AUDITOR GENERAL'S REPORT
ACTION REQUIRED

Review of Toronto Transit Commission Bus Maintenance and Shops Department, Phase Two: Non-Revenue Fleet and Equipment Management and Maintenance

Date:	February 6, 2015
To:	TTC Audit Committee
From:	Auditor General
Wards:	All
Reference Number:	

SUMMARY

The Auditor General's 2013 Audit Work Plan included an audit of the Toronto Transit Commission (TTC) Bus Maintenance and Shops Department. Due to the Department's extensive operations, the audit was divided into two separate phases. Phase One, which focused on conventional buses, was completed in December 2013, and the audit report was submitted to the TTC Audit Committee and the TTC Board in February 2014.

Phase Two focused on TTC's non-revenue fleet and resulted in two audit reports. This report focuses on the management and maintenance of non-revenue and equipment fleet. A separate report addresses controls over fuel card usage for the non-revenue and equipment fleet.

The audit report includes 21 recommendations to help improve vehicle reliability, operational effectiveness and efficiency, as well as controlling fleet costs. All of the audit recommendations are in keeping with and supportive of strategic objectives set out in TTC's Five-Year 2013-2017 Corporate Plan.

The audit results and recommendations are contained in the attached report entitled "Review of Toronto Transit Commission Bus Maintenance and Shops Department, Phase Two: Non-Revenue Fleet and Equipment Management and Maintenance." Management responses to the audit recommendations are also attached.

RECOMMENDATIONS

The Auditor General recommends that:

1. The Board request the Chief Executive Officer to review the current non-revenue vehicle and equipment fleet management structure with a view to ensuring all key fleet management functions are defined and established with adequate corporate oversight.

2. The Board request the Chief Executive Officer to consider implementing a chargeback process or other measures for non-revenue vehicle and equipment costs to help optimize use of vehicle and equipment resources by user departments and enhance accountability.

3. The Board request the Chief Executive Officer to enhance the current review and approval process for non-revenue vehicle and equipment acquisitions such that the needs, purposes, and projected usage of the requested vehicles and equipment can be adequately evaluated.

4. The Board request the Chief Executive Officer to conduct detailed reviews of utilization levels of non-revenue vehicles and equipment to identify and minimize underutilized vehicles and equipment.

5. The Board request the Chief Executive Officer to undertake an assessment of alternatives of meeting non-revenue vehicle and equipment needs prior to finalizing annual vehicle and equipment procurement decisions.

6. The Board request the Chief Executive Officer to take immediate actions to identify and prioritize the replacement of existing aging non-revenue vehicles incurring significant annual maintenance and repair costs.

7. The Board request the Chief Executive Officer to ensure that vehicle life cycle costs are actively monitored and analyzed as part of the non-revenue fleet management functions. A re-assessment of the current non-revenue vehicle replacement criteria should be undertaken to ensure the criteria are effective in preventing excessive maintenance and repair costs.

8. The Board request the Chief Executive Officer to review inventory management of non-revenue vehicles and fleet equipment to ensure the inventory is accurate, complete, and up-to-date. Steps to be taken should include but not be limited to:

    a. Assigning a staff person responsible for the oversight and management of inventory;

    b. Establishing clear policy and criteria defining the type and value of assets to be tracked;

c. Ensuring records kept in the Vehicle Work Order (VWO) system meet annual asset reporting requirements; and

d. Expanding the current criteria for tracking fleet equipment in VWO to establish a centralized and complete fleet equipment database.

9. The Board request the Chief Executive Officer to review the existing list of long-term rentals of non-revenue vehicles to determine whether these long-term rentals are justified and cost-effective.

10. The Board request the Chief Executive Officer to enhance current rental vehicle review and approval process by incorporating a corporate-wide review of rental vehicle needs, available vehicle resources, and opportunities for shared usage.

11. The Board request the Chief Executive Officer to review rental vehicle insurance costs provided by rental companies. A determination should be made as to whether self insurance coverage is less costly.

12. The Board request the Chief Executive Officer to work collaboratively with the Director of the City of Toronto Fleet Services Division to determine the feasibility of issuing a joint Request for Quotation (RFQ) in future acquisition of rental vehicles.

13. The Board request the Chief Executive Officer to take steps to improve non-revenue vehicle user compliance with scheduled maintenance, including steps to address user concerns.

14. The Board request the Chief Executive Officer to ensure accurate and up-to-date non-revenue vehicle kilometrage data are obtained to facilitate effective preventive maintenance scheduling.

15. The Board request the Chief Executive Officer to improve the effectiveness of the Vehicle Work Order system for non-revenue fleet management. Steps to be taken should include but not be limited to:

    a. Addressing existing preventive maintenance scheduling issues in the system;

    b. Ensuring adequate system access is provided to garage management staff;

    c. Re-assessing the practicality of existing data entry controls;

    d. Ensuring accuracy of system generated management reports; and

    e. Expanding the existing system reports to include reports on fleet management key performance indicators.

16. The Board request the Chief Executive Officer to develop and implement non-revenue fleet quality assurance processes to systematically monitor and detect repair quality issues.

17. The Board request the Chief Executive Officer to ensure adequate controls are in place at TTC garages to deter and detect ordering of non-revenue vehicle and equipment parts for non-TTC uses. Periodic reviews should be considered by TTC internal audit staff.

18. The Board request the Chief Executive Officer to take steps to shorten garage service turnaround time for non-revenue fleet by addressing issues pertaining to garage capacity, availability of technicians, parts availability and maintenance scheduling.

19. The Board request the Chief Executive Officer to shorten the period of time readying a new non-revenue vehicle for operation. Steps to be taken should include but not be limited to setting a targeted time frame and improving coordination and communication among various TTC departments.

20. The Board request the Chief Executive Officer to establish a formal warranty management process for non-revenue vehicles and fleet equipment such that warranty claims are maximized.

21. The Board request the Chief Executive Officer to ensure the non-revenue vehicle procurement process take into account the ease and practicality of warranty administration.

22. This report be forwarded to the City's Audit Committee for information.

Financial Impact

The implementation of recommendations in this report will likely result in cost savings and improved operating efficiency. The extent of any resources required or potential cost savings resulting from implementing the recommendations in this report is not determinable at this time.

COMMENTS

TTC's non-revenue vehicles (NRVs) and equipment are used by all five revenue fleets (bus, subway, streetcar, Wheel-Trans, and Scarborough Rapid Transit), and other TTC departments to support ongoing transit operations and capital projects. As of June 2014, TTC's NRV fleet consisted of 455 vehicles and 363 units of equipment at an estimated replacement value of $65 million.

Our audit on NRV and equipment fleet management and maintenance identified 21 recommendations pertaining to management structure, vehicle and equipment acquisition, inventory management, rental vehicles, garage operations, and warranty administration. Our findings regarding non-compliance with scheduled maintenance were raised in previous TTC's internal audit reports issued in 2005 and 2010 respectively. To date these issues continue to exist.

Implementation of the recommendations in this audit report will help improve vehicle reliability, operational effectiveness and efficiency, as well as controlling fleet costs.

The audit report entitled “Review of Toronto Transit Commission Bus Maintenance and Shops Department, Phase Two: Non-Revenue Fleet and Equipment Management and Maintenance” is attached as Appendix 1. Management’s response to each of the recommendations contained in the report is attached as Appendix 2.

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SIGNATURE

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Beverly Romeo-Beehler, Auditor General

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ATTACHMENTS

Appendix 1: Auditor General's Report, Review of Toronto Transit Commission Bus Maintenance and Shops Department, Phase Two: Non-Revenue Fleet and Equipment Management and Maintenance

Appendix 2: Management’s Response to the Auditor General’s Review of Toronto Transit Commission Bus Maintenance and Shops Department, Phase Two: Non-Revenue Fleet and Equipment Management and Maintenance

Appendix 1

AUDITOR GENERAL'S REPORT

Review of Toronto Transit Commission Bus Maintenance and Shops Department

Phase Two: Non-Revenue Fleet and Equipment Management and Maintenance

December 24, 2014

Beverly Romeo-Beehler, **CPA, CMA, B.B.A., JD**
Auditor General

TORONTO

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EXECUTIVE SUMMARY

Phase One focused on conventional buses

The Auditor General's 2013 Audit Work Plan included an audit of the Toronto Transit Commission (TTC) Bus Maintenance and Shops Department. Due to the Department's extensive operations, the audit was divided into two separate phases. Phase One, which focused on conventional buses, was completed in December 2013, and the audit report was submitted to the TTC Board in February 2014.

Phase Two focused on the non-revenue and equipment fleet

The objective of the Phase Two audit, which is the subject of this report, was to assess the effectiveness and efficiency of the management and maintenance of TTC's non-revenue and equipment fleet. Phase Two resulted in two audit reports. This report focuses on the management and maintenance of non-revenue and equipment fleet. A separate report addresses controls over fuel card usage for the non-revenue and equipment fleet.

TTC's non-revenue vehicles (NRVs) and equipment are used by all five revenue fleets (bus, subway, streetcar, Wheel-Trans, and Scarborough Rapid Transit), and other TTC departments to support ongoing transit operations and capital projects.

455 NRVs and 363 units of equipment at approximately $65 million replacement value

As of June 2014, TTC's NRV fleet consisted of 455 vehicles and 363 units of equipment at an estimated replacement value of $65 million. TTC's approved 2014 capital budget included $7.7 million for purchase of NRVs and $5.1 million for fleet equipment.

Strengthening corporate oversight and accountability

The current de-centralized management structure should be reviewed

Under the current de-centralized structure, the Bus Maintenance and Shops Department is responsible for procurement and maintenance, and individual TTC user departments are responsible for identifying their vehicle needs. A number of key fleet management functions such as a corporate-wide assessment of vehicle needs and control of rental vehicles have not been defined or established in the current structure. In our view, a number of issues identified in our audit result from deficiencies in the existing management structure. TTC should review its current NRV fleet management structure with a view to strengthening corporate oversight.

Re-allocating fleet costs to user departments will help optimize use of vehicle resources

Currently, all NRV and equipment procurement, ongoing maintenance and fuel costs are part of the Bus Maintenance and Shops Department's annual capital and operating budgets. The NRV fleet costs are not re-allocated to user departments. TTC should consider implementing measures to provide an incentive for user departments to track, monitor and optimize the use of vehicle resources. A chargeback system is an example of the possible measures.

Ensuring cost-effective acquisition and replacement

Prioritizing NRV and equipment purchases based on needs, usage, and costs

To ensure cost-effective acquisition and replacement of NRVs and equipment, TTC needs to implement a more rigorous corporate review and approval process for purchase requests, systematically review and identify under-utilized vehicles and equipment, and prioritize the replacement of aging vehicles in the existing fleet. Our key findings are summarized below:

- User departments' purchase requests for vehicles or equipment in general did not contain specific information on projected usage or a detailed impact statement if the requested vehicles or equipment were not provided

18% of NRVs were driven less than 10,000 km per year

- 18 per cent of NRVs were driven on average less than 10,000 km per year, and eight of the 43 NRVs scheduled for replacement in 2015 had less than 10,000 yearly km average

- 23 per cent of sedans and light-duty vehicles in the fleet were older than 10 years exceeding the Department's approved age replacement thresholds

Costs of maintaining an aging NRV for 2 to 3 years could exceed the cost of purchasing a new vehicle

- Based on TTC's labour, fringe benefits and overhead rates, the estimated average maintenance and repair costs of an aging light-duty vehicle are in the range of $13,000 to $15,000 per vehicle per year. Maintaining an aging vehicle beyond the replacement threshold for two to three years may result in cumulative maintenance and repair costs exceeding the cost of purchasing a new vehicle.

Reviewing the justification and economy of long-term rentals

25 of the 81 rental vehicles have been rented for longer than 3 years

Rental vehicles comprise part of TTC's pool of vehicle resources. As of July 2014, TTC rented 81 vehicles, the majority of which were crew cab pickups. The annual rental expenditures were approximately $0.8 million. While rental vehicles should generally be for short-term purposes according to the Department's rental vehicle policy, 25 of the 81 rentals have exceeded three years. In particular, 11 rentals have exceeded five years, and three were longer than nine years. The justification and the economy of continuing rentals for such an extended period should be reviewed.

Improving user compliance with scheduled maintenance

Maintenance of NRVs and equipment is conducted at two TTC garages managed by the Department. A key factor in NRV maintenance is user cooperation in making vehicles available for maintenance when a maintenance notification is received.

High user non-compliance with scheduled maintenance

Our review found high levels of user non-compliance. Based on our review of 40 sampled vehicles' maintenance records for a period of 22 months, 80 per cent of vehicles had missed or significantly delayed one or more scheduled maintenance services. In particular, approximately 28 per cent of the sampled vehicles did not receive any preventive maintenance for an interval ranging from seven to 12 months.

68% of sampled vehicles on average broke down twice a year

Delays in maintenance increase the likelihood of vehicle breakdown. Our analysis found that 68 per cent of the sampled NRVs reported at least one roadcall (i.e. vehicle breakdown) within the review period. The number of roadcalls for these vehicles was high, averaging two roadcalls per vehicle per year.

A number of reasons contribute to user non-compliance

According to our survey of NRV users, a number of reasons contribute to user non-compliance including long garage service turnaround time and spare vehicles not suitable for operational needs.

Enhancing preventive maintenance effectiveness

76% of garage resources were for unplanned repairs

A common performance indicator for gauging effectiveness of a fleet preventive maintenance program is the percentage split between planned versus unplanned activities. Our analysis found that 76 per cent of the Department's garage labour hours were for unplanned repair activities, while according to an industry guideline only 40 per cent should be for unplanned repair activities.

Effectiveness of the maintenance program can be hampered by a number of issues

The effectiveness of the Department's maintenance program could be hampered by a number of issues including:

- Lack of regular maintenance increases chances of vehicle breakdowns and demands for repairs
- Lack of accurate vehicle kilometerage and usage data to aid the design of an effective maintenance program
- Inadequate customization of the Vehicle Work Order system to support NRV maintenance activities
- Lack of quality assurance measures to systematically monitor and detect repair quality issues

Improving efficiency and economy of garage operations

Average 7.6 garage turnaround days per maintenance and repair

Based on our analysis of work order history of 40 sampled vehicles, the average garage service turnaround time was 7.6 days per maintenance and repair. In addition, on average it took 28 days to ready a new vehicle for operation. Such delays in putting a vehicle in service could impact planned TTC activities and elapse valuable warranty coverage. Warranty is generally based on years or kilometerage, whichever expires first.

Collaborative opportunities in fleet management

Auditor General has for many years been promoting shared services

The Auditor General has raised in numerous audit reports the need for consolidating various administrative and operational functions throughout the City and its agencies to improve services, enhance efficiency and reduce costs. Fleet management is one of the functions identified for shared service or consolidation.

Audit identified two specific consolidation potentials but other collaborative opportunities exist

Our review of TTC's NRV fleet management and maintenance identified a potential opportunity in consolidating rental vehicle contracts between the TTC and the City. Additionally, our review of TTC's fuel card program identified an opportunity for TTC to join the City Fleet Services Division's fuel supply system. Results of our fuel card review are contained in a separate audit report. Potentially other fleet management functions may benefit from collaborative services between the TTC and the City.

The City has established processes to explore further collaborative opportunities in fleet management

Following the Shared Services Efficiency Study undertaken by KPMG LLP in 2012-2013, the City established a Fleet Services Centre of Excellence to examine further shared services opportunities between the City and its agencies. In addition, the City has established a Fleet Management Steering Committee comprised of senior fleet management representatives of the City and its agencies including the TTC. These recent initiatives will help to ensure that the City and agency staff will continue to identify opportunities for shared services and resources.

Auditor General's recommendation follow-up process

Implementation of audit recommendations will be reviewed in 2016

The Auditor General conducts an annual follow-up process to determine the implementation status of previously issued audit recommendations. Recommendations contained in this report will be included in the 2016 follow-up process and the results will be reported to the TTC Audit Committee and the TTC Board.

Potential reviews by the TTC Internal Audit

Potential review areas for TTC's Internal Audit Department

Certain issues identified in this audit relate to ongoing management functions that may benefit from periodic internal reviews. These potential review areas include ongoing inventory management of NRVs and equipment, and controls over vehicle parts. The TTC Audit Department along with senior management may wish to consider conducting periodic reviews of these areas in its future work plans.

Conclusion

Audit provided 21 recommendations to help improve operational effectiveness and efficiency

Our Phase Two review of TTC's NRVs and equipment fleet provided 21 recommendations to improve vehicle reliability, operational effectiveness and efficiency, as well as controlling fleet costs.

All of the audit recommendations are in keeping with and supportive of the strategic objectives set out in the TTC's Five-Year Corporate Plan 2013-2017.

BACKGROUND

TTC provides an integrated network of transit systems

The Toronto Transit Commission (TTC) is the third largest public transit system in North America serving over 4.5 million people in the Greater Toronto Area through an integrated transit network consisting of buses, streetcars, subways and light rail.

Phase Two audit focused on NRVs and shop equipment

The TTC Bus Maintenance and Shops Department is responsible for maintenance and repair services of a large fleet of vehicles and equipment including buses, Wheel-Trans accessible buses, non-revenue vehicles (NRVs), and various shop equipment. An audit of the Department's bus maintenance program was completed in 2013. The focus of this report was on the NRV and equipment fleet.

Auditor General has thus far conducted two audits on bus and NRV maintenance

With the completion of this review, the Auditor General has conducted two audits of TTC's bus and NRV maintenance programs. The Auditor General has not conducted any review relating to the maintenance of streetcars or subway rail cars. Such a review may be the subject of future audits by the Auditor General.

Recommendations from both our Phase 1 and Phase 2 reports likely have relevance to streetcars and subway rail cars. In this context, both reports should be reviewed to determine their relevance.

NRVs are used by all revenue fleets and projects

TTC's NRVs and equipment are used by all five revenue fleets (bus, subway, streetcar, Wheel-Trans, and Scarborough Rapid Transit) and other TTC departments to support ongoing transit operations and capital projects.

455 NRVs and 363 units of equipment at approximately $65 million replacement value

As of June 2014, TTC's NRV and equipment fleet consisted of 455 vehicles and 363 units of equipment. The replacement value of the NRV and equipment fleet, according to staff, was estimated at approximately $65 million. Table 1 provides a breakdown of the types of NRV and equipment. TTC's approved 2014 capital budget included $7.7 million for the purchase of NRVs and $5.1 million for shop equipment.

Table 1: Number of TTC non-revenue vehicles and fleet equipment by type, based on June 2014 Fleet Plan

Non-Revenue Vehicles	Number
Sedans	53
Light Duty Trucks and Vans (e.g. cargo van, minivan, crew cab, cube van)	232
Medium Duty Trucks (e.g. emergency service truck, aerial device, armoured truck)	41
Heavy Duty Trucks (e.g. Dump truck, overhead truck, cube truck, specialty truck)	68
Swingloaders, Front End Loaders	18
Trailers	43
Total non-revenue vehicles	**455**
Fleet Equipment	
Forklifts	81
Sweepers and scrubbers	39
Scissor lifts/boom lifts	34
Generators	31
Compressors	26
Welders	26
Snow blowers	26
Power washers	23
Tractors	21
Other equipment	56
Total fleet equipment	**363**

Examples of TTC non-revenue vehicles and equipment

$5.4 million annual direct operating costs

The Bus Maintenance and Shops Department's 2013 direct operating costs for NRVs and fleet equipment were approximately $5.4 million including maintenance and repairs, parts, and fuel. Maintenance and repair services of NRVs and equipment are conducted at two TTC garages managed by the Department. In addition, two staff members of the Department's Vehicle Engineering Section are responsible for NRV and equipment procurement and other related functions.

Most NRVs and equipment are marked to indicate TTC property

To help ensure TTC's NRV and equipment fleet is used only for TTC purposes, the majority of TTC NRVs and equipment are marked to clearly indicate that they are TTC property. The few exceptions are NRVs used for surveillance or transporting cash as part of revenue operations.

AUDIT OBJECTIVE, SCOPE AND METHODOLOGY

The Auditor General's 2013 Audit Work Plan included an audit of TTC's Bus Maintenance and Shops Department. A key responsibility of the Department is ongoing maintenance of conventional buses, Wheel-Trans accessible buses, NRVs, and shop equipment.

Phase 1 audit was completed in December 2013

Due to the Department's extensive operations, the audit was divided into two separate phases. Phase One focused on conventional buses and was completed in December 2013. The Phase One audit report entitled "*Review of Toronto Transit Commission Bus Maintenance and Shops Department, Phase One: Bus Maintenance and Warranty Administration*" was presented to the TTC Audit Committee and the TTC Board in February 2014. The audit provided 18 recommendations to help improve the effectiveness, efficiency and the economy of bus maintenance operations.

Phase 2 focused on the NRV and equipment fleet

Phase Two of the audit, which is the subject of this report, was originally planned to include a review of the Department's remaining functions that were not included in the Phase One audit. These functions would include the maintenance of Wheel-Trans buses, NRVs and fleet equipment, as well as the operation of the Department's Harvey Shop. However, after conducting initial planning work, it was apparent that audit resources would be best directed to maintenance and management of NRVs and fleet equipment.

Our rationale for excluding Wheel-Trans buses and Harvey Shop from Phase Two is as follows:

Certain audit recommendations for conventional buses are applicable to accessible buses

The TTC's Wheel-Trans fleet consists of 221 specialized accessible buses. While the accessible buses are different from the conventional buses, the maintenance operations of both fleets are similar in many aspects. Consequently, recommendations in the Phase One audit report pertaining to monitoring of bus repair quality, improving repair efficiency, and improving warranty administration would be applicable to Wheel-Trans accessible buses. We have discussed this with the Department's management staff who agreed to, where applicable, extend the implementation of Phase One audit recommendations to Wheel-Trans bus maintenance.

Operations of the Duncan Shop were included in the Phase 1 audit

The Bus Maintenance and Shops Department operates two heavy repair shops as follows:

- Duncan Shop- primarily for major bus mechanical repairs and rebuilds

- Harvey Shop- primarily for structural repairs and rebuilds of streetcars and buses

Harvey Shop would be undergoing major re-design and changes making an audit difficult

A review of the Duncan Shop operations was included in the Phase One audit. During our planning phase of the Phase Two audit, we were advised by TTC staff that Harvey Shop was in need of major facility re-design in order to accommodate the new articulated streetcars and buses which are significantly longer than the existing models. TTC staff were in the process of submitting 2015 capital cost requests for the Harvey Shop. Given the anticipated major facility re-design, a review of the Harvey Shop at present would not be a good use of audit resources.

Our initial planning work identified a number of potential opportunities for improving the management and maintenance of NRVs and equipment. As such we decided to focus the Phase Two audit on the NRV and equipment fleet.

Audit objective was to assess the effectiveness and efficiency of the NRV and equipment fleet management

The objective of the Phase Two audit was to assess the effectiveness and efficiency of the management and maintenance of TTC's NRV and equipment fleet. The audit covered the period from January 2013 to June 2014, except where historical data was reviewed.

The Phase Two audit included a review of the following areas:

- Vehicle procurement, utilization and disposal
- Inventory management
- Rental vehicles
- Compliance with preventive maintenance schedules
- Cost effectiveness and reliability of preventive maintenance and repairs
- Use of manufacturer warranties

Our audit work included the following:

A wide range of reviews, analyses, and staff interviews and consultation were conducted for the audit

- Reviews of relevant legislative and policy requirements
- Reviews of relevant literature, external consultant reports, and internal and external audit reports
- Reviews of the Department’s financial and operational data
- Interviews with the Department and other TTC staff
- On-site visits of TTC garages
- A survey of user department staff regarding compliance with maintenance schedules
- Reviews of maintenance records at garages
- Analyses of Vehicle Work Order system records
- Consultation with the Director of the City of Toronto Fleet Services Division

A separate report was issued for fuel card management

Our Phase Two audit also included a review of fuel card usage for NRVs and equipment. The results of our fuel card review are contained in a separate audit report entitled "*Non-Revenue Vehicle Fuel Card Controls Need Immediate Improvement*."

Compliance with generally accepted government auditing standards

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

AUDIT RESULTS

Efforts are underway to standardize the existing fleet

During the initial phase of our audit, we noted that the existing fleet consisted of many different makes and models. Staff advised that they have already begun issuing multi-year purchase contracts where possible in an effort to standardize the fleet.

TTC has established corporate policy and procedures for asset disposal

Based on our review of a sample of decommissioned vehicle records, the disposal of NRVs and equipment was for the most part conducted by staff in accordance with the TTC Corporate Surplus Assets Sales Policy and prescribed procedures.

Our audit identified a number of improvement opportunities in the management and maintenance of TTC's NRV and equipment fleet. Our audit findings and recommendations are contained in the following sections:

A. GOVERNANCE

A.1. Ensuring Adequate Corporate Oversight

Fleet management includes a range of key functions from needs assessment to control of rental vehicles

Best practices in fleet management encompass a number of key functions including:

- Needs assessment
- Regular utilization monitoring and reporting
- Life cycle management
- Procurement
- Inventory management
- Maintenance and repairs
- Warranty administration
- Control of rental vehicles

TTC does not have a centralized management structure for NRV and equipment fleet

Unlike the City of Toronto or other agencies in which fleet is managed by a centralized and specialized division, the TTC does not have a centralized NRV and equipment fleet management section. The current management of TTC's NRV and equipment fleet is a joint responsibility between the Bus Maintenance and Shops Department and various TTC user departments.

Under the current structure, the Bus Maintenance and Shops Department is responsible for ongoing maintenance and procurement of NRVs and equipment. User departments are responsible for identifying their vehicle acquisition and rental needs, and compliance with maintenance schedules.

In addition to vehicle maintenance, the Department assigns two staff for NRV procurement and related functions

Ongoing maintenance and repair of NRV and equipment is conducted at two TTC garages managed by the Bus Maintenance and Shops Department. In addition, two staff members of the Department's Vehicle Engineering Section are responsible for NRV procurement and related functions including preparation of procurement specifications, inspecting new vehicles before delivery to TTC garages, and maintaining a vehicle and equipment asset database.

A number of key fleet management functions have not been defined or established

Our review noted that a number of key fleet management functions at a corporate level have not been defined or established within the current NRV fleet management structure. These key management functions should include a TTC-wide assessment of vehicle needs, determination of the best means to meet vehicle needs, control of rental vehicles, and oversight of vehicle and equipment inventory.

In our view, a number of issues identified in our audit result from deficiencies in the existing management structure for the NRV and equipment fleet.

Recommendation:

1. **The Board request the Chief Executive Officer to review the current non-revenue vehicle and equipment fleet management structure with a view to ensuring all key fleet management functions are defined and established with adequate corporate oversight.**

A.2. Allocating Vehicle and Equipment Costs to User Departments

All NRV costs are borne by the Department

All NRV and equipment procurement, ongoing maintenance and fuel costs are part of the Bus Maintenance and Shops Department's annual capital and operating budgets. The NRV fleet costs are not re-allocated to user departments.

No department is directly held accountable for NRV fleet costs under current cost structure

Grouping all NRV and equipment costs under one department's budgets helps simplify the annual budget planning and request process. However, under TTC's current NRV cost structure, no department is directly held accountable for the costs. The Bus Maintenance and Shops Department cannot be held accountable for the costs as NRVs and equipment associated costs are incurred by user departments for their operations. The user departments do not need to be accountable for the costs because they do not impact their individual capital or operating budgets.

A cost charge-back helps optimize use of resources by user departments

To provide an incentive for user departments to monitor and optimize the use of vehicle resources, the TTC should consider implementing measures such as a chargeback system to re-allocate certain NRV and equipment costs to individual user departments. A chargeback system in accounting is a method of allocating the cost of service to the user of the service. A chargeback system is generally viewed as an effective and ongoing means of controlling costs.

Recommendation:

2. **The Board request the Chief Executive Officer to consider implementing a chargeback process or other measures for non-revenue vehicle and equipment costs to help optimize use of vehicle and equipment resources by user departments and enhance accountability.**

B. VEHICLE AND EQUIPMENT ACQUISITION

B.1. Incorporating a More Rigorous Review and Approval Process

A 5-year fleet plan based on departmental requests and maintenance staff consultations

To make a purchase request for NRV or equipment, user departments are required to submit a written request to the Department's Non-Revenue Fleet Supervisor. According to TTC staff, the written requests should provide a brief description of the vehicle or equipment required and an impact statement if the requested vehicle or equipment is not provided.

Based on the requests from departments and consultations with maintenance staff on existing vehicle or equipment conditions, the NRV fleet staff develop a five-year fleet plan itemizing individual vehicle or equipment to be replaced and acquisition of additional vehicles and equipment.

Detailed usage information was usually not included in request memos

Our review of a sample of requests and discussions with staff noted that the purchase requests were in general brief without specific information on projected usage (e.g. how often and how much the vehicle or equipment would be used) or a detailed impact statement. Such information is needed to facilitate a rigorous corporate review and approval process.

Recommendation:

3. **The Board request the Chief Executive Officer to enhance the current review and approval process for non-revenue vehicle and equipment acquisitions such that the needs, purposes, and projected usage of the requested vehicles and equipment can be adequately evaluated.**

B.2. Reviewing Utilization Levels and Alternatives

A review of utilization levels among the existing fleet is an important fleet management function

An important fleet management function is regular usage reviews to identify low-usage vehicles and equipment, and determining whether the low-usage vehicles and equipment should be retained, reassigned or eliminated.

According to staff, the Department's NRV fleet staff conducts yearly reviews of vehicle usage but the review results are not documented. Staff also indicated that based on the yearly review results, vehicles with low kilometrage would be retained and the five-year fleet plan would be adjusted accordingly.

18% of NRVs were driven for an average of less than 10,000 km per year

Based on our analysis of 337 NRVs for which kilometrage records were available, approximately 18 per cent of vehicles had been driven for an average of less than 10,000 km per year. Results of our analysis are summarized in Table 2.

Table 2: TTC non-revenue vehicle yearly kilometrage average by type of vehicle, based on an analysis of 337 vehicles, 2014

Average yearly kilometrage	<5,000 (km)	5,000 - 10,000 (km)	10,001 - 15,000 (km)	15,001 - 20,000 (km)	20,001 - 40,000 (km)	>40,000 (km)
Sedan*	1	4	6	4	23	13
Van*	7	21	46	23	28	5
Truck*	1	1	10	2	3	0
Large van/ crew cab/ pickup**	3	12	23	18	16	2
Heavy duty truck**	2	10	26	13	14	0
Total	14	48	111	60	84	20
% of Total	4%	14%	33%	25%	25%	6%

*Under 4,500 kg ** Over 4,500 kg

A number of vehicles due to their nature of work were excluded from our analysis because kilometrage is not a relevant measure for usage. Examples of the excluded vehicles are training vehicles, dump trucks, aerial devices, and trucks carrying corrosive materials. We did not analyse equipment usage as records from hourly meters were not readily available for analysis.

8 vehicles scheduled for replacement in 2015 had less than 10,000 km yearly average

In the five-year fleet replacement plan, staff identified 43 motor vehicles to be replaced in 2015. Our review noted that eight of the 43 vehicles had yearly kilometrage average below 10,000 km. The replacement of these vehicles should be re-assessed.

We understand that certain low-usage vehicles are justified due to their unique use. For instance, as staff indicated, a number of the low-usage vehicles kept by the Department were "extended service" vehicles intended to be used as spares and therefore would not be accumulating high kilometrage.

Minimizing underutilized NRVs and equipment helps reduce capital expenditures

Nonetheless, under-utilized vehicles and equipment need to be reviewed and minimized where appropriate to help reduce capital expenditures for vehicle and equipment replacement, as well as reducing the associated maintenance and operating costs.

In addition to a detailed review of usage and operational needs, a review of alternative means to meet the vehicle needs should be conducted by fleet management staff prior to finalizing replacement decisions.

Rather than providing TTC-owned vehicles, certain vehicle needs can be met by alternatives

As part of our audit, we discussed with management staff the following alternatives to help reduce fleet costs:

- Reassignment of existing low-usage vehicles and equipment
- Establishment of a motor vehicle pool for user groups with similar vehicle needs and work in close proximity
- Short-term vehicle rental to meet seasonal operational needs
- Reimbursement for staff to use their privately owned vehicles when the transportation does not involve carrying cargo or heavy duty equipment

Certain vehicle alternatives are considered by staff

Reimbursing staff for using their personal vehicles, according to management staff, is not feasible because in general TTC's NRVs are used to transport crews and equipment that cannot be accommodated by personal vehicles. Staff indicated that options such as re-assigning low-usage vehicles and equipment and short-term rental are considered to a certain extent.

Recommendations:

4. **The Board request the Chief Executive Officer to conduct detailed reviews of utilization levels of non-revenue vehicles and equipment to identify and minimize underutilized vehicles and equipment.**

5. **The Board request the Chief Executive Officer to undertake an assessment of alternatives of meeting non-revenue vehicle and equipment needs prior to finalizing annual vehicle and equipment procurement decisions.**

B.3. Implementing Life Cycle Management (LCM)

The goal of Life Cycle Management (LCM) is to replace vehicles at an optimal point thereby maximizing vehicle usage life and resale value without incurring excessive maintenance and repair costs.

Replacement age and km thresholds have been established for each type of vehicle

The Department has established NRV replacement criteria for various types of vehicle. Examples of these criteria are:

- Sedans 6 years or 175,000 km
- Vans 7 years or 175,000 km
- Pick-up trucks 8 years or 175,000 km

Approximately 23% of sedans and light-duty vehicles were older than 10 years

Based on our analysis, as of May 2014, approximately 23 per cent of sedans and light-duty vehicles (including vans and small trucks) in the existing fleet were older than 10 years.

To assess the annual costs of maintaining an aging NRV, we reviewed maintenance records of a sample of 10 high-usage and aging light-duty vehicles from three NRV user departments. All of the 10 aging vehicles had accumulated more than 200,000 kilometres as of May 2014 therefore exceeding the kilometrage threshold for replacement.

Average 121 maintenance and repair hours per aging vehicle per year

Based on our analysis, these aging light-duty vehicles required on average 121 maintenance and repair hours per vehicle per year, more than doubling the average 50 maintenance and repair hours for light-duty vehicles. The average part costs for these types of vehicles were approximately $1,800 in 2013. The part costs for aging vehicles were likely to be higher than the average but specific part costs per vehicle were not available.

Annual maintenance and repair costs per aging vehicle in the range of $13,000 to $15,000

Based on our analysis of average labour hours, the current TTC labour, fringe and overhead rates assigned to the NRV garage, and the average parts costs, the costs of maintaining an aging light-duty vehicle are in the range of $13,000 to $15,000 per vehicle per year. At this cost level, extending the life of an aging vehicle two to three years beyond the replacement criteria will likely result in cumulative maintenance and repair costs exceeding the cost of purchasing a new vehicle.

Aging vehicles are less reliable and taking up additional garage resources

Aside from the high maintenance and repair costs, an aging fleet is less reliable and prone to breakdowns. Maintenance of aging vehicles also consumes additional garage resources taking up manpower, hoists and storage space.

Our analysis results underscore the need for active monitoring and analysis of vehicle life cycle costs to prioritize vehicle replacement. Timely replacement of the aging fleet will result in overall savings to the TTC, improve vehicle reliability, and help alleviate garage capacity shortage.

Vehicle replacement criteria should be reviewed to ensure they are effective

Furthermore, we noted that those vehicles currently below the Department's replacement thresholds had required significant annual maintenance and repair hours. We understand from staff that a recent review of the effectiveness of the NRV replacement criteria has not been conducted. It would be prudent for the Department to re-assess the effectiveness of its current replacement criteria in preventing excessive maintenance and repair costs.

Recommendations:

6. **The Board request the Chief Executive Officer to take immediate actions to identify and prioritize the replacement of existing aging non-revenue vehicles incurring significant annual maintenance and repair costs.**

7. **The Board request the Chief Executive Officer to ensure that vehicle life cycle costs are actively monitored and analyzed as part of the non-revenue fleet management functions. A re-assessment of the current non-revenue vehicle replacement criteria should be undertaken to ensure the criteria are effective in preventing excessive maintenance and repair costs.**

C. INVENTORY MANAGEMENT

All NRV and equipment maintenance and repair records are kept in the Department's Vehicle Work Order (VWO) system which was implemented in August 2012. At the outset of our audit, staff advised that the VWO system was not adequately customized for NRVs and equipment and a number of system modifications and upgrades have been pending.

An oversight of VWO inventory for NRVs and equipment should be assigned to a staff person

Aside from system modifications, we noted improvement opportunities in a number of other areas as follows:

- The Department should assign a staff person responsible for ensuring the NRV and equipment records in VWO are accurate, complete and up-to-date. Current roles and responsibilities of the NRV Fleet Supervisor do not include management oversight of NRVs and equipment records in VWO.

- Written policy and criteria need to be clearly developed to define the value and the type of equipment assets that should be tracked in VWO.

Inefficient to maintain two separate databases

- While the Department uses VWO to track maintenance records, its non-revenue fleet staff uses an Access database to track active vehicle and equipment records for TTC's annual asset reporting purpose. The two databases are not integrated and are separately maintained by different staff. VWO should be modified to meet annual asset reporting requirements to avoid the need to maintain a separate asset tracking database.

The fleet equipment inventory is incomplete

- The VWO inventory of fleet equipment is not complete. Current Departmental practice is to include in the VWO system only units of equipment that are maintained by the Department. Equipment purchased through the Department's capital budget but under manufacturer warranty is not registered in VWO until after the warranty expires. Similarly fleet equipment maintained by other TTC shops for streetcars and rail cars is not tracked in VWO.

A centralized and complete equipment database should be established

The acquisition costs of certain of TTC's fleet equipment are substantial at over $100,000 per unit (e.g. railcar mover, sweeper, and snowplough). To safeguard this class of assets and promote shared usage across TTC departments, it is important for TTC to maintain a centralized, up-to-date, and complete database of this class of assets.

Recommendation:

8. **The Board request the Chief Executive Officer to review inventory management of non-revenue vehicles and fleet equipment to ensure the inventory is accurate, complete, and up-to-date. Steps to be taken should include but not be limited to:**

    a. **Assigning a staff person responsible for the oversight and management of inventory;**

    b. **Establishing clear policy and criteria defining the type and value of assets to be tracked;**

    c. **Ensuring records kept in the Vehicle Work Order (VWO) system meet annual asset reporting requirements; and**

    d. **Expanding the current criteria for tracking fleet equipment in VWO to establish a centralized and complete fleet equipment database.**

D. RENTAL VEHICLES

The Department has established a policy for rental vehicles

The Department has established a policy for rental vehicles outlining the usual circumstances necessitating rentals and the required approval policy. According to the policy, non-revenue vehicle rentals are "usually" required:

- To accommodate special needs such as seasonal work or when permanent vehicles are unavailable due to accidents, repairs or servicing
- To cover the period pending the acquisition or arrival of a permanent vehicle
- To enable staff to confirm usage rates or capabilities before submitting a request for a permanent vehicle.
- To permit short-term operations near the end of a project when permanent vehicles cannot be extended in service or replaced

Number of rental vehicles varies between 60 and 80 each month

Due to the short-term nature of rental vehicles, the number of rentals varies from month to month between 60 and 80 vehicles depending on the time of the year. More vehicles are usually rented during summer months for construction activities and seasonal work.

The majority of rentals were crew cab pickup at approximately $1,200 monthly rental fee

As of July 2014, TTC rented from three companies a total of 81 vehicles, the majority of which were crew cab pickup (40 vehicles), followed by cargo and cube vans (27 vehicles). The average rental costs (including insurance and taxes) for a crew cab pickup were approximately $1,200 per month, and for a cube van approximately $1,400 per month.

Annual rental expenditures are approximately $0.8 million

TTC's annual rental expenditures are approximately $0.8 million in the past few years. The rental fees cover preventive maintenance and insurance provided by the rental companies. Rental costs are charged back to the operating budgets of the user departments requesting the rentals. The two top user departments for rental vehicles are Rail Infrastructure with 25 rentals, and Plant Maintenance with 22 rentals as of July 2014.

D.1. Reviewing the Justification and the Economy of Long-Term Rentals

25 of the 81 vehicles have been rented for over 3 years

Rental contracts are renewed annually after authorization by senior management. Although rental vehicles should generally be for short-term purposes, our review noted that 25 of the 81 rentals (as of July 2014) have been on-going longer than three years. In particular, 11 rentals have been longer than five years, and three have been longer than nine years.

Reasons for the 25 long-term rentals as provided by staff

Staff provided further details for the 25 long-term rentals as follows:

- Ten rentals have been awaiting new vehicles to be delivered in 2014
- According to user department management staff, five rentals will continue until 2020 capital budget request for permanent vehicles
- Five rentals are for special projects and no permanent vehicles have been requested

- Four rentals are for security and investigative purposes necessitating changing vehicle models frequently

- One rental is due to delays in tendering for a permanent vehicle

The length of rental period for 10 vehicles could potentially be 10 years or longer

Regarding the rental of the five vehicles which will continue until the 2020 capital budget request, since these rentals were initiated in 2010, by 2020 they would have incurred 10 years of rental costs. In our view, the justification and cost-effectiveness of these particular rentals should be reviewed. Similarly, for the other five rental vehicles used for special projects, these vehicles' rental contracts were initiated between 2008 and 2010, and with no request for permanent vehicle these rentals will likely continue for an extended period.

Long-term rentals should be reviewed to determine whether they are justified and cost-effective

Rentals longer than five years run the risk of total rental fees outweighing the costs of ownership. It is important for the TTC to review the list of long-term rental vehicles to ensure they are justified, and to determine whether it would be more economical to meet the vehicle needs through ownership.

Recommendation:

9. The Board request the Chief Executive Officer to review the existing list of long-term rentals of non-revenue vehicles to determine whether these long-term rentals are justified and cost-effective.

D.2. Reviewing Rental Requests at the Corporate Level

Roles of fleet staff on rentals are limited to administrative work

According to TTC's vehicle rental policy, it is not the role of the Department's NRV fleet staff to approve or deny rental requests provided the authorization process has been followed. The roles of the NRV fleet staff in rental vehicles are mostly administrative including acquiring the requested rentals, verifying monthly invoices, and maintaining an up-to-date rental list.

Rental requests are approved by senior management staff based on request memos from staff

The current rental approval process requires departmental staff to submit a rental request for senior management approval. The requests usually contain information such as the purpose and the number of vehicles needed, duration of rental, and available departmental operating budget to cover the rental fees. Information such as the initial rental starting date, and the anticipated usage in terms of kilometrage or hours may or may not be included in the requests seeking management approval.

The City of Toronto Fleet Services Division requires each vehicle rental request to be supported by a business case detailing purpose and anticipated usage.

A corporate-wide review of rental requests and available vehicle resources should be conducted

According to fleet management best practices, controls over vehicle rentals should be part of regular fleet management functions. Rental vehicles form part of TTC's corporate pool of vehicle resources. After confirmation by departmental staff of the rental needs and available budget, fleet management staff should undertake a corporate-wide review to determine whether the rental needs can be met by existing TTC-owned vehicles or shared usage with other rental vehicles. Such a review needs to be conducted at the corporate level to take into account all available vehicle resources. Detailed information on anticipated usage should be included in rental requests to facilitate the review.

Recommendation:

10. The Board request the Chief Executive Officer to enhance current rental vehicle review and approval process by incorporating a corporate-wide review of rental vehicle needs, available vehicle resources, and opportunities for shared usage.

D.3. Evaluating Insurance Coverage Options

Costs of rental vehicle insurance packages are approximately $160,000 per year

TTC's vehicle rental contracts include insurance coverage provided by each rental company. The insurance premium is approximately 25 per cent of the base rental price ranging from $170 to $380 monthly cost per vehicle. Insurance covers third-party public liability up to $1 million and comprehensive and collision damage without any deductible or with $2,000 deductible as specified in individual contract. Of the total $0.8 million annual vehicle rental costs, an estimated $160,000 is for purchase of insurance packages from rental companies including 13 per cent HST on insurance packages.

Insurance packages purchased from rental companies are subject to 13% HST

Under provincial tax rules, vehicle insurance purchased directly from an insurance company is not subject to any tax. However, vehicle insurance purchased through a rental company is subject to 13 per cent HST. As a result, TTC's purchased insurance premiums from rental companies are subject to the full 13 per cent HST.

City Fleet does not purchase rental insurance packages

The City of Toronto Fleet Services Division rents about 250 vehicles from five rental companies. The City however does not purchase insurance package for rentals. Insurance for rental vehicles are covered by the City's self-insurance arrangement.

Both the City and TTC are self-insured

Similar to the City's risk management practice, TTC is self-insured in many aspects of its operations through the TTC Insurance Company Limited. For example, all TTC revenue vehicles are covered by the TTC's self-insured arrangement.

Not clear why TTC opted for purchasing insurance packages for rental vehicles

Both the City of Toronto and the TTC have opted for self insurance coverage for economic reasons. TTC finance staff did not provide clear information explaining the rational for TTC to purchase insurance coverage from vehicle rental companies.

Recommendation:

11. The Board request the Chief Executive Officer to review rental vehicle insurance costs provided by rental companies. A determination should be made as to whether self insurance coverage is less costly.

D.4. Collaborating With the City Fleet in Issuing Future Rental Contracts

The TTC and the City Fleet rental contracts are for the most part comparable

Our review of the separate rental vehicle contracts issued by the TTC and the City Fleet Services found that both acquired similar types of vehicles from the same rental companies. The TTC and the City Fleet rental contacts are for the most part comparable with a slightly higher price but more flexibility built into the City Fleet contract (such as unlimited mileage, free of charge for minor surface scratches, and the right to repair damage to rental vehicles to industry standards).

A joint RFQ may obtain better pricing and contract terms for both the TTC and the City Fleet

The City Fleet Services acquired approximately 250 rentals and the TTC acquired approximately 80 rentals. It may be beneficial for the TTC and the City Fleet to work together to determine whether they can issue a joint Request for Quotation (RFQ) in future vehicle rentals.

Recommendation:

12. The Board request the Chief Executive Officer to work collaboratively with the Director of the City of Toronto Fleet Services Division to determine the feasibility of issuing a joint Request for Quotation (RFQ) in future acquisition of rental vehicles.

E. Garage Operations

Maintenance of NRVs and equipment is conducted at the Duncan Shop and the Lakeshore Garage managed by the Bus Maintenance and Shops Department. Details of the garage operations are provided in Table 3.

Table 3: Duncan Shop and Lakeshore Garage non-revenue vehicle and equipment maintenance operations, as of June 2014

	Type of Non-Revenue Vehicle	Number of Vehicle/Equipment	Workforce
Duncan Shop	Mid to heavy-duty vehicles mostly over 4,500 kg	237 vehicles 363 rubber-tired equipment	22 approved positions including 1 supervisor* and 3 forepersons
Lakeshore Garage	Light duty vehicles under 4,500 kg	218 vehicles	10 approved positions including 1 supervisor

*Also responsible for two other sections within the Duncan Shop

E.1. Concerns about Non-Compliance With Scheduled Preventive Maintenance

All NRVs receive minor and major PMIs, and additional yearly MTO inspection for vehicles over 4,500 kg

All vehicles over 4,500 kg are required to have an annual Ministry of Transportation of Ontario (MTO) inspection. This applies to most NRVs maintained at the Duncan Shop. In addition to the annual MTO inspection, all NRVs are scheduled to receive minor and major preventive maintenance inspections (PMIs) at one of the two garages.

PMI intervals vary significantly among vehicles

Under the Department's current time-based maintenance schedule (e.g. every 3 months), PMI intervals vary significantly among vehicles. A typical PMI schedule for mid to heavy-duty vehicles consists of a minor inspection every three months, a major inspection every six months, and an MTO inspection every year.

Audit findings regarding compliance level with scheduled maintenance inspections

40 vehicles' maintenance records were reviewed

To assess compliance with PMI schedule, we reviewed work orders and maintenance records of 40 randomly selected vehicles, 20 from each of the two garages, for a period of 22 months (since the inception of the VWO system from August 2012 to May 2014).

High user non-compliance with scheduled maintenance

A key factor in maintenance of NRVs is user co-operation to return their vehicles to garages upon receiving maintenance notifications. Our review found high level of user non-compliance. Overall, 80 per cent of the vehicles sampled had missed or significantly delayed at least one or more scheduled maintenance within the review period. In particular, 11 of the 40 sampled vehicles (28 per cent) did not receive any PMI for an interval ranging from seven to twelve months.

Previous TTC internal audit reports identified the same concerns but they continue to exist

Our findings are consistent with issues identified in previous TTC's internal audit reports. The TTC Audit Department conducted two separate audits of the Bus Maintenance and Shops Department in 2005 and 2010. Both audits found issues relating to NRV non-compliance with scheduled maintenance inspections. Based on our audit findings, these issues have not been rectified and continue to exist.

Impact of non-compliance with scheduled maintenance

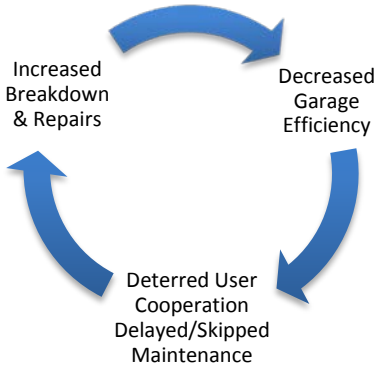
68% of sampled vehicles on average broke down twice per year

Non-compliance with preventive maintenance impacts vehicle reliability and increases the likelihood of vehicle breakdown or commonly referred to as "roadcall". Among the 40 vehicles reviewed, 27 (68 per cent) reported at least one roadcall within the review period. The number of roadcalls for the 27 vehicles was high averaging two roadcalls for each vehicle per year.

Systemic issues undermining garage effectiveness and efficiency

In essence, the effectiveness and efficiency of garage operations is undermined by a continued cycle (Figure 1) of non-compliance with scheduled maintenance, decreased vehicle reliability and increased demands for repairs.

Figure 1: Cycle of garage operations in NRV fleet maintenance



Factors contributing to high user non-compliance

To determine factors contributing to the high level of non-compliance, we conducted a user survey and follow-up discussions with individual user group staff where needed. The common concerns expressed by user department staff are summarized below:

Users are deterred by long out-of-service days, poor spare vehicle conditions, and unreasonable maintenance schedule

- Many NRVs are specialized vehicles critical to TTC's operations or special projects. Downtime for meeting vehicle maintenance requirements is not initially factored into operation or project schedule.

- User departments are concerned by long out-of-service days for even a small repair leaving crew members idling for days.

- Spare vehicles provided to user departments have limited working capacity or are not always in good condition.

- When user groups take the vehicles to garages for maintenance outside of the maintenance schedule, garages are frequently at capacity and cannot work on the vehicles.

- User department staff may not receive notifications for maintenance either due to outdated contact list in VWO or system issues.

- VWO system issues result in unreasonable scheduling thus further discouraging users from complying with the required maintenance schedule.

Certain of the above user concerns are consistent with our audit findings which are outlined later in the report.

Difficulties encountered in garage operations

Non-compliance with maintenance schedule could hamper the garage's ability to plan work effectively

Garage staff indicated their difficulties in planning work effectively when NRV users do not adhere to the planned maintenance schedule. In general, non-compliance with maintenance schedule increases the likelihood of mechanical problems and results in higher demands for repair. Since the costs of maintenance and repair are part of the Bus Maintenance and Shops Department's budget, there is no budget consequence to user departments for non-compliance with scheduled maintenance, nor does the Department have any authority to require user departments to adhere to maintenance schedule.

Recommendation:

13. The Board request the Chief Executive Officer to take steps to improve non-revenue vehicle user compliance with scheduled maintenance, including steps to address user concerns.

E.2. Enhancing Preventive Maintenance Effectiveness

The ratio between planned and unplanned activities should be 60/40 split

A common performance indicator for gauging effectiveness of a fleet preventive maintenance program is the percentage split between planned versus unplanned activities. According to our consultation with the Director of the City's Fleet Services Division and our review of fleet management publications, for a diverse fleet such as TTC's NRVs the optimal split should be 60 per cent for planned activities (e.g. scheduled maintenance inspections), and 40 per cent for unplanned activities (e.g. repairs).

76% of NRV garage maintenance hours were for unplanned activities

The Department does not currently track or monitor planned versus unplanned activities. At the request of audit staff, TTC staff provided 2013 maintenance labour hours and work order data. Our analysis of the data found that 24 per cent of maintenance hours were for planned activities, and 76 per cent for unplanned activities, a significant departure from the optimal maintenance-to-repair ratio.

As indicated previously, the high user non-compliance with preventive maintenance schedule could increase the likelihood of mechanical problems therefore necessitating more unplanned repair activities. A number of other issues could also hamper the effectiveness of the Department's preventive maintenance program, each of which is discussed in further detail as follows:

(a) Lack of accurate vehicle kilometrage and usage data to aid the design of an effective maintenance program

Current maintenance schedule is time-based due to the lack of means to automatically retrieve vehicle kilometrage data

An effective maintenance schedule should be based on vehicle usage, commonly measured by kilometrage accumulated. The Department currently has no means of automatically retrieving up-to-date kilometrage from NRVs and therefore unable to schedule PMIs based on vehicle kilometrage. Instead, the frequency of PMIs (e.g. every three or six months) is determined by maintenance staff based on individual vehicle's historical usage.

Staff did not consistently update system kilometrage during inspections

Although garage staff are required to update vehicle kilometrage in the VWO system during maintenance inspections, our review noted that in approximately 50 per cent of inspections kilometrage was not updated by staff. For vehicles brought to the garage for repairs, there is no requirement for staff to update kilometrage in the system during repairs.

Current time-based maintenance program could result in performing inspections too early or too late

As a result, the Department does not have up-to-date kilometrage for a significant number of NRVs. The current time-based maintenance intervals may not be in keeping with actual vehicle usage, potentially resulting in PMIs being conducted either too early or too late. Performing PMIs too early could result in excessive maintenance and unnecessarily increasing maintenance costs and interruptions to operations, whereas too late could result in excessive wear and increasing downtime and repair costs.

The Department is planning to install a GPS system in NRV fleet

To address the lack of accurate kilometrage issue, the Department's management staff have embarked on developing a capital project to install a GPS system in each NRV to enable automatic transfer of kilometrage data to the VWO system.

Recommendation:

14. The Board request the Chief Executive Officer to ensure accurate and up-to-date non-revenue vehicle kilometrage data are obtained to facilitate effective preventive maintenance scheduling.

(b) Inadequate customization of the Vehicle Work Order (VWO) system to support NRV maintenance activities

A considerable number of system issues persist after initial system implementation in August 2012

As indicated previously, the Department's VWO system was not adequately customized for the non-revenue fleet during initial system implementation in August 2012. Nearly two years afterward, a considerable number of system issues continue to persist. During the course of our audit, we had detailed discussions with management staff on our findings and concerns about the VWO system issues. For the purpose of this report, only a brief summary of the major system issues is included as follows:

VWO ceases generating future work orders when a maintenance activity is overdue

- When a maintenance activity is overdue, VWO[1] will cease generating future work orders and inspection notifications to users for this type of maintenance activity. Our sample review found approximately 43 per cent of vehicles had incomplete scheduling of VWO maintenance work orders due to this issue.

The date-based option chosen by management could result in unreasonable intervals between scheduled maintenance

- The maintenance schedule in VWO can be either date-based or interval-based. Management decided to use the date-based option under which the system fixes each PMI[2] activity on a pre-determined date. When a PMI is conducted earlier or later than the scheduled date, the next scheduled inspection is not adjusted accordingly resulting in unreasonably long or short intervals between PMIs. Under the interval-based option, the system adjusts PMI schedule based on actual inspection dates and is therefore a more desirable option. However, to date no action has been taken to change the system to the interval-based option.

Garage management staff need to constantly adjust system schedule but are not given system access

- Given the numerous system scheduling issues, garage management staff need to constantly adjust system schedules to re-align PMI activities. However, they are not given system access and have to request system administrators to make the adjustments. In light of the frequent and large number of system adjustments required on a daily basis, the current schedule adjustment process needs to be simplified and garage management staff should be given sufficient system access to perform their job efficiently.

Updating kilometrage in VWO can be a frustrating task for garage staff due to built-in input controls

- To reduce data input errors, certain data entry controls are built into VWO such as limiting kilometrage updates to a certain maximum value. As a result of these data entry controls, technicians can only make minor adjustments to existing kilometrage in the system. Where a significant adjustment is needed, and this occurs frequently, garage technicians have to request the system administrators to update system kilometrage records. The practicality of the existing data entry controls should be re-assessed to ensure these controls do not inadvertently deter technicians from updating kilometrage as required.

[1] VWO – Vehicle Work Order System
[2] PMI – Preventive maintenance inspection

Key performance indicator reports for NRVs have not been developed in VWO

- To date, only a few management report templates have been developed for NRVs in VWO. Our review of system generated reports found certain report results inaccurate and unreliable. Furthermore, reports on commonly used fleet management performance indicators, such as annual operating costs per kilometer driven, annual operating costs per vehicle, and out of service days per maintenance, have not been developed in the VWO system. In many cases, the data for key performance indicator reports has not been systematically collected or inputted into the system.

Recommendation:

15. The Board request the Chief Executive Officer to improve the effectiveness of the Vehicle Work Order system for non-revenue fleet management. Steps to be taken should include but not be limited to:

a. Addressing existing preventive maintenance scheduling issues in the system;

b. Ensuring adequate system access is provided to garage management staff;

c. Re-assessing the practicality of existing data entry controls;

d. Ensuring accuracy of system generated management reports; and

e. Expanding the existing system reports to include reports on fleet management key performance indicators.

(c) Lack of quality assurance measures

Quality assurance process for NRV repair quality has not established

The Department has not established a formal quality assurance process to systematically monitor and detect repair quality issues. Currently, supervisory reviews of specific vehicles are conducted on an as needed basis when they are made aware of potential repair issues. Furthermore, system exception reports identifying repeated repairs have not been developed in the VWO to aid management monitoring.

Sample review found 15% of vehicles with repeated repairs

Our review noted six of the 40 sampled vehicles (15 per cent) had repeated repairs for the same defects during the review period. Several user department staff also expressed their concern about repair quality in response to our user survey. Subsequent to our Phase 1 audit, the Department has implemented a quality review and assurance program for bus repairs. The same quality assurance program should be extended to the non-revenue fleet.

Recommendation:

16. The Board request the Chief Executive Officer to develop and implement non-revenue fleet quality assurance processes to systematically monitor and detect repair quality issues.

E.3. Ensuring Adequate Controls Over Parts Issuance

Supervisory approval of part orders is not required

The current parts issuance procedures for NRVs do not include adequate controls to deter or detect ordering of vehicle parts for non-TTC uses. Under the current process, garage technicians request parts from Materials and Procurement staff in charge of the stock room without the need to obtain supervisory approval.

System part issuance records are not linked to individual vehicle

Part issuance data for NRVs is not captured in VWO. Part information is recorded at an aggregate level in the Materials and Procurement module in the Industrial Financial System (IFS). However, the aggregate records do not show for which vehicle the parts are ordered. Consequently, the IFS parts issuance reports cannot be reconciled with individual vehicles to determine the reasonableness of parts issuance by vehicle. This gap in the IFS system records also prevented audit staff from carrying out procedures to identify questionable part orders.

Better controls for parts issuance are needed

While garage management staff agreed that better controls are needed, they indicated that it would be impractical to require supervisory staff to approve all part requests due to the sheer volume of requests. As a compensating control, staff agreed to modify the existing IFS system to add vehicle information to parts issuance records, and the parts issuance reports will be periodically reviewed by garage management staff.

Inventory management of NRVs/equipment and vehicle parts are ongoing management areas that may benefit from periodic internal reviews. As such the TTC's Audit Department should consider conducting reviews of these areas in its future work plans.

Recommendation:

17. The Board request the Chief Executive Officer to ensure adequate controls are in place at TTC garages to deter and detect ordering of non-revenue vehicle and equipment parts for non-TTC uses. Periodic reviews should be considered by TTC internal audit staff.

E.4. Improving Efficiency and Economy

(a) Reducing "out of service" days

Average 57 "out of service" days for maintenance and repair per vehicle per year

Based on our analysis of work order history of 40 vehicles, each maintenance and repair took a vehicle out of service for an average of 7.6 days, totaling on average 57 out of service days per vehicle per year. We were not able to delineate the "out of service" days between a maintenance inspection and a repair because in many cases these two types of activity were carried out together at the garage.

Users were concerned about the long turnaround time

The results of our review echo concerns expressed by user department staff who cited the long turnaround time as one of the reasons for user non-compliance with scheduled maintenance. According to staff, vehicles frequently sat idle in garages waiting to be maintained or repaired.

Factors such as limited garage capacity, lack of body repair technicians, and parts unavailability prolong turnaround time

According to TTC staff and our analysis, the lengthy service turnaround time are caused by a number of factors:

- Garage capacity constraints such as limited hoists and technicians
- Lack of dedicated body repair technicians for NRVs. Body repairs of revenue vehicles understandably is given priority.

- Unavailability and prolonged ordering period for parts, particularly for mid to heavy-duty NRVs maintained at the Duncan Shop.

- User non-compliance with scheduled maintenance and various VWO scheduling issues undermine garage efficiency.

Recommendation:

18. The Board request the Chief Executive Officer to take steps to shorten garage service turnaround time for non-revenue fleet by addressing issues pertaining to garage capacity, availability of technicians, parts availability and maintenance scheduling.

(b) Reducing new vehicle commissioning period

It should normally take no more than one week to ready a new NRV for TTC operations

On average each garage receives approximately 20 new NRVs per year. Upon receiving a new vehicle, garage staff need to undertake and coordinate a number of tasks (e.g. installation of fire extinguisher, beacon light and radio equipment, and vehicle registration) to ready a vehicle for TTC operations. This period of time, between vehicle delivery and in-service date, is referred to as "commissioning time." According to TTC garage staff, the commissioning time for an NRV should normally take no more than one week.

Garages took on average 28 days to commission a new vehicle

Our sample analysis found that it took garages on average 28 days to commission a new vehicle. Based on our review, better coordination and communication across and within TTC departments, as well as establishing a target time frame, should help shorten the commissioning period.

Delays in readying new vehicles impact operations, warranty and garage resources

Delays in putting a vehicle in service could impact planned TTC activities and service delivery. In addition, prolonged commissioning period elapses warranty coverage as warranty is generally based on years or kilometrage whichever expires first. Delays in readying a new vehicle for service also prolong the need for garages to maintain an aging fleet which consumes additional garage resources as discussed earlier in this report.

Recommendation:

19. The Board request the Chief Executive Officer to shorten the period of time readying a new non-revenue vehicle for operation. Steps to be taken should include but not be limited to setting a targeted time frame and improving coordination and communication among various TTC departments.

F. WARRANTY ADMINISTRATION

F.1. Establishing a Formal and Effective Warranty Administration Process

Manufacturer warranty for the majority of NRVs are:

- Three years or 60,000 km for bumper-to-bumper coverage
- Five years or 100,000 km for power trains such as engines and transmissions
- Five years or 80,000 km for emission and corrosion

In our Phase One audit, we identified potential warranty revenue increases in the range of $4 million to $5 million per year by maximizing warranty claims for buses. Warranty claim revenues for NRVs are much less than warranty revenues for buses due primarily to the lower NRV procurement costs.

A formalized NRV warranty claim administration process has not been established

Nonetheless, with a fleet of approximately 450 vehicles, a formalized NRV warranty administration and management process should be in place to maximize claim revenues. Such a formalized process, however, has not been established by the Department.

Warranty claim rates varied between the two garages

Warranty claims are currently dependent on the diligence and discretion of individual garage personnel. As a result, the warranty claim rates appeared to vary significantly between the two NRV garages. Our review of a sample of 20 NRVs maintained by one garage did not identify any missed warranty claims. For another garage, our review of nine recently purchased vehicles identified missing warranty claims for three vehicles.

To maximize warranty claims, a formalized process needs to be established consisting of the following key elements:

(a) A dollar threshold for warranty claims

A claim dollar threshold helps ensure cost-effectiveness of warranty claims

For non-revenue vehicles, it may be more cost-effective to conduct certain small dollar repairs in-house than to transport the vehicles to dealers for warranty repairs considering vehicle downtime and impact on TTC operation. To ensure warranty claims for NRVs are cost-effective, the Department needs to set a claim dollar threshold for NRV warranty claims.

(b) An information system supporting warranty administration

An adequately designed information system to facilitate claim processing

An effective warranty process requires an information system to provide technicians with warranty coverage and expiration information, automatically flag a claim opportunity, prompt technicians to submit the claim, and track claim status. The Department's VWO system has not been developed to provide any of the above. Technicians currently have to resort to making individual telephone calls to vehicle procurement staff to obtain warranty information.

Process should require periodic management reviews of claim submissions and status

(c) Periodic management reviews

To ensure that claim opportunities have been maximized with due regard to cost-effectiveness, periodic management reviews of claim submissions and status should be part of the warranty administrative process.

While the focus of our review was on NRVs, the same warranty administration criteria are likely applicable to the fleet equipment maintained by the Department.

Recommendation:

20. The Board request the Chief Executive Officer to establish a formal warranty management process for non-revenue vehicles and fleet equipment such that warranty claims are maximized.

F.2. Considering Warranty Administration During Procurement

The lack of local dealership led to management forgoing warranty on repair to avoid significant vehicle down time

In our review of vehicle warranty claims, we noted that one armoured truck was modified by a Quebec outfitter which did not have a dealership in Toronto. After considering the extensive downtime to transport the vehicle to Quebec for repair and the limited number of armoured trucks available, garage management staff decided to forgo the warranty repair and conducted the repair in-house, which took a total of 50 labour hours.

While this might be an isolated incident, it underscores the need for considering the ease of warranty administration during the vehicle procurement process.

Recommendation:

21. The Board request the Chief Executive Officer to ensure the non-revenue vehicle procurement process take into account the ease and practicality of warranty administration.

CONCLUSION

CEO has set out clear directions on how to improve TTC

In his Five-Year Corporate Plan 2013-2017, the TTC Chief Executive Officer identified seven strategic objectives and core strategies to "transform the TTC, our performance and our reputation". The seven strategic objectives include specific initiatives to transform employee performance and culture, improve vehicle reliability, and deliver optimal value for money.

21 audit recommendations to help improve vehicle reliability, effectiveness and efficiency, as well as controlling fleet costs

This report presents the results of our review of the management and maintenance of TTC's non-revenue fleet. The report contains 21 recommendations pertaining to management structure, vehicle and equipment acquisition, inventory management, rental vehicles, garage operations, and warranty administration. Our findings regarding non-compliance with scheduled maintenance were raised in previous TTC's internal audit reports issued in 2005 and 2010 respectively. To date these issues continue to exist.

Implementation of the recommendations in this audit report will help improve vehicle reliability, operational effectiveness and efficiency, as well as controlling fleet costs. All of the audit recommendations are in keeping with and supportive of the strategic objectives set out in the TTC's Five-Year Corporate Plan 2013-2017.

APPENDIX 2

Management's Response to the Auditor General's Review of Toronto Transit Commission Bus Maintenance and Shops Department Phase Two: Non-Revenue Fleet and Equipment Management and Maintenance

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
1.	**The Board request the Chief Executive Officer to review the current non-revenue vehicle and equipment fleet management structure with a view to ensuring all key fleet management functions are defined and established with adequate corporate oversight.**	X			TTC will review the existing governance structure. The review will include roles and responsibilities to ensure key fleet management functions are defined and controlled. Areas of focus will include: - Staff resources for NRV Procurement, Maintenance & Leasing - Procedures & cost analysis for procurement & leasing - Commission wide NRV needs assessment - Rationalization of fleet management software and tools - Improved maintenance schedules and enforcement - Procedures & policies for fuel use Target Schedule: - Completion of review & development of implementation plan Q4 2015 - Schedule for improvements to be developed by Q4 of 2015

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
2.	**The Board request the Chief Executive Officer to consider implementing a chargeback process or other measures for non-revenue vehicle and equipment costs to help optimize use of vehicle and equipment resources by user departments and enhance accountability.**	X		Management does not consider a charge back process practical or to be of value added. Non-revenue capital and operating costs are a very small percentage of User Groups' Departmental budgets. Monitoring & control is therefore expected to be difficult. Management proposes an alternative process whereby an annual or semi-annual report is provided to Department Heads to show status of operating and capital budget expenditure for the year. Stricter enforcement of procedures and policies (procurement, rental and maintenance schedules) is expected to also assist with accountability	An annual report will be developed for Department Heads. The report will include: - Total Annual Maintenance Costs By Department - Total Annual Fuel Costs By Department - Total Annual Vehicle Purchases & Vehicle Lease Costs By Department Target Schedule: - Completion of Report Q4 of 2015
3.	**The Board request the Chief Executive Officer to enhance the current review and approval process for non-revenue vehicle and equipment acquisitions such that the needs, purposes, and projected usage of the requested vehicles and equipment can be adequately evaluated.**	X			Management has commenced a Commission wide NRV needs assessment. As part of this review an improved justification and approval process for vehicle procurements and leasing will be developed. Target Schedule: - Completion of Commission wide Non-Revenue Vehicle needs analysis Q4 of 2015 - Needs analysis for Non-Revenue Equipment to be addressed in 2016

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
4.	**The Board request the Chief Executive Officer to conduct detailed reviews of utilization levels of non-revenue vehicles and equipment to identify and minimize underutilized vehicles and equipment.**	X			See response for Recommendation #3
5.	**The Board request the Chief Executive Officer to undertake an assessment of alternatives of meeting non-revenue vehicle and equipment needs prior to finalizing annual vehicle and equipment procurement decisions.**	X			See response for Recommendation #3
6.	**The Board request the Chief Executive Officer to take immediate actions to identify and prioritize the replacement of existing aging non-revenue vehicles incurring significant annual maintenance and repair costs.**	X			Aged vehicles identified in the audit have been replaced in Q4 of 2014. Prioritization of replacements will be further reviewed in the Commission wide NRV needs assessment. See response for Recommendation #3 Vehicle life cycle costing & replacement criteria will also be reviewed and compared to industry standards. Review will be part of the Commission Wide NRV Needs Assessment Reference response for Recommendation #3 Target Schedule: Q4 of 2015

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
7.	**The Board request the Chief Executive Officer to ensure that vehicle life cycle costs are actively monitored and analyzed as part of the non-revenue fleet management functions. A re-assessment of the current non-revenue vehicle replacement criteria should be undertaken to ensure the criteria are effective in preventing excessive maintenance and repair costs.**	X			Re-assessment of NRV replacement criteria will be included in the Commission wide NRV needs assessment. See response for Recommendation #3 Tools to assist monitoring life cycle costs will be also be reviewed in Q4 of 2015. Improvements identified during the review to be scheduled accordingly based on commitments already established in the Information Technology Services Department Reference response to Recommendation #3 Target Schedule Q4 of 2015

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
8.	**The Board request the Chief Executive Officer to review inventory management of non-revenue vehicles and fleet equipment to ensure the inventory is accurate, complete, and up-to-date. Steps to be taken should include but not be limited to:**				
	a. Assigning a staff person responsible for the oversight and management of inventory;	X			See response for Recommendation #1. Governance structure to be reviewed with possible staff reorganization to ensure oversight and management of vehicle inventory
	b. Establishing clear policy and criteria defining the type and value of assets to be tracked;	X			Policies to be reviewed as part of the Commission wide NRV needs assessment. See response for Recommendation #3
	c. Ensuring records kept in the Vehicle Work Order (VWO) system meet annual asset reporting requirements; and	X			Similar response to Recommendation #7 for items C and D. Tools to assist monitoring life cycle costs will be also be reviewed in Q4 of 2015. Improvements identified during the review to be scheduled accordingly based on commitments already established in the Information Technology Services Department
	d. Expanding the current criteria for tracking fleet equipment in VWO to establish a centralized and complete fleet equipment database.				Target Schedules – Reference responses for Recommendation #1, 3 and 7

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
9.	**The Board request the Chief Executive Officer to review the existing list of long-term rentals of non-revenue vehicles to determine whether these long-term rentals are justified and cost-effective.**	X			See response to Recommendation #3
10.	**The Board request the Chief Executive Officer to enhance current rental vehicle review and approval process by incorporating a corporate-wide review of rental vehicle needs, available vehicle resources, and opportunities for shared usage.**	X			See response to Recommendation #3
11.	**The Board request the Chief Executive Officer to review rental vehicle insurance costs provided by rental companies. A determination should be made as to whether self insurance coverage is less costly.**	X			Staff will review and conduct a cost benefit analysis of vehicle insurance provided by rental companies vs self-insurance coverage Target completion date – Q4 of 2015

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
12.	**The Board request the Chief Executive Officer to work collaboratively with the Director of the City of Toronto Fleet Services Division to determine the feasibility of issuing a joint Request for Quotation (RFQ) in future acquisition of rental vehicles.**	X			TTC Management is already on the City Of Toronto Shared Services Committee. Review of the practicality of issuing a joint RFQ is already in discussion and is ongoing Target Schedule - Ongoing
13.	**The Board request the Chief Executive Officer to take steps to improve non-revenue vehicle user compliance with scheduled maintenance, including steps to address user concerns.**	X			Maintenance staff will develop and communicate tighter maintenance schedules. Monthly reports will be developed for Department Heads to enforce compliance Improved maintenance schedules will be developed with the implementation of new IT tools to collect accurate mileage. Target Schedule Q4 of 2015
14.	**The Board request the Chief Executive Officer to ensure accurate and up-to-date non-revenue vehicle kilometrage data are obtained to facilitate effective preventive maintenance scheduling.**	X			As identified in the Audit Report, ITS is currently designing and implementing tools to ensure accurate collection of vehicle mileage. Based on data collected, improved maintenance schedules will be developed. Target Schedule - Rollout of new tools to the NRV fleet is scheduled for 2016

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
15.	**The Board request the Chief Executive Officer to improve the effectiveness of the Vehicle Work Order system for non-revenue fleet management. Steps to be taken should include but not be limited to:** **a. Addressing existing preventive maintenance scheduling issues in the system;** **b. Ensuring adequate system access is provided to garage management staff;** **c. Re-assessing the practicality of existing data entry controls;** **d. Ensuring accuracy of system generated management reports; and** **e. Expanding the existing system reports to include reports on fleet management key performance indicators.**	X			Management will conduct a gap analysis to review the tools and training available to schedule and track maintenance activities. The gap analysis and improvement plan will be developed by Q4 of 2015. IFS upgrades identified in Phase 1 of this audit will be applicable to recommendations identified in this Phase 2 audit. These upgrades identified for Phase 1 included: - Improved user interface for maintenance and materials staff - Improved scheduling features - Improved maintenance and material inventory control& tracking features - Improved report features - Improved warranty administration process Rollout of these upgrades is currently scheduled for 2017. The gap analysis will help identified other areas of concerns.

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
16.	**The Board request the Chief Executive Officer to develop and implement non-revenue fleet quality assurance processes to systematically monitor and detect repair quality issues.**	X			A Vehicle Reliability & Quality Assurance Group was implemented in 2014. In addition, a Reliability Centered Maintenance program was introduced in Q4 of 2014 for City Garages. Development of QA and RCM programs for NRV will be assessed in 2016. Rollout of new processes to coincide with IFS upgrades and the gap analysis identified in Recommendation #15
17.	**The Board request the Chief Executive Officer to ensure adequate controls are in place at TTC garages to deter and detect ordering of non-revenue vehicle and equipment parts for non-TTC uses. Periodic reviews should be considered by TTC internal audit staff.**	X			Improved material inventory control features are being developed and implemented at City Bus Garages as part of the Phase 1 audit recommendation and as part of the IFS upgrades. Similar controls will be implemented in the NRV sections as part of these upgrades and is currently scheduled for 2017. See response for Recommendation #15 ****** NOTE: Resources identified in the 2015-2024 Budget Submission to assist with new material return & warranty admin processes were not approved. Management is reviewing alternative options & solutions. Staff will update the Auditor General's Office upon resolution of this matter***

Rec No.	Recommendations	Agree (X)	Disagree (X)	Management Comments: *(Comments are required only for recommendations where there is disagreement.)*	Action Plan/Time Frame
18.	**The Board request the Chief Executive Officer to take steps to shorten garage service turnaround time for non-revenue fleet by addressing issues pertaining to garage capacity, availability of technicians, parts availability and maintenance scheduling.**	X			Improvements to IT tools to enhance maintenance scheduling will assist to shorten turnaround times. See response for Recommendation #15
19.	**The Board request the Chief Executive Officer to shorten the period of time readying a new non-revenue vehicle for operation. Steps to be taken should include but not be limited to setting a targeted time frame and improving coordination and communication among various TTC departments.**	X			Similar to response #18. See response for Recommendation #15
20.	**The Board request the Chief Executive Officer to establish a formal warranty management process for non-revenue vehicles and fleet equipment such that warranty claims are maximized.**	X			See response to Recommendation #15
21.	**The Board request the Chief Executive Officer to ensure the non-revenue vehicle procurement process take into account the ease and practicality of warranty administration.**	X			Staff will review contract specifications on all future orders to improve on practicality of warranty administration. Included in this review will be the need for provisions to specify local suppliers and service centers