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# Flowbird System & MyKey Application Audit Report

Governance & Audit Report No. 2023-4

Issued on June 14, 2023

## EXECUTIVE SUMMARY

### Background

The Internal Audit Work Plan approved by the Governance and Audit Committee for fiscal year 2023 included a Flowbird System and MyKey Application Audit Review.

The Flowbird System and MyKey Application was launched in conjunction with the opening of the Red Line. The purpose of the MyKey Application is to allow riders to pay fares via media cards and scanning the MyKey smartphone app. Riders can also load fares into their MyKey account by the smart phone app, Ticket Vending Machines (TVMs), online webpage or the Retail Desk at the Carson Transit Center.

To ensure MyKey media card availability across the IndyGo network, a retail network vendor was selected.

Our audits are performed in accordance with the professional practice standards of the Institute of Internal Auditors. This report was prepared for use by IndyGo’s Board of Directors, Governance and Audit Committee, and management.

### Objective and Scope

Examine the current process and controls related to the Flowbird system and MyKey app. Considerations included:

- Product expectations vs. delivery
- Point of sale results and reconciliations
- Partner portal usage
- Technology – vendor support and access controls
- Retail Network

### Overall Report Rating & Observations

*(See Appendix A for definitions)*

	Report Rating	Number of Observations by Rating		
		High	Medium	Low
<b>Flowbird System &amp; MyKey Application</b>	<b>High</b>	<b>4</b>	<b>1</b>	<b>0</b>

### Overall Summary and Review Highlights

We observed that IndyGo’s expectations with the Flowbird System and MyKey Application was to provide multiple avenues for riders to pay fares onboard the fixed route buses as well as paying fares at stations for the Bus Rapid Transit (BRT) lines. In addition, a new retail desk Point of Sale System was included as part of the Flowbird System which has been recently updated.

Our review identified observations which may enhance the overall Flowbird System and MyKey application, improve functionality of systems and applications, and assist in increasing fare revenue. Our five observations related to the following areas:

- AXIOS (Fare Validators)
- Ticket Vending Machines (TVMs)
- Flowbird Portal
- Partner Portal
- Retail Network

The observations and management’s responses are presented in our accompanying report.

Our overall report rating for this Flowbird System & MyKey Application audit is “High” risk.

We would like to thank IndyGo staff and all those involved in assisting us in connection with the review.

Questions should be addressed to the IndyGo Department of Governance and Audit at [batkinson@indygo.net](mailto:batkinson@indygo.net).

**1. AXIOS (Fare Validators)**

<p><b><u>Observation:</u></b>          Axios are the fare validators used onboard all IndyGo buses as well as the BRT stations. The purpose is to collect the fares from the MyKey media cards or smartphone app by using a tap process or optical scanner.</p>	<p><b><u>Recommendation:</u></b>          Develop a process and route to check the function of each Axio on a regular preventive maintenance schedule.</p>	
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**Observation Rating: Medium**

<p>Optical scanning with use of the mobile app was not always reading the QR code to pull the fare from the rider’s MyKey account. The problem was determined to be the distance and angle between the rider’s smartphone and the optical scanner. This problem was not evident on the newer model Axios which have the optical scanners built in at a different angle.</p> <p>During BRT station visits to check the functionality of the Axios, it was determined that some Axios were not working and offline. The Axios at the BRT stations are connected to the Flowbird System by a cellular modem. G&amp;A reported the non-functioning Axios to IndyGo’s Treasury Department for repair.</p>	<p>During discussion with the eFare manager, we were informed that the Treasury Department is adjusting the location and angle of each Axio onboard the buses. Our recommendation is to continue adjusting the older model Axios’ location and angle on all buses until the entire fleet updated and tested.</p> <p>The Treasury Department should develop a routine preventive maintenance plan that includes a schedule to check function and connectivity of Axios at the BRT stations</p>	<p><b><u>Management Action Plans:</u></b>          Treasury team will be moving the location of the AXIO’s to the middle of the dash within the Coach then raising the AXIO up 1 ½ inches in height with a slight rotation to the door. This will ensure that there is additional space for scanning threshold and making it more natural for riders to scan. After all AXIOs have been moved, a communication on ensuring that riders need to not be so close to the device when scanning and placing the device further toward the AXIO.</p> <p><b><u>Responsible Parties:</u></b>          Treasury &amp; eFares Product Manager</p> <p><b><u>Due Dates:</u></b>          August 18<sup>th</sup>, 2023</p>
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## 2. Ticket Vending Machines (TVMs)

<p><b>Observation:</b>          Over three days of observations, it was noted that 17 of 20 TVMs checked at the BRT stations were not working. All TVMs at the Carson Transit Center (CTC) were working correctly. TVMs at the BRT stations are connected to the Flowbird System by a cellular modem and those at the CTC are directly connected to the IndyGo network.</p>	<p><b>Recommendation:</b>          It is recommended that IndyGo insist on receiving more robust support from the Flowbird vendor.</p>	
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**Observation Rating: High**

<p>There are forty TVM machines currently on the IndyGo network.</p> <ul style="list-style-type: none"> <li>4 at CTC</li> <li>34 at BRT Stations</li> <li>2 at Super Stops</li> </ul> <p>After meeting with the eFare solutions manager, it was determined the heartbeat of the equipment was malfunctioning. The heartbeat is the system to maintain connectivity to the network by a cellular connection. The TVM operating system regularly pings the network to continue the connection by cellular modem. It was determined that the Flowbird Hub was not detecting when the heartbeat process was not working causing the machines not to be connected. Despite the Flowbird Hub showing the machines in operation. The vendor told IndyGo that despite the heartbeat issue, the machines should work. IndyGo determined that was not the case.</p> <p>Due to the Flowbird Hub displaying the TVMs were connected and in operation, it is unknown when the problem originally occurred causing an unknown timeframe of lost fare revenue.</p> <p>As a temporary work around, the Treasury Department was traveling to all the machines daily to reboot the operating system until an upgraded version of the system software could be provided. It was determined that IndyGo was utilizing version 37 out of 52 versions of software.</p>	<p>The vendor needs to provide a way for the IndyGo eFare Solutions Manager and the Treasury Department to monitor the heartbeat of the TVM machines cellular connection online through the Flowbird Hub.</p> <p>IndyGo should insist that the Flowbird vendor provide notification when software updates are released. As all TVMs should be connected to the Flowbird system, development of a method to push updates through the system rather than manually updating each machine in person.</p>	<p><b>Management Action Plans:</b>          Treasury will continue working with Flowbird on receiving a permanent fix for the TVM modem issue. After this issue has been resolved, to work on an enhancement for notifications on lost heartbeat for the TVMs. The second enhancement is to request that devices can be updated via Flowbird HUB to reduce the effort for updates. Will also request newer versions of TVM versions quarterly or bi-annually to keep up on software versions.</p> <p><b>Responsible Parties:</b>          Flowbird, Treasury, &amp; eFares Product Manager</p> <p><b>Due Dates:</b>          July 31st, 2023</p>
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TVM software upgrades were not being provided by the vendor for IndyGo to install. IndyGo TVMs were running an older version of software without knowledge of upgraded versions. When released, software updates do not automatically occur and IndyGo was not notified. For updates, the vendor must contact IndyGo and send a copy of the software program. The update is a manual process with each machine being updated with a flash drive. There is not a process to push the upgrade to the machines through the system connection.

### 3. Flowbird Hub

<p><b>Observation:</b>          The Flowbird Hub is a web-based program to capture data from the various Flowbird components and report the data in corresponding modules. There are ten modules making up the Hub.</p>	<p><b>Recommendation:</b>          It is necessary for the vendor to have all parts of the Flowbird Hub working as expected at the time the service was contracted by IndyGo.</p>	
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Observation Rating: High

<p><b>Customer Relationship Management</b> – This module stores all Patron account information with their email, name, phone, last activity, # of media, and statuses. Each individual account can be managed and modified as needed and a history of the account.</p> <p><b>Devices</b> – This module allows the management of TVMs and AXIOs. There is information about the devices along with settings for hours of operations of the device.</p> <p><b>Fares</b> – This module allows for the setup and configuration of different fare media, discounted programs or additional fare functionality.</p> <p><b>Front Desk</b> – This module manages the Point-of-Sale stations, types of products, customer representative accounts, sales analytics and Hawkeye.</p> <p><b>Hawkeye</b> – Intended to be used by the Security Department to manage fare inspection employees and equipment.</p> <p><i>This portion of the HUB is not working because of the setup of the fare inspection hand-held devices. The hand-held devices were originally set up to use Wi-Fi for connection. Because of intermittent Wi-Fi availability, sim cards were added for use on a cellular network. Because of Wi-Fi availability on buses and at the stations and the proximity of each, the device is always searching for Wi-Fi signals or a cellular connection. When the devices are trying to connect, it cannot be used for checking MyKey cards for fare payments. This module is no</i></p>	<p><b>Hawkeye</b> – Fare enforcement is currently a problem with the Redline and the Hawkeye fare inspection equipment not working only adds to the issues. The settings of the fare inspection equipment need to be reviewed to sort out the problems with Wi-Fi and cellular functionality. The Security Department cannot check the MyKey cards for payments or issue warnings.</p> <p><b>Monitoring</b> – It is recommended that the monitoring module be reviewed for correct reporting. During this review, it was determined that the TVMs were all reporting as working and online but were not. Any functionality not reporting on the Monitoring Module should be added and the newest version of software included by the vendor.</p> <p><b>Partners &amp; Programs</b> – This function is not set up and usable. A separate observation for the Partner Portal is included with this review.</p>	<p><b>Management Action Plans:</b>          eFares Product Manager will work on the outstanding issue areas of the Flowbird HUB with Flowbird. Outline the exact issues for what issues and missing functionality that need to be resolved.</p> <p><b>Responsible Parties:</b>          Vendor Flowbird &amp; eFares Product Manager</p> <p><b>Due Dates:</b>          Q1 2024</p>
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*longer being used because it is not functioning for fare inspection.*

**Jobs** – Manages and history of bulk operations media.

**Media** – Manages different types of fare media, media lookup, history of transaction to individual media and view of fare caps.

**Monitoring** – Manages real time information of the TVMs and AXIOs. This will show the active alerts of issues and heartbeats that need to be monitored. Media validations can also be tracked in this module.

*This section of the Hub is what was reporting the TVMs as up and functioning when they were not working due to the heartbeat and cellular connection.*

**Partners & Programs** – Module allows setting up different third-party locations of fares such as free or reduced fares.

*It was determined that this module is not set up and functional for use.*

**Revenue** – Revenue is reported by various payment locations: TVMs, Retail Desk Point of Sale, Mobile App, Webpage and Retail Network. After a recent update to the Point-of-Sale system, the revenue module is correctly reporting for each revenue section being used.

**4. Partner Portal**

<p><b><u>Observation:</u></b>          The purpose of the Partner Portal was to manage large groups of MyKey cards issued by one card purchaser.</p>	<p><b><u>Recommendation:</u></b>          Insist the vendor complete the Partner Portal programming and release the update to IndyGo.</p>	
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**Observation Rating: High**

<p>The design of the Partner Portal was for managing a group of MyKey cards. Examples would be community outreach programs or schools. An account balance could be distributed by the partner to the various cards in their program. Community outreach programs and schools could assign cards and manage the balances assigned to their individual clients.</p> <p>This module has never been completed by the vendor and is not available for IndyGo partner use. This product would have been very useful for the IndyGo Foundation who partners with many community services organizations which provide transportation to their clients. This would also eliminate the need to purchase the large volume and denominations of paper passes which are currently being used.</p>	<p>It is recommended that IndyGo hold the vendor responsible for the completion of this proposed function.</p> <p>The Partner Portal was an expected function that would have replaced the large paper pass purchases by IndyGo large volume customers.</p>	<p><b><u>Management Action Plans:</u></b>          eFares Product Manager will work on the outstanding issue areas of the Flowbird HUB with Flowbird. Outline the exact issues for what issues and missing functionality that need to be resolved.</p> <p><b><u>Responsible Parties:</u></b>          Vendor Flowbird &amp; eFares Product Manager</p> <p><b><u>Due Dates:</u></b>          Q1           2024</p>
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**5. Retail Network**

<p><b>Observation:</b>          IndyGo contracted a vendor to establish a retail network for MyKey fare media sales, including reloading of funds on fare media cards, that will be implemented in geographic areas identified by IndyGo as disproportionately impacted by new fare policies requiring the use of Ticket Vending Machines (TVMs) and/or wireless mobile applications to purchase certain bus fares.</p>	<p><b>Recommendation:</b>          Establish a retail network in geographic areas disproportionately impacted by the currently IndyGo fare policy.</p>	
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**Observation Rating: High**

<p>The RFP for the retail card network was issued in April 2019 with a five-year contract initiated in April 2020.</p> <p>Various milestones within the scope of work have not been met. Initially there was a delay in product availability due to the national chip shortage.</p> <p>As of this time, the retail network has not been set up and no products or retail providers are available to the IndyGo ridership as required by the Fare Equity Study completed by IndyGo.</p>	<p>IndyGo should insist that the vendor start the fare media production and established a retail network as listed in the scope of work expected by this contract.</p> <p>If the scope of work cannot be met by the current retail network vendor, the selection of a new vendor should be completed to ensure the retail network concept is put into place.</p>	<p><b>Management Action Plans:</b>          The retail network has been placed on hold to validate its necessity along with the costs and logistics. The vendor contract ends May 2024.</p> <p>Strategic Planning is performing a fare equity analysis to replace to 2017 and 2019 reports to determine if a retail network is needed.</p> <p><b>Responsible Parties:</b>          Strategic Planning</p> <p><b>Due Dates:</b>          12/31/2023</p>
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## APPENDIX A – RATINGS DEFINITIONS

Observation Rating Definitions		Report Rating Definitions	
Rating	Definition	Rating	Explanation
<b>Low</b>	Process improvements exist but are not an immediate priority for IndyGo. Taking advantage of these opportunities would be considered best practice for IndyGo.	<b>Low</b>	Adequate internal controls are in place and operating effectively. Few, if any, improvements in the internal control structure are required. Observation should be limited to only low risk observations identified or moderate observations which are not pervasive in nature.
<b>Medium</b>	Process improvement opportunities exist to help IndyGo meet or improve its goals, meet, or improve its internal control structure, and further protect its brand or public perception. This opportunity should be considered in the near term.	<b>Medium</b>	Certain internal controls are either: <ul style="list-style-type: none"> <li>• Not in place or are not operating effectively, which in the aggregate, represent a significant lack of control in one or more of the areas within the scope of the review.</li> <li>• Several moderate control weaknesses in one process, or a combination of high and moderate weaknesses which collectively are not pervasive.</li> </ul>
<b>High</b>	Significant process improvement opportunities exist to help IndyGo meet or improve its goals, meet, or improve its internal control structure, and further protect its brand or public perception presents. This opportunity should be addressed immediately.	<b>High</b>	Fundamental internal controls are not in place or operating effectively for substantial areas within the scope of the review. Systemic business risks exist which have the potential to create situations that could significantly impact the control environment. <ul style="list-style-type: none"> <li>• Significant/several control weaknesses (breakdown) in the overall control environment in part of the business or the process being reviewed.</li> <li>• Significant non-compliance with laws and regulations.</li> <li>• Observations which are pervasive in nature.</li> </ul>
<b>Not Rated</b>	Observation identified is not considered a control or process improvement opportunity but should be considered by management or the Board, as appropriate.	<b>Not Rated</b>	Adequate internal controls are in place and operating effectively. No reportable observations were identified during the review.