Information Update – Data Analytics Report

To:	Chair and Board of Directors
Through:	President/CEO Inez Evans
From:	Deputy of Governance & Audit Brian Atkinson
Date:	September 16, 2021

GOVERNANCE & AUDIT DATA ANALYTICS REPORT

Fare Audit Follow-Up: Data Efficacy

As a result of work performed during our Fare Counting & Reconciliation audit, which we reported upon during the June 2021 Governance & Audit Committee meeting, we noted potential opportunities to better leverage fare data to enhance strategic planning and analysis across multiple functions.

During the audit we attempted to identify root causes that appear to be preventing the optimization of data analytics related to fares and other operational matters. As we spoke with numerous stakeholders across IndyGo, we noted recurring themes of challenges around data integrity, availability, and usage – similar to those we had noted during various prior audits. The most frequently noted challenge was around data integrity – the ability of users to rely upon the data being provided by certain systems, both on and off the buses.

Accordingly, we recommended as part of the Fares audit that the G&A Committee would agree to adding a new assessment whereby, we would look further into the people, process, and technology limitations affecting data integrity.

We have completed our work, and our resulting conclusions can be categorized four ways:

- Hardware/Software Limitations
- Operational Requirements
- Talent Needs
- Forthcoming Procurement Diligence

We have opted to report our conclusions as an Informational Item since action plans to address most of these issues are already in place across the agency. We would like to emphasize that management's successful completion of these action plans – along with our additional recommendations – will be critical to the future successful harvesting and analysis of reliable fare, passenger, route, and other downstream operational data.

Hardware/Software Limitations

Presently the technology profile onboard the buses appear somewhat piecemeal, rather than a collective set of intentionally selected components that are unified as a single solution. The onboard technology stack enables day-to-day operations; however, as we have noted, ongoing challenges exist that have forced workarounds and have prevented the agency from realizing necessary efficiency gains.

We met with numerous stakeholders across IT, CVT (Connected Vehicle Technology), and various Operational functions. The overarching theme we noted involved a combination of sub-standard cellular modems; poor support from AVAIL on

equipment; data streams from the buses not being decoded properly on the back-end; and ongoing issues with the AVAIL server.

Our overarching recommendation would be that a unified connected vehicle technology solution be identified. All onboard and bus-related technology should be re-evaluated, including radio transmission and cellular communication equipment, and the CAD/AVL software which has not met performance requirements since implementation. We would also encourage the agency to consider holistically the best-fit combination of hardware and software, which may include components already in-use that could be effectively integrated with newly acquired components. As any future investment in new unified technology solution will be significant, it will be important to generate high levels of value and effectiveness from the overall project.

Through discussion with IT and CVT stakeholders, this process is already underway. We encourage agency leadership to elevate this to an enterprise-wide initiative, including collaboration across all stakeholder departments and led by a senior member of management to provide proper ongoing top-down messaging and resourcing.

Operational Requirements

For optimal tracking of buses for all things from route sign updating at the stops to Operator scheduling, all the way to tracking and scheduling preventative maintenance, frequent GPS vehicle checkpoints are required. Currently, given the hardware and software challenges described above, checkpoints are provided only every 15 seconds, rather than on a second-by-second cadence. It is believed that the inability to ping a GPS coordinate more frequently than every 15 seconds is due to a combination of lacking cellular bandwidth and constrained back-end data processing capacity.

Talent Needs

Best practices guiding the successful design, implementation/integration, and maintenance of onboard and other operational systems typically involve one of two talent scenarios, neither of which is present within IndyGo.

a. A single team comprised of individuals with skill sets encompassing both IT infrastructure and transit operations owns the implementation of new systems from end-to-end. This team is able to work with stakeholders in both IT and Operations to design, install, and maintain a solution (which can be comprised of any combination of hardware and software, either purchased or internally developed).
b. The second scenario would differ only in that there would be separate teams in IT and Operations, both appropriately skilled to address the aspects of the design/build/maintain process. Both teams would leverage the same project management approach (preferably Agile, Sprints, or a hybrid), and would maintain a collaborative approach through the life of the project.

We have seen most frequently that appointing an IT liaison, in this case within Operations, can be most successful. The individual would possess the familiarity with IT infrastructure and project management, which when combined with the agency operational experience provides an ideal union between IT and Operations.

We also noted that the agency has established Performance Management groups in the past, in an effort to create an expert-level resource to support how the various tools interface between Operations, Maintenance, IT/CVT, Strategic Planning, and Finance. We encourage this effort as an avenue to identify the best-fit individuals for the new role.

Forthcoming Procurement Diligence

As noted, IT and CVT are already working together to map out the technical requirements for a new CAD/AVL system. To maximize return on future investment into a new system, we have also recommended holistic consideration of a unified connected vehicle technology package, that may very well require procurement of complimentary components to the CAD/AVL system. We have also recommended that all stakeholder groups collaborate in this process.

Accordingly, given the gravity of any RFP (Request for Proposal) that is ultimately generated for a new CAD/AVL system, we also recommend that a Procurement project manager be assigned early and allowed to work alongside IT, CVT, and Operations as the technical requirements are mapped.

We also recommend that Procurement exercise every tool at its disposal, including RFIs (Requests for Information) and on-site visits to similar properties in order to view first-hand the pros and cons of certain CAD/AVL systems that may become procurement candidates. By observing the CAD/AVL functionality as well as supporting technology and learning first-hand both the wins and the challenges facing the selected similar agencies, IndyGo can stress-test its own assumptions and ultimately craft a highly targeted and effective RFP.

RECOMMENDATION:
Receive the report.

Brian Atkinson
Deputy of Governance & Audit