motorway • At the next junction, turn right towards Chur (E43/A13) • At the next junction, turn right towards Zürich/Sargans/Mels (A3)

Test case ID	TF04
	- At the next junction, turn right towards Basel/Westring-Zürich/Flughafen/Bern/St. Gallen (A3) - At the next junction, turn right towards Bern/Basel/St. Gallen/Westring-Zürich (A3) - At the next junction, turn left towards Bern/Basel (E60/A1/A3) - At the next junction, turn right towards Deutschland/France/Basel/Brugg (E60/A3) - At the next junction, turn left towards Karlsruhe/Deutschland (A2/E35) - Exit Switzerland via the Basel/Weil motorway border crossing/customs office
Comments	None

5.6 TF05 – North/west axis

Test case ID		TF05
Description		North/west axis
Test route	Entry:	Thayngen border crossing
	Route:	Zurich-Aarau-Bern-Lausanne
	Exit:	Bardonnex border crossing
Distance check		- Route cover transit trip A4 - Alternative route Lausanne-Bern (A12) is covered - Destination/origin traffic Espace Mittelland, Central Switzerland and Lake Geneva region
Operating scenario check		One EETS journey on one day
Vehicle configuration		40 tonnes, Euro 5, articulated lorry
Passage enforcement stations		Effretikon Süd (EFFS), Cham West (CHAW), St. Prex West (PREW)
Expected result		Distance: 419.31 km (+/- 4% = 402.54 km,..., 436.08 km)

Trial Operation Specification - Level 3

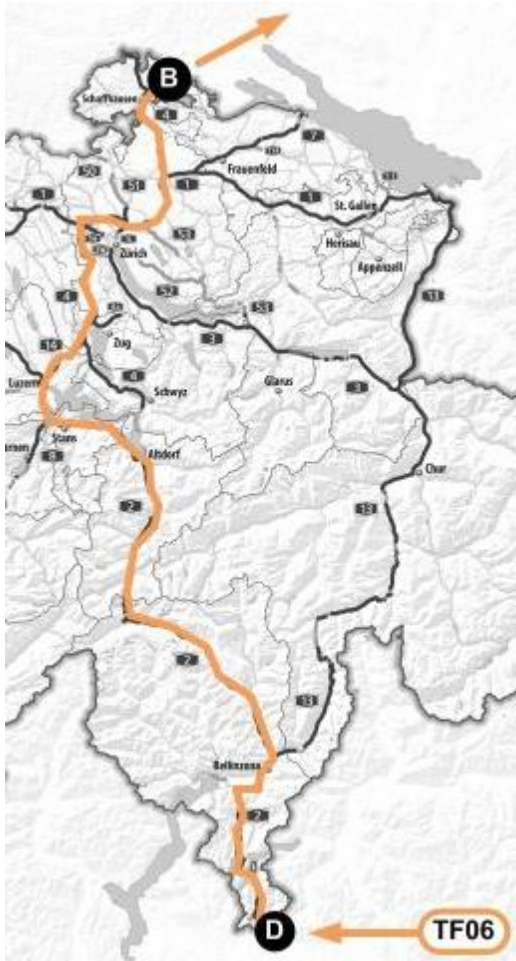| Test case ID	TF05
Detailed description test route	If no instructions are given, the route is followed. • Entry into Switzerland from Germany on Bundesstrasse 34 • Before border crossing take the right lane for goods transport into the customs plaza Thayngen • Drive by the customs office (47.741027, 8.718417), continue the same road (now J15) • Turn left onto the A4 towards Zürich at the next junction • At the next junction, turn right towards Zürich//Wülflingen (A4) • At the next junction, turn right towards Bern/Chur/Luzern/Flughafen/Nordring-Zürich (A1/A4/E41/E60) • At the next junction, turn left towards Bern/Chur/Luzern/Nordring-Zürich (A1/A4/E41/E60) • At the next junction, turn left towards Chur/Luzern/Westring-Zürich (A3) • At the next junction, turn right towards Gotthard//Luzern/Zug (E41/A4) • At the next junction, turn left towards Luzern/Gisikon-Root (A14) • At the next junction, turn left towards Gotthard/Interlaken/Luzern (E35/A2) • At the next junction, turn right towards Interlaken (A8) • During the course of the route, the A8 motorway becomes Route 4 • Turn left at the next junction and then immediately right onto the A8 motorway towards Interlaken/Bern/Thun • At the next junction, turn left towards Bern/Thun/Spiez (A8) • During the course of the route, the A8 motorway becomes Route 4 and then the A8 again • At the next junction, go straight towards Bern/Thun/Spiez (A8) • During the course of the route, the A8 motorway becomes Route 6 and 11 • Turn left onto the A8 towards Bern/Thun/Spiez/Kandersteg at the next junction • At the next junction, turn left towards Bern/Thun-Süd (A6) • At the next junction, take the second lane from the right towards Fribourg/Lausanne/Bern-Neufeld (E25/E27/A1) • At the next junction, turn right towards Vevey/Fribourg/Bern-Bümpliz (E27/A12) • At the next junction, turn right towards Genève/Lausanne (E62/A9) • At the next junction, turn right towards Genève/Lausanne-Sud (E25/E62/A1) • At the next junction, turn right towards Genève (E25/E62/A1) At the next junction, turn right towards France/Genève-la Praille/Aéroport/Gd-Saconnex (E25/E • Before border crossing turn right and inside the customs plaza drive by the Bardonnex customs office (46.150569, 6.095887) • Exit Switzerland via the Bardonnex border crossing
Comments	None

5.7 TF06 – North/south axis A2/A4 two-day trip

Test case ID	TF06
Description	EETS journey north/south axis A2/A4 with two days of driving in Switzerland
Test route Entry: Route: Exit:	Chiasso Brodega Merci border crossing/customs office (45.837491, 9.036350) Lugano-Gotthard-Schwyz-Zurich Thayngen border crossing/customs office (47.740425, 8.718055)
Distance check	• Route cover transit trip A2 • Route with heavy foreign vehicle traffic • Destination/origin traffic Ticino and Central Switzerland
Operating scenario check	• An EETS journey with two days of driving in Switzerland
Vehicle configuration	40 tonnes, Euro 5, articulated lorry
Passage enforcement stations	Bellinzona Nord (BESN), St. Gotthard Nord (GOTN), Cham Ost (CHAO), Effretikon Nord (EFFN)
Expected result	Distance: 299.34 km (+/- 4% = 287.37 km,..., 311.31 km)
Detailed description test route	If no instructions are given, the route is followed. • Entry into Switzerland from Italy on the A9 (E35) motorway

Trial Operation Specification - Level 3

Test case ID	TF06
	• After the Chiasso Brodega Merci border crossing/customs office, take the A2 • At the next junction, turn left towards Basel/Zürich/Luzern/San Gottardo (A2) • Shortly before the entrance to the Gotthard tunnel, take the exit "Airolo/Nufenen/Bedretto" and park at the stopping area "Parkplatz Airolo" (46.523923, 8.603628). • To continue on the following day, take the entrance to the A2 motorway towards Zürich/Luzern/San Gottardo • At the next junction, turn right towards Zürich/Schwyz/Altdorf (E41/A4) • At the roundabout, take the second exit onto the A4/E41 • At the next junction, turn left towards Zürich am Albis (E41/A4) • At the next junction, turn left towards Bern/Basel/St. Gallen/Westring-Zürich (E41/A3/A4) • At the next junction, turn right towards St. Gallen/Flughafen/Nordring-Zürich/Zürich City (E60/A1) • At the next junction, turn left towards St. Gallen/Schaffhausen (E41/E60/A1/A4) • At the next junction, turn right towards Schaffhausen/Henggart (E41/A4) • At the next junction, turn left towards Stuttgart/Singen/Thayngen/SH-Herblingen (E41/E54) • Exit Switzerland via the Thayngen border crossing/customs office
Comments	The stopping area "Parkplatz Airolo" [46.523923, 8.603628] is used only for switching the EETS OBU on and off. It is assumed that drivers will then drive to a hotel with an appropriate parking space. After the overnight stay, the EETS journey must be continued from the same stopping area. "Parplatz Airolo" is located directly beside the exit with the sign "Airolo/Nufenen/Bedretto" and has 500 free parking spaces (cars). (http://airolo.ch/de/seilbahnen/winter/services/parkplaetze.html)

Trial Operation Specification - Level 3

TF06 - test route:

TF06 - stopping area:

## 5.8 TF07 – West/south axis A9 (journey with different vehicle parameters)

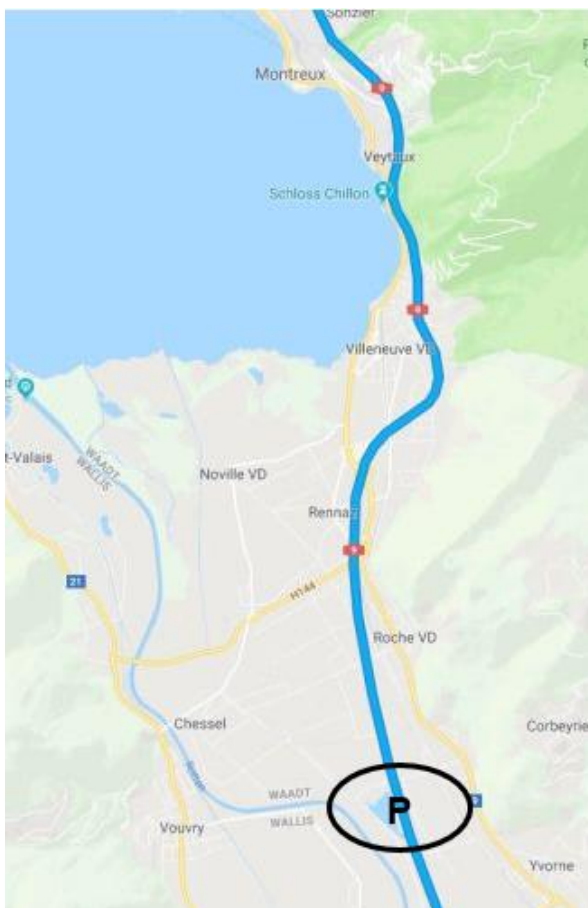| Test case ID	TF07
Description	West/south axis A9, journey with different vehicle parameters for parts of the trip. At the stopping area ("Le Chablais Ouest" services), a trailer (not previously present/declared) is declared on the EETS OBE.
Test route Entry: Route: Exit:	Vallorbe-Route border crossing Lausanne-Montreux-Yvorne (stopping area)-Simplon Gondo border crossing
Distance check	• Route cover transit trip A9 • GPS reception Valais
Operating scenario check	• One EETS journey on one day • One EETS journey with different vehicle parameters
Vehicle configuration	Before stopping area: • 8 tonnes, Euro 5, articulated lorry, tractor only After stopping area: • 40 tonnes, Euro 5, articulated lorry including semi-trailer
Passage enforcement stations	Bex Sud (BEXS) (after stopping area), Simplon Süd (SIMS)
Expected result	Entry to stopping area: 80.08 km (+/- 4% = 76.88 km,..., 83.28 km) Stopping area to exit: 146.78 km (+/- 4% = 140.91 km,..., 152.65 km) Total distance: 226.86 km (+/- 4% = 207.79 km,..., 235.93 km)
Detailed description test route	If no instructions are given, the route is followed. • Entry into Switzerland from France on Route nationale N57 • Before border crossing turn left into the customs plaza Vallorbe-Route • After border crossing inside the customs plaza drive by the customs office (46.731401, 6.385742), continue on the same road (now E23) • At the roundabout, take the second exit towards Orbe/Lausanne/Yverdon (E23/A9) • At the next junction, turn right towards Simplon/Gd-St-Bernard/Lausanne (E23/E25/A1/A9) • At the next junction, turn right towards Simplon/Gd-St-Bernard/Lausanne-Nord/Vevey Montreux (E62/A9) • When you come to "Le Chablais Ouest" services (46.337380, 6.931143), enter, park, change the rate (declare trailer) and continue your journey • During the course of the route, the A9 motorway becomes Route 9 • Continue on Route 9 • At the roundabout, take the slip road to the A9 towards Simplon/Brig • At the next junction, turn right towards Milano/Domodossola/Simplon (E62/A9) • During the course of the route, the A9 motorway becomes Route 9 – continue on it • Pass the Gondo customs office (46.196170, 8.141587) and exit Switzerland via the Gondo border crossing

Trial Operation Specification - Level 3

Comments	The stopping area ("Le Chablais Ouest" services [46.337380, 6.931143]) is used to register the trailer declaration. The trailer declaration is not registered for the first part of the route. After the stopping area, the trailer declaration is registered according to the trailer declaration type (simple or weight declaration).

TF07 - test route:
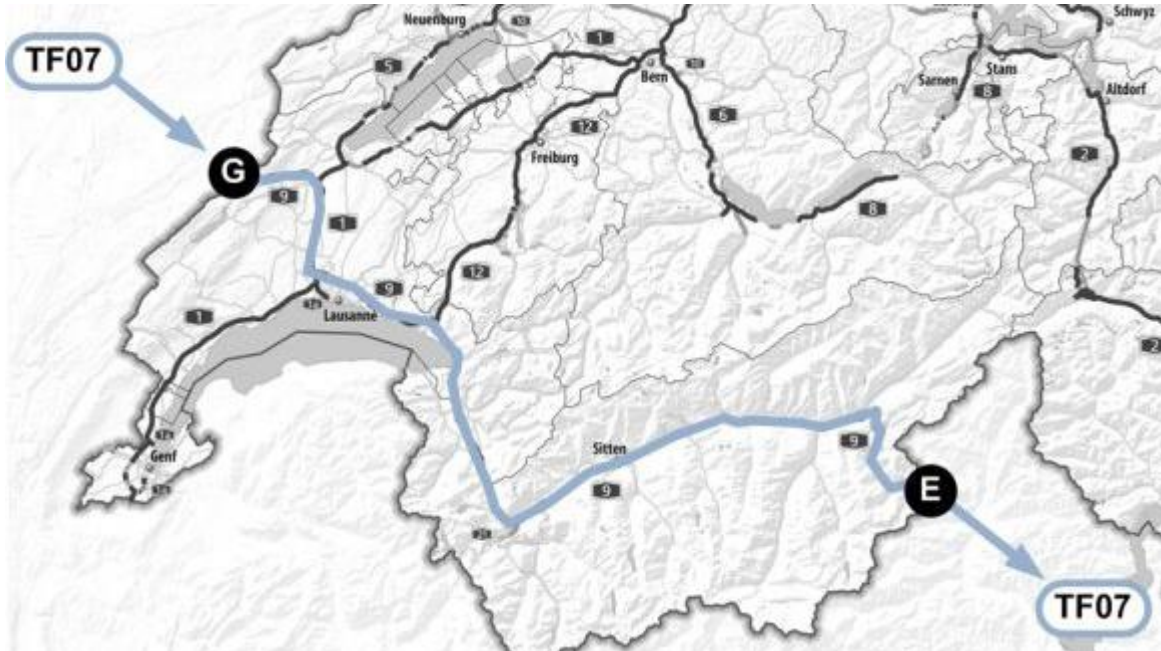
TF07 - stopping area:

5.9 TF08 – A5 EETS journey with a three-day stay

Test trip ID	TF08
Description	An EETS journey with a three-day stay in Switzerland, whereby no driving is allowed on day two.
Test route Entry: Route: Exit:	Round trip: Vallorbe-Route border crossing Neuchâtel-Biel (stopping area)-Neuchâtel Vallorbe-Route border crossing
Distance check	• Route cover A5
Operating scenario check	• Testing of the correct transmission of the EETS journey declaration with multiple data items, whereby there is no journey shown for day two
Vehicle configuration	40 tonnes, Euro 5, articulated lorry
Passage enforcement stations	Épendes Ost (EPEO)
Expected result	Distance: 183.17 km (+/- 4% = 175.84 km,..., 190.49 km)
Detailed description test route	Outward trip • Entry into Switzerland from France on Route nationale N57 • Before border crossing turn left into the customs plaza Vallorbe-Route • After border crossing inside the customs plaza drive by the customs office (46.731401, 6.385742), continue on the same road (now E23) • At the roundabout, take the second exit towards Orbe/Lausanne/Yverdon • At the next junction, turn left towards Bern/Fribourg/Neuchâtel/Yverdon (A1) • At the next junction, turn right towards Neuchâtel//Yverdon-Ouest/Ste-Croix (A5) • During the course of the route, the A5 motorway becomes Route 5 – continue on it • At the roundabout (in Biel), take the second exit and stay on Route 5 (Seevorstadt) • At the earliest opportunity, turn right to the public parking spaces at Seefelsweg (47.135317, 7.235556) in Biel Return trip • The return trip starts at the specified stopping area (public parking spaces at Seefelsweg (47.135317, 7.235556) in Biel) • When joining Route 5, drive on the left towards Neuchâtel • At the roundabout, take the first exit towards Neuchâtel (Route 5) • At the next junction, turn left towards Lausanne/Neuchâtel/Le Landeron (A5) • At the next junction, turn right towards Besançon/Lausanne/Vallorbe (A1) • At the next junction, turn right towards Besançon/Vallorbe/Orbe (A9) • During the course of the route, the A9 motorway becomes E23 – continue on it

Trial Operation Specification - Level 3

Test trip ID	TF08
	• At the roundabout, take the first exit towards Dijon/Besançon/Pontarlier
	• turn right into the customs plaza Vallorbe-Route and drive by the customs office (46.731301, 6.385957)
	• After border crossing inside the customs plaza exit Switzerland to France on Route nationale N57
Comments	The stopping area is at the public parking spaces at Seefelsweg (47.135317, 7.235556) in Biel. The stopping area is used only for switching the EETS OBU on and off. It is assumed that drivers will then drive to a hotel with an appropriate parking space. After the overnight stays, the EETS journey must be continued from the same stopping area.

TF08 - test route:
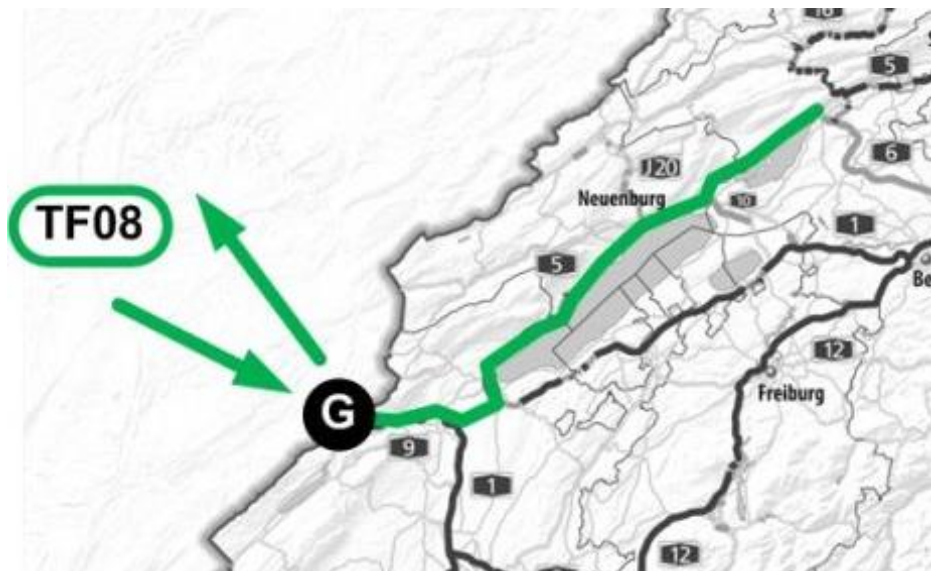
TF08 - stopping area:

5.10 TF09 – Several EETS journeys per day with the same vehicle/EETS OBE

| Test case ID		TF09
Description		Several EETS journeys per day with the same vehicle/EETS OBE
Test route 1	Entry: Route: Exit:	Bargen border crossing Büsingen am Hochrhein (Enklaven)-Neunkirch Trasadingen border crossing
Test route 2	Entry: Route: Exit:	Koblenz border crossing/customs office (47.608146, 8.233990) Bad Zurzach-Glattfelden Rafz-Solgen border crossing/customs office (47.614313, 8.571833)
Test route 3	Entry: Route: Exit:	Neuhausen am Rheinfall border crossing Neuhausen am Rheinfall-Schaffhausen Süd (A4) Bargen border crossing
Distance check		• Short EETS journeys
Operating scenario check		• Testing of the correct transmission of each of the three individual EETS journey declarations • Testing of the correct transmission in the case of the route through enclaves-Büsingen am Hochrhein • Testing of the correct transmission in the case of the route in the immediate vicinity of a foreign country
Vehicle configuration		40 tonnes, Euro 5, articulated lorry
Passage enforcement stations		None
Expected result test route 1		Distance: 40.30 km (+/- 4% = 38.69 km,..., 41.91 km)
Expected result test route 2		Distance: 36.56 km (+/- 4% = 35.10 km,..., 38.02 km)
Expected result test route 3		Distance: 21.20 km (+/- 4% = 20.35 km,..., 22.05 km)

Trial Operation Specification - Level 3

| Test case ID	TF09
Detailed description test route 1	If no instructions are given, the route is followed. • Entry into Switzerland from Germany on Bundestrasse 27 • After the border crossing and Bargen customs office with beacon location (47.794844, 8.586540), continue on the same road (A4) • At the next junction, turn right towards Singen/SH-Herblingen (E41/E54) • Leave the motorway at the SH-Herblingen exit towards SH-Herblingen/Stetten/Dörflingen • At the next junction, turn right onto Gennersbrunnerstrasse • Veer right at the next junction and follow the signs for Büsingen • At the T junction, turn right onto Junkerstrasse • At the T junction, turn left onto Fischerhäuserstrasse • Drive straight – the street becomes Route 14 • Drive through the Galgenbuck tunnel • At the roundabout, take the first exit and stay on Route 14 • At the roundabout, take the second exit towards Basel/Waldshut-T./Trasadingen/Neunkirch/Hallau (Route 13) • At the roundabout, take the second exit and stay on Route 13 • Exit Switzerland via the Trasadingen customs office with beacon location (47.662287, 8.432222) and border crossing
Detailed description test route 2	If no instructions are given, the route is followed. • Entry into Switzerland from Germany on Rheinbrückenstrasse • After the Koblenz border crossing/customs office, turn right onto Bahnhofstrasse • At the roundabout, take the third exit and stay on Bahnhofstrasse • At the roundabout, take the third exit towards Schaffhausen/Eglisau (Route 4) • Exit Switzerland via the Rafz-Solgen border crossing/customs office
Detailed description test route 3	If no instructions are given, the route is followed. • Entry into Switzerland from Germany on Bundesstrasse 27 • After the border crossing and Neuhausen am Rheinfall (Jestetten) customs office with beacon location (47.669566, 8.595905), take Route 4 • At the next junction, turn right towards Schaffhausen (Route 14) • At the next junction, turn left towards Konstanz/Winterthur/Schaffhausen (Route 14) • Continue until you reach the motorway slip road towards Stuttgart/Singen (A4) • At the next junction, turn right towards Donaueschingen/Bargen (A4) • Exit Switzerland via the Bargen customs office with beacon location (47.794442, 8.589144) and border crossing
Comments	Border customs offices that generally have rather less traffic have been chosen. The start and finish of this test trip can be combined with other test trips.

Trial Operation Specification - Level 3

Test case ID	TF09
	The test routes sometimes follow the German border. This is the case between Koblenz and Schaffhausen (test route 2), as well as on the A4 above Schaffhausen (test routes 1 and 3).

TF09 - test route 1
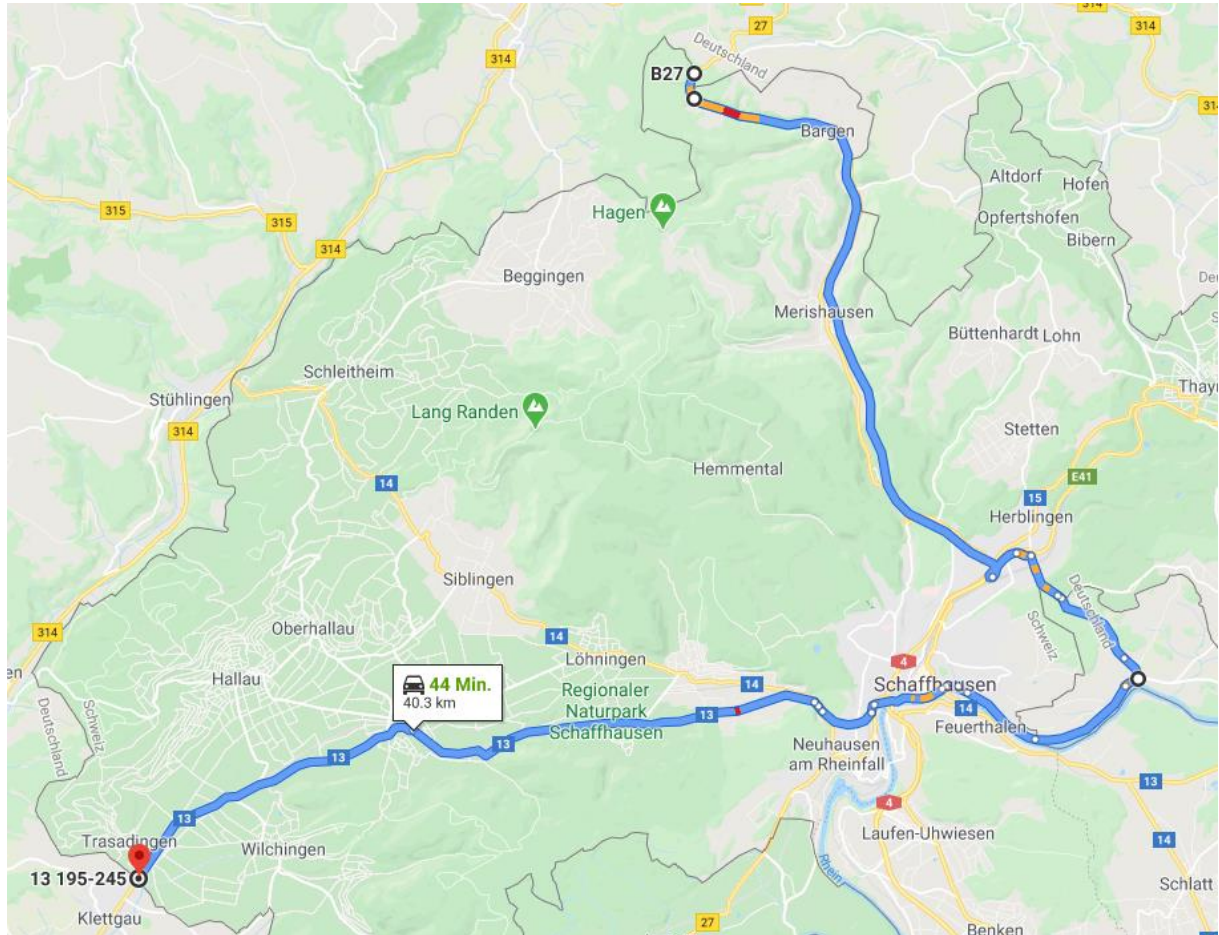
TF09 - test route 2
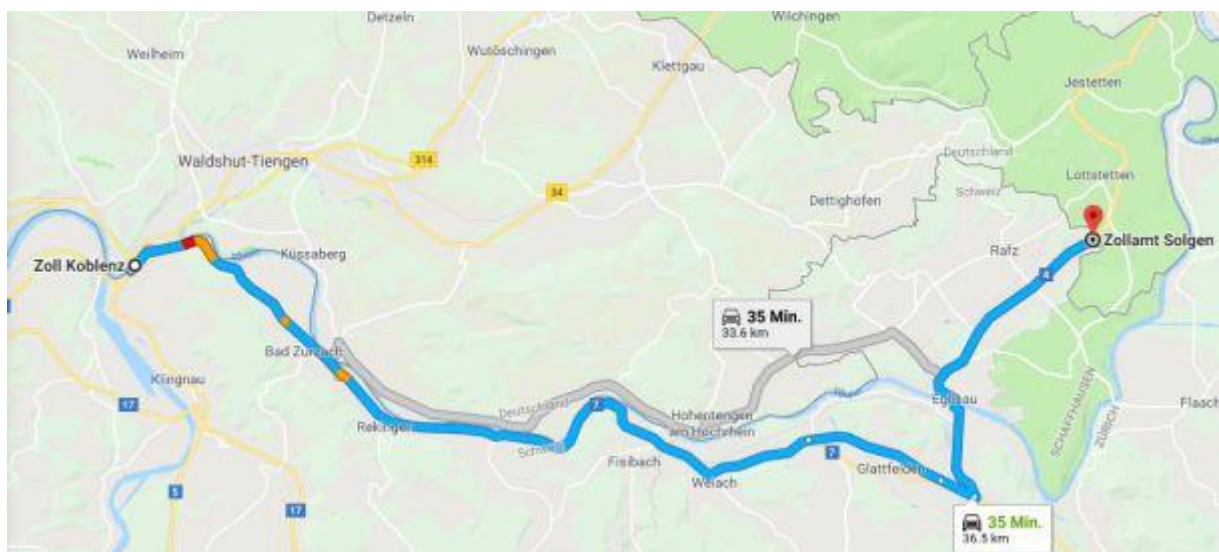
Trial Operation Specification - Level 3

TF09 - test route 3