Regional Bus Pilot 1 (RBP1) Summary Report

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Document

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NTS0529	N/A

Version History

Reference Documents

Document ID	Version	Date	Title
NTS0376	3.0	4 April 2008	Regional Bus Pilot Trial 1 Plan
N/A	N/A	N/A	Regional Bus Pilot Trial 1 Schedule
NTS0018	1.0	30 June 2006	NTS Test Plan

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1. Executive Summary

1.1 Objective

As part of the NTS implementation program, Kamco conducted Regional Bus Pilot 1 (RBP1) from 30 April to 23 May 2008. The objective of the pilot was to trial the NTS bus package, including back office activities, in an in-field environment. RBP1 also provided an opportunity to exercise, validate and refine a wide range of Kamco's operational procedures. The valuable lessons learned from this trial will also assist in enhancing subsequent testing and trialling.

1.2 Background

The TTA certified that Kamco had met the agreed RBP1 entry criteria and Kamco entered RBP1 on schedule on 30 April 2008.

RBP1 was based out of McHarry's Buslines in Geelong and involved executing scenarios simulating Customer and Operator behaviour on five buses over three routes and two zones in Geelong and the Bellarine Peninsula. End-to-end transaction flows and reporting functionality was verified and scenarios to test 'back office' activities and processes involving McHarry's, Kamco and the TTA were also conducted.

Prior to RBP1, an Environmental Trial (ET) was conducted in Geelong during April. Successful results proved that the NTS environment was sufficiently stable to enter RBP1.

1.3 Performance & Results

Of 124 scenarios that were run, 112 passed (90.32%) and 12 failed (9.68%). None of these failures are considered critical and are being managed through Kamco's defect management process. Preliminary results after ten days of trialling showed a pass rate of 94.8; the final analysis included an additional three days of trialling.

On one day and separate to the scenario verifications, a volume trial simulating many customers interacting with the NTS over a number of bus stops resulted in 638 transactions being generated. In total, 933 transactions were generated during RBP1, of which 932 (99.89%) flowed to their correct back office areas.

The NTS functioned well for most trialling activities, as shown by the scenario pass rate of 90.32%. Essential on-bus activities such as scan on and scan off, top up myki, purchase of short-term tickets using cash or myki money, driver log on / off, route and shift selection and GPS connectivity and accuracy performed well. Back office processes and operational procedures such as end-to-end data transaction flows, generation of reports, training, communications, installation and commissioning were generally good.

The operator (McHarry's) was pleased with the NTS training, performance and ease of use of the myki solution.

1.4 Conclusions

RBP1 met expectations and achieved its objectives in that it highlighted what NTS devices, components and processes worked well in the field, as well as identifying elements that need further attention. In summary RBP1 has provided:

- Verification of the implementation approach and processes;
- Verification of the bus package and operational procedures;
- Verification of the training programme;
- Achievement of a key project milestone;
- Positive operator feedback.

Kamco will conduct a series of field tests across other transport modes during the second half of 2008 including an additional test on regional buses.

2. RBP1 Background

2.1 Document Purpose

This document provides a summary of activities and results of the RBP1 which was undertaken in April/May 2008.

This document is intended for the following audiences:

- Kamco Executive and staff
- TTA Executive and staff
- McHarry's staff
- Operator representatives (e.g. BusVic)
- Other stakeholders.

A glossary of terms is in Appendix C.

2.2 Background

RBP1 was delivered as a component of the implementation of the New Ticketing Solution (NTS). Implementation of the NTS includes a series of Environmental Trials (ETs) and Pilots designed to ensure that each mode of public transportation is verified in the field environment. Prior to any field deployment of devices and software, Kamco and its sub-contractors validated the functionality through comprehensive tests and acceptance programmes at a number of sites including the Integrated Test Facility (ITF) in Melbourne. The ETs and Pilots evaluate the external impact of field conditions on the NTS which cannot be simulated in a test laboratory.

The staged ET and Pilot approach to delivering the NTS project was established in conjunction with the TTA and Transport Operators. These stages will build upon each other, increasing functionality and user groups. The incremental approach allowed for controlled exposure to features of the NTS and if necessary, activity can be paused while any unexpected results are investigated and system or process corrections made.

This approach was designed to mitigate risk and ensure that Kamco gained understanding of each unique stakeholder environment. Each transit mode is different and has different components of the NTS ('work packages') being implemented into its environment.

RBP1 was based out of McHarry's Buslines in Geelong and involved the executing of scenarios simulating customer and operator behaviour on five buses over three routes and two zones in Geelong and the Bellarine Peninsula. End-to-end transaction flows and reporting functionality was verified and scenarios to exercise 'back office' activities and processes involving McHarry's, Kamco and the TTA were also conducted.

Prior to RBP1, an ET was conducted in Geelong during April to verify whether the NTS environment was sufficiently stable before entering RBP1. The ET enabled Kamco to verify the technology in the field. It provided a quality control check to ensure the functionality was working prior to introducing the stakeholders.

RBP1 enabled Kamco to verify certain components of the NTS, including the people, the process and the technology. During RBP1, Kamco's operating company (OpCo) supported the field activity by exercising its Standard Operating Procedures (SOPs) and Operational processes.

2.3 Purpose of RBP1

The purpose of RBP1 was to verify certain components of the NTS in the live environment. It exercised the current iteration of device and back office software and OpCo SOPs, which were integrated in the production environment, with the physical implementation of the devices and the networks through to the data centre.

The objectives of the RBP1 were to:

- Verify the Bus Package in the field;
- Verify the operation of all relevant NTS Back Office processing and reporting;

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- Verify the operation and performance of relevant NTS devices and infrastructure;
- Verify that Kamco representatives, acting as patrons, can use the NTS in accordance with relevant RBP1 business outcomes.

RBP1 provided an opportunity to exercise and refine a wide range of Kamco's operational procedures including:

- Release management;
- Implementation;
- Installation and Commissioning;
- Pilot Management and Execution;
- Training;
- Communications; and
- Stakeholder Relations.

An important objective of RBP1 was to gather initial impressions from the Operator about the NTS and the Pilot Programme. RBP1 also provided the Operator with the opportunity to verify its business change plan for the introduction of the NTS.

2.4 Scope of RBP1

The scope of Regional Bus Pilot 1 included:

- Five buses from the McHarry's Buslines Depot in Geelong which were installed with NTS hardware and commissioned with the current iteration of integrated software;
- A fully commissioned depot infrastructure, network and data centre;
- OpCo infrastructure services monitoring of the in-scope infrastructure;
- Validation of a defined set of Kamco's processes and procedures;
- Kamco representatives acting as the patron to interact with McHarry's staff, via a controlled, monitored and documented set of scenarios at the depot and out on bus routes in Geelong;
- The scenarios for RBP1 were selected by the Kamco Pilot Team from a subset of the System Qualification and User Acceptance test scripts. They were reviewed by Kamco OpCo staff and TTA prior to execution;
- The functionality for RBP1 was described in terms of roles, channels and functionality;
- There were four user groups that were part of RBP1; Patron, Operator, TTA operating entity (TopCo) and OpCo.
- In summary the customer scenarios included:
  - Add value to myki ('top up myki')
  - Purchase short term tickets using cash and myki money
  - Scan on and scan off
- Five bus drivers were trained on NTS devices through Kamco's 'Train the Trainer' program. The training enabled the Operators to use the devices and conduct the following scenarios:
  - Driver ability to log on and conduct a shift
  - Interact with customers (Kamco staff played the role of the customer)
  - Driver ability to complete sale of various products (short term tickets and myki money)
- Production of End of Day Reports and reconciliation with the Back Office;
- A series of post implementation review sessions were held with each stakeholder group to ensure that all the key lessons from the RBP1 were captured;
- Demonstration of Zone based fares was executed on three routes. Two single zone (zone 4) and one multi zone route (zone 4 and zone 5) was used in the execution of the Pilot;
- Real time verification of the NTS;
- Core and Initial Services sufficient to support RBP1. Workarounds were required for some functions (e.g. card initialisation, call centre, etc).

3. Summary of Results

3.1 RBP1 Stage Overview

RBP1 was delivered in a staged approach, with each stage delivered on a sequential basis. Once the process for Entry was completed, Pilot commenced with a stabilisation period to ensure that there was a stable platform for the scenario execution. Once the stabilisation stage was complete, the scenarios were executed to verify the NTS in the field and detailed results were gathered. The Pilot Team then entered a period to review the deliverables and complete RBP1. The diagram below represents the entry point and the stages that were delivered for RBP1.
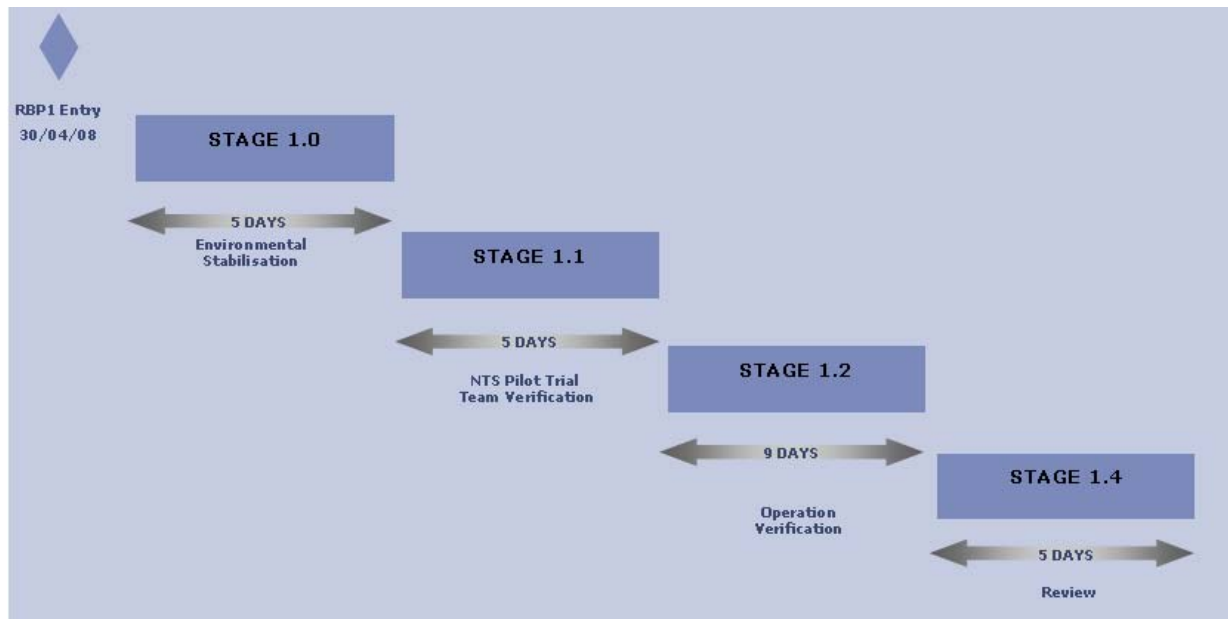
RBP1 – Stage Overview

NB. Stage 1.3 was not executed for RBP1. Stage 1.3 (Patron Verification) is the verification of Patron scenarios using an external group of Patrons. This type of verification is planned for RBP2.

Kamco designed a phased approach for the delivery of ETs and Pilots which is to be applied to each field test in the future. It is a 5 staged approach, with each stage introduced on a sequential basis and building upon the previous stage. RBP1 was delivered in a four-staged approach, as Stage 1.3 was not executed. Kamco acted as Patrons in stages 1.1 and 1.2. The table below represents the stages, the dates, the planned and actual durations. All the Stabilisation activities were completed ahead of schedule, so Stage 1.1 commenced two days earlier than scheduled. Some further testing of the Patron Portal was conducted in Stage 1.2. This did not delay the start of 1.4, as they ran in parallel.

Stage	Name	Planned Duration (business days)	Actual Duration	Actual Start Date	Actual End Date
1.0	Environment Stabilisation	5 days	3	30/04/08	02/05/08
1.1	NTS Pilot Team Verification	5 days	5	05/05/08	09/05/08
1.2	Operator Verification	5 days	9	12/05/08	22/05/08
1.4	Wrap Up and Review	5 days	5	19/05/08	23/05/08

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3.2 Entry to RBP1

To commence RBP1, Kamco was required to meet a set of entry criteria defined in Schedule 45 of the Kamco and TTA Project Agreement (please see Appendix A). In summary, the entry criteria were completed and passed a testing program including:

1. full test documentation

2. specified RBP1 scenarios

3. RBP1 plan

4. Schedule

5. traceability log

6. devices and software installed into a production environment

7. training delivered

8. the people, process and technology in place to enable the provision of delivery services

9. approval of the Pilot Review Board to enter pilot.

All the Entry Criteria were achieved in accordance with the pre agreed schedule. The TTA deemed that Kamco had met the RBP1 entry criteria and issued a certificate of completion on 30 April 2008.

The Entry Criteria were managed through Kamco's dependency management process. This process provides reporting capability with visibility to all stakeholders. Progress against each entry criteria was monitored by each of the Workstream Managers and the Pilot Team on a daily basis to assess the risk against entry to RBP1.

The Pilot Review Board was established comprising members of both the TTA and Kamco Executive teams. In the lead up to RBP1, the Pilot Review Board convened three times. The purpose of the first two meetings was to ensure that the entry date of 30 April 2008 to RBP1 was feasible. At these meetings, the Pilot Team presented the current status and progress towards the RBP1 entry milestone.

The objective of the third Pilot Review Board meeting was to decide whether to give the final approval to commence RBP1. Based on the inputs presented to the Board, it unanimously approved the Pilot Team's recommendation to commence RBP1 on 30/04/08.

3.3 Environment Stabilisation - Stage 1.0

This stage commenced on 30th April 2008.

In this stage, Kamco ensured that the configuration set up was complete and verified that each bus operated in standalone mode. Tests were executed on each bus to ensure the Smartcard functionally integrated with the software and with the devices in standalone mode.

Five buses and McHarry's depot were installed with the latest NTS hardware and software and scenarios simulating Customer and Operator behaviour were trialled on three routes across Geelong (zone 4) and the Bellarine Peninsula (zone 5). Training, including 'Train The Trainer' sessions, was provided to five bus drivers, two trainers and other pilot participants prior to entering RBP1.

Also at this stage the Pilot Team conducted a readiness review with the OpCo Team. A checklist was built in conjunction with the OpCo Team to determine the state of readiness of the people, processes and systems to be used in RBP1. Following successful completion of the checklist, Kamco commenced scenario execution.

The Stabilisation stage was completed in 3 business days. This was 2 days ahead of schedule, hence the next stage commenced 2 days early on Monday 5th May.

3.4 Scenario Verification - Stages 1.1 and 1.2

Stages 1.1 and 1.2 commenced on the 5th June and 12th June 2008 respectively. These stages verified a subset of the NTS Bus package in the field. To achieve this, a set of scenarios was executed based on patron activity, operator requirements and system deliverables that were expected to occur during a standard business day at a bus depot and on the bus. The overall impression and feedback received from the Operator staff was very positive.

For clarity, the following definitions are provided for a Scenario and a Transaction:

- A **Scenario** is a set of activities which has a defined outcome. The scenarios for RBP1 were repeated in different permutations and combinations (as transactions) to simulate real life situations occurring on a day to day basis.

- A **Transaction** is generated from the execution of a Scenario. During the test period scenarios were repeated a number of times in various combinations to simulate real life situations and became the definition surrounding what transactions were generated as part of the process. A transaction can be a financial transaction or a non-financial transaction. For example, selling a ticket is a financial transaction; however, viewing a balance on a myki card is a non-financial transaction.

RBP1 scenarios were a sub-set of the overall test scripts and were chosen to test the main bus functionality such as scan on and scan off, top up myki, purchase of products using cash and myki money, driver log on/off, driver breaks and route and shift selection. The inclusion of zones 4 and 5 was designed to test multi-zonal operability and verify GPS functionality.

Back office operations were also tested to verify such items as connectivity, depot functionality and processes, end-to-end data and transaction flows, call centre/customer/operator web-site and portal functionality and the generation, accuracy and completeness of reports.

Mercury Quality Centre (MQC - an online testing management tool) was used to record the scenarios and test results throughout RBP1. Any defects raised against the scenarios were managed through MQC and these were then managed according to the Defect Management Process. All defects raised were assigned to the development teams and tracked with their respective owners for resolution within the next release of software.

An integrated version of NTS, including Back Office release MRIT17 and Front Office release R12 was deployed for RBP1. Functionality of the NTS demonstrated that a transaction could be created by using a card on a device and that data went through to the back office and into the Data Warehouse. In achieving this, the end of day (EOD) reports were generated and reviewed.

In stage 1.1, Kamco acted as the Patron and Operator running the scenarios. The NTS Pilot Team executed the scenarios during Stage 1.1 to ensure that the system performed as designed before it was fully exposed to the Operator.

In Stage 1.2, the Operator (McHarry's) was introduced to fulfil its role in the execution of the scenarios. The operator was educated via a Train the Trainer program completed prior to the commencement of the Pilot. The effectiveness of this training was also evaluated during these stages.

The Operator interacted with the NTS at the driver level as well as at the depot level. In Stage 1.2, the drivers interacted with the NTS simulating a standard business day including conducting shifts, undertaking myki sales, myki top-ups, etc. Similarly at the depot level, reports were made available via an Operator Web Portal.

During Stage 1.2, the volume of transactions was significantly increased by executing the planned scenarios on multiple occasions.

A set of scenarios were defined to be executed in different permutations and combinations over the Stages 1.1 and 1.2. Planning sheets and daily run sheets were generated, and test results were documented by the Kamco business analysts and test team as the testing progressed.

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3.4.1 Overall Results

Transaction Volumes

A total of 933 transactions were generated during RBP1. The focus for Stage 1.1 was to ensure that all the different scenarios were executed and measured. In Stage 1.2 the focus moved to increasing the volumes. The table below details the transaction volumes in both Stages 1.1 and 1.2.

Transactions	Stage 1.1	Stage 1.2	Total
Number of transactions	131	802	933

<p align="center">Table 1 - Number of transactions performed</p>

The following table represents the transaction volumes per day. It details the key steps in the transaction lifecycle. Each transaction was checked to ensure that it reached the Arcos Server, Axapta, TPPS and then finally the Data Warehouse (DWH). All but 1 transaction successfully flowed through the system into the DWH.

There was a 'volume trial' conducted on the 14th May to simulate a number of customers boarding a bus over a number of stops which resulted in 638 transactions. This test was conducted to assess the performance of the NTS when 50 passengers boarded the bus at the same time, thereby generating 50 'Scan-Ons'. The results were very positive and provided insight into the experience of the Operator and Patron in a high patronage situation.

Transaction Generated Date	Transaction Volume	Reached Arcos Server	Reached Axapta / TPPS	Reflected in DWH Reports
5-May	11	11	11	11
6-May	23	23	23	23
7-May	38	38	38	38
8-May	48	48	48	48
9-May	11	10	10	10
12-May	29	29	29	29
13-May	66	66	66	66
14-May	638	638	638	638
15-May	38	38	38	38
16-May	31	31	31	31
TOTAL	**933**	**932**	**932**	**932**

<p align="center">Table 2 – Day by Day Transaction Flow</p>

On 9th May, one of the transactions did not reach the back office. An application reboot occurred at the time of a 'top up myki' transaction on the BDC and the transaction did not leave the BDC. Defect number 6358 is currently under investigation.
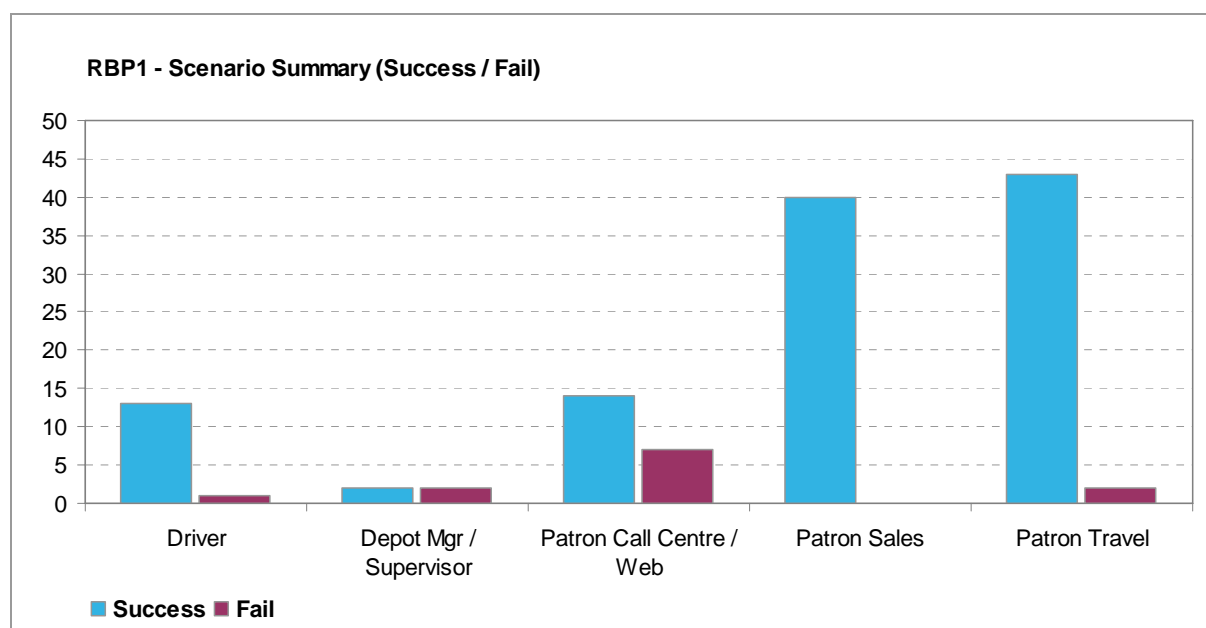
Scenario Summary

Outlined in the charts below is the detail surrounding the number of scenarios executed and the relative Pass / Fail status over a two week period, the numbers in the table represent the total of Week 1 (Stage 1.1) and Week 2 (Stage 1.2). The scenario column represents the scenario grouping which are ordered by user experience. The table below shows that of 124 scenarios performed, 112 passed.

Scenarios	No of Scenarios run	Success in Geelong	Failed in Geelong	% Pass Rate
Driver Scenarios	14	13	1	92.85
Depot Manager / Supervisor Scenarios	4	2	2	50.00
Patron Call Centre / Patron Web Scenarios	21	14	7	66.67
Patron Sales Scenarios	40	40	0	100.00
Patron 'Travel' Scenarios	45	43	2	95.56
TOTAL	**124**	**112**	**12**	**90.32**

Table 3 Number of Scenarios executed Stages 1.1 and 1.2

The pass rate of the scenarios conducted in Stages 1.1 and 1.2 was 90.32%. The criteria used to determine Pass or Fail was aligned to the expected scenario outcomes (i.e.) was the expected scenario outcome successfully achieved (Pass/Fail). For further details on this please see sections 3.4.2 Stage 1.1 Summary and 3.4.3 Stage 1.2 Summary.

Bar Chart 1 – RBP1 Scenario Summary

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3.4.2 Stage 1.1 Summary

Transaction Volumes

The focus for Stage 1.1 was to keep the transaction volumes low and ensure that all different types of scenarios had been verified. In Stage 1.1, 50 scenarios were run generating 131 transactions.

Scenario Summary

A total of 50 scenarios were executed during Stage 1.1.

Scenarios	Planned Scenarios	No of Scenarios run	Success in Geelong	Failed in Geelong	% Pass Rate of Executed Scenarios
Driver	7	7	6	1	85.71
Depot Manager / Supervisor	2	1	1	0	100
Patron Call Centre / Patron Web	21	0	0	0	N/A
Patron Sales	21	20	20	0	100
Patron 'Travel'	23	22	22	0	100
Total	**74**	**50**	**49**	**1**	**98.00**

Table 4 – Number of Scenarios executed Stage 1.1

The pass rate of the scenarios conducted in Stage 1.1 was 98.00%. One Driver Scenario 'failed' during execution. This scenario included multiple test steps, involved in performing a shift on the bus; one step within that scenario (printing of the End of Shift report) failed to occur due to the BDC shutting down prior to the end-of-shift function being performed. This problem did not re-occur during Stage 1.2. An investigation into this problem is in progress and a permanent fix will be introduced in the next NTS bus package cycle.

In Stage 1.1, Kamco intended to run 74 scenarios - 50 of those were executed. In total 24 scenarios could not be executed in Stage 1.1, the reasons being:

- 2 of the 24 Scenarios could not be executed because Route Data had been labelled as Zone 5, instead of Zone 4. This was amended and deployed into RBP1 environment and the scenarios were executed in Stage 1.2 - see Table in Section 3.4.3 – Stage 1.2 Summary.

- 21 of the 24 Scenarios could not be executed because the Patron Portal was not available for the first week of testing - additional enhancements and testing in the ITF was being completed to enable Card Registration prior to field verification. This was successfully tested in the ITF and the scenarios were executed in Stage 1.2 - see Table in Section 3.4.3 – Stage 1.2 Summary.

- 1 of the 24 Scenarios could not be executed because the printing of tax invoice for a reversal of myki top up had an associated defect and was therefore removed from scope.

The removal of this 1 scenario, resulted in 73 scenarios being in scope for Stage 1.2. An additional scenario was added to Stage 1.2 to test the battery power of the BDC. This resulted in a total of 74 scenarios being in scope for Stage 1.2.

The graph below illustrates the passed and failed scenarios against each scenario group.

RBP1 - Stage 1.1 Scenario Summary (Success / Fail)
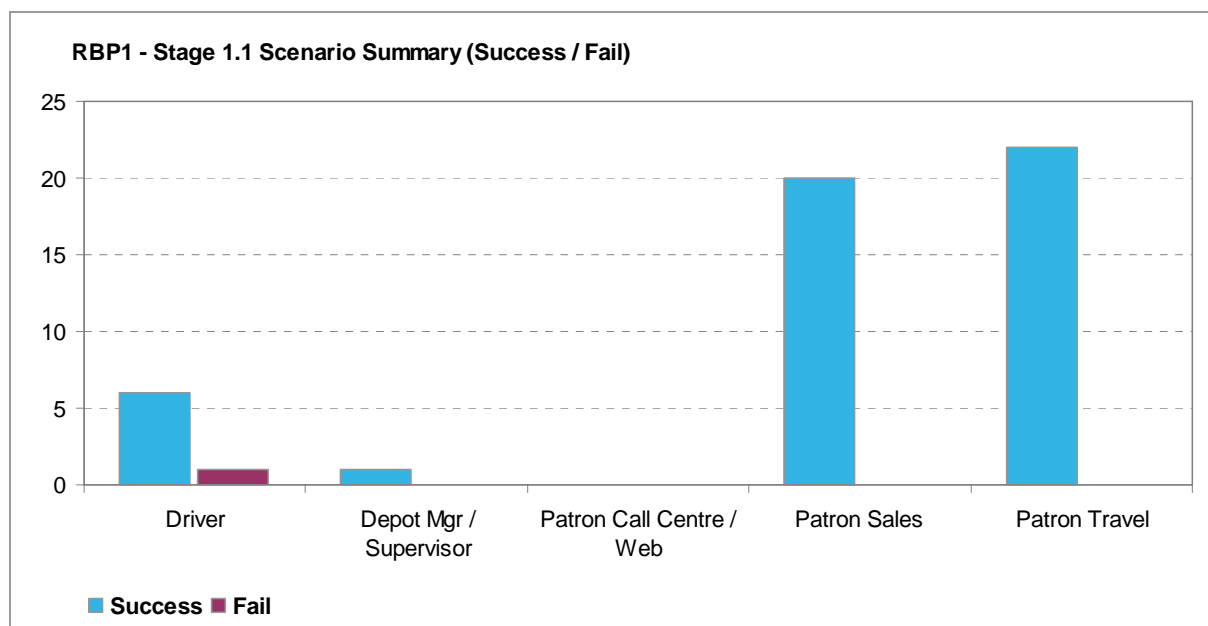
Bar chart 2 - Stage 1.1 Scenario Summary

3.4.3 Stage 1.2 Summary

Transaction Volumes

In Stage 1.2 the focus moved to generating higher transaction volumes to put different levels of stress on the system. The system reacted very well during these tests. In this week, 74 scenarios were run, generating 802 transactions.
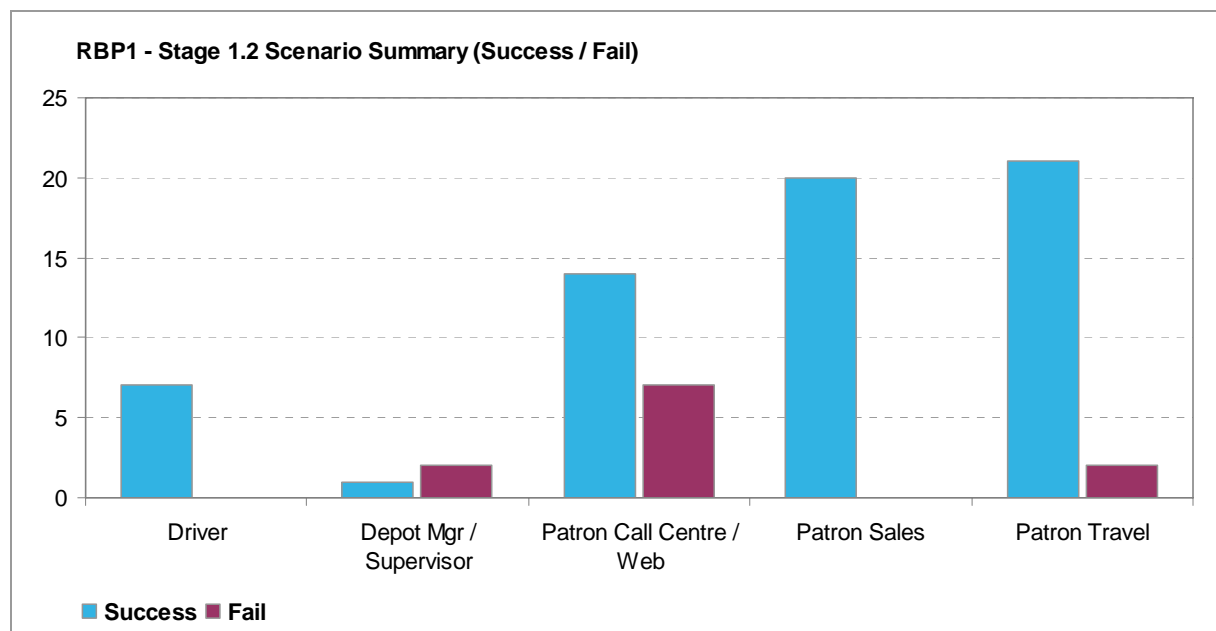
Scenario Summary

In Stage 1.2 a total of 74 scenarios were executed.

Scenario	Planned Scenarios	No of Scenarios run	Success in Geelong	Failed in Geelong	% Pass Rate of Executed Scenarios
Driver Scenarios	7	7	7	0	100
Depot Manager / Supervisor Scenarios	3	3	1	2	33.33
Patron Call Centre / Patron Web Scenarios	21	21	14	7	66.67
Patron Sales Scenarios	20	20	20	0	100
Patron 'Travel' Scenarios	23	23	21	2	91.30
Total	**74**	**74**	**63**	**11**	**85.14**

Table 4 – Number of Scenarios executed Stage 1.2

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The pass rate of the scenarios conducted in Stage 1.2 was 85.14%. The results of the scenario related to the Stage 1.1 BDC shut down did not re-occur during Stage 1.2. A permanent fix will be introduced in the next NTS bus package cycle. The Stage 1.2 failures were:

- Two Depot Manager / Supervisor scenarios failed during this week for reporting completeness and formatting reasons. The reports actually ran correctly, however the report display was incorrect. On further investigation the data in the back office was found to be correct. Feedback from the Depot Manager has been raised with the software development team and the problem will be rectified in the next NTS bus package cycle.

- Seven Patron Call Centre / Web scenario failed during execution. The patron was unable to print a statement with transaction history. The patron was able to view the results correctly and the data in the back office was correct. The Call Centre team were able to print the correct results directly from the back office. The Patron was not able to print from the Portal. To rectify this an additional link will be added to the Portal to enable the Patron to generate and print a Service Request. This has been developed and is currently being tested. The fix will be delivered in the next NTS bus package cycle.

- Two Patron 'Travel' scenarios failed during execution. These issues were related to the forced scan off functionality (i.e. the patron failed to scan off with the card and so the system forced a scan-off). A defect has been raised which will be rectified in the next bus package cycle.

RBP1 - Stage 1.2 Scenario Summary (Success / Fail)

Bar Chart 3 - Stage 1.2 Scenario Summary

3.4.4 Observations

RBP1 met all objectives and tested Kamco's operational procedures. Essential transactions and scenarios were conducted and correctly flowed through to the back office and ultimately the Data Warehouse.

During RBP1 Kamco captured and recorded a number of observations that were not specifically related to the scenarios. These were captured in the Observations Log (see Appendix B), for further investigation. The Pilot Team triaged observations on a daily basis and either assigned Defect, a Service Request (raised by the OpCo), or closing action item.

3.5 Review – Stage 1.4

The primary objective of field trialling is to test, validate and learn. To date, Kamco has conducted a number of field activities and as part of its commitment to continuous improvement, ensures that after each one a thorough review is conducted. The review is called a Post implementation Review (PIR). This approach ensures that key learnings are captured and if necessary, fed back into the operational process to enhance standard operating procedures (SOPs).

Following previous field activity in Q4 2007 and Q2 2008, Kamco completed PIRs. Subsequently a number of improvements were made to the NTS and its operational procedures. It was evident in RBP1 that these upgrades have improved the execution and results of RBP1.

During RBP1, Kamco continuously gathered data about the executed scenarios, field observations and back office operational activities. In Stage 1.4, Kamco reviewed all the RBP1 activity in a series of PIR workshops.

The objective of the workshops was to review what went well, what did not go well and to brainstorm ideas for enhancing future testing and trialling phases. There was a PIR held with each workstream:

1. Kamco Pilot Team

2. Kamco Pilot Team and Kamco OpCo

3. Kamco and TTA Pilot Team

4. Kamco Pilot Team and McHarry's

Each PIR involved:

- A comprehensive overview of the activities that were performed during RBP1

- An assessment of the areas that worked well and the areas needed to be improved

- Deciding if a process or SOP improvement is required

- Generating a request for system change where necessary

- Developing a plan to audit the workstreams to ensure that the improvements and changes have been implemented.

The main recommendations from these workshops were:

- Recording of trial results at the 'step' level rather a 'scenario' level

- TTA to investigate post train the trainer support

- Speed up the reporting of trial results

- Setup a Ticket Office Terminal to sell cards in the next trialling phase

- Establish Operational Data Management procedures prior to the next testing phase

- Develop a process for the acquisition of operational Data

- Refinement of Release Management Strategy procedures prior to next pilot phase

- Further involve the TTA in the field trialling preparation, scenario verifications and results analysis.

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4. Conclusion

RBP1 met expectations and achieved its objectives.

It highlighted the following:

1. NTS devices, components and processes worked well in the bus environment;

2. No significant testing issues were discovered;

3. Of 124 scenarios that were run, 112 passed (90.32%) and 12 failed (9.68%). None of these failures are considered critical. The 12 failures are scheduled to be fixed in the next release; they are being managed through Kamco's defect management process;

4. On one day and separate to the scenario verifications, a volume trial simulating many customers interacting with the NTS over a number of bus stops resulted in 638 transactions being generated. In total, 933 transactions were generated during RBP1, of which 932 (99.89%) flowed to their correct back office areas.

The on-bus activities such as scan on and scan off, top up myki, purchase of short term tickets (STTs) using cash or myki money, driver log on/off, route and shift selection and GPS connectivity and accuracy performed to expectation, as business outcomes were met. Back office processes and activities such as end-to-end data, transaction flows and generation of reports were demonstrated to provide the required functionality.

The operator (McHarry's) expressed high level of satisfaction with the NTS training, system performance and ease of use.

RBP1 has been an invaluable exercise giving Kamco the opportunity to successfully test the bus package in the field and verify its implementation programme. A number of clear objectives were set out at the beginning RBP1 and these have all been achieved. In summary RBP1 has provided:

- Verification of the implementation approach and processes;
- Verification of the bus package and operational procedures;
- Verification of the training programme;
- Achievement of a key project milestone;
- Positive operator feedback.

Kamco will conduct a series of field tests across other transport modes during the second half of 2008 including an additional test on regional buses.

Appendix A. RBP1 Entry Criteria and Prerequisites

The table below list the Entry Criteria (this includes Entry Criteria defined in the Project) and Prerequisites that were met prior to RBP1 commencement.

Item	Entry Criteria	Achieved
1	TTA and Kamco acceptance of the RBP1 Plan (word document)	Yes
2	TTA and Kamco acceptance of the RBP1 Project Schedule (Microsoft Project)	Yes
3	Have in place the people, process and technology, including workarounds, in accordance with the Plan, to enable the Core and Initial Services to be provided	Yes
4	Provide a production environment to execute RBP1 (this includes connectivity to the Data Centre)	Yes
5	Install the tested software required for RBP1 based on the RBP1 Functional Matrix into the production environment	Yes
6	Test scenarios, test cases and test scripts prepared in accordance with the NTS Test Plan to establish that the functionality described in the RBP1 Functionality Matrix is developed and sufficiently stable to enable RBP1 to commence	Yes
7	Deliver the completed SIT, SQT and UAT Test Report which demonstrates that the RBP1 functionality has passed its testing as described in the RBP1 Functional Matrix	Yes
8	Scenarios for execution in RBP1	Yes
9	Installation of devices in a minimum of 5 buses and 1 depot at McHarry's	Yes
10	Established Project Management Processes (dependency management, issues management, operational activity, resourcing, etc)	Yes
11	Establishment of a Pilot collaboration site on SharePoint for all project documentation	Yes
12	Development of Pilot Templates (Scenario templates)	Yes
13	A Plan for TTA Stakeholder Communication (approach, strategy, audiences, collateral, promotion, etc.)	Yes
14	Identification and Implementation of User Profiles	Yes
15	Agree on Daily Execution Schedule template	Yes
16	Perform Data collection and survey of three McHarry's routes: • Route 45 – East Geelong Zone 4 • Route 62 – St Albans Park Zone 4 • Route 99 – The Bellarine Peninsula Zone 4 and 5	Yes
17	Reference Data supplied to support RBP1	Yes

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Item	Entry Criteria	Achieved
18	Provide Pilot Cards to support the ET and RBP1: • 1000 Short Term Tickets • 250 myki cards: - 70 Registered - 130 Anonymous - 50 Spares • 36 Operator Cards: - 10 Driver for McHarry's (Service Provider 18) - 2 Driver for another Operator (demonstrate security) - 5 Technician/Maintenance - 5 Supervisor - 14 Spares Note: These cards will have test keys that can be used in the Production Environment. At the end of Pilot these cards will be recalled. They will not be used outside the scope of Pilot Trial activities. The Production Cards will have a different set of security keys, which means that the Pilot Cards will be not be useable once the Production keys are installed on the devices.	Yes
19	25 Paper Rolls for the Bus Driver Console (BDC) - 5 for each bus	Yes
20	Completion and review of the SIT Test Report	Yes

Appendix B. RBP1 Observation Log

During RBP1 Kamco captured and recorded a number of observations that were not specifically related to the scenarios. These were captured in the Observations Log (see Appendix B), for further investigation. The Pilot Team triaged observations on a daily basis and either assigned Defect, a Service Request (raised by the OpCo), or closing action item.

Date	Observation	Comment
5-May	**Observation:** Bus 12: 10.00 - 11am FPD-m#103-04022 did not boot. On-bus investigation by an ACS Engineer resulting in the cause being identified as corrupt compact flash. A maintenance request was raised in accordance with Operational SOPs and the compact flash was replaced and fixed. **Impact:** Delayed commencement of scenario execution by approx. 1 hour.	This was responded to in accordance with maintenance procedure, as it would do during Operations.
5-May	**Observation:** Of the 10 STT cards taken on-bus, 8 were displaying as previously used (product already loaded) during scenario execution on bus. 50 cards in the Pilot stock had preloaded value on from card quality validation check. They remain in our current stock and may resurface during our testing. In this case, testers will record all necessary information for future reference and possible further investigation into issue. **Impact:** Lesson learnt - remove cards used for quality validation from stock available for testing.	This will not occur in Operations.
5-May	**Observation:** Communication between on-board devices and WLAN was not successful on one occasion. Needed to re-start and ensure that BDC/FPD-m remained powered up, to allow for subsequent data transmission on scheduled time lapse. **Impact:** Delay in commencement of EOD process; approx. 30 minutes.	Planning is ongoing to replace Wireless LAN card in BDC; this is being managed through Defect number 4137.
5-May	**Observation:** Call Centre Portal not available to allow execution of related scenarios. **Impact:** Scenarios have been carried forward to subsequent test days.	SR#000081_117 raised.
5-May	**Observation:** Operator Portal user access has not been created to allow execution of related scenarios. **Impact:** Scenarios have been carried forward to subsequent test days.	Operational Support provided IDs to execute the scenarios.
6-May	**Observation:** In Operator Portal, attempt to raise a Service Request resulted in .net time out error. Issue has been escalated via email for resolution. **Impact:** Prevents progression of scenario execution.	This was responded to in accordance with Call Centre Help Desk procedure, as it would do in Operations.
6-May	**Observation:** BDC Terminal ID 104-00498 (Bus 12) needs to be replaced due to a faulty SRAM and WIFI card. Service Request has been raised to replace the device, will be undertaken by Engineer today. Update: device replaced and installation basic sanity tests have been executed successfully. **Impact:** Delayed commencement of scenario execution by 20 minutes.	Observation closed as scenario was executed and it passed.

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Date	Observation	Comment
6-May	**Observation:** Of 11 transactions generated (on 5 May), 4 did not appear to map through to the DWH Reports. Remains under investigation. **Update 7 May:** Identified that missing transaction data entered the ARCOS Adapter, but never continued out of the adapter into the Product Sale Biztalk service. Adapter did not raise an exception, indicating that the specific exception was not previously catered for, as this would be the only reason why the transaction never continued in the process. Forty test transactions have been run in SQT in an attempt to replicate the issue; all were successful. Investigations continue. **Update 8 May:** The 4 transactions have now been located, archived in the Arcos Adapter. Investigations are continuing into the cause of this. Process is to then resubmit these transactions to Arcos Adapter. Subsequently resubmitted and successfully mapped to DWH Reports.	SR 000167_117
6-May	**Observation:** Application froze on BDC Terminal ID 104-00004 (Bus 81) at end-of-shift and needed to be re-started. Log files have been provided to Wayfarer for further investigation. **Impact:** Minimal delay at end-of-shift. Scenario OP_2.1.1 classed as 'Fail' as End-Of-Shift was not provided. **Update:** The investigated root cause for this problem is the BDCs handling of ignition voltage noise and is going to be fixed on Application and Operating System level on the BDC for R15	Defect # 6185
6-May	**Observation:** The zone information for several routes does not match the NTS Routes & Stops specification. In fact all the routes where all stops should be in zone 4 are in zone 5 in the integrated tariff data. This results in that on the BDC on this specific route, only zone 5 and zone 4-5 tickets can be purchased instead of zone 4 and zone 4-5 as expected. **Impact:** the test run sheets need to be changed for that or the pilot tariff data needs to be changed for that. Test scenarios are able to be executed. Service Request has been raised to initiate further investigation and resolution.	SR 000073_117
7-May	**Observation:** On Customer Portal / Register myki, need to populate fields 'Username' 'Password' and an answer to a security question. Numerous attempts have resulted in "Unable to create the User". Service Request 000081_117 raised for escalation and resolution. **Impact:** Patron Call Centre and Patron Web Scenarios are not able to be executed as yet. Execution deferred until issue is resolved.	SR 000081_117
7-May	**Observation:** On-bus test run exceeded time expectation; bus required by operator to fulfil school bus run, and will not return to depot until 6.30pm approx. Devices have been powered off and will not be available until Thursday morning, for us to power on devices to enable data download. Agreed approach is that data will be reviewed in line with download date (ie. all data downloaded via Arcos on Thursday - comprising test scenarios executed on Wednesday and Thursday - will be treated as Thursday transactions). **Impact:** Delay in review, validation and reporting of test scenarios executed on Wednesday. Will be included in Thursday validation etc.	This was responded to in accordance with Finance SOP, as it would do during Operations.

Date	Observation	Comment
7-May	**Observation:** BDC did not come out from Travel Mode when within GPS footprint at Stop 10a on Route 99In. Related to GPS data error in the tariff data for this stop. **Impact:** No impact. Bus Driver manually touched the BDC to take it out of Travel Mode (correct Stop displayed in BDC).	Metlink own this data - this observation has been raised via the Operational Workstreams
7-May	**Observation:** On two occasions, the BDC re-started without any manual actions to initiate this. At this time, no shift had been selected on the BDC. **Impact:** No impact. Issue to be discussed with Engineer to understand issue further.	Defect #6680
7-May	**Observation:** When selecting new trip (Route 99In), BDC did not respond. After approx. 5 minutes, BDC came into service but FPD-ms were showing Out of Service. Devices were re-started by turning the circuit breakers off and on. This resolved the issue. **Impact:** Delayed progression by 15 minutes. **Update:** The investigated root cause for this problem is the BDCs handling of ignition voltage noise and is going to be fixed on Application and Operating System level on the BDC for R15	Defect #6185
8-May	**Observation:** On one occasion, the application restarted, between stops 4 and 5 on Route 45In, without any manual actions to initiate this **Impact:** End-Of-Shift Report did not include transactions generated prior to this application re-start. Known issue. **Update:** The investigated root cause for this problem is the BDCs handling of ignition voltage noise and is going to be fixed on Application and Operating System level on the BDC for R15	Defect #6185
8-May	**Observation:** On one occasion, the BDC rebooted without any manual actions to initiate this. At this time, no shift had been selected on the BDC. **Impact:** No impact. Issue to be discussed with Engineer to understand issue further.	Defect #6680
8-May	**Observation:** Scenario PA_2.2.21 executed; initial observations of Kamco testers (and TTA observer) were that results Failed the expected outcome of this scenario. Later investigation and in-depth review of the Scenario Objective and Scenario Expected Result resulted in a change of understanding, that this scenario has successfully Passed.	Observation closed as scenario was executed and it passed.
9-May	**Observation:** On one occasion, the application restarted, when stationary at Stop 3 on Route 45In (Bus 12) at 10:15am, without any manual actions to initiate this. **Impact:** End-Of-Shift Report did not include transactions generated prior to this application re-start. Also, the last transaction on the BDC (top up myki) added the value to the card, a receipt was obtained, but the transaction did not transmit to Arcos. Defect #6185 has been raised in MQC. **Update:** The investigated root cause for this problem is the BDCs handling of ignition voltage noise and is going to be fixed on Application and Operating System level on the BDC for R15.	Defect #6185

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Date	Observation	Comment
12-May	**Observation:** On one occasion, the BDC re-started without any manual actions to initiate this. At this time, no shift had been selected on the BDC. **Impact:** No impact. Issue has been observed previously, and further testing / observations are underway. Defect #6680 has been raised for escalation and resolution.	Defect #6680
12-May	**Observation:** Executed scenario to sell STT using myki money (myki card 23682111). Value of $1.80 was deducted from myki, but BDC 'froze' when STT was placed on reader and STT was not issued. Attempted to reinstate value on myki, but unable to proceed. Transactional data in Arcos accurately reflects deduction of $1.80 from myki, and no issue of STT. **Impact:** No impact. Generates an unreconciled transaction (deduction of value from myki, but no STT ticket issued for that value). When attempting to reinstate value (ticket reversal), voucher printed from BDC showing: "MYKI MONEY REFUND FAIL myki money could not be refunded for this transaction. Please take this ticket to our Travel shop to arrange a refund. Refund owed: $1.80". **Update:** transaction was passed to TPPS however no sign of this value is shown on the smartcard usage report for the card. Defect # 6364 raised. The investigated root cause for this problem is the BDCs handling of ignition voltage noise and is going to be fixed on Application and Operating System level on the BDC for R15.	Defect #6364 and #6680
13-May	**Observation:** On one occasion on three buses (Bus 81 , Bus 27 - 2nd trip - and Bus 48), the BDC rebooted without any manual actions to initiate this. At this time, no shift had been selected on the BDC. **Impact:** No impact. Issue has been observed previously, and further testing / observations are underway. Defect #6680 has been raised for escalation and resolution.	Defect #6680
13-May	**Observation:** On (Bus 81, BDC10400004) attempted to execute scenario PA_2.1.15. On BDC, input sale of 3 STT payable from myki. Presented myki when directed. BDC did not read myki. Alternate myki presented - did not read. No error messages received, BDC tone indicated it was waiting for BDC to be presented. Cancelled transaction. Tested BDC using Technician card - successful. Input sale of 1STT payable from myki - processed successfully. Input sale of 2STT payable from myki - processed successfully. (Both using initial myki). **Impact:** No impact (able to sell 3 STT to patron with myki, but needed to be done as two transactions). Connection to the reader got lost and couldn't be established anymore during the transaction. This is fixed with R14.	Defect #6376

Date	Observation	Comment
13-May	**Observation:** Executed scenario to sell 3xSTT using myki money (myki card 92896856, Bus 48, BDC1040005). Value of $9.60 was deducted from myki, but BDC 'froze' when STT was placed on reader and STT was not issued. Attempted to reinstate value on myki, but unable to proceed. Transactional data in Arcos accurately reflects deduction of $9.60 from myki, and no issue of STT. **Impact:** No impact. Generates an unreconciled transaction (deduction of value from myki, but no STT ticket issued for that value). When attempting to reinstate value (ticket reversal), voucher printed from BDC showing: "MYKI MONEY REFUND FAIL myki money could not be refunded for this transaction. Please take this ticket to our Travel shop to arrange a refund. Refund owed: $9.60". Relates to Defect # 6364 **Update:** The investigated root cause for this problem is the BDCs handling of ignition voltage noise and is going to be fixed on Application and Operating System level on the BDC for R15.	Defect #6364 and 6680
13-May	**Observation:** Bus 27 BDC Device 10400003: Application Error. Window appeared on BDC "Application BDC.exe has performed an illegal operation and will be shut down". Needed to restart the device by tripping the circuit breakers. **Impact:** Needed to start new trip. Two transactions previously completed were not included on the EOS Report. **Update:** This has been fixed with R14 and is already verified in SIT.	Defect #6387
13-May	**Observation:** When Bus 48 returned to depot, Comms indicator showed 'green'. After approx. 1 minute, a Windows error message was received "cannot connect to DCHP server…". **Impact:** Log files on BDC have been copied, and observed that there are no transactions recorded on the BDC to transmit (despite numerous transactions successfully processed during the shift). Note that FPD-m transactional data has been received. **Update:** Further investigation found that, due to a temporary error on Arcos, almost all operation logs could not be processed. The files were successfully processed later in the evening (after EOD), apart from the BDC records from Bus #27 (a.m. trip). Remains under investigation. **Update 20May:** Issue has been fixed in the new Arcos version 7.6.9 which has been released along with R14 and is currently being tested in SIT.	SR 000128_117
14-May	**Observation:** On one occasion, the BDC rebooted without any manual actions to initiate this. At this time, no shift had been selected on the BDC. **Impact:** No impact. Issue has been observed previously, and further testing / observations are underway. Defect #6680 has been raised for escalation and resolution.	Defect #6680
14-May	**Observation:** Bus 48 BDC Application Error. Window appeared on BDC "Application BDC.exe has performed an illegal operation and will be shut down". Needed to restart the device by Technician accessing the BDC. Upon restart, BDC displayed current shift and location. However, earlier transactions were not included in EOS Report. **Impact:** Two transactions previously completed were not included on the EOS Report. **Update:** This has been fixed with R14 and is already verified in SIT.	Defect #6387

Date	Observation	Comment
14-May	**Observation:** Bus 81, FPD-m 10300006 transaction data did not upload to Arcos. When detected, the bus was out of the depot. Technician will power up the units when possible (most likely on Thursday). **Impact:** those 280 transactions should not be expected to be in today's data. **Update:** 14/5 3:30pm: transactions received in Arcos.	No Defect or SR raised, as we were intentionally powering-off devices during RBP1. This action would not be replicated in normal operations.
14-May	**Observation:** Fifteen myki cards were rejected when attempting to use at the devices. All myki cards were Concessional (various categories) which appears to be the cause. The Concessional types on these cards were: Vic. Seniors Card / Tertiary Student / Secondary Student / Vic. Health Card / War Veterans/Widows. Believed to be a configuration issue in that these Concession categories may not exist in the devices. Currently under investigation to confirm. **Update 15/5:** Caused by concession types on test myki cards (sold on TOT) do not match with BDC configuration. **Impact:** No impact; used supply of spare cards to execute scenarios.	This was responded to in accordance with Operational Support SOP, as it would do during Operations.
15-May	**Observation:** On one occasion on each bus, the BDC rebooted without any manual actions to initiate this. At this time, no shift had been selected on the BDC. **Impact:** No impact. Issue has been observed previously, and further testing / observations are underway. Defect #6680 has been raised for escalation and resolution.	Defect #6680
16-May	**Observation:** On one occasion on each bus, the BDC rebooted without any manual actions to initiate this. At this time, no shift had been selected on the BDC. **Impact:** No impact. Issue has been observed previously, and further testing / observations are underway. Defect #6680 has been raised for escalation and resolution.	Defect #6680
16-May	**Observation:** To reduce value on myki (as preparation for scenario PA_2.2.3), attempted to purchase 3 STTs paid from myki money. Used myki #6123491 but BDC #10400001 would not read the myki when presented to the reader when instructed. Note that this myki had been used on the same bus/trip today for previous transaction (scan on), and performed successfully. Attempts to use myki for any transaction or read card details was unsuccessful after this issue. It would thus appear that the sale of multiple STTs paid from myki somehow voids the myki card. **Impact:** No impact to scenarios; used alternate myki and reduced card value via other transaction sales. Defect #6376 has been updated with these further observations. Specific card has been provided for further analysis.	Defect #6376
16-May	**Observation:** Executed scenario OP_2.2.1 and OP_2.2.2. Located issue within Operator reports. **Impact:** Scenarios Failed. Defect #6401 raised	Defect #6401
19-May	**Observation:** Test scenario BDC_V_10020 (to validate the power usage of the on-bus devices and the impact on the vehicle power supply) could not be run during the planned field test dates. Test will be executed 19May - 22May, with the result available for reporting on 23May. **Impact:** This scenario was executed and the result was 'pass'.	Observation closed as scenario was executed and it passed.

Date	Observation	Comment
19-May	**Observation:** Patron Call Centre scenario PA_2.3.3: attempted to print transaction history. Received error message " System.IO.DirectoryNotFoundException: Could not find a part of the path 'C:\inetpub\wwwroot\NTSWebPortal\pdf\Temp\myki_form_My_transacti ons_2008_5_19.pdf'." **Impact:** Unable to validate functionality. Defect #6418 raised (may relate to existing Defect #5856, currently under investigation)	Defect #6418
19-May	**Observation:** Patron Call Centre scenario PA_2.3.3: attempted to filter transaction history. When Transaction Type = 'Top Up' selected, full transaction list was displayed, including Fare Product Sale transactions (Fare Product Usage transaction was excluded from on-screen view). **Impact:** Minimal impact; all transactions are available for viewing. Defect #6431 raised for issue awareness.	Defect #6431
19-May	**Observation:** Patron Call Centre scenario PA_2.3.3 and PA_2.3.6: unable to execute scenario component of requesting a tax invoice and a historical cardholder statement, as all transactional history is in current month only. **Impact:** Test scenarios to be noted as 'Out of Scope'; would require re-test after end of transactional month, if test environment available at that time to report data.	This test scenario was removed from RBP1 activities as tax invoice functionality was not in original scope.
19-May	**Observation:** Patron Web Portal does not function adequately if Patron uses latest version of Windows Internet Explorer (v7). Portal is available via Firefox web browser, and apparently with earlier versions of Windows IE. **Impact:** Minimal impact for testing. Installed Firefox web browser on test hardware.	This was responded to in accordance with Operational Support SOP, as it would do in Operations.
20-May	**Issue:** Unable to continue execution of Patron Call Centre / Web scenarios as previously established user profiles have been deleted. Requests to reinstate the user profiles have been unsuccessful to date, and time constraints will prevent remaining testing. **Impact:** Unable to execute final outstanding scenarios	This was responded to in accordance with Operational Support SOP, as it would do in Operations.

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Appendix C. Glossary of Terms/Acronyms

Term / Acronym	Definition
ACS	Affiliated Computer Services, Inc – Swiss based provider of integrated transport ticketing solutions
Arcos	Device management software application
Axapta	Customer management software application
BDC	Bus Driver Console
BusVic	Bus Association of Victoria Pty Ltd
Core & Initial Services	Services to be provided by OpCo as specified in Project Agreement
Defect	In Pilot context, a 'defect' is an unexpected outcome during execution of a Scenario and logged for subsequent investigation and resolution
DWH	Data Warehouse
ET	Environmental Trial
FPD-m	Fare Payment Device-Mobile – device at which customers 'scan on' and 'scan off'
Functional Matrix	Mapping of RBP1 functionality to other NTS documentation
ITF	Integrated Test Facility – Kamco test facility / laboratory in Melbourne
Kamco	Keane Australia Micropayment Consortium Pty Ltd
McHarry's	McHarry's Buslines Pty Ltd – Geelong based bus operator used for RBP1
MQC	Mercury Quality Centre – test management software
myki	Brand name for transport ticketing Smartcard for use throughout Victoria
myki money	Stored value on a myki
myki pass	Stored value travel pass for a certain time period
NTS	New Ticketing Solution to be implemented across Victoria
Observation	Issues observed during Pilot activities that don't relate to a specific Scenario – recorded in an 'Observation log' for further investigation
OpCo	NTS Operational company run by Kamco
Pilot Review Board	Board with equal representatives from Kamco and TTA Executive teams to review Pilot status and approve / reject Pilot Team recommendations
RBP1	Regional Bus Pilot Trial 1 – trial phase forming part of NTS Pilot program
RBP2	Regional Bus Pilot Trial 2 – trial phase forming part of NTS Pilot program
Scan on and scan off	Customers pass their myki over a myki scanner to record their transport travel – customers 'scan on' at the beginning of each trip and 'scan off' at the conclusion of each trip
Scenario	Trial activities designed to simulate NTS interaction in a 'live' situation
Sharepoint	File sharing application
SIT	System Integration Testing – phase to test integration of NTS releases
SOP	Standard Operating Procedure
SQT	System Qualification Testing - phase to test functionality of NTS releases

Term / Acronym	Definition
STT	Short Term Ticket – single use transport ticket
Top up myki	Adding funds to a myki or renewing a myki pass
Traceability log	Functionality mapping of testing / Pilot cases, scenarios and results to other NTS documentation
Transaction	Events / results generated by the execution of a Scenario
TPPS	Transaction management software application
TTA	Transport Ticketing Authority
TTT	Train the Trainer
TopCo	NTS Operational company run by TTA
UAT	User Acceptance Testing - phase to test user requirements of NTS releases
Wayfarer	Wayfarer Transit Systems Ltd - Poole, England based designer and manufacturer of equipment for public transport ticketing

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