# RE: Negative Balances and Passenger Count Question

Hayden Woodhead

Fri 9/03/2018 2:50 p.m.

To: Sonia Simpson <sonia.simpson@aut.ac.nz>;

Thank you, we are definitely designing around intermittent internet availability.

We agree drivers shouldn't have to use their devices and we plan on developing the driver app to be usable on a low end devices to reduce the capital expenditure of the organization purchasing them.

From: Sonia Simpson
Sent: Friday, March 9, 2:43 PM
Subject: RE: Negative Balances and Passenger Count Question
To: Hayden Woodhead, Sally Vallely

Hello Tech Ticket Team

I am comfortable with this especially when considered against the level of photocopy fraud we are probably already carrying.
There is wifi on the buses however it is not strong and is prone to drop out.

Metrics are sent weekly and we are happy to share these stats with you. Attached is the data to date. If we forget to share, give us a nudge.
Remember also the reasonable requirement that the bus company would have to provide a smart phone to the drivers. They should not be expected to use their own phones.

Kind regards
Sonia

**Sonia Simpson**

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**From:** Hayden Woodhead [mailto:qsj6872@autuni.ac.nz]
**Sent:** Friday, 9 March 2018 1:44 PM
**To:** Sally Vallely <sally.vallely@aut.ac.nz>; Sonia Simpson <sonia.simpson@aut.ac.nz>
**Subject:** Negative Balances and Passenger Count Question

As you mentioned in the meeting the other day, you don't want to allow students to go into negative balance. However, there is a situation where we think negative balances are required. One of our goals is to allow passengers to the use the app and drivers to scan on passengers without an active internet connection. As such, we can't always check with the ticketing system to ensure that the balance is positive. We can only check whether or not the QR code is valid and then sync records once a connection is restored.

Consider the following scenario:
A student's device is not connected to the internet but they have a balance allowing for 1 ride. The driver's scanning device is online and as such, upon presenting their ticket, the students balance is debited the cost of one ride. The student's device remains offline and is unable to sync with the system. It therefore continues to show their QR code with a balance for 1 ride. On their next journey the drivers scanning app is also offline. The app will verify the student's QR code isn't forged but it cannot check the students balance. It allows the student onto the service and saves the record of the trip to sync later. Upon connecting back to the internet, the drivers scanning app syncs with the system. The system realizes that a student has used more rides than they should have.

While this scenario may be rare, it is a distinct possibility. We would suggest allowing students to go into a negative balance only in this instance. When students next top up, this debt would be settled.

What are your thoughts?

Also, how often does the bus company send you metrics on passenger numbers?

Thanks
Hayden