LTU Nationwide GNSS Tolling System

OBU Providers and EETS Certification Guide and Test Procedures

Doc No. 30009
Version 2.1

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Overview of changes.

No.	Version	Status	Date	Contributor	Type of the change
1	0.1	Draft	16.06.2026	Oliver Bändl	First Version
2	1.0	Released	22.06.2026	Oliver Bändl	Final approved version
3	2.0	Released	25.06.2026	Oliver Bändl	Minor comments integrated
4	2.1	Released	29.06.2026	PMO	Second version

Table 1 Overview of changes

Reference to the status, versions and data classification.

Status:	
Draft	the document is being processed
Released	the document has been checked and released, it can only be modified if the version number is updated.
Obsolete	the document is not valid anymore
Versions:	
0.1, 0.2	draft versions
1.0	**first released version with the status “Released“**
1.1, 1.2, etc.	draft versions, that supplement version 1.0
2.0	**second released version with the status “Released”**
Data classification	
Public	No restriction
Internal	Restricted to internal and external Kapsch employees
Confidential	**Restricted to selected active directory and/or sharepoint groups (default)**
Secret	Restricted to selected employees, server encryption needed

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1 General

1.1 Purpose of the Document

The purpose of the E2E integration tests is to assess the correct implementation of the interface according to the applicable specifications, which are listed under the technical part of the EETS Toll Domain Statement (technical perspective).

The E2E integration test is focusing on the following elements related to the correct implementation of the interface between the Toll Charger System and the prospective EETS TSP (or National OBE Provider):

- Setting up a trust relationship (i.e. exchange of trust objects)
- Management of exception lists (exempt list /blocklist)
- Reception of Toll Context data
- Provision of Toll Declarations
- Provision of Billing Details (EETS TSP only scenarios)
- Provision of Payment Claims (EETS TSP only scenarios)

The test approach combines validation of individual interface components with:

- **End-to-End Transition Scenarios**, covering the complete processing flow across Toll Context, Toll Declaration, Billing Details, and Payment Claims
- **Special / Exception Handling Scenarios**, validating business cases such as rejected and subsequently corrected and reprocessed transactions
- **Edge and Negative Test Scenarios**, including timeouts, invalid or unknown references, and inconsistent or unmatched data exchanges

The setup of a trust relationship is conducted via a manual process and is part of the preparation phase for the integration tests.

The integration test scenarios cover the following processes conducted with the prospective EETS Providers / National OBE Providers:

- Introduction of a new **EETS TSP** or **National OBE Provider** – handover and import of trust objects
- Regular service operation—transaction flow between the **EETS TSP** or **National OBE Provider** and the Toll Charger System
- Claim management processes covering scenarios where claims are initiated by:
  - the **EETS TSP** towards the Toll Charger System
  - the Toll Charger System towards the **EETS TSP**
- Payment processes with the **EETS TSP** – invoicing and payment claims

After successful execution of the E2E integration tests defined in this document, the **EETS Provider / National OBE Provider** receives a valid Suitability Certificate confirming completion of the E2E integration tests and may proceed to the next project phase according to the overall project plan.
In addition, the E2E integration tests may support the validation of initial operational readiness, including the correct behaviour of OBUs from a business perspective and the proper generation of toll declarations. If not fully covered within this test phase, the validation of OBUs as charging elements may be completed in a subsequent project phase.

1.2 Abbreviations

The following table contains a list of most important abbreviations used within this document to enable easy reading.

Abbreviation	Explanation
ANPR	Automatic Number Plate Recognition
CBO	Commercial Back Office
CRM	Customer Relationship Management
CSR	Certificate Signing Requests
DB	Database
DC	Data Center
DWH	Data Warehouse
EBO	Enforcement Back Office
EERP Provider	An entity which, under a separate contract, makes EETS available to the EETS User, remits tolls to the relevant Toll Charger and is registered in its Member State of establishment
EETS	European Electronic Toll Service
EETS User	A natural or legal person who has entered into a contract with an EETS Provider to use EETS
EIB	EETS Interface Bus
GNSS	Global Navigation Satellite System (GPS)
GNSS devices	Devices using satellite positioning – On Board Units (OBUs) and mobile phones
OBU	On Board Unit; the complete set of hardware and software components installed in the vehicle for toll service provision
OBE	On Board Equipment; the complete set of hardware and software components installed in the vehicle for toll service provision
LTUNWTS	Lithuania Nationwide Tolling System
RL	Republic of Lithuania
Road tolls	A charge levied on vehicles for the use of certain roads, motorways or other infrastructure
Supplier	Entity providing services to the Customer
TD	Toll Declaration
TP	Vehicle
User	Vehicle operators subject to toll charges
Vehicle category	Characteristics of motor vehicles, their trailers and related systems

Table 2 Abbreviations

1.3 Definitions

Definitions used within this document follow the terminology applied in EETS regulations, relevant ISO standards and project documentation. Where no explicit definition is provided, commonly accepted EETS terminology applies.

1.4 List of Referenced Documents

Ref. No	Document Number	Document Type	Document Title
[1]		Specification	EETS Toll Domain Statement
[2]		Specification	EETS Integration Guide 1.1

Table 3 References

2 Test Overview

This chapter provides an overview of the planned testing activities, the systems under test and the interfaces involved.
The following figure depicts the functional system overview of the Toll Charger System.

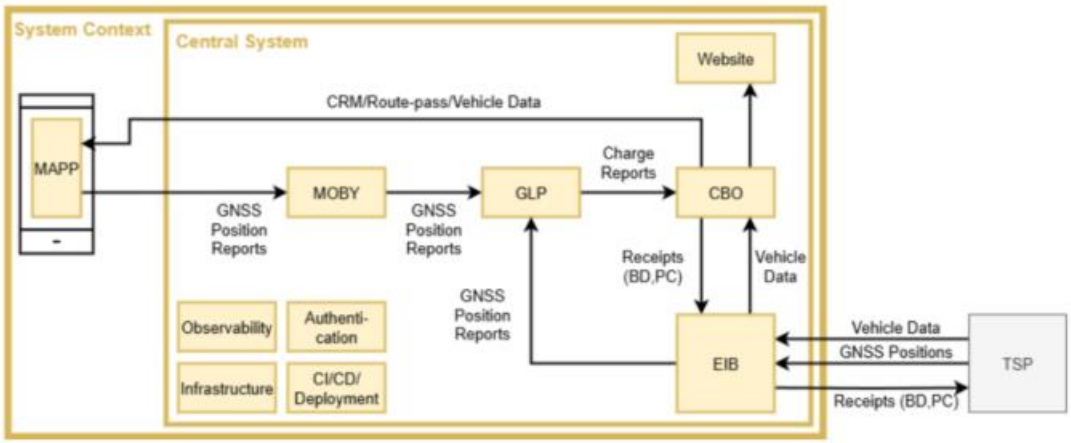


Figure 1 System Architecture Diagram

The following subchapters describe the involved Interface from the toll charger system to support the Suitability for Use.

2.1 EETS Interface Layer

The EETS Interface Layer manages the communication between the Toll Charger System and EETS Providers / National OBE Providers. *The term "EETS Interface Layer" corresponds to the “EIB – EETS Interface Bus”.*

The necessary business rules and processes are implemented at the sender and/or receiver ends. The interface layer dispatches received information internally to the relevant back-office systems.
The EETS Interface Layer consists of a combination of services working together to provide a logical bridge between EETS Providers / National OBE Providers and the Toll Charger System, including:

- **Input web services**
  Receive requests from EETS Providers / National OBE Providers (e.g. Toll Declarations according to ISO 12855) and convert them into internal structures. During this conversion, incoming data is validated for syntactical correctness.
- **Message handling services**
  Analyse incoming data semantically according to defined business rules (semantic validation, security checks, consistency checks) and process the messages accordingly. These services also convert messages originating from internal back-office systems into ISO 12855 message structures.
- **Output web services**
  Provide processed messages and responses to external EETS Providers.
- **Archive and monitoring components**
  Store exchanged ISO 12855 interface messages and communication data for traceability, audit and troubleshooting purposes. Historical data can be accessed via the EIB Archive GUI.

3 Test Preparations

3.1 Test Environment and Location

The E2E integration tests will be conducted in the defined **EETS environment** of the Toll Charger System. All necessary network connections must be established by both parties before test execution, including but not limited to:

- Secure network connectivity (e.g. VPN)
- Endpoint configuration and declaration
- Firewall, routing and access configuration

3.2 Test Data

For the different integration tests on the interface, simulated Toll Declaration data can be used.
Multiple datasets with varying values and declaration attributes must be prepared by the EETS Provider / National OBE Provider. These datasets shall be mutually agreed upon during a coordination workshop between the Toll Charger System and the EETS Provider before test execution.
The detailed execution of individual test scenarios is defined in the corresponding test cases maintained in the test management system.

3.3 Test Personnel / Organization

The following roles are required to perform the E2E integration tests.

Role	Responsible Organisation	Responsibilities
EETS Integration Manager	Toll Charger System	Single point of contact for communication and coordination
E2E Test Coordinator	Toll Charger System	Coordination of E2E integration tests and validation of results
EETS Provider Coordinator / National OBE Provider Coordinator	EETS Provider /National OBU Provider	Coordination of test activities on provider side
Information Security Manager	Both parties	Management of certificates, trust objects and security approvals
Test Engineer	Both parties	Execution of tests and verification of test results

Table 4 E2E Integration Requirements

4 Test Execution Procedure

This section describes the generic procedure for execution of the tests defined in this test plan.

- The EETS Test Coordinator verifies that all preconditions and preparations are fulfilled.
- Test Engineers are assigned to the relevant test scenarios.
- Test execution is coordinated according to the agreed test schedule.
- Tests are executed and results are documented.
- Deviations and defects are recorded and evaluated.
- Retests are coordinated if required.
- Billing Details and Payment Claims over the EETS Interface are only covered between EETS TSP and TC.

There are dedicated test procedures for service operations (toll context data, list handling, and toll declarations) and claim management (i.e. when a payment claims gets rejected). Details can be found in the test cases.

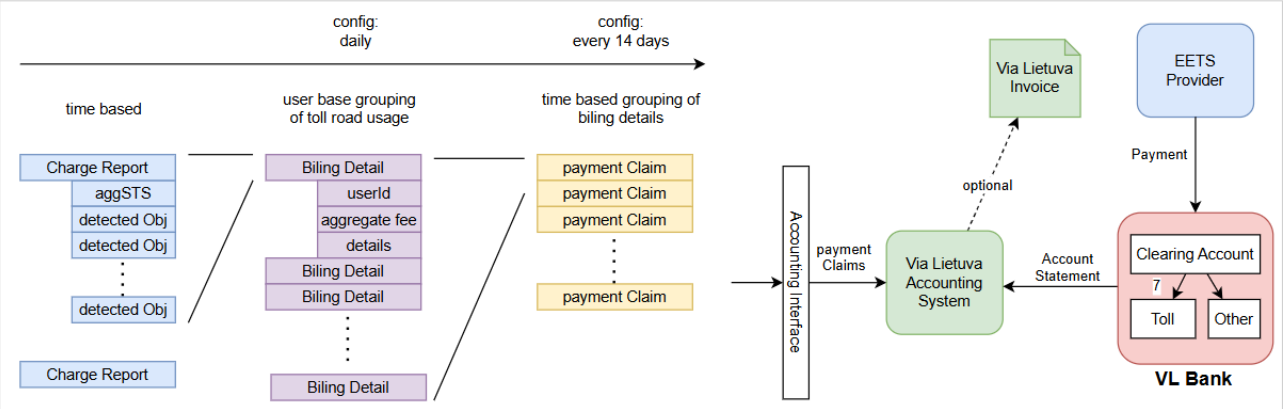


Figure 2 Payment Claims and Invoice Process

5 End-to-End Integration Test Principles

- Tests are executed constructively.
- Tests may be suspended in case of a critical defect.
- Retest dates are agreed jointly by the involved parties.
- Successful execution of the E2E integration tests is a prerequisite for proceeding to subsequent project phases.

6 General Preconditions for All E2E Integration Tests

The establishment of a trust relationship between the Toll Charger (TC) and the EETS Provider (TSP) / National OBE Provider (TDP) is a mandatory precondition for test execution.
Although the required EETS certificates are expected to be installed on both systems before testing, this precondition will be explicitly verified in the first test case to ensure proper communication between the two systems.

- Key pairs and Certificate Signing Requests (CSRs) are created
- CSRs are submitted to an external Certificate Authority
- Signed certificates are received and deployed on both systems
- Certificates are securely stored and made available to the interface components
- The cryptographic context is configured and activated

7 End-to-End Test Case Management

The detailed E2E integration test cases are maintained in the Toll Chargers test management system (Jira). For the purpose of certification, a defined subset of test cases is exported and provided as part of this document.

The test cases cover

- Interface validation
- Message handling
- Acknowledgement flows
- Error handling scenarios
- Protocol timing and acknowledgement handling (including delayed ACKs, retries and timeout behaviour)

The exported test cases form an integral part of the certification test scope.
Detailed test execution steps, data setups, and technical implementation aspects are maintained within the test management system (Jira) and may be adapted as needed during the integration phase.
The initial set of test cases applies to both EETS TSPs and National OBE Providers, while the second set is specific to EETS TSPs only (e.g., billing details and payment claims).

8 Field Tests / Driving Validation

8.1 Purpose

The purpose of the field tests is to validate the correct behaviour of the EETS Provider / National OBE Provider under real driving conditions.
These tests verify that:

- GNSS-based OBUs correctly detect road usage (GPS accuracy).
- Driven routes are accurately translated into Toll Declarations
- Toll Declarations sent by the EETS Provider / National OBE Provider correspond to real vehicle movements

The field tests complement the interface-based E2E integration tests and ensure that the complete tolling chain functions correctly in real-world conditions.
The EETS Provider / National OBE Provider is responsible for processing, filtering and interpreting GNSS data in a way that ensures accurate generation of Toll Declarations.
The field tests verify that the data processing performed by the EETS Provider / National OBE Provider is sufficient to support correct toll charging by the Toll Charger System.

8.2 Scope

The driving tests include:

- Real vehicle movement on predefined routes
- GNSS tracking using OBUs and an independent reference system
- Generation and transmission of Toll Declarations
- Comparison of declared toll segments with actual driven routes

8.3 Test Setup

8.3.1 Vehicles and Equipment

- Test vehicle equipped with EETS Provider / National OBE Provider OBUs
  - There may be up to two OBE of different types in one vehicle, with up to three units of each type, making a total of six OBE units (three units of each of the two different types of OBE).
  - The vehicle must be equipped with OBE that meet the minimum parameters specified in Annex
    No 1 (Procedure for Onboarding On-Board Equipment into the Via Toll System)
- Reference tracking system (e.g. mobile application or GPS tracker)

8.3.2 Configuration

- Active Toll Context
- Correct vehicle classification configured on OBU
- Communication between OBU and the EETS Provider / National OBE Provider backend is active

Vehicle classifications, axle configurations and emission classes used during the field tests shall be defined before test execution.
These parameters must reflect the applicable rules of the respective Toll Domain and shall be agreed upon between the Toll Charger and the EETS Provider / National OBE Provider.
At least one representative vehicle per relevant toll class shall be included in the test scenarios.
The reference GNSS tracking system shall be based on a modern and properly maintained device to ensure sufficient positioning accuracy. The reference system must be capable of providing reliable GNSS data suitable for comparison with Toll Declarations generated by the EETS Provider / NAtional OBE Provider.
Where possible, multiple reference sources may be used to validate GNSS accuracy.

8.4 Execution Procedure

1. The test vehicle drives a predefined test route
2. GNSS positions are recorded:
   - by the OBU
   - by an independent reference system
3. The EETS Provider / National OBE Provider processes the trip and generates Toll Declarations
4. Toll Declarations are transmitted to the Toll Charger System
5. The results are compared with:
   - reference GNSS track
   - predefined expected route

8.5 Driving Scenarios

The following driving scenarios shall be covered:

8.5.1 Core Scenario – Standard Route

- Mixed route including:
  - motorways

  - primary roads
  - entry and exit ramps
- Roundtrip structure (start point → destination → return)
- Multiple repetitions to ensure consistent behaviour

8.5.2 Additional Real-World Scenarios

To ensure robustness of GNSS-based toll detection, the following scenarios shall be included:

- Road segments where toll roads pass through urban areas with dense road networks
- Urban environments with parallel roads and complex routing situations
- Highway driving with multiple entry and exit ramps
- Mixed toll and non-toll road segments with frequent transitions
- Cross-border driving scenarios involving entry and exit of the Toll Domain
- Border regions with potential GNSS disturbances or signal inconsistencies

These scenarios are intended to validate the robustness of the EETS Provider's data processing and filtering mechanisms under challenging real-world conditions.

8.6 Field Test Configuration

Multiple test runs shall be performed to ensure reproducibility
Different vehicle configurations shall be included, where applicable
Reference tracking must be active for all test runs
All test runs shall be documented and uniquely identifiable.

8.7 Validation Criteria

The following validation criteria are used to assess the correctness and completeness of Toll Declarations.

8.7.1 Route Coverage

- All driven toll segments are detected and included in Toll Declarations

8.7.2 No False Positives

- No toll segments are declared that were not actually driven

8.7.3 Completeness

- No missing segments within the driven route
- No unexpected gaps in Toll Declarations

8.7.4 Temporal Consistency

- The sequence of Toll Declarations reflects the actual driving order
- Timestamps are plausible and consistent

8.7.5 Context Application

- Correct vehicle classification is applied
- Applicable toll rules and road classes are correctly interpreted

8.7.6 Position Accuracy (Tolerance Handling)

- GNSS positions correspond to the driven route within acceptable tolerance
- Minor deviations are allowed, provided they do not result in incorrect tolling

8.8 Result Evaluation

Each driving test is evaluated by comparing:

- Reference GNSS tracking data
- Toll Declarations provided by the EETS Provider / National OBE Provider

Test results are classified as:

- Passed – no critical deviations identified
- Passed with minor deviations – acceptable within tolerance
- Failed – missing segments, incorrect segments, or major inconsistencies

8.9 Documentation and Traceability

The following artifacts must be collected and stored:

- Recorded GNSS tracks (reference system)
- Toll Declarations received from the EETS Provider / National OBE Provider
- Comparison and evaluation results

These artefacts ensure full traceability and support audit and certification processes.

9 EETS Provider / National OBE Provider Integration Test Cases

No	Test Case ID	Test Case Summary
1	GNSSMTOLL-1560	EETS TSP / National OBE Provider - EETS Encryption Keys
2	GNSSMTOLL-1555	EETS TSP / National OBE Provider - New Toll Context Data TC -> TSP
3	GNSSMTOLL-1558	EETS TSP - Manage Exception List
4	GNSSMTOLL-1559	EETS TSP / National OBE Provider - Provision of Toll Declarations with OBU
5	GNSSMTOLL-1561	EETS TSP / National OBE Provider - Toll Declaration after new version of Toll Context
6	GNSSMTOLL-1757	EETS TSP Receives and Accepts Billing Details from TC (E2E)
7	GNSSMTOLL-1565	EETS TSP Sends Negative Acknowledgement for Billing Details (E2E)
8	GNSSMTOLL-1562	EETS TSP Handles Re-Sent BD After Missing Acknowledgement (TimeOut E2E)
9	GNSSMTOLL-1760	EETS TSP Rejects Billing Details with Invalid Format (E2E)

No	Test Case ID	Test Case Summary
10	GNSSMTOLL-1761	EETS TSP Handles Duplicate Billing Details Correctly (E2E)
11	GNSSMTOLL-1762	EETS TSP Sends Partial Acknowledgement for Billing Details (E2E)
12	GNSSMTOLL-1758	EETS TSP Receives and Accepts Payment Claims from TC (E2E)
13	GNSSMTOLL-1569	EETS TSP Sends Negative and Positive Acknowledgement for Payment Claims (E2E)
14	GNSSMTOLL-1563	EETS TSP Handles Re-Sent PC After Missing Acknowledgement (TimeOut E2E)
15	GNSSMTOLL-1787	EETS TSP Processes Re-Sent Billing Details and Payment Claims Without Duplication (E2E)
16	GNSSMTOLL-1788	EETS TSP Rejects Payment Claims Without Matching Billing Details (E2E)
17	GNSSMTOLL-1791	EETS TSP Handles Acknowledgements with Invalid or Unknown References Correctly (E2E)
18	GNSSMTOLL-1789	EETS TSP - Onboarding and Initial End-to-End Transaction Processing (Full E2E)

9.1 GNSSMTOLL-1560 EETS TSP / National OBE Provider - EETS Encryption Keys

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1560
	Test Case Author
	Herzig
Test Case	
EETS TSP / National OBE Provider - EETS Encryption Keys	

Test Purpose

Verifies that the TC and TSP can exchange over the EETS EBI interface using configured EETS Encryption Keys.

Requirement(s) covered

Pre-Condition(s)

- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	Verify that TSP added and uses current EETS encryption keys to use the EETS EIB.		EETS Encryption Keys were shared with the TSP and TSP installed and activated them.

9.2 GNSSMTOLL-1555 EETS TSP / National OBE Provider - New Toll Context Data TC -> TSP

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1555
	Test Case Author
	Herzig
Test Case	
EETS TSP / National OBE Provider - New Toll Context Data TC -> TSP	

Test Purpose

Requirement(s) covered

Pre-Condition(s)

- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	Toll Charger (TC) creates new version of Toll Context and a supervisor/admin export and sends it to the TSP.		TSP receives exported Toll Context data which contains valid json description.
2	TSP imports the new version of the Toll Context data and waits until new version is active.		New version of Toll Context activated after time elapsed.

9.3 GNSSMTOLL-1558 EETS TSP - Manage Exception List

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1558
	Test Case Author
	Herzig
Test Case	
EETS TSP - Manage Exception List	

Test Purpose

Demonstrate that the TSP can trigger updates in exempt list and blocklist and distributes them to the TC where the data is updated and verified.

Requirement(s) covered

Pre-Condition(s)

- EETS Encryption keys has been exchanged
- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TSP adds License plates on the exempt list and it is sent via EIB to TC.		TC has received new full exempt list update and the data are stored in TC EBO database.
2	Compare exempt list from TSP with updated exempt list from TC.		Both white lists are identical.
3	TSP adds License plates on the block list and it is sent via EIB to TC.		TC has received new full block list update and the data are stored in TC EBO database.
4	Compare black list from TSP with updated block list from TC.		Both block lists are identical.

9.4 GNSSMTOLL-1559 EETS TSP / National OBE Provider - Provision of Toll Declarations with OBU

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1559
	Test Case Author
	Herzig
Test Case	
EETS TSP / National OBE Provider - Provision of Toll Declarations with OBU	

Test Purpose

Demonstrate that a Toll Declaration created from a **vehicle that has a registered OBU on-board** and sent from the TSP to the TC where it is acknowledged.

Requirement(s) covered

Pre-Condition(s)

- EETS Encryption keys has been exchanged
- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TSP generates Toll Declaration Data with driving of car equipped with registered OBU or simulated GPS data. The OBU is sending actual position if applicable.		Toll Declaration data is created by the TSP.
2	Toll Declaration Data contains toll declaration for all defined vehicle categories. The Toll declaration data is sent.		TC has received Toll Declaration Data and sends Acknowledgment back to TSP.

9.5 GNSSMTOLL-1561 EETS TSP / National OBE Provider - Toll Declaration after new version of Toll Context

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1561
	Test Case Author
	Herzig
Test Case	
EETS TSP / National OBE Provider - Toll Declaration after new version of Toll Context	

Test Purpose

Requirement(s) covered

Pre-Condition(s)

- EETS Encryption keys has been exchanged
- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TC provides a new version of Toll Context to the TSP.		TSP successfully imports the new Toll Context version.
2	TSP waits until the new Toll Context becomes active.		TSP uses the new context version for processing.
3	TSP generates Toll Declarations based on: • the new Toll Context • valid vehicle classification and sends them to the TC via EETS interface.		Toll Declarations are successfully received by TC. Toll Declarations reference the correct Toll Context version.
4	TC processes the received Toll Declarations.		TC sends valid acknowledgements (ACK) to the TSP. No schema or business errors are detected.

9.6 GNSSMTOLL-1757 EETS TSP Receives and Accepts Billing Details from TC (E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1757
	Test Case Author
	Herzig
Test Case	
EETS TSP Receives and Accepts Billing Details from TC (E2E)	

Test Purpose

Requirement(s) covered

Pre-Condition(s)

- EETS Encryption keys has been exchanged
- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TC generates and sends Billing Details to the TSP via EETS interface.		TSP successfully receives the Billing Details.
2	TSP validates the Billing Details.		Billing Details are valid and processable.
3	TSP sends positive acknowledgement (ACK) to TC.		ACK message is successfully received by TC. Billing Details are marked as accepted.

9.7 GNSSMTOLL-1565 EETS TSP Sends Negative Acknowledgement for Billing Details (E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1565
	Test Case Author
	Herzig
Test Case	
EETS TSP Sends Negative Acknowledgement for Billing Details (E2E)	

Test Purpose

Requirement(s) covered

Pre-Condition(s)

- Toll Declarations were sent from TSP to TC
- EETS Encryption keys has been exchanged
- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TC sends Billing Details to the TSP		TSP successfully receives the Billing Details
2	TSP validates the Billing Details and detects an issue		TSP sends a negative acknowledgement (NACK) with rejection reason and a custom text.
3	TC sends corrected Billing Details to the TSP		TSP receives updated Billing Details
4	TSP validates corrected Billing Details		TSP sends positive acknowledgement (ACK) Corrected Billing Details are successfully accepted

9.8 GNSSMTOLL-1562 EETS TSP Handles Re-Sent BD After Missing Acknowledgement (TimeOut E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1562
	Test Case Author
	Herzig
Test Case	
EETS TSP Handles Re-Sent BD After Missing Acknowledgement (TimeOut E2E)	

Test Purpose

This test verifies that the TSP system correctly handles re-sent Billing Details and Payment Claims in cases where an acknowledgement was not successfully delivered.

Such retry scenarios may occur due to communication or infrastructure issues and do not represent new transactions.

The TSP must ensure that re-sent messages are handled consistently with the original processing and do not lead to duplicate processing, inconsistent states, or incorrect financial impact.

Requirement(s) covered

Pre-Condition(s)

- EETS Encryption keys has been exchanged
- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TC generates and sends Billing Details to the TSP.		TSP receives the Billing Details.
2	TSP does not send an acknowledgement.	(simulate network issue or inactive service)	No ACK/NACK is received by TC within configured timeout.
3	Wait until acknowledgement timeout is reached.		TC triggers resend mechanism.
4	TC resends the Billing Details.		The same Billing Detail is received again by the TSP (e.g. with the same identifier).

			Therefore, the TSP handles the message as a retry. ▪ The processing result remains consistent with the initial handling. ▪ No duplicate processing occurs. ▪ No conflicting status is created compared to the initial processing. ▪ No duplicate financial impact is generated.

9.9 GNSSMTOLL-1760 EETS TSP Rejects Billing Details with Invalid Format (E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1760
	Test Case Author
	Herzig
Test Case	
EETS TSP Rejects Billing Details with Invalid Format (E2E)	

Test Purpose

Verify that the TSP correctly rejects Billing Details containing invalid or malformed data.

Requirement(s) covered

Pre-Condition(s)

- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TC sends Billing Details with invalid format (e.g. broken schema / missing field).		TSP receives message but detects invalid structure.
2	TSP sends negative acknowledgement (NACK).		NACK is sent with appropriate error details. Invalid Billing Details are not processed.

9.10 GNSSMTOLL-1761 EETS TSP Handles Duplicate Billing Details Correctly (E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1761
	Test Case Author
	Herzig
Test Case	
EETS TSP Handles Duplicate Billing Details Correctly (E2E)	

Test Purpose

Verify that the TSP does not process duplicate Billing Details multiple times.

Requirement(s) covered

Pre-Condition(s)

- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TC sends Billing Details to TSP.		TSP receives Billing Details.
2	TC sends the same Billing Details again (duplicate).		TSP detects duplicate.
3	TSP processes only one instance.		No duplicate charging occurs. TSP responds correctly (ACK or specific handling).

9.11 GNSSMTOLL-1762 EETS TSP Sends Partial Acknowledgement for Billing Details (E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1762
	Test Case Author
	Herzig
Test Case	
EETS TSP Sends Partial Acknowledgement for Billing Details (E2E)	

Test Purpose

Verify that the TSP correctly handles partial acceptance scenarios.

Requirement(s) covered

Pre-Condition(s)

- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TC sends Billing Details containing multiple charge elements.		TSP receives all elements.
2	TSP accepts some elements and rejects others.		TSP sends partial acknowledgement.
3	Acknowledgement contains: • accepted items • rejected items with reasons		Structure is correct and consistent.

9.12 GNSSMTOLL-1758 EETS TSP Receives and Accepts Payment Claims from TC (E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1758
	Test Case Author
	Herzig
Test Case	
EETS TSP Receives and Accepts Payment Claims from TC (E2E)	

Test Purpose

Requirement(s) covered

Pre-Condition(s)

- EETS Encryption keys has been exchanged
- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TC generates and sends Payment Claims to the TSP via EETS interface.		TSP successfully receives the Payment Claims.
2	TSP validates the Payment Claims.		Payment Claims are valid and processable.
3	TSP sends positive acknowledgement (ACK) to TC.		ACK message is successfully received by TC. Payment Claims are marked as accepted.

9.13 GNSSMTOLL-1569 EETS TSP Sends Negative and Positive Acknowledgement for Payment Claims (E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1569
	Test Case Author
	Herzig
Test Case	
EETS TSP Sends Negative and Positive Acknowledgement for Payment Claims (E2E)	

Test Purpose

Verify that the TSP correctly rejects invalid Payment Claims and accepts corrected Payment Claims in a subsequent exchange.

Requirement(s) covered

Pre-Condition(s)

- In the TC system are BD's in the status Accepted or Accepted Automatically
- EETS Encryption keys has been exchanged
- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TC sends Payment Claims to the TSP.		TSP successfully receives the Payment Claims.
2	TSP validates the Payment Claims and detects an issue.		TSP sends a negative acknowledgement (NACK) with rejection reason.
3	TC sends corrected Payment Claims to the TSP.		TSP receives updated Payment Claims.
4	TSP validates corrected Payment Claims.		TSP sends positive acknowledgement (ACK). Corrected Payment Claims are successfully accepted.

9.14 GNSSMTOLL-1563 EETS TSP Handles Re-Sent PC After Missing Acknowledgement (TimeOut E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1563
	Test Case Author
	Herzig
Test Case	
EETS TSP Handles Re-Sent PC After Missing Acknowledgement (TimeOut E2E)	

Test Purpose

This test verifies that the TSP system correctly handles re-sent Billing Details and Payment Claims in cases where an acknowledgement was not successfully delivered.

Such retry scenarios may occur due to communication or infrastructure issues and do not represent new transactions.

The TSP must ensure that re-sent messages are handled consistently with the original processing and do not lead to duplicate processing, inconsistent states, or incorrect financial impact.

Requirement(s) covered

Pre-Condition(s)

- In the TC system are BD's in the status Accepted or Accepted Automatically
- EETS Encryption keys has been exchanged
- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	TC generates and sends Payment Claims to the TSP.		TSP receives the Payment Claims.
2	TSP does not send an acknowledgement.	(simulate network issue or inactive service)	No ACK/NACK is received by TC within configured timeout.
3	Wait until acknowledgement timeout is reached.		TC triggers resend mechanism.
4	PC resends the Payment Claims.		The same Payment Claim is received again by the TSP (e.g. with the same identifier).

			Therefore, the TSP handles the message as a retry. ▪ The processing result remains consistent with the initial handling. ▪ No duplicate processing occurs. ▪ No conflicting status is created compared to the initial processing. ▪ No duplicate financial impact is generated.

9.15 GNSSMTOLL-1787 EETS TSP Processes Re-Sent Billing Details and Payment Claims Without Duplication (E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1787
	Test Case Author
	Herzig
Test Case	
EETS TSP Processes Re-Sent Billing Details and Payment Claims Without Duplication (E2E)	

Test Purpose

This test verifies that the TSP system correctly handles repeated reception of Billing Details and Payment Claims due to retry scenarios. The system must ensure idempotent processing and avoid duplicate financial impact.

Requirement(s) covered

Pre-Condition(s)

- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	Billing Details are received by the TSP.		Billing Details are processed successfully. Data is stored correctly. Valid acknowledgement is generated (if applicable).
2	The same Billing Details are received again.		The TSP system recognizes the duplicate. No duplicate processing is triggered. No duplicate financial impact is created.
3	A Payment Claim is received by the TSP.		Payment Claim is processed successfully. Correct linkage to Billing Details is ensured (if applicable). Valid acknowledgement is generated (if applicable).
4	The same Payment Claim is received again.		The system recognizes the duplicate. No repeated processing or payment occurs. System state remains consistent.

9.16 GNSSMTOLL-1788 EETS TSP Rejects Payment Claims Without Matching Billing Details (E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1788
	Test Case Author
	Herzig
Test Case	
EETS TSP Rejects Payment Claims Without Matching Billing Details (E2E)	

Test Purpose

This test verifies that the TSP system correctly rejects Payment Claims that cannot be matched to any existing Billing Details.
The TSP must ensure that only valid and properly linked financial data is processed.

It is assumed that no corresponding Billing Detail exists in the system.

Requirement(s) covered

Pre-Condition(s)

- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	The TSP receives a Payment Claim without any matching Billing Detail (e.g. unknown or missing reference).		The TSP system rejects the Payment Claim. The rejection clearly indicates that no matching Billing Detail was found. No processing or financial impact occurs. The system remains consistent and stable.

9.17 GNSSMTOLL-1791 EETS TSP Handles Acknowledgements with Invalid or Unknown References Correctly (E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1791
	Test Case Author
	Herzig
Test Case	
EETS TSP Handles Acknowledgements with Invalid or Unknown References Correctly (E2E)	

Test Purpose

This test verifies that the TSP system correctly handles acknowledgements that reference **unknown or invalid message identifier**s.

The TSP must ensure that only acknowledgements with valid and traceable references are processed and that inconsistent or incorrect references do not affect system integrity.

Validates robustness of reference handling and ensures that incorrect acknowledgements cannot corrupt processing state or lead to inconsistent message tracking.

Requirement(s) covered

Pre-Condition(s)

- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	The TSP receives an acknowledgement that contains an invalid, unknown, or mismatching reference ID.		The TSP system identifies the reference as invalid or unknown. The acknowledgement is rejected or ignored. No changes are made to existing processed data. The system remains consistent and stable. (Optional) An error or warning is logged for traceability.

9.18 GNSSMTOLL-1789 EETS TSP - Onboarding and Initial End-to-End Transaction Processing (Full E2E)

Test Set	**Test case ID**
EETS E2E TSP Integration	GNSSMTOLL-1789
	Test Case Author
	Herzig
Test Case	
EETS TSP - Onboarding and Initial End-to-End Transaction Processing (Full E2E)	

Test Purpose

This test verifies that the TSP system can successfully process an initial end-to-end transaction flow, covering all main processing steps from toll declaration to financial processing.

It provides proof that all components and message exchanges work together correctly in a complete scenario. Partially already tested isolated.

Requirement(s) covered

Pre-Condition(s)

- Initial onboarding and configuration (e.g. key exchange and toll context setup) have been completed successfully.
- TSP is configured in the system

Nr	Test Step	Test Data	Expected Results
1	The TSP processes a toll declaration.		The toll declaration is processed successfully. The data is correctly interpreted and prepared for further processing.
2	The TSP receives and processes Billing Details.		Billing Details are accepted and processed correctly. The data is stored and available for payment processing.
3	The TSP receives and processes a Payment Claim.		The Payment Claim is accepted and processed correctly. The correct linkage to Billing Details is ensured. The financial process is completed consistently.

10 EETS TSP / National OBE Provider E2E Driving Scenarios

No	Test Case ID	Test Case Summary
1	GNSSMTOLL-1868	Driving Scenario 1 (Start/End Jakai Roundabout)
2	GNSSMTOLL-1870	Driving Scenario 2 (Panevėžys – Raubonys – Panevėžys)
3	GNSSMTOLL-1869	Driving Scenario 3 (Start/End Garliava – Polish-Lithuanian Border)

10.1 GNSSMTOLL-1868 Driving Scenario 1 (Start/End Jakai Roundabout)

Test Set	**Test case ID**
EETS E2E Driving Validation	GNSSMTOLL-1868
	Test Case Author
	Herzig
Test Case	
Driving Scenario 1 (Start/End Jakai Roundabout)	

Test Purpose

Requirement(s) covered

Pre-Condition(s)

- Test runs on any test route, comprising two runs of at least 50 km, including stops.
- Test routes may be adjusted in the event of road repair works on the specified routes.
- During one of the two closed-route running tests, OBE must be switched off during stops at the rest area.
- During one of the two stops at the rest area in the closed-route test, OBE must be switched on
- The duration of the stop at the rest area shall be 30 minutes
- Closed-route tests shall be carried out on a toll road, a non-toll road and by stopping at a designated rest area
- It shall be recommended to start the closed-route test at the beginning of the test route and to finish it at the end of the test route. A closed-route running test may be started at any point on the test route, but it must be finished at the same point
- OBE must be switched on, connected to a power source and have the GNSS signal before starting to move along the test route
- The vehicle must be equipped with OBE that meet the minimum parameters specified in Annex No 1
- There may be up to two OBE of different types in one vehicle, with up to three units of each type, making a total of six OBE units (three units of each of the two different types of OBE)
- Closed route running tests on the running section shall be carried out by OBE suppliers or OBE operators, or EETS providers
- Closed route tests shall be conducted on one of the three test routes, with the entire route covered at least twice
- Each of the test routes shall be a closed, i.e. the entire route shall be run in a loop in the direction of traffic flow

Nr	Test Step	Test Data	Expected Results
1	Prepare test vehicle with active OBU and configured vehicle profile.		OBE is active and configured correctly.
2	Drive the pre-defined driving scenario (driving steps in test data section)  	1) At Jakai roundabout, take the toll-free slip road in Vilnius direction and continue until entering the toll road A1 Vilnius–Kaunas–Klaipėda; Page 6/12 Issue of 24/04/2026 V1 RULES FOR TESTING ON-BOARD EQUIPMENT (OBE) BY MEANS OF CLOSED-ROUTE RUNNING TESTS 2) the route shall continue along the toll road A1 Vilnius–Kaunas–Klaipėda to one-level intersection with Road 228 Dauparai–Gargždai–Vėžaičiai; 3) at the intersection, exit the toll road A1 Vilnius-Kaunas-Klaipėda and enter the non-toll road 228 Dauparai–Gargždai–Vėžaičiai; 4) follow the route along the whole toll-free road 228 Dauparai–Gargždai–Vėžaičiai to the two-level intersection with road A1 Vilnius-Kaunas-Klaipėda; 5) at the junction, exit the toll-free road 228 Dauparai–Gargždai–Vėžaičiai onto the toll-free slip road and continue by entering the toll road A1 Vilnius-Kaunas-Klaipėda in the direction of Vilnius; 6) proceed along the route on the toll road A1 Vilnius-Kaunas-Klaipėda to the two-level intersection of Kryžkalnis (the two-level intersection of roads A1 Vilnius-Kaunas-Klaipėda and A12 Riga* Šiauliai–Tauragė–Kaliningrad*); 7) at Kryžkalnis intersection, take the exit from the toll road A1 Vilnius-Kaunas-Klaipėda onto the toll free slip road in the direction of Šiauliai and proceed to the roundabout; 8) at the roundabout, take the second exit and proceed along the	Route driven and recorded.

		toll-free road towards the toll road A1 Vilnius-Kaunas-Klaipėda in the direction of Klaipėda; 9) continue the route along the toll road A1 Vilnius-Kaunas-Klaipėda to the two-level junction with road 4516 Skaudvilė–Bijotai–Karyznos; 10) at the junction, exit the toll road A1 Vilnius-Kaunas-Klaipėda onto the toll-free slip road until the entrance to the petrol station – the parking area for heavy-duty vehicles on the right-hand side of the road; 11) choose the entry to the petrol station – the parking area for heavy-duty vehicles and take a stop there; 12) after stopping, the continue the route by exiting the parking area onto the toll-free slip road towards the toll road A1 Vilnius-Kaunas-Klaipėda in the direction of Klaipėda; 13) continue the route continues along the toll road A1 Vilnius-Kaunas-Klaipėda to the two-level intersection with road 228 Dauparai–Gargždai–Vėžaičiai; 14) at the intersection, exit the toll road A1 Vilnius-Kaunas-Klaipėda onto the non-toll slip road and continue along the toll road 166 Plungė–Vėžaičiai in the direction of Gargždai; 15) from the toll road 166 Plungė–Vėžaičiai, enter the non-toll road 228 Dauparai–Gargždai Vėžaičiai; 16) continue the route along the toll-free road 228 Dauparai–Gargždai–Vėžaičiai to the one-level intersection with road 2210 Eglynai–Dauparai; 17) turn right at the intersection and proceed along the toll-free road 2210 Eglynai–Dauparai; 18) continue the route along the toll-free road 2210 Eglynai–Dauparai to the two-level intersection	

		with the road A1 Vilnius–Kaunas–Klaipėda; 19) at the junction, exit the toll-free road 2210 Eglynai–Dauparai onto the toll-free slip road and continue by entering the toll road A1 Vilnius-Kaunas-Klaipėda in the direction of Klaipėda; 20) continue the route along the toll road A1 Vilnius-Kaunas-Klaipėda to Jakai roundabout; 21) at the roundabout, exit the toll road A1 Vilnius-Kaunas-Klaipėda onto the toll-free slip road towards the Jakų roundabout; 22) exit the toll-free slip road to enter Jakai roundabout.	
3	Complete route and stop GNSS tracking.		TSP Mobile App stopped. Full reference route data is available.
4	After completing the closed-route running tests, a form provided for in Annex No 2 shall be filled in for each run.	[^Annex-2_FORM-FOR-THE-FULL-CYCLE-RUNNING-TEST-ON-THE-TEST-ROUTE-1.pdf] https://vialietuva.lt/wp-content/uploads/2026/05/Annex-2_FORM-FOR-THE-FULL-CYCLE-RUNNING-TEST-ON-THE-TEST-ROUTE-1.pdf	Document filled out.
5	Retrieve Toll Declarations generated by the EETS Provider.		Toll Declarations are received by the TC system.
6	Compare Toll Declarations with reference GNSS track.		All driven toll segments are correctly identified. No missing segments are present. No additional (false) segments are generated. Sequence and timestamps correspond to actual driving behaviour.

10.2 GNSSMTOLL-1870 Driving Scenario 2 (Panevėžys – Raubonys – Panevėžys)

Test Set	**Test case ID**
EETS E2E Driving Validation	GNSSMTOLL-1870
	Test Case Author
	Herzig
Test Case	
Driving Scenario 2 (Panevėžys – Raubonys – Panevėžys)	

Test Purpose

Requirement(s) covered

Pre-Condition(s)

- Test runs on any test route, comprising two runs of at least 50 km, including stops.
- Test routes may be adjusted in the event of road repair works on the specified routes.
- During one of the two closed-route running tests, OBE must be switched off during stops at the rest area.
- During one of the two stops at the rest area in the closed-route test, OBE must be switched on
- The duration of the stop at the rest area shall be 30 minutes
- Closed-route tests shall be carried out on a toll road, a non-toll road and by stopping at a designated rest area
- It shall be recommended to start the closed-route test at the beginning of the test route and to finish it at the end of the test route. A closed-route running test may be started at any point on the test route, but it must be finished at the same point
- OBE must be switched on, connected to a power source and have the GNSS signal before starting to move along the test route
- The vehicle must be equipped with OBE that meet the minimum parameters specified in Annex No 1
- There may be up to two OBE of different types in one vehicle, with up to three units of each type, making a total of six OBE units (three units of each of the two different types of OBE)
- Closed route running tests on the running section shall be carried out by OBE suppliers or OBE operators, or EETS providers
- Closed route tests shall be conducted on one of the three test routes, with the entire route covered at least twice
- Each of the test routes shall be a closed, i.e. the entire route shall be run in a loop in the direction of traffic flow

Nr	Test Step	Test Data	Expected Results
1	Prepare test vehicle with active OBU and configured vehicle profile.		OBU is active and configured correctly.
2	Drive the pre-defined driving scenario (driving steps in test data section)	Start/end of the Route: Garliava intersection (two-level intersection of roads A5 Kaunas–Marijampolė–Suvalkai* and 130 Kaunas–Prienai–Alytus). Route description: 1) at Garliava intersection, take the toll road A5 Kaunas–Marijampolė–Suvalkai* towards Marijampolė until Mauručiai intersection (a two-level intersection of roads A5 Kaunas–Marijampolė Suvalkai* and 230 Mauručiai–Vinčai–Puskelniai); 2) at Mauručiai intersection, exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road and continue to the roundabout with the toll-free road 230 Mauručiai–Vinčai–Puskelniai; 3) continue the route along the toll-free road 230 Mauručiai–Vinčai–Puskelniai and enter the toll-free slip road. From the slip road, proceed onto the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of Marijampolė; 4) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to Puskelniai intersection (a two-level intersection of the road A5 Kaunas–Marijampolė–Suvalkai* and the local road (Ramunės g., Vienkiemių g.)); 5) at Puskelniai intersection, exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road in the direction of Marijampolė; 6) continue the route along the toll-free slip road towards Marijampolė to the roundabout; at the roundabout, take the third exit and continue along the toll-free road to the next roundabout;	Route driven and recorded.

7) at the roundabout, take the first exit; continue the route along the toll-free road to the next
roundabout and take the second exit; proceed along the toll-free road onto the toll road A5 Kaunas
Marijampolė–Suvalkai* in the direction of the Polish-Lithuanian border;
8) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to Pakusinė viaduct –
the two-level intersection with the road A7 Marijampolė–Kybartai–Kaliningrad*;
9) at the two-level intersection with the road A7 Marijampolė–Kybartai–Kaliningrad*, exit the toll road
A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road and proceed to the roundabout with
the district road 5122 Ožkabaliai–Turgalaukis–Liudvinavas;
10) at the roundabout, take the third exit and continue along the toll-free slip road until entry to the
toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of the Polish-Lithuanian border;
11) continue along the toll road A5 Kaunas–Marijampolė–Suvalkai* to the two-level intersection with
the road 200 Kalvarija–Gražiškiai–Vištytis;
12) at the two-level junction with the road 200 Kalvarija–Gražiškiai–Vištytis, exit the toll road A5
Kaunas–Marijampolė–Suvalkai* onto the non-toll slip road;
13) continue the route along the toll-free slip road to the roundabout and take the second exit;
14) after leaving the roundabout, continue the route along the toll-free slip road to the roundabout
with road 200 Kalvarija–Gražiškiai–Vištytis, where the second exit is taken;
15) after exiting the roundabout, continue the route along the toll-free slip road to the roundabout
and take the second exit towards the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of
the Polish-Lithuanian border;
16) after exiting the roundabout, proceed along the toll-free slip road until

		entering the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of the Polish-Lithuanian border; 17) continue along the toll road A5 Kaunas–Marijampolė–Suvalkai* until the exit towards Pasiekos settlement; 18) exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road, proceed to the roundabout and take the second exit; 19) after leaving the roundabout, continue the route along the toll-free slip road; after passing the viaduct, turn right at the intersection and, at the next intersection, turn right towards the viaduct; 20) after passing the viaduct, turn left at the intersection towards the roundabout and use the third exit; 21) the route continues along the toll-free slip road to the roundabout, where the third exit towards the viaduct is taken; 22) continues the route along the toll-free slip road from the viaduct to the roundabout and take the second exit onto the slip road; 23) continues the route to the intersection described in point 19, turn left and at the next intersection turn right towards the viaduct; 24) after passing the viaduct, turn left at the intersection towards the roundabout and take the second exit, then continue the route along the toll-free slip road until entering the toll road A5 Kaunas Marijampolė–Suvalkai* in the direction of Kaunas; 25) continue along the toll road A5 Kaunas–Marijampolė–Suvalkai* to the exit at the two-level intersection in the direction of Naujienėlė settlement; 26) exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the non-toll slip	

		road, go to the roundabout and take the third exit; 27) after exiting the roundabout, continue the route along the toll-free slip road to the roundabout with road 201 Marijampolė–Kalvarija, take the third exit and proceed along the slip road to the next roundabout; 28) at the roundabout, take the third exit and continue along the toll-free slip road to the next roundabout; 29) at the roundabout, take the fourth exit and continue along the toll-free slip road until joining the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of Kaunas; 30) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to the two-level intersection with road 5122 Ožkabaliai–Turgalaukis–Liudvinavas; 31) at the two-level intersection with road 5122 Ožkabaliai–Turgalaukis–Liudvinavas, exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road, proceed to the roundabout with the district road 5122 Ožkabaliai–Turgalaukis–Liudvinavas and take the third exit; 32) after exiting the roundabout, continue the route along the toll-free slip road to the roundabout and take the first exit; 33) after exiting the roundabout, continue the route along the toll-free slip road to the roundabout and take the first exit; 34) after exiting the roundabout, enter the parking area and stop. In the parking area, select any available parking space for heavy-duty or light-duty vehicles; 35) after stopping, continue the route by exiting the parking area via the toll-free slip road and take the third exit at the roundabout with the road A7 Marijampolė–Kybartai–	

		Kaliningrad*; 36) after exiting the roundabout, continue the route along the toll-free slip road until entering the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of Kaunas; 37) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to the two-level intersection in the direction of Marijampolė; 38) exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the non-toll slip road and proceed to the roundabout, take the second exit there and proceed to the next roundabout; 39) at the roundabout, take the third exit, continue along the toll-free slip road to the next roundabout and take the first exit there; 40) after exiting the roundabout, continue the route along a toll-free slip road to the three-way intersection and turn left; 41) continue the route along the toll-free slip road until entering the toll road A5 Kaunas Marijampolė–Suvalkai* in the direction of Kaunas; 42) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to the two-level intersection with road 230 Mauručiai–Vinčai–Puskelniai; 43) exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road, continue to the roundabout, take the first exit and proceed to the next roundabout; 44) at the roundabout, take the first exit, continue along the entire toll-free road 230 Mauručiai Vinčai–Puskelniai, take the second exit at the roundabout and enter the toll-free slip road; 45) continue the route along the toll-free slip road until entering the toll road A5 Kaunas Marijampolė–Suvalkai* in the direction of Kaunas; 46) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to Garliava intersection.	

3	Complete route and stop GNSS tracking.		TSP Mobile App stopped. Full reference route data is available.
4	After completing the closed-route running tests, a form provided for in Annex No 2 shall be filled in for each run.	[^Annex-2_FORM-FOR-THE-FULL-CYCLE-RUNNING-TEST-ON-THE-TEST-ROUTE-1.pdf] https://vialietuva.lt/wp-content/uploads/2026/05/Annex-2_FORM-FOR-THE-FULL-CYCLE-RUNNING-TEST-ON-THE-TEST-ROUTE-1.pdf	Document filled out.
5	Retrieve Toll Declarations generated by the EETS Provider.		Toll Declarations are received by the TC system.
6	Compare Toll Declarations with reference GNSS track.		All driven toll segments are correctly identified. No missing segments are present. No additional (false) segments are generated. Sequence and timestamps correspond to actual driving behaviour.

10.3 GNSSMTOLL-1869 Driving Scenario 3 (Start/End Garliava – Polish-Lithuanian Border)

Test Set	**Test case ID**
EETS E2E Driving Validation	GNSSMTOLL-1869
	Test Case Author
	Herzig
Test Case	
Driving Scenario 3 (Start/End Garliava – Polish-Lithuanian Border)	

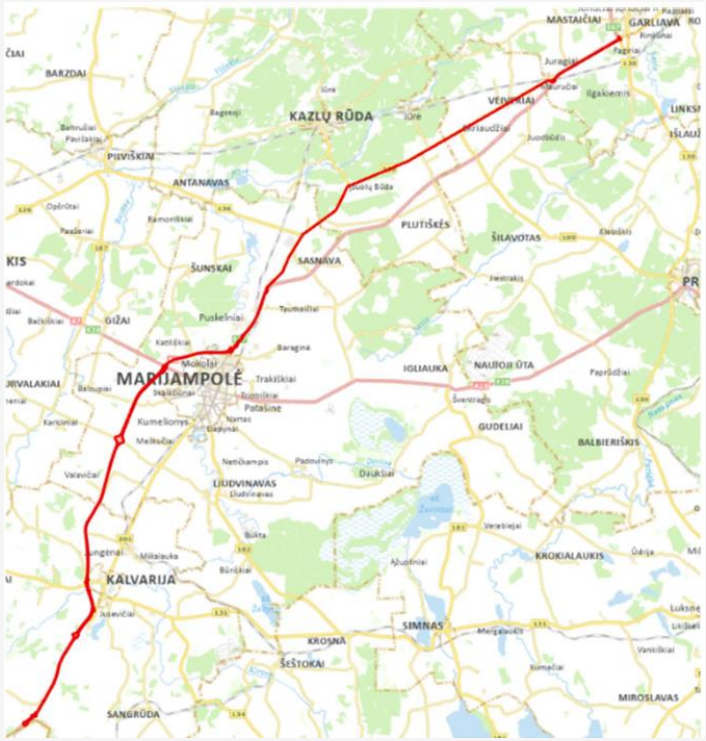
Test Purpose

Requirement(s) covered

Pre-Condition(s)

- Test runs on any test route, comprising two runs of at least 50 km, including stops.
- Test routes may be adjusted in the event of road repair works on the specified routes.
- During one of the two closed-route running tests, OBE must be switched off during stops at the rest area.
- During one of the two stops at the rest area in the closed-route test, OBE must be switched on
- The duration of the stop at the rest area shall be 30 minutes
- Closed-route tests shall be carried out on a toll road, a non-toll road and by stopping at a designated rest area
- It shall be recommended to start the closed-route test at the beginning of the test route and to finish it at the end of the test route. A closed-route running test may be started at any point on the test route, but it must be finished at the same point
- OBE must be switched on, connected to a power source and have the GNSS signal before starting to move along the test route
- The vehicle must be equipped with OBE that meet the minimum parameters specified in Annex No 1
- There may be up to two OBE of different types in one vehicle, with up to three units of each type, making a total of six OBE units (three units of each of the two different types of OBE)
- Closed route running tests on the running section shall be carried out by OBE suppliers or OBE operators, or EETS providers
- Closed route tests shall be conducted on one of the three test routes, with the entire route covered at least twice
- Each of the test routes shall be a closed, i.e. the entire route shall be run in a loop in the direction of traffic flow

Nr	Test Step	Test Data	Expected Results
1	Prepare test vehicle with active OBU and configured vehicle profile.		OBE is active and configured correctly.

2	Drive the pre-defined driving scenario (driving steps in test data section) 	Start/end of the Route: Garliava intersection (two-level intersection of roads A5 Kaunas–Marijampolė–Suvalkai* and 130 Kaunas–Prienai–Alytus). Route description: 1) at Garliava intersection, take the toll road A5 Kaunas–Marijampolė–Suvalkai* towards Marijampolė until Mauručiai intersection (a two-level intersection of roads A5 Kaunas–Marijampolė Suvalkai* and 230 Mauručiai–Vinčai–Puskelniai); 2) at Mauručiai intersection, exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road and continue to the roundabout with the toll-free road 230 Mauručiai–Vinčai–Puskelniai; 3) continue the route along the toll-free road 230 Mauručiai–Vinčai–Puskelniai and enter the toll-free slip road. From the slip road, proceed onto the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of Marijampolė; 4) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to Puskelniai intersection (a two-level intersection of the road A5 Kaunas–Marijampolė–Suvalkai* and the local road (Ramunės g., Vienkiemių g.)); 5) at Puskelniai intersection, exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road in the direction of Marijampolė; 6) continue the route along the toll-free slip road towards Marijampolė to the roundabout; at the roundabout, take the third exit and continue along the toll-free road to the next roundabout; 7) at the roundabout, take the first exit; continue the route along the toll-free road to the next	Route driven and recorded.

		roundabout and take the second exit; proceed along the toll-free road onto the toll road A5 Kaunas Marijampolė–Suvalkai* in the direction of the Polish-Lithuanian border; 8) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to Pakusinė viaduct – the two-level intersection with the road A7 Marijampolė–Kybartai–Kaliningrad*; 9) at the two-level intersection with the road A7 Marijampolė–Kybartai–Kaliningrad*, exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road and proceed to the roundabout with the district road 5122 Ožkabaliai–Turgalaukis–Liudvinavas; 10) at the roundabout, take the third exit and continue along the toll-free slip road until entry to the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of the Polish-Lithuanian border; 11) continue along the toll road A5 Kaunas–Marijampolė–Suvalkai* to the two-level intersection with the road 200 Kalvarija–Gražiškiai–Vištytis; 12) at the two-level junction with the road 200 Kalvarija–Gražiškiai–Vištytis, exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the non-toll slip road; 13) continue the route along the toll-free slip road to the roundabout and take the second exit; 14) after leaving the roundabout, continue the route along the toll-free slip road to the roundabout with road 200 Kalvarija–Gražiškiai–Vištytis, where the second exit is taken; 15) after exiting the roundabout, continue the route along the toll-free slip road to the roundabout and take the second exit towards the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of the Polish-Lithuanian border;	

		16) after exiting the roundabout, proceed along the toll-free slip road until entering the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of the Polish-Lithuanian border; 17) continue along the toll road A5 Kaunas–Marijampolė–Suvalkai* until the exit towards Pasiekos settlement; 18) exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road, proceed to the roundabout and take the second exit; 19) after leaving the roundabout, continue the route along the toll-free slip road; after passing the viaduct, turn right at the intersection and, at the next intersection, turn right towards the viaduct; 20) after passing the viaduct, turn left at the intersection towards the roundabout and use the third exit; 21) the route continues along the toll-free slip road to the roundabout, where the third exit towards the viaduct is taken; 22) continues the route along the toll-free slip road from the viaduct to the roundabout and take the second exit onto the slip road; 23) continues the route to the intersection described in point 19, turn left and at the next intersection turn right towards the viaduct; 24) after passing the viaduct, turn left at the intersection towards the roundabout and take the second exit, then continue the route along the toll-free slip road until entering the toll road A5 Kaunas Marijampolė–Suvalkai* in the direction of Kaunas; 25) continue along the toll road A5 Kaunas–Marijampolė–Suvalkai* to the exit at the two-level intersection in the direction of Naujienėlė settlement;	

		26) exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the non-toll slip road, go to the roundabout and take the third exit; 27) after exiting the roundabout, continue the route along the toll-free slip road to the roundabout with road 201 Marijampolė–Kalvarija, take the third exit and proceed along the slip road to the next roundabout; 28) at the roundabout, take the third exit and continue along the toll-free slip road to the next roundabout; 29) at the roundabout, take the fourth exit and continue along the toll-free slip road until joining the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of Kaunas; 30) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to the two-level intersection with road 5122 Ožkabaliai–Turgalaukis–Liudvinavas; 31) at the two-level intersection with road 5122 Ožkabaliai–Turgalaukis–Liudvinavas, exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road, proceed to the roundabout with the district road 5122 Ožkabaliai–Turgalaukis–Liudvinavas and take the third exit; 32) after exiting the roundabout, continue the route along the toll-free slip road to the roundabout and take the first exit; 33) after exiting the roundabout, continue the route along the toll-free slip road to the roundabout and take the first exit; 34) after exiting the roundabout, enter the parking area and stop. In the parking area, select any available parking space for heavy-duty or light-duty vehicles; 35) after stopping, continue the route by exiting the parking area via	

		the toll-free slip road and take the third exit at the roundabout with the road A7 Marijampolė–Kybartai–Kaliningrad*; 36) after exiting the roundabout, continue the route along the toll-free slip road until entering the toll road A5 Kaunas–Marijampolė–Suvalkai* in the direction of Kaunas; 37) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to the two-level intersection in the direction of Marijampolė; 38) exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the non-toll slip road and proceed to the roundabout, take the second exit there and proceed to the next roundabout; 39) at the roundabout, take the third exit, continue along the toll-free slip road to the next roundabout and take the first exit there; 40) after exiting the roundabout, continue the route along a toll-free slip road to the three-way intersection and turn left; 41) continue the route along the toll-free slip road until entering the toll road A5 Kaunas Marijampolė–Suvalkai* in the direction of Kaunas; 42) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to the two-level intersection with road 230 Mauručiai–Vinčai–Puskelniai; 43) exit the toll road A5 Kaunas–Marijampolė–Suvalkai* onto the toll-free slip road, continue to the roundabout, take the first exit and proceed to the next roundabout; 44) at the roundabout, take the first exit, continue along the entire toll-free road 230 Mauručiai Vinčai–Puskelniai, take the second exit at the roundabout and enter the toll-free slip road; 45) continue the route along the toll-free slip road until entering the toll road A5 Kaunas	

		Marijampolė–Suvalkai* in the direction of Kaunas; 46) continue the route along the toll road A5 Kaunas–Marijampolė–Suvalkai* to Garliava intersection.	
3	Complete route and stop GNSS tracking.		TSP Mobile App stopped. Full reference route data is available.
4	After completing the closed-route running tests, a form provided for in Annex No 2 shall be filled in for each run.	[^Annex-2_FORM-FOR-THE-FULL-CYCLE-RUNNING-TEST-ON-THE-TEST-ROUTE-1.pdf] https://vialietuva.lt/wp-content/uploads/2026/05/Annex-2_FORM-FOR-THE-FULL-CYCLE-RUNNING-TEST-ON-THE-TEST-ROUTE-1.pdf	Document filled out.
5	Retrieve Toll Declarations generated by the EETS Provider.		Toll Declarations are received by the TC system.
6	Compare Toll Declarations with reference GNSS track.		All driven toll segments are correctly identified. No missing segments are present. No additional (false) segments are generated. Sequence and timestamps correspond to actual driving behaviour.

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