



# TRANSNET RFID SYSTEM

## PROGRESS REPORT

March 19, 2012

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## Overview

In the past few months, TransNet has made substantial progress in the completion of a prototype of the TransNet RFID system. Some key functional requirements have been met and the development team is working on meeting the rest of them throughout the remaining weeks.

Currently, TransNet is working on resolving some problematic bugs encountered in the system software and ensuring all system specific functional specifications have been met.

## Technical Development

### RFID Tracking System

The RFID Tracking System is composed of our network of RFID Readers installed on each SkyTrain, the on-board SkyTrain computer which collects the RFID tag data from the reader, and the central database which collects all of the tag data from all of the trains.

All of the software required for controlling the reader, collecting all of the tag data, and transmitting this data over WiFi to the central database has been completed and is working properly. The central database has been built and populated with mock train and RFID tag data for use in our demonstration. All of the software for receiving the transmitted tag data and updating the database has been completed and is working properly.

### Image Processing

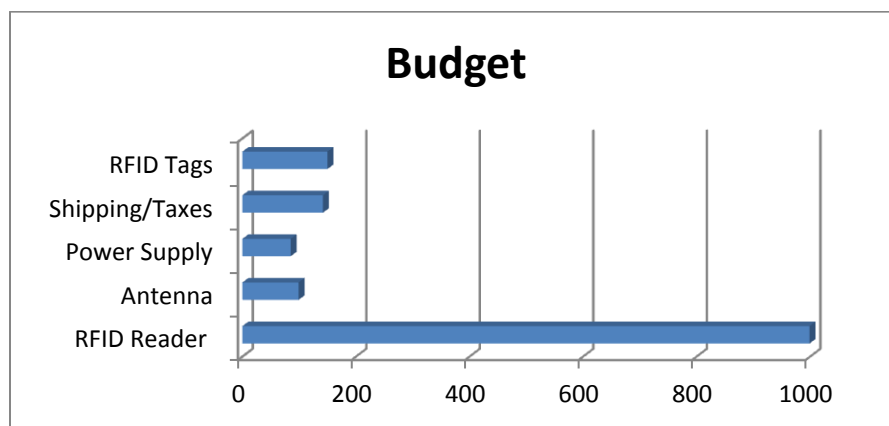
Considering that this particular aspect of the project is the most challenging – progress has been for the most on schedule. Current implementation meets the following functional specification requirements:

1. Detect a single person entering through a wagon door.
2. Detect a single person exiting through a wagon door.
3. Detect one person entering and 1 person exiting through a wagon door while both are in the camera's field of view.
4. Counter shall be initialized to 0 at start of counting process.
5. Detect two individuals entering at the same time - counter shall be incremented by two.
6. Detect two individuals exiting at the same time - counter shall be decremented by two.
7. Snapshot of the background to account for different lighting conditions.

However, we have encountered a few bugs which still need to be resolved. Moreover, a final algorithm (i.e. elimination by deduction [improved individual identification]) is still being incorporated. Appropriate template for final demonstration presentation still needs to be developed. Overall, we feel confident about the performance of our system thus far and hope to better refine the process.

## Budget

Given the cost breakdown in Figure 1, TransNet has spent \$1321 surpassing our initial budget of \$1090. Our company underestimated the cost of shipping from America and decided to purchase a high quality RFID reader from Impinj. We selected this reader because of its high sensitivity and excellent performance, which we needed for our project. We have yet to purchase the RFID tags and project the cost of those items to be \$150; thus, bringing our projected total to \$1475.



**Figure 1:** The figure above illustrates the budget for our project.

## Human Resources

Group dynamics are solid and all team members are working together effectively and efficiently. We had planned most of our group meetings to occur after lectures on Tuesday or Thursday since this is the only time all five group members are readily available. However, it turned out that these lectures were rarely held after the month of January, so most Tuesdays and Thursdays had most group members not traveling to SFU, so no meetings were held. We therefore have had less scheduled meetings take place than was initially planned. Nevertheless, communication within the group is still strong and everyone is always on the same page.

## Action Items

Throughout the coming weeks, TransNet will be integrating the RFID system, database, and image processing software together, as well as implementing some billing methods.

After the above is done, extensive testing will be performed to ensure functional requirements of the overall system are met. Many different scenarios will be tested and the resulting system output observed. Rare scenarios will also be tested, and how the system responds will be observed. This will be used to observe where the system might fail. In addition, these tests will provide a measure of the reliability of the overall system.