Transit Cash Collection and Processing
Fare Box Processing and Maintenance

October 2010

Background:

The Halifax Regional Municipality (HRM) Transportation and Public Works (TPW) business unit, (Metro Transit division) has responsibility for approximately 302 buses; 202 buses currently run from the Ilsley Ave. Transit facility (Ilsley Ave.) and 100 from the Ragged Lake Transit facility (RLTC). Annually Metro Transit has revenues in the order of $9.2 million (cash) and $6.1 million (tickets) collected in fare boxes.

The processes surrounding the handling of fare boxes and their contents involve both TPW and Finance business units. TPW has responsibility for emptying the contents of fare boxes and repair of both the fare boxes as well as the fare box receptacles. Finance has responsibility for handling of coin and tickets as well as responsibility for inventory of some parts for fare box maintenance.

Management has predicted unprecedented growth over the medium term[1] for Metro Transit resulting in an increased volume of revenues (cash) through the fare boxes[2].

With the opening of the Ragged Lake Transit Centre in August 2010, the renovations planned for the Ilsley Transit Garage and the anticipated growth noted earlier, a validation of the current controls surrounding coin collection, coin transportation and the maintenance of fare boxes was undertaken to ensure HRM's assets are being appropriately protected.

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[1] From DCOA memo January 6, 2010 HRM ALL

[2] IBI Group – Five Year Strategic Operational Plan p28 "Across all age groups, paying for transit by cash and or with tickets were tied for being the most popular forms of payment, except for the 16 to 24 year-olds, who use transit much more frequently than other age cohorts and therefore preferred to use either a Metropass or U Pass."

Given the recent theft of cash from Metro Transit, the Auditor General felt the project needed to be an immediate priority and the 2010/2011 Work Plan was amended to provide for this project.

Objectives:

Objectives of the review were to validate current controls within Metro Transit and Finance coin collection, coin processing and maintenance systems, and to ensure controls appear sufficient for future growth.

The project also had as one of its objectives the possible development of recommendations to assist Management in the strengthening of existing controls as well as the development of additional controls deemed appropriate by the Auditor General.

Scope:

The review looked at coin collection at both the Ilsley Ave. Transit Garage and the Ragged Lake Transit Centre. We reviewed controls and overall maintenance surrounding fare boxes as they currently exist at Ilsley Ave., but were only able to discuss the plans for fare box maintenance at RLTC as final processes were not yet fully in place. The handling of coin processing in the HRM coin room was out of the scope of this examination, as it was dealt with in previous work under the *Compliance and Operational Review - Cash Controls and Accounts Receivable Audit* (2007), conducted by the Business Systems and Control group.

Methodology:

The processes involved in undertaking this review included:

- interviewing Transit middle management responsible for maintenance processes
- interviewing frontline Transit and Finance supervisors responsible for day-to-day maintenance, cash collection and delivery of services
- interviewing Transit service delivery staff responsible for daily maintenance and delivery of other services
- on site observations of daily operations
- reviewing various logs, records and documentation created as standing policies or created during the course of fare box maintenance.

Detailed Findings and Recommendations:

1. Fare Box Handling Process - Ilsley Ave. Transit Garage

The fare box process at Ilsley Ave. commences during the 3:00 pm - 11:00 pm shift. Buses enter the transit garage, starting at approximately 5:45 pm, approach the "placer's stand" and stop at a predetermined mark in view of video surveillance. The placer and/or the helper (Hostlers) take an electronic key from a wall mount outside the placer's stand to unlock the door to the electronic fare box. The design of the fare box system ensures the fare box canister is sealed as it exits the fare box stand on the bus. The key is returned to its normal position, the fare box canister is placed into the GFI receiver (safe), the door is closed and contents (coin and tickets) emptied. The canister is returned to the bus, the door is closed and an audible alarm sounds to indicate a locked cabinet. The Hostler also accepts a "defect card" from the bus driver containing various trip information as well as specific problems noted. The defect card indicates any issues the driver(s) may have experienced during their shift, including issues with fare boxes. Defect cards are sorted and provided to a supervisor when defects are noted.

The Hostler, filling the "placer's" role, determines the position the bus will be placed in the yard, and notifies the driver where to park.

At approximately 7:00 pm Hostlers start to bring in the placed buses from the yard for fuel, fluid checks and cleaning, returning the buses to the yard once processed. The pace during the peak period, in which buses are processed, is rapid. A bus is emptied every 90 to 120 seconds with fare boxes and receivers receiving some knocks in the fast paced process.

Since the opening of RLTC and the relocation of the coin room to RLTC, it has been suggested on more than one occasion, a single GFI receiver at Ilsley Ave. could not likely handle all the coin for a single day. A second receiver is currently in place to handle the volume; however, should a unit be out of service, there is a risk all bus revenue may not be emptied (and counted) for a given day.

During an observation period at Ilsley Ave. we observed a fare box canister lid-locking mechanism fail. This failure caused the contents, both tickets and coin to empty onto the floor of the placer's stand and loose change remained in the bus. We asked supervisory staff what the procedure was for such an incident, however we are told no policy exists.

Fare Box Handling Process - Ragged Lake Transit Centre

The fare box process at RLTC starts during the 7:00pm-2:30am shift. Buses returning to RLTC are often placed directly in the indoor storage facility by the operators, based on the location assigned through the "placer" at the front gate. During entry through the front gate, defect cards are collected. Starting at 7:00pm, Hostlers bring the parked buses through one of the two maintenance lines where two video surveillance cameras are in place to capture the process. A crew of two or three individuals processes the bus. The buses are fuelled, fluids checked, a "light" cleaning takes place and the fare boxes are emptied. Fare boxes are emptied through the use of one of two electronic keys, stored on one of the GFI receivers. The process to empty the boxes is the same as Ilsley Ave., except at RLTC the Hostlers are empting and cleaning the bus while other individuals do external servicing. Additional time is available for emptying the fare box canister which allows for more care in handling the fare box canisters and receivers.

Recommendations:

1.1 Metro Transit consider a harmonized approach to fare box collection which would work at both Ilsley Ave. and Ragged Lake Transit Centre. Consideration should be given to adopting at Ilsley Ave. the processes used at RLTC where buses are fully serviced in one pass, through the use of two fully equipped service lanes.

1.2 Metro Transit, in collaboration with Finance and the HRM Corporate Security Office, develop a comprehensive set of policies for the handling of fare box revenues and maintenance of fare boxes. These policies should address, as a minimum, the emptying of fare boxes, the repair of fare boxes, loose change (through spill or coin overflow), jammed fare boxes while buses are on the road (i.e. how or can drivers accept coin if the fare box is jammed), the storage of parts and the handling and issuing of fare box keys.

Management Response:

1.1 *The fare collection system in place at RLTC was proposed and approved for Ilsley. This was agreed to by [named individuals]. When [named individual] at Ilsley, was advised as to the approach for fare collection he advised that the fuel/wash area at Ilsley would collect much more snow, slush and salt than at RLTC, which could affect the operation of the GFI receivers, increase maintenance, and their overall useful life. Management took these comments under advisement and agreed to remain with the current system of fare collection at the Ilsley Placers Stand. Management was aware of some issues with respect to fare collection at Isley in the short-term after the opening of RLTC. The Placers Stand at Ilsley has been renovated to foster a smoother fare collection process and it seems to be efficient and meeting operational requirements. Having said that, management will discuss the possibility of dumping the fare box after the bus is fuelled and washed instead of when the bus comes out of active service. Management will continue to monitor fare collection at Ilsley and if the current system becomes inefficient and cause breach of controls, management will look at the possibility of moving the collection of fares to the fuel/wash line.*

1.2 *Agree. Substantial integration between policy and technology will improve security at both RLTC and BTC. The threat and risk assessment required to determine the needs will be time consuming. Finance is in the process of formulating and drafting Standard Operating Procedures around coin processing and will expand the scope of this exercise to include the above mentioned recommendation. Finance will provide the Business Analyst resources, and will document best practices. Transit, Transit Fleet, Transit System Security and Corporate Security will be expected to provide the user expert resources to formulate best practices.*

2. Fare Box Maintenance

The design of the GFI fare box has two distinct areas where problems may occur. The upper level, where the coin and ticket / currency (paper) receptacles are located can become jammed, whereby additional transit fares cannot be accepted. Lower level issues involve the mechanical apparatus used to deposit the coin and paper into the internal canister. Issues with either area could be significant enough such that a bus would not be able to accept fares before appropriate maintenance took place.

Upper Level Fare Box Issues

Fare box issues within this area usually relate to jams in the electronic/mechanical receptacles for coin or bills/tickets. Issues in this area are usually noted by drivers on the defect card and the affected buses are parked in the "defect line" for later repair. Responses from Transit indicated at Ilsley Ave. jams in the upper level are handled by any mechanic available. At RLTC only two individuals were identified as being trained for maintenance on fare box jams; both individuals work the day shift.

Lower Level Fare Box Issues

Issues in the lower level of the fare box are generally more involved, requiring additional training beyond that required for top level access. There are three individuals identified for full fare box repairs: two at Ilsley Ave. and one at RLTC.

GFI Receivers

Maintenance issues with the GFI receivers are handled by the same three individuals with responsibility for full fare box repair. Repairs and preventative maintenance to keep the receivers operational are critical. An out of service or "full" receiver could disable HRM's ability to empty bus fare boxes. During this review we were told a situation arose where the one receiver installed at the time at Ilsley Ave. was not sufficient for accepting the total daily volume.

Fare Box Repair Personnel

At the Ilsley Ave. facility there are two individuals fully trained in fare box repair, allowing them to access all components and ancillary equipment. Management advises all mechanics are capable of servicing the top level of the fare box for the purpose of removing jams. At the Ilsley Ave. facility a 1st Class Repair Person (day shift) is charged with the full time responsibility for maintenance surrounding fare box repair, the other individual fully trained in fare box maintenance does so as required or on a fill-in basis only. A log book at Ilsley Ave. is used to

track access to the fare box repair keys. Upon examination, we found repair positions other than mechanics or the designated fare box repair individuals had signed out keys for fare box repair.
The RLTC has one mechanic fully trained for fare box repair. A second mechanic is trained for top level only repairs. The fully trained individual is a day shift mechanic with responsibilities for fare box repair, radio repair and other mechanical items. The top level fare box individual is a mechanic on the day shift, Sunday to Thursday, with other responsibilities outside of fare box maintenance.

Fare Box Repair – Work Locations
Observations at both the Ilsley Ave. and Ragged Lake sites indicated some storage locations for keys which are used for fare box repair are not currently captured by video surveillance.

The site identified by staff at Ilsley Ave. where most "in bus" fare box repairs take place [specific site noted] does not have video surveillance. The door leading to the [area identified] is also not captured by video.

At the RLTC site, the room designated for fare box repair does not have video surveillance observing the entrance door. A specific site was not identified to us where "in bus" fare box repairs would take place at RLTC.

Recommendations:

2.1 A minimum of two individuals (one at Ilsley Ave., one at RLTC) should be assigned the primary responsibility of fare box repair and preventative maintenance. One individual should be assigned responsibility as backup to the two primary individuals in their absence. Vacations and time off among the three individuals should be coordinated to ensure coverage.

2.2 Policies to provide for regular preventative maintenance should be put in place for all fare boxes and ancillary equipment including the GFI receivers.

2.3 To strengthen controls and protect staff, access to keys allowing access to parts and the internal workings of fare boxes and GFI receivers by mechanical or other staff, should be limited to those primarily responsible for the delivery of the service. Mechanical staff outside of the two primary providers and backup personnel should no longer have access to repair any level of the fare box and/or receivers.

2.4 Access to the two fare box repair facilities should be restricted by a key accessible only to those designated as fare box repair personnel, or at a minimum, an electronic key swipe should be installed on each room to track entry.

2.5 Cameras should be installed at the Ilsley Ave. facility to capture entry and exit to the fare box repair room.

2.6 The designated parking location for “in bus” fare box repairs, at the Ilsley Ave. facility, should have prominent pavement markings (for proper bus positioning) and a surveillance camera installed, to protect the fare box technician in the execution of any “in bus” fare box repairs. A policy should be developed that all “in bus” repairs take place at this location and in full view of cameras.

2.7 Cameras should be installed the RLTC to capture entry and exit to the fare box repair room.

2.8 A designated spot for “in bus” fare box repair at the RLTC should be identified and appropriately equipped with markings and cameras as suggested for the Ilsley Ave. facility. A policy should be developed that all “in bus” repairs take place at this location in full view of cameras.

Management Response:

2.1 *Agree in principle. As fare box dumping and functionality is a critical function, Management will work on ensuring the skills required at both garages will be implemented.*

2.2 *Agree. See Management Response to 1.2.*

2.3 *Agree. Controls with respect to issuing keys, including what personnel is authorized and safeguarding keys need to be implemented and have a clear SOP. Spare fare boxes and fare box parts should be secured by stores and not accessible to employees. Corporate Security is in the process of developing a key policy. Priority areas such as fare box rooms may be addressed before a formal policy is approved.*

2.4 *Agree. Transit System Security has advised that this is completed.*

2.5 *Agree. A threat and risk assessment will assist in determining needs and placement. Transit System Security in conjunction with Corporate Security will be implementing new security protocols at Ilsley this year and next year.*

2.6 *Agree. Substantial integration between policy and technology will improve security at both RLTC and BTC. Threat and risk assessment will help to identify requirements which will streamline security efforts for both locations by using similar processes and technology. Transit System Security in conjunction with Corporate Security will be implementing new security protocols at Ilsley this year and next year.*

2.7 *Agree.*

2.8 *Agree.*

3. Camera Positions – GFI Receivers

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The RLTC with its two GFI receiver locations has a dedicated camera for each service line. The current location of the surveillance camera on the forty-foot bus line provides good coverage and exceptional video quality. The location of the camera for the sixty-foot line provides fair coverage with exceptional video quality. We have been advised by the Security and Special Events Manager for Metro Transit the location of the camera on the sixty-foot line will be re-located to provide better coverage.

Recommendations:

3.1 Cameras and camera views at Ilsley Ave. should be adjusted to capture [named items] whether they are located in temporary or permanent locations.

3.2 Camera quality at Ilsley Ave. around the GFI receivers, fare box repair location and fare box repair room should be of similar quality to that at RLTC.

3.3 Camera views at RLTC for the sixty foot service lane should be adjusted to properly capture the GFI receiver and emptying process.

Management Response:

3.1 *Agree*
3.2 *Agree*
3.3 *Agree.*

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4. Documentation of Policies, Processes, and Procedures

We had asked Transit Fleet Services for a copy of all documentation regarding policies and procedures for the processes surrounding the emptying and maintenance of fare boxes. We were advised outside of the one point mentioned in [sensitive document named], written procedures do not exist.

We have also asked Finance for copies of any written procedures provided to Transit relating to fare box handling and/or fare box repair. It is our understanding none exist.

Recommendations:

See Recommendation 1.2 regarding written policies and procedures.

4.1 Finance should provide to fare box repair staff appropriate bags, seals and procedures to be used, prior to any servicing activities taking place when cash is present.

4.2 Finance should provide appropriate bags, seals and procedures to Transit supervisory staff in the event of cash and/or tickets becoming loose during the daily fare box emptying process.

Management Response:

4.1 *Agree*
4.2 *Agree*

5. Manual Keys and Card Swipe

Throughout the course of this review, the topic of keys surfaced during all interviews. There were concerns expressed by individuals at all levels: too many individuals have keys to secured areas. Examination of paper records documenting issued keys provided by HRM Corporate Security indicated a total of 93 "10-series" keys at the master or sub-master level have been issued. We noted some individuals had multiple master keys assigned to them. Many individuals on the list are previous employees and indicators show multiple keys having been issued to the same employee. Keys in this "10" series are typically used for interior doors at Ilsley Ave. and RLTC. Users of a 10A series key (61 keys issued) have access to the "lock box" containing the fare box keys, fare box electronic key (used to empty fare box) and the temporary location of the key to the fare box repair room. Keys taken from this box are to be recorded in the log book located in the box.

Recommendations:

5.1 To regain control over all keys and access to items and areas discussed in this review a comprehensive re-key and re-issue should be undertaken by HRM Corporate Security involving the stakeholders in both Transit and Finance. Policies should be developed for the issue and retrieval of manual keys from staff no longer in the position for which the keys were originally issued. The use of an electronic key box (Recommendation 6.2) would greatly reduce the number of keys required to be issued.

5.2 Restricted keys for access to fare boxes (manual keys and electronic keys) should be more tightly controlled to allow only those primarily responsible for fare box repair to have access. A two-part system, requiring a key combination via the foreman together with the fare box technician, should be required to gain access to the controlled keys.

Management Response:

5.1 and 5.2 *Agree. Corporate Security has asked [company named] to provide pricing for a key control box which is tied into their access control system (the proxy ID cards we have). The box is similar to what we have at Ilsley but all transactions are recorded on the corporate access control system. Funding may be required delaying implementation to 2011-12.*

6. Electronic Key Safe/Manual "Lock Box"

During one onsite observation period, we were advised the lock to the fare box repair room at Ilsley Ave. was recently changed, the key in the electronic key safe was not current and the current key was in the "lock box" in the foremen's office. This "locked box" is accessible with a 10A key. On examination September 29, 2010, the key to the fare box repair room was not present, (it was subsequently returned at a later date). An examination of the log book located in the "lock box" used to track secured keys, showed no record of the key(s) being signed out or ever returned. The last record for September 28th indicated an entry where keys were returned. This log book is intended to identify by date who took the keys, time out, and time in with an acknowledgement signature. The book does not indicate which specific key(s) was signed out, (the book is used for the sign-out of the electronic key, fare box keys, and most recently the key to the fare box repair room).

The electronic key safe, if used properly, should be able to protect sensitive keys and provide a reasonable access log for tracking purposes. The current open setup of the electronic key safe in the foremen's office does not allow for privacy. While entering their electronic combination, an individual's combination could easily be observed. We asked for access to the logs for the device but neither Transit nor Finance were able to provide this information or give direction on who might be able to provide it.

Recommendations:

6.1 The electronic key safe at Ilsley Ave. should be better positioned or a shield over the keypad be installed to allow privacy while entering individual combinations (or as an alternative, a card swipe be installed).

6.2 The electronic key box should be used to store the necessary keys required for the foremen or acting foremen to carry out their duties. The use of a combination issued to each foreman/acting foreman need only be changed as positions change rather than reclaiming/re-issuing keys with changes in staffing. (See Recommendation 5.1)

6.3 The key for the fare box repair room should be removed from this box. (See Recommendation 5.2)

6.4 A policy to ensure appropriate access to the electronic key box, whether through a combination or a card swipe, should be developed and an individual made responsible for its review.

6.5 With the controls listed above and other recommendations, the requirement for the manual log book may be eliminated.

Management Response:

6.1, 6.2, 6.3, 6.4, 6.5 *Agree. Funding may be required delaying implementation to 2011-12.*

7. Key Storage at RLTC

During a visit to the Ragged Lake Transit facility on the evening of September 20, 2010 we observed the foremen's office unsecured. We were able to enter the outer office and the inner office unnoticed. Located in the inner office desk drawer we observed secure keys used to access fare boxes, in an unsecured desk drawer. The desk drawer was equipped with a lock; however, the keys to this lock were in the drawer lock.

Recommendations:

7.1 An electronic key storage system should be installed for RLTC similar to the recommended solution for Ilsley Ave. (See Recommendations 6.1, 6.2, 6.3, 6.4, and 6.5.)

Management Response:

7.1 *Agree. Funding may be required delaying implementation to 2011-12.*

8. Inventory and Control

No Accurate Inventory of Fare Boxes

SAP procurement records indicate during the period September 2006 to December 2009 a total of 308 fare boxes of the type currently in use were purchased. An inventory completed in May 2010 by Metro Transit accounted for 307 of these fare boxes. In June 2010, SAP records indicate an additional 10 fare boxes were purchased. We asked Transit for a revised count of buses and fare boxes during the course of this review and were advised the fleet consisted of 302 buses (202 based out of Ilsley Ave. and 100 at RLTC); all buses have fare boxes with the exception of 24 Access-A-Bus vehicles. We have asked Transit for an updated inventory of fare boxes beyond the 278 installed in buses; however, we have yet to receive an update.

Spare Parts/Inventory Unsecured

A concern echoed throughout this examination was the security of fare boxes and control of security locking mechanisms. On examination of storage, we observed approximately 17 new and used fare boxes in an unsecured mezzanine storage area of the Ilsley Ave. facility. Upon closer examination, by moving one of the units, loose coin could be heard moving within the unit. These fare boxes can be easily tampered with and secure parts removed, with these actions potentially remaining undetected for significant periods of time. Additionally, on a walk-through at the Ilsley Ave. facility, four additional unsecured fare boxes were visible on the shop floor.

Stores Inventory

Finance Stores, located at both transit facilities, stock very few parts for fare box repair. At Ilsley Ave., most of repair parts and specifically those of a more sensitive nature are kept in the fare box repair room. At the time of this review, parts had not yet been transferred to RLTC.

Finance Management have expressed concerns with respect to the receiving, inventorying, storing and issuance of parts for fare boxes and the number of individuals having access to their facilities. Our observations and opinions would support those concerns.

Recommendations:

8.1 A secure room, other than the fare box repair room be designated at each facility, to house the inventory of spare parts, spare fare boxes and spare receivers. These rooms should be keyed to the "same lock" as the fare box repair rooms, thus enabling the same restricted access.

8.2 A complete inventory of fare boxes, canister secure- locking mechanisms (bullets) and fare box keys, should be undertaken to determine HRM's potential risk. On determination of any missing inventory, an action plan should be developed to mitigate risk and potential losses.

8.3 All excess inventories of parts and fare boxes be immediately secured.

8.4 Develop a process where Finance Stores is equipped to receive, store and distribute parts designated for fare box repair.

8.5 Access to Finance Stores be restricted to those individuals responsible for the delivery of the stores service.

Management Response:

8.1, 8.2, 8.3, 8.4, 8.5 *Agree. Funding with respect to 8.1 may be required, thus implementation may not be feasible until 2011-12.*

9. General Observations

In late 2009, the Municipality received an anonymous tip regarding a possible theft of coin and used tickets through Metro Transit maintenance operations. It was determined, through a separate examination from this project (previously reported on by OAG), the allegation was well founded and steps were taken to tighten controls. We believe if the electronic fare boxes HRM currently has installed were equipped with the fare/ticket registering modules, the theft would likely have been uncovered prior to having received the anonymous tip, thus minimizing lost revenue. Registering fare boxes are similar in concept to the parking meters HRM has installed, where the expected revenue stream is compared to the actual revenue counted. When a significant difference is noted, further examination is undertaken to identify the area of loss. This system has been successfully used in the past within HRM to identify and stop parking meter thefts.

The benefits, beyond those of control, of using registering fare boxes would enable Transit to better determine revenue per bus/route, allowing for more accurate ridership information and hence management of routes.

Recommendations:

9.1 Transit along with Finance investigate and develop/submit a business case for upgrading the current electronic fare box technology to registering fare box technology.

Management Response:

9.1 *Agree. A business case for capital funding will be submitted for the 2011-12 budget. If successful, a project steering committee of stakeholders will be struck to move the initiative forward and successfully implement. Such a project is estimated to cost approximately 6 million dollars.*

Management from Finance, Transit, Corporate Security appreciates the effort put into this review and report by the Auditor General and will work together to remedy internal controls and implement best practices and technologies.

Attachment 1

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