



# **Pre-pilot Test Report**

## *Luxembourg Pilot*

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| Project Owner   | Roel Testroote   |
| Project Manager | Christian Brafine  |
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| Distribution    | Roel Testroote (Open Ticketing Institute)<br>David Viaggi (Verkéiersverbond, project manager)<br>Jochem Baud (OTI)<br>Christian Brafine (UL)<br>Kley Renolds (OTI) |

### UL TS B.V.

De Heyderweg 2  
2314 XZ LEIDEN  
The Netherlands

Tel. +31 71 581 36 36

Fax +31 71 581 36 30

E-mail [info@ul-ts.com](mailto:info@ul-ts.com)

Website [www.ul-ts.com](http://www.ul-ts.com)

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# 1 Introduction

The European Travellers Club (ETC) is a pan-European initiative to enable an interoperable travel experience across countries using a single travel card. The first ETC pilot is planned in Luxembourg. This pilot will enable customers to use their transit card to gain access to a parking at Belval. By using the same card in and around the center of Luxembourg City, travelers are able to acquire digital stamps, which can lead to a discount on a monthly pass for parking.

To prepare for this pilot, two end-to-end tests have been performed. The first was performed on 2016-07-12 in the ETC lab in Amersfoort, during which all test cases were performed. However, the terminals and cards used during these tests did not adequately represent the production environment. To mitigate the chance of risks when incorporating real terminals into the system, a limited second test was performed on 2016-09-01 and 2016-09-12 in Luxembourg on a number of terminals running in production.

## 1.1 Goal of this document

The goal of this document is to give a clear overview and understanding of the tests that have been executed and the issues that have been found during the pre-pilot tests.

## 1.2 Scope

The scope of the tests is limited to the user interactions with the system. It does not take into account individual components and interfaces. Instead, it will only focus on the input from the user and the feedback it gets back from the system.

## 1.3 Intended audience

This document is aimed at those participants of the European Travelers Club that require assurance of the user-readiness of the Luxembourg pilot, including:

- scheme owners
- operators

## 2 Test setup

### 2.1 Test object

The object under test is the ETC system to be used for the Luxembourg pilot. An overview of this system is given in appendix A.1. The system exists of the following components:

- Generic Secure Token application loaded on a transit card
- Parking entry terminal
- Parking exit terminal
- Parking connector acting as an intermediary between the parking terminals and the hub
- Transit terminal
- Counter clerk app
- Consumer app
- Hub
- Luxembourg specific services
  - Clerk service
  - P+R Lux service
  - Matching service
  - Click service
  - Stamp service
- Reporting portal (out of scope)
- Ticker

A comprehensive list of version and build numbers for the different components is included in the Test Execution report [1].

### 2.2 Test environment

For both end-to-end tests, the servers and services in the production environment were used.

During the first end-to-end test, three workarounds were employed:

- Because no parking terminals were available in the lab, a parking terminal simulator was used to perform parking entry and parking exit actions.
- To facilitate the execution of a number of more complex test cases which required tapping the card at specific times, a transit terminal simulator was used.
- A batch of cards was used that was not correctly personalized.

During the second end-to-end test only production terminals and correctly personalized pilot cards were used.

## 3 Test results

### 3.1 Summary

During the first end-to-end test execution 66 of the 70 test cases were performed. One of the test cases was not able to be performed successfully. Four test cases were no longer applicable: Two were targeting the Reporting portal, which was deemed out of scope, and two others were targeting behavior that was not yet implemented.

For the test on production, the four non applicable test cases were removed. One test case was added to target a specific issue that was encountered in previous tests. The focus of this test was the usage of real terminals and real life scenario's. As such, not all test cases were executed. 31 test cases were performed of which one failed.

Because of an ambiguity in the result of one of the test cases, one complete use case (covering 4 test cases) was performed a second time in production.

The table below summarizes the test results:

| Verdict                            | Lab test  | Production test |
|------------------------------------|-----------|-----------------|
| Passed                             | 65        | 30              |
| Failed                             | 1         | 1               |
| Inconclusive                       | 0         | 0               |
| Not applicable                     | 4         | 0               |
| Not executed                       | 0         | 36              |
| <b>Total number of test cases:</b> | <b>70</b> | <b>67</b>       |

Table 1: Summary of test case execution results of the test run

### 3.2 Releases

During the test execution of the first end-to-end test two new system updates were released as a result of fixed issues. Depending on the type of update, a number of test cases were rerun to limit the risk of regression. For more details, see the detailed execution report [1].

During the second test execution, two issues were fixed.

### 3.3 Issues

Table 2 lists the user issues encountered during the pre-pilot tests.

| Test | Description  | Resolution                                    | Severity | Status |
|------|--|---|----------|--------|
| 1    | The system linked an exit event incorrectly to the latest entry, causing travelers to not receive their stamp. | Issue was fixed during first end-to-end test. | Medium   | Closed |

| Test | Description   | Resolution                                     | Severity | Status |
|------|---|--|----------|--------|
| 1    | The system determines the validity of the monthly pass based on the current time at the service instead of the timestamp given by the terminal. | Issue was fixed during first end-to-end test.  | Low      | Closed |
| 1    | The system did not provide a stamp to a traveler when the parking session was spread over two days but did not cross the 04:00 boundary.        | Issue was fixed during first end-to-end test.  | Medium   | Closed |
| 1    | The system provided a stamp to a traveler when the parking session crossed the 04:00 boundary.  | Issue was fixed during first end-to-end test.  | Medium   | Closed |
| 1    | The system did not provide a stamp to a traveler when the click is made on a different day that when the parking session started.               | Issue was fixed during first end-to-end test.  | Medium   | Closed |
| 1    | The system does not award a discount voucher to a card that has not been bound yet.   | Issue was fixed between tests.                 | Low      | Closed |
| 1    | The Clerk app displays the discount voucher as already used on a card that has not been bound yet.  | Issue was fixed during first end-to-end test.  | Low      | Closed |
| 2    | The system does not account for the time zone when determining whether a stamp was earned.  | Issue was fixed during second end-to-end test. | Medium   | Closed |
| 2    | The Traveler App does not display a stamp in the stamp book even though it is visible in the ticker feed.                                       | Issue was fixed and retested.                  | Medium   | Closed |

Table 2: List of issues

In addition, two issues were monitored by 42Tech which have been logged in Table 3.

| Test | Description   | Resolution                      | Severity | Status |
|------|---|---------------------------------|----------|--------|
| 1    | Upon entry (of driver and car) the SB system throws a timeout, which seeks to cancel the entry after it has been approved (and after entry has taken place). This exception is ignored by the system of 42Tech. | S&B is looking into this issue. | Low      | Open   |



| Test | Description  | Resolution   | Severity | Status |
|------|--|--|----------|--------|
| 1    | The INIT/HighQ Trip Frequency Feed does not update for any of the cards used in the tests. | 42Tech has asked for assistance, troubleshooting is still ongoing. Not critical but we eventually want this feed to work as it has potential to be expanded into real-time trip details. | Low      | Open   |

Table 3: List of additional issues

### 3.4 Detailed execution report

A detailed overview of all test cases that have been executed in the first test run in the lab and the second test run on production can be found in respectively:

- *Luxembourg Pre-pilot Test Lab – Test Execution v1.0.xlsx [1]*
- *Luxembourg Pre-pilot Test Production – Test Execution v1.0.xlsx [2]*



## 4 Conclusion

To verify the readiness of the system for the pilot two end-to-end tests were performed:

- A test covering all applicable specified test cases, performed in an environment that was only partially representative for the production environment.
- A limited test, covering the most relevant test cases, performed in a complete production environment.

Based on the test results of these tests we can conclude that all issues with a direct impact on the user have been resolved. However, two issues (with status severity *low*) that have been discovered from monitoring the system are still open. One issue that is caused by a component is mitigated by another. The other issue does not affect any critical current functionality.

As such, we conclude that the results from both end-to-end tests indicate that there are no issues which are blocking a go live for the pilot.

## References

| Ref. | Title   | Author                     | Status | Version | Date    |
|------|---|----------------------------|--------|---------|---------|
| [1]  | Luxembourg Pre-pilot Test Lab – Test Execution        | Menno de Bell              | Final  | 1.0     | 07-2016 |
| [2]  | Luxembourg Pre-pilot Test Production – Test Execution | Menno de Bell/David Viaggi | Final  | 1.0     | 09-2016 |
| [3]  |   |                            |        |         |         |
| [4]  |   |                            |        |         |         |

# A.1 System overview

