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## **Bus Rapid Transit (BRT) Review**

**Governance & Audit Report No. 2023-2**

Issued on April 3, 2023

## EXECUTIVE SUMMARY

### Background

In May 2018, the Indianapolis Public Transportation Corporation (IndyGo) began construction of the Red Line, the first Bus Rapid Transit (BRT) line in Indianapolis. The Red Line, being the first phase of what is to become a three-line BRT system, opened on September 1, 2019. Two additional BRT Lines (Purple Line and Blue Line) are currently being planned.

The 13-mile route provides service to more than 50,000 residents and nearly 150,000 jobs.

The Redline is serviced by a fleet of articulated battery electric buses that have right and left door side boarding, serving a total of 34 stations.

The Indianapolis system includes the following Federal Transit Authority recognized BRT main features: Dedicated Lanes and Alignment, Off-Board Fare Collection – Pre-Ticketing, Intersection – Signal Priority, Platform Level Boarding, High-Capacity Vehicles and Quality Stations.

Our assessments 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 IndyGo’s Red Line BRT and provide improvements and considerations to be updated prior to the Purple and Blue Line openings.

- On board announcements at stops.
- Video at stations and on-board bus.
- Bus location and mobile app updates
- Integrity of data published at stations.
- Fare collection system
- Station cleanliness and amenities

### Overall Report Rating & Observations

*(See Appendix A for definitions)*

	Report Rating	Number of Observations by Rating		
		High	Medium	Low
<b>BRT Review</b>	<b>High</b>	<b>3</b>	<b>0</b>	<b>1</b>

### Overall Summary and Review Highlights

The FY 2023 Internal Audit Work Plan approved by the Governance and Audit Committee included a Bus Rapid Transit (BRT) Review.

Various aspects specific to BRT have been reviewed on IndyGo’s Red Line to best prepare for opening two additional BRT routes the Purple Line and Blue Line. The Red Line has now been in operation for over three years. This purpose of this review is to make note of what is working well and where improvements could be made before opening additional BRT lines.

Multiple rides were performed to review systems, buses, stations and offboard fare collection.

Four observations come from this review which include:

- Fare Evasion
- On Board Buses
- Fare Collection Equipment
- Stations

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).

## OBSERVATIONS SUMMARY

Following is a summary of the observations noted. Definitions of the observation rating scale are included in Appendix A.

Governance and Audit Observations	
Recommendation Title	Rating
1. Fare Evasion	High
2. On Board Buses	High
3. Fare Collection Equipment	High
4. Red Line Stations	Low

**1. Fare Evasion**

**Observation:**  
 During three days of Red Line rides, it was observed that most riders do not validate a card/ticket or pay at the station ticket vending machines.

**Recommendation:**  
 Management should consider taking a fresh look at the BRT fare collection processes to determine ways to prevent fare evasion and educate the ridership on fare payment processes.

**Observation Rating: High**

During one afternoon of riding the Red Line, it was observed that only two riders validated a pass at the MyKey validator.

Two new BRT riders were observed trying to pay the driver after boarding the bus. There was a misunderstanding of the payment process which is to take place at the BRT station.

It was clearly observed that most riders board the bus with no intention of paying at the station.

Observed over twenty Charter School students boarding a Red Line bus at one stop. No students validated a card at the station. A student shared that free bus rides are part of an agreement with the school and only a student ID is required. On investigation with IndyGo, it was determined that the Charter School does not have an agreement for students to use IndyGo services at no cost.

During two morning and one afternoon ride on the Red Line stopping at all stations and transferring buses, no fare inspectors were seen working. Contact was made with security to learn that there is budget for two fare inspectors but only one fare inspector position is currently filled. This position of fare inspector is contracted through the IndyGo security vendor.

Consider working with the security vendor to ensure they are meeting contractual requirements to provide the necessary agreed number of fare inspectors. Increase the number of fare inspectors as additional BRT lines are opened as well as covering all hours of operations.

Increase rider awareness of how to pay to ride the BRT lines. This could include additional signage at the stations explaining where and how to pay. Fare inspectors spend time explaining the fare validation process to riders when fare evasion is observed. Issue a citation for a repeat offender.

Management may consider contacting the Charter School to work out a payment arrangement for students to ride or increase fare inspection at the station near the school.

Consider a method to prevent a rider from entering the BRT station without first validating a card or paying the fare. This may involve reworking the station design or placement of fare collection equipment for future BRT lines.

**Management Action Plans:**

*Security Response*  
 Due to the larger-than-expected hourly rate increase for all parts of the security contract, security services had to be modified to meet the approved 2023 budget. Part of the modification was moving from two fare inspectors per shift to one per shift. This new contract started on March 05, 2023, and will continue in its current form until the start of the new budget for 2024. With that budget, the amounts that the Board approved will allow the security vendor to bring on four more fare inspectors. It will be the decision of the Executive Team if those four new positions will be used on the Red Line or be used on the Purple Line. It will also be discussed if they want to have a total of 16 inspectors, which would allow eight inspectors on each BRT Line.

The Security Department does cover all hours of service on the Red Line. IndyGo has the inspectors do random checks on random sections of the line during the service day. Fare inspectors cannot issue citations at this time as it would require a change to the City Code and a process for passengers to be able to pay the fine, ask for a reduction of the fine, or contest the fine.

*Public Affairs Response*

IndyGo has developed a comprehensive plan to better educate the public about how to pay to ride at BRT stations. That campaign started last year with a series of announcements that play on the public address systems on all buses, at the Transit Center and specifically at each BRT station.

IndyGo is in the process of installing new signage at each BRT station on the platforms and around the ticket vending machines that call attention to where and how to pay before boarding the BRT bus.

**Responsible Parties:**

Security

Public Affairs

**Due Dates:**

Security – January 1, 2024

Public Affairs – August 31, 2024

**2. On Board Buses**

<p><b><u>Observation:</u></b></p> <p>Twenty-three BRT buses were ridden over a three-day period. Observations were made regarding on board announcements, signage, video monitors, door opening and station pull ups.</p>	<p><b><u>Recommendation:</u></b></p> <p>Provide expectations of coach operators to pay attention to what is going on with the bus and systems and log any issues for maintenance. Improving method of interacting with riders regarding stops and location.</p>	
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**Observation Rating: High**

<p>During the Red Line ride along, it was noted that station announcements could not be heard on most of the buses. Those that did have station announcements, the volume was very low and could not be heard while the bus was in motion. The coach operators did not announce the stops on buses when the automated station announcement was not working.</p> <p>After meeting with Maintenance, it was determined that the coach operators did not list the station announcement issue on the daily log for the bus, therefore the issue was not reported to Maintenance for investigation.</p> <p>The only way to know the next stop was to stand to look out of the bus window or windshield. This would not be helpful for someone traveling from out of town who is not familiar with Indianapolis roadways or in the case of being visually or physically impaired.</p> <p>Only a small number of the buses have a diagram on board displaying the Red Line route. A diagram would be helpful for riders to know the next stations coming up.</p> <p>There are on board video screens to display various IndyGo events and announcements. This video system is currently turned off on all Red Line buses.</p>	<p>After meeting with Maintenance and the Connected Vehicle Team, it was discovered that there were speaker problems with 21 of 22 buses during first round of checking. The speakers were failing, not the announcement system. Maintenance has placed necessary orders for parts and are scheduling the buses for service as soon as parts are available. In some cases, as many as 7 speakers were not working on a single bus. Eventual speaker failure seems to be a manufacturing defect.</p> <p>Management could consider utilizing the on-board video screens to display a diagram of the BRT route as well as the next station information. This would be most useful for hearing impaired riders. If buses are shared by future BRT lines, the diagrams for each route could be displayed electronically rather than switching out posters on the buses.</p> <p>Verify there is a route diagram located on each BRT bus either electronically or by poster. This would be helpful for riders to determine when their stop is coming up.</p> <p>Consider training operators to be consistent with the door opening procedure to avoid confusion if the door will automatically open or if the rider must open the door. Opening the door is difficult for a rider using a mobility device.</p>	<p><b><u>Management Action Plans:</u></b></p> <p>Upon receipt of the initial findings from G&amp;A’s BRT Review, the Connected Vehicle Technology team and maintenance department quickly got together to develop a plan to remediate the reported issues. Both teams immediately began a campaign which involved working together on third shift to identify, troubleshoot, and repair all ADA related issues. The bulk of the issues found were related to defective or disconnected speakers, but all issues impacting ADA systems were identified and repaired. Additional actions were taken including setting the default volume of the Avail system’s annunciations at a higher level. This will help ensure that even when the system is functioning properly, the system minimum level is at an appropriate level to be useful to all riders. As of April 5, 2023, CVT and maintenance have completed a final inspection and verified that all ADA systems are working as intended across the BRT fleet. Moving forward, CVT and maintenance have committed to working together to identify ADA related issues through a new collaborative preventative maintenance schedule so that these issues are not allowed to become as impactful as was found by the G&amp;A team.</p> <p>The on-board video screens referenced by G&amp;A are an Infotainment system which is deployed across the entire BRT fleet. Recently, in response to long standing supply chain and</p>
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Some of the buses do not automatically open all doors at the station. There is a green light and message for the rider to open the door. This created confusion as to when a rider must open the door themselves.

Bus parking distance from the station platform is not consistent. Crossing from the bus to the station is difficult for riders with mobility devices. G & A witnessed a rider jump off the platform between the station and the bus at the Fountain Square north bound station. Fortunately, the driver noticed the person in the mirror as well as another rider yelling out to the driver. This rider created a very dangerous safety concern which could have been avoided if the bus was closer to the platform.

Consider re-training or testing the coach operator's ability to park the bus an acceptable distance from the platform with consistency. This would help our riders who are dependent on a mobility device as well as prevent someone from jumping down between the station and the bus.

vendor support issues, the decision was made by operations to have this system turned off. This was determined to be the best course of action in response to a rising number of screens failing while the vendor has been unable to provide spare equipment or provide adequate support. A path forward for a reintroduction of the system is currently being investigated by CVT and operations. The vendor has proposed a meeting where they hope to outline a plan to get the system operational. Pending the outcome of this meeting, the vendor has committed to an onsite visit to begin replacing defective units as well as providing training and documentation on the system itself.

**Responsible Parties:**

Connected Vehicle Team/Maintenance

**Due Dates:**

On Board Announcements/ADA Compliance - Completed

**3. Fare Collection Equipment**

<p><b><u>Observation:</u></b>                  During the three-day ride along, fare collection equipment was observed and tested. A total of 20 ticket vending machines and fare validators were checked.</p>	<p><b><u>Recommendation:</u></b>                  Management should review the processes of checking the fare collection equipment on a regular basis and see that the vendor is meeting IndyGo’s needs.</p>	
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**Observation Rating: High**

<p>During the three-day ride along and stopping at nearly all Red Line stations, it was observed that basically no Ticket Vending Machines (TVMs) were working. Station TVMs are connected by an internal cellular device.</p> <p>Following the second ride along, it was determined that no stations south of the transit center had working TVMs. On return to IndyGo, the TVM vendor hub was checked by staff which showed all TVMs online and in working order. An additional ride along was done on March 29 after reviewing the hub showing all TVMs were online and working. It was determined that the TVMs were still not working and the vendor hub software was not displaying an error. Over the 3 days of observations, it was noted that 17 of 20 machines checked were not working. The machines that did work were those at the CTC which are directly connected to the network.</p> <p>The eFare solutions manager determined there to be a cellular connectivity error with the cellular provider for the TVMs. The TVM vendor software was not capturing the connectivity problem and was falsely reporting to IndyGo staff that the machines were in service. The manager also stated that the vendor has not updated IndyGo TVMs with the most up to date software version.</p> <p>There were 5 of 14 fare validators at the station platforms not in working order. They also have a cellular connection.</p> <p>Both the TVMs and the fare validators have dirty screens and exterior cabinets. This makes the fare collection equipment to look out of service.</p>	<p>Management should consider holding the fare equipment vendor responsible for reimbursing IndyGo for estimated lost revenue based on the number of days the TVMs were out of service. IndyGo should receive credit from the cellular provider for all days out of service. IndyGo did not have valid information as to TVM operation due to the online status reporting error with the hub software.</p> <p>Management should consider developing a regular preventative maintenance plan for all fare collection equipment at the BRT stations. Part of the preventative maintenance should include verifying the equipment is in working order and cleaned on a regular basis. A regular station inspection schedule should be developed rather than depend on the system hub which proved to fail in this instance.</p> <p>The eFare management should insist that the current vendor is performing in agreement with the contract and providing software updates as they are released.</p>	<p><b><u>Management Action Plans:</u></b>                  We agree to implement a regular preventative maintenance and cleaning schedule for all fare collection equipment at the BRT stations. We will continue to monitor the fare collection alarms and transactions in the Flowbird Hub on a daily basis and address the issues as needed. We will also clean and test equipment functionality when we visit the machines. Treasury staff has been visiting BRT stations every other day to perform a reboot of TVM’s nor working, vendor is working on software update to eliminate functionality issues.</p> <p><b><u>Responsible Parties:</u></b>                  Treasury Manager/eFare Manager</p> <p><b><u>Due Dates:</u></b>                  Cleaning schedule started 04/03/2023 and it will continue every other week or as needed.</p>
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**4. Red Line Stations**

<p><b><u>Observation:</u></b> G &amp; A visited 14 station to observe cleanliness, signage and amenities.</p>	<p><b><u>Recommendation:</u></b> It is recommended that IndyGo continue efforts to make the Red Line stations as comfortable, clean and safe for riders.</p>	
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**Observation Rating: Low**

<p>It was observed that all overhead video displays for bus arrival times at the individual Red Line stations were working correctly. The time display for the bus arrival proved to be very accurate. If there was a delay occur for a particular bus, the monitor updated as well. The video display also showed issued like detours that may affect a rider’s trip.</p> <p>Station announcements were working correctly reminding riders of IndyGo rules.</p> <p>Each Red Line station visited over a three-day period was in clean order. There was an occasional cup thrown down or forgotten item but in general they were in satisfactory condition.</p> <p>In visiting the Red Line stations both directions from the Carson Transit Center it was observed that there is old signage relative to the frequency of service on the route. The large sign at each station lists bus arrival times as every 10 minutes. Due to driver availability the Red Line is experiencing the same issues as fixed routes. Route times had to be adjusted to run every 15 minutes to provide adequate coverage for the riders.</p>	<p>Management could consider replacing the large information signs at each station if the current 15-minute bus frequency is planned to remain in place.</p> <p>Management may consider having staff regularly checking the stations for any condition that would interfere with rider access or safety.</p> <p>It is noted that an IndyGo employee corrected the barrier and sign at the 14<sup>th</sup> street station after being notified.</p>	<p><b><u>Management Action Plans:</u></b> IndyGo is in the process of update the large information signs at each of the stations. This design will also be used at the new Purple Line stations when they come online in late 2024. As we work to update the design and replace the Red Line signage, all schedule frequency will be included on the real time screens.</p> <p><b><u>Responsible Parties:</u></b> Public Affairs</p> <p><b><u>Due Dates:</u></b> Red line sign updates 12/31/2023 Purple line at start of revenue service.</p>
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IndyGo has a no smoking policy for stations. There were multiple observations of individuals smoking at the station.

It was noticed at the 14<sup>th</sup> Street north bound station the bollards were damaged from a vehicle strike. IndyGo is aware of the situation and repairs are expected. It was noticed that someone from the public moved the sign and barrier from the bollard area into the sidewalk ramp access to the station.

## 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.