Winnipeg

Audit of Emergency Mechanical Services Branch October 2004

Audit Department

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Executive summary

In June 2003, the Resource Manager of the Winnipeg Fire Paramedic Service (WFPS) asked the Audit Department to conduct a performance audit of the Emergency Mechanical Services Branch (EMSB). The objectives of the audit were to review EMSB's mandate and resources, assess its compliance with the relevant standards and to make recommendations to improve the Branch's efficiency and effectiveness.

EMSB plays a vital role in support of the WFPS mission "*to serve and safeguard our community".* The principal functions of EMSB include the preventative and corrective maintenance of the department's fire apparatus and the performance of mandatory inspections. When the Fire and Ambulance Departments amalgamated in 2000, the EMSB was responsible for the maintenance and repair of both heavy and light fleet. However, in June 2002, the Fleet Management Agency (FMA) of the Public Works Department assumed the responsibility for light fleet, while EMSB concentrated its efforts on the maintenance and repair of the heavy fleet apparatus and related equipment.

We were unable to provide a comprehensive assessment of EMSB's current performance, due to the lack of established performance standards and performance information. However, an independent consultant, who we hired to assist with the audit, reported that the Branch is in compliance with the applicable recognized standards for apparatus safety and maintenance.

With regards to the efficiency and effectiveness of EMSB's operations, we identified several areas of weaknesses, some of which could potentially be addressed through the establishment of a strategic partnership between EMSB and FMA. One significant weakness related to the lack of an automated shop maintenance system. Currently, it is difficult for the Branch to assess the effectiveness of its preventative maintenance programs and to track vital information such as the maintenance frequency, operating cost and age for each major piece of apparatus. The availability of this type of information is critical for the department's asset management strategy. Such information is necessary to make the appropriate replacement decisions. We recommended that WFPS should expedite the acquisition of an automated shop maintenance system. FMA should be consulted to determine whether their system would be suitable for the Branch's purposes.

EMSB's hours of operation also posed a another area of major concern. In view of the fact that WFPS operates on a 24-hour a day, 7 day a week basis, a critical support function such as EMSB should be available to support that service delivery as needed. Our review revealed that there have been occasions when the Operations Division did not have a sufficient number of apparatus on the weekends. A partnership with FMA has the potential to alleviate this problem, as FMA operates two repair facilities on a 24-hour a day basis.

The communication processes between EMSB and the rest of the department, specifically senior management and the station personnel, have to be improved. The lack of information flowing between these groups has impacted the efficiency of the Branch. In an emergency response service such as WFPS, adequate and timely information is critical to achieving its objectives. EMSB plays a vital, behind the scenes role, where the information they have or can provide may not only save money, but could assist the Operations Division in potentially saving lives.

We believe that the implementation of our recommendations will not only improve the operations of EMSB, but will also have a significant impact on the overall department.

Background

In June 2003, the Resource Manager of the Winnipeg Fire Paramedic Service (WFPS) asked the Audit Department to conduct a performance audit of the Emergency Mechanical Services Branch (EMSB). The audit would focus primarily on the heavy fleet operations and the areas of concern that were highlighted at that time included

- appropriateness of budget for level of maintenance required;
- staff complement and workload;
- appropriateness of outsourcing of repairs; and
- need for an automated repair tracking system.

Audit objectives

The objectives of the audit of EMSB were:

- To review the mandate, organization and resources of EMSB.
- To assess compliance with current policies, procedures and external standards.
- To make recommendations to improve the efficiency and effectiveness of operations and provide optimal service to WFPS.

Audit scope and approach

The audit has been conducted in accordance with generally accepted auditing standards. In preparing our report, we have relied upon extensive interviews with EMSB management, staff and others, and information, data, and other documentary evidence provided to us. The conclusions reached in this report are based upon information available at the time. In the event that significant information is brought to our attention after completion of the audit, we reserve the right to amend the conclusions reached.

We approached our audit in three phases:

- Preliminary survey phase
- Fieldwork phase
- Reporting phase

In conducting our audit, we employed a variety of methods:

- We conducted interviews and discussions with the Deputy Chief Support Services, Director and staff of EMSB, Deputy Chief Operations, Platoon Chiefs and a sample of District Chiefs, Captains and Lieutenants.

- We determined the most significant risks that could inhibit or prevent the achievement of EMSB's business objectives and identified and evaluated the controls that were in place to mitigate these risks.

- We reviewed and analyzed relevant background information and documentation, operating information and processes, policies and procedures, and independent consulting reports.

- We observed the day-to-day operations and developed a flowchart of EMSB's operations.

- We hired an independent consultant from the Municipal Consulting Section of CGI Insurance Business Services, to evaluate EMSB's compliance with relevant safety and maintenance standards and to gather benchmarking information from similar jurisdictions.

- We communicated the results of our audit on an on-going basis and presented a formal report to the WFPS Senior Management, the Chief Administrative Officer, Audit Committee and Council at the end of the audit.

Audit conclusions

Based on the audit work completed, we concluded that

- The mandate and organization of EMSB are relatively clear, but sufficient information is not available to assess the adequacy of EMSB's financial and human resources.
- EMSB is in compliance with the relevant safety and maintenance standards.
- Improvement in the communication processes between EMSB and the rest of the department and the establishment of a strategic partnership between EMSB and FMA would enhance the efficiency and effectiveness of the Branch's operations.

Acknowledgements

The Audit Department wants to extend its appreciation to the many individuals who participated in the audit and, in particular, the Deputy Chief Support Services and the Director and staff of EMSB. Their comments and insights assisted us in completing our analysis and provided the foundation for many of the report recommendations.

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October 19, 2004
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Introduction to Emergency Mechanical Services Branch

EMSB plays a vital role in support of the WFPS mission "*to serve and safeguard our community*".

When the Fire and Ambulance Departments amalgamated in 2000, EMSB was responsible for the maintenance and repair of both heavy and light fleet. However, in June 2002, the Fleet Management Agency (FMA) of the Public Works Department assumed the responsibility for light fleet, while EMSB concentrated its efforts on the maintenance and repair of the heavy fleet apparatus and related equipment.

EMSB's responsibilities include the following:

- preventative and corrective maintenance,
- performance of Manitoba Department of Transportation and Government Services vehicle inspections,
- oversight of warranty work,
- subcontracting of maintenance work where appropriate, and
- inspections of newly acquired vehicles.

Business objectives

Clearly articulated objectives provide direction to an organization.

Although there were no established objectives for EMSB, we used information that we obtained in the preliminary phase of our review, and developed the following key business objectives:

- To ensure the maintenance of heavy fleet apparatus is fiscally efficient and consistent with generally accepted fire industry standards.
- To support and foster interdepartmental cooperation to ensure optimal service delivery.
- To develop and implement new maintenance and repair techniques.

Organizational structure and complement

EMSB is the responsibility of the Deputy Chief Support Services. The authorized complement for the Branch for 2003 is 10 full-time permanent positions. See Appendix 1 for Organization Chart.

Emergency Mechanical Services Branch Positions

Position	Number
Director of EMSB	1
Supervisor	1
Mechanic	6
Utility worker	1
Administration Clerk	1

Director of EMSB

The director manages the overall operations of the Branch to ensure that optimum service is maintained within the approved operating budget.

Supervisor
The supervisor manages the day-to-day operations, which includes supervising staff and scheduling. The supervisor ensures all heavy fleet vehicles and equipment are properly maintained and repaired in accordance with established standards.

Mechanic
The mechanic inspects, maintains and repairs all fire apparatus and some fire equipment in compliance with the regulations and general orders of WFPS and the relevant external standards.

Utility Worker
The utility worker performs general maintenance of WFPS equipment and picks up and delivers department vehicles, parts and supplies. This position was vacant for several months during 2003 and was filled in April 2004.

Administration Clerk
The administration clerk provides administrative support to EMSB as well as to Light Fleet and the Safety Officer.

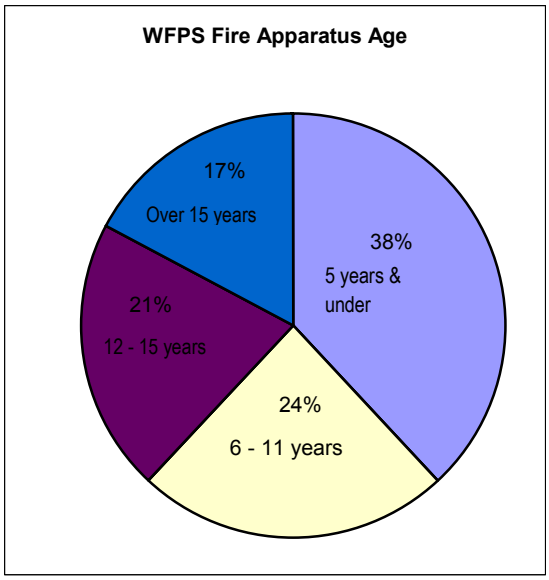
WFPS heavy fleet

EMSB performs preventative and corrective maintenance on a total of 83 apparatus in WFPS heavy fleet. The range in age of the fleet is very broad, with apparatus ranging in age from 3 years for the Quints to 25 years for a rescue unit purchased in 1979. Currently, 21% of the department's front line heavy fleet apparatus is between 12-15 years while 17% is over 15 years. WFPS has established life cycles of 20 years for pumpers and rescue units and 25 years for aerial ladders. In its effort to reduce the age of the heavy fleet, and accordingly reduce the maintenance costs, the department has acquired some newer apparatus over the last three years.

WFPS Heavy Fleet			
Apparatus	**In Service**	**Reserve**	**Support**
Pumpers	27	7	1
Rapid response pumpers	3		
Rescues	6	3	
Aerials	3	1	
Quints	6	1	
M.I.R.V.'s	2		
Haz-mat	2		
Tanker	1		
Buses	3		
Boats	2		
Trailers	3		
Tractors	4		
Miscellaneous	8		
Total	**70**	**12**	**1**

Description of EMSB's operations

The challenge that faces EMSB, is to adequately maintain the department's heavy fleet within the approved budget, and to ensure that the vehicles are safe, reliable and always available for the Operations Division. The primary means utilized by EMSB to ensure that the fleet is maintained in an acceptable readiness condition, are its preventative maintenance programs, which are structured around a series of inspections. These include the Schedule A Servicing, Schedule B Inspection and



WFPS Apparatus			
Year purchased	Aerials/Quints	Pumpers	Rescues
1979			1
1980		3	
1982		2	
1984	1		
1986		1	
1988	1	1	2
1987	1		
1989		3	
1990		5	
1992			1
1993	1		
1994		7	3
1997			1
1998		5	
2000	6		
2001	1	8	1
Total	**11**	**35**	**9**

Manitoba Department of Transportation and Government Services (DOT) Vehicle Inspection.

Based on oil analyses conducted by EMSB as well as best practice, the Schedule A inspection is performed after an apparatus run of 100 hours. The station personnel is required to notify EMSB when 100 hours of usage is approaching, so the apparatus can be scheduled in for servicing. During this inspection, the fluid compartments and grease points are checked and serviced as required. A visual check of all emergency and non-emergency equipment is also performed.

The Schedule B inspection is an equipment performance check, which is done annually. This inspection, which is based on the manufacturers' recommendations and best practice, involves a thorough examination of the apparatus, including the engine, transmission, water tank, pump, foam system and cab and body condition. The DOT vehicle inspection is a mandatory, annual inspection, which focuses on all safety related areas, such as brakes, tires, steering and suspension. For scheduling purposes, the DOT vehicle inspection is often combined with the Schedule B inspection.

In addition to the scheduled inspections, EMSB also conducts repairs as reported by the station personnel or as discovered by the EMSB staff. Depending on the severity of the problem, these repairs may be done immediately or may be delayed until the next scheduled inspection.

EMSB performs its vehicle and equipment maintenance activities at 2546 McPhillips Street, in facilities that are equipped with drive through bays, hoists and cranes. All the mechanics possess the Emergency Vehicle Technician (EVT) Certification and they attend various training programs to upgrade their skills, some of which are organized by the manufacturers. They have to be knowledgeable of the various safety and maintenance standards and regulations that apply to the maintenance of fire apparatus. The staff also relies on having the appropriate tools, equipment and manuals to perform their assigned tasks effectively and efficiently.

Report on performance

As WFPS provides an emergency response service to the public, it is critical that the department is always equipped with the required resources to carry out its mandate effectively and efficiently. EMSB's operations will therefore significantly impact the department's service delivery.

The Branch is an 8-hour a day, Monday to Friday operation and during this period, the staff is not only required to perform the regularly scheduled preventative maintenance and inspections but also to quickly respond to any priority repair requests.

Current performance results

An integral part of our audit is the assessment of the performance of the Emergency Mechanical Services Branch. However, our ability to provide an objective assessment is dependent on the availability of reliable and relevant performance information. Due, in part, to the lack of appropriate information systems, we are unable to provide a comprehensive evaluation of EMSB's performance. This absence of adequate performance related information also hinders the WFPS' ability to determine the effectiveness or efficiency of the Branch.

Effectiveness performance measures
• Scheduled repair rate • Rework rate • Preventative maintenance compliance • Average vehicle availability

Notwithstanding, we have identified certain performance indicators, which we believe are critical in assessing whether EMSB has achieved its mandate. Although no information was available for the majority of these performance indicators, we have highlighted them because they are very important measures, which will enable WFPS' senior management to assess EMSB's performance in the future.

Effectiveness of EMSB's performance

Efficiency performance measures
• Budget variances • Staff productivity and workload levels • Repair turnaround time

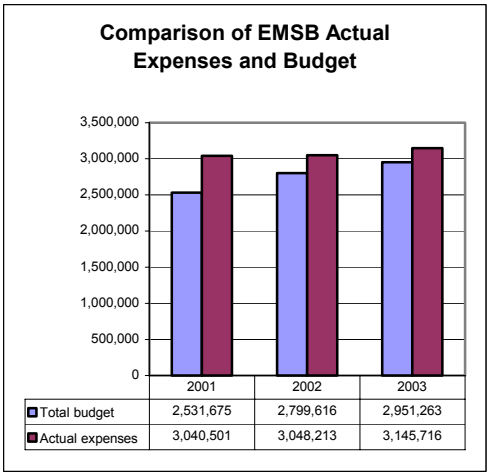
The Director of EMSB has emphasized that the main focus of the Branch is to implement a structured preventative maintenance program, which would ensure the availability of a reliable fleet of vehicles. Accordingly, the effectiveness of EMSB's preventative maintenance programs should be measured by comparing the percentages of scheduled maintenance work and unscheduled repairs. It would also be valuable to determine the proportion of repairs that had to be repeated within a specified time period. This information is not currently tracked but is essential to enable EMSB to determine whether the Branch needs to

revise the frequency and content of its preventative maintenance programs.

Another effectiveness measure is the percentage of preventative maintenance services that were performed during a specified period compared to the total that was expected for that period. We reviewed EMSB's vehicle inspection schedules for the 12 months in 2003 and noted that all the Schedule B and DOT inspections were completed during the year.

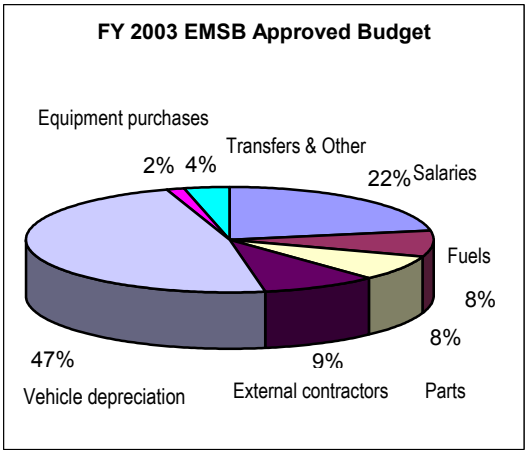
2003 Schedule A Inspections		
Apparatus	**Actual**	**Expected**
Pumpers	131	186
Rapid response pumpers	6	6
Rescues	35	54
Aerials/Quints	28	51

However, there is room for improvement with respect to the Schedule A inspections. In order to assess the percentage compliance with regards to these inspections, we obtained the Schedule A logs for all the apparatus. Based on the hours recorded at the beginning and end of 2003 for each apparatus unit, we estimated the total hours of usage for the year. We then determined the expected number of Schedule A inspections and compared this number with the actual number of inspections that were performed. Our results indicate that the percentage of Schedule A inspections performed on pumpers, rescues and aerials were 70%, 65% and 55% respectively. This compliance rate needs to be improved, as the impact of not performing timely inspections can range from increased repair costs and the associated reduced availability to decreasing the lifespan of a fleet vehicle. We would have expected EMSB to track such information and to take the necessary steps to ensure that the required inspections were conducted.



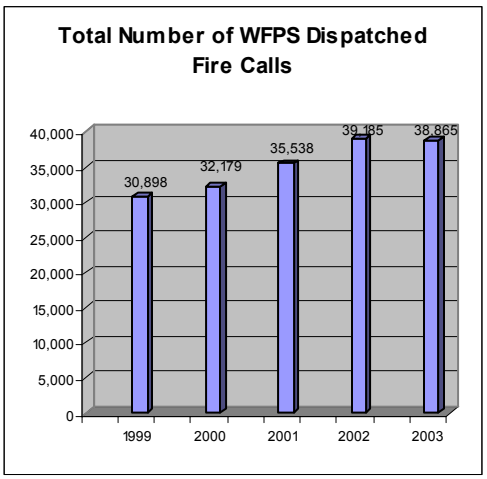
Efficiency of EMSB's performance

An assessment of the efficiency of EMSB's performance has to take into consideration the department's asset management strategy. Decisions relating to repairs versus replacement of the apparatus would affect the level of costs incurred to maintain the vehicles. However, in order to make sound replacement decisions, it is important to have accurate information on maintenance frequency, operating cost and age for each major piece of apparatus. EMSB is currently unable to provide this information due to the lack of an appropriate shop maintenance system, and we therefore had to rely on very limited data to conduct this assessment.



From a financial perspective, the results indicate that EMSB exceeded its budget for 2001 to 2003. This information could be misleading without recognition of the fact that a substantial portion (51%) of EMSB's budget relates to an allocation for depreciation and transfers,

areas that are outside EMSB's control. It is noteworthy, however, that the percentage variance between the budget and actual expenses decreased from 20% to 8.8% and 6.6% over the 3-year period. This decrease could be attributed to various factors, including a more realistic budget being established or EMSB's ability to maintain its operations at a reasonable level of expenditure.



We also noted that the number of dispatched fire calls increased over the years from 1999 to 2002, with a slight decrease in 2003. It is reasonable to expect that the level of activity of the department's vehicles will impact EMSB's operations. The potential for mechanical breakdowns would be increased with additional usage, resulting in the need to obtain more parts due to the associated wear and tear on the older apparatus. Although a review of the composition and age of the heavy fleet was outside the scope of our audit, we must emphasize that these factors will undoubtedly have a significant impact on EMSB's operations.

An analysis of the automotive parts expenses reveal that the expenses in 2002 increased by 15%, while there was a 2% decrease in 2003 from the previous year. When we compared the changes in the number of dispatched fire calls for this period, we noted that the calls in 2002 increased by 10% and decreased by approximately 1% in 2003 from the prior year. These results are in line with our expectations.

Another critical efficiency measure relates to the staff productivity and workload levels. This information was not available during our review, but it is essential in order to determine the appropriateness of the staffing levels. In addition, standards relating to the turnaround times for the scheduled preventative maintenance and repair work would provide an objective means of assessing whether EMSB's performance is acceptable.

Summary of performance results

We have not been able to provide a full report on the performance of EMSB because of the lack of established performance standards and the unavailability of performance information. Without performance indicators related to areas such as the timeliness and quality of EMSB's service, the staff productivity and efficiency, we could not reach a definite conclusion on EMSB's current performance.

Risk assessment

We used a risk-based approach to perform this audit. This approach involved looking at all business processes of EMSB, understanding the environment in which they operate, and documenting potential risks that could impact the delivery of the Branch's services.

Risk is defined as any circumstance or event that will have an impact on the achievement of business objectives. Accordingly, risk can be either a threat or an opportunity. The failure to seize an opportunity can negatively impact the achievement of business objectives.

In conjunction with EMSB's management, we developed a listing of potential risks and documented the controls used to mitigate each risk. Management then performed a self-assessment on the functioning of the current state of controls. We also conducted a Risk Management workshop with the staff to obtain their perspective of the risks that could prevent the Branch from achieving its objectives.

We reviewed the information and developed a Preliminary Risk Profile, which was used to focus our resources on specific areas for the audit.

Risk profile

The Risk Profile is a map that indicates the most significant risks facing the EMSB operation at this point in time. We have used *The City of Winnipeg Corporate Risk Framework* to categorize risks by source as shown on the next page. However, the Risk Profile has value beyond the conduct of the audit. Management can use the Risk Profile to identify where their resources should be focused to effectively manage the key risks associated with the EMSB operation.

The Risk Profile of EMSB will change due to changes in the operating environment or as management initiates changes in processes or policies that support EMSB's service. Implementation of the audit recommendations will also change the risk profile as risk management practices are strengthened. The recommendations contained in the report are intended to provide management with actions that will assist in the mitigation of the significant risks or control gaps identified during the audit.

EMSB Risk Profile

Context Risks These risks relate to internal and external factors that impact the environment in which the organization operates or business processes are conducted.			
External Environment	**Organizational Culture**	**Compliance**	**Business Process**
Mutually beneficial partnership between EMSB and Fleet Management Agency	Inadequate working relationships between EMSB and overall department	Non-compliance with City of Winnipeg purchasing policy	Inefficient work flow - manual work order process - lack of inventory management system - failure to perform maintenance in a timely manner
Limited availability of specialist suppliers and contractors	Unclear and/or potential non-adherence to lines of authority	Non-compliance with safety, maintenance and environmental standards	Inadequate quality control system
	Lack of performance targets		High level of dependency on third parties - contractors - suppliers - manufacturers

Resource Risks These risks relate to the resources used by the organization to accomplish its objectives.			
Human Resources	**Financial Resources**	**Information Resources**	**Physical Assets**
Insufficient staff to manage workload	Insufficient capital/operational funding	Lack of automated shop maintenance system	Lack of up-to-date tools and diagnostic equipment
Lack of succession plan		Lack of performance measurement system	Inadequate building facilities
Inadequately trained staff			Inadequate servicing of EMSB's tools, equipment and facilities
Loss of experienced staff due to retirement or injury/disability			

Legend

- Critical risk: CAO involvement essential, inform committee of Council.
- High risk: Senior management involvement essential, inform CAO.
- Moderate risk: management mitigation & monitoring required, inform senior management.
- Low risk: manage by routine procedures.

Observations and recommendations

Our observations and recommendations are categorized by area of risk. It is important to view all recommendations within the context of both current operations and future challenges.

Strategic partnership with FMA

1. WFPS should explore the opportunity to develop a partnership between EMSB and FMA.

In light of the city's commitment to provide quality services to its citizens at an affordable cost and to minimize duplication, we believe that a partnership with FMA would be a step in accomplishing this goal. FMA has systems and processes in place that could be beneficial to EMSB's operations. Furthermore, FMA is currently performing several functions for the WFPS, including the maintenance of its light fleet and the drafting of the specifications for new fire apparatus.

If WFPS is satisfied with the services that are currently provided, it would be prudent for the department to explore additional areas in which FMA could assist the department. In the short-term, WFPS could develop a partnership with FMA, allowing access to FMA's skills and resources that are already available. However, in order to ensure that the arrangement will be mutually beneficial on a long-term basis, WFPS should conduct a more detailed analysis to assess the strengths and weaknesses of both parties, as well as those areas in which they are efficient and effective.

Although a partnership arrangement will provide an opportunity for the WFPS to achieve its objectives, consideration should also be given to the associated risks. WFPS senior management should therefore clearly define the services that would be required as well as the service expectations.

We will highlight the potential areas that a partnership would be beneficial in the appropriate sections of the report.

Recommendation 1

We recommend that WFPS senior management should seek to develop a partnership between EMSB and FMA.

The department should identify the skills and resources in FMA that could be utilized to enhance EMSB's operations.

Management response

Preliminary discussions seem to suggest that the best arrangement would be to look for opportunities to engage FMA in a consultative process, adopt their fleet management systems and use their acquisition expertise.

If WFPS could be assured of continued autonomy at EMSB while adopting the business practices of the FMA, all parties might profit from the exercise.

Compliance with safety and maintenance standards

In an emergency response service, not only the safety of the public, but also the staff personnel, is a critical consideration. Neither the lives of the citizens who are being served, nor the operators of the emergency response vehicles should be endangered during an emergency. Accordingly, it is to be expected that there will be various regulatory authorities to ensure that appropriate standards are in place to govern such operations. The primary authorities that have developed these standards and regulations include

- Manitoba Department of Transportation and Government Services;
- National Fire Protection Association; and
- Underwriters' Laboratories of Canada.

Benefits of Maintenance Programs

- **reduce risk of injuries**
- **minimize operation interruptions**
- **reduce equipment downtime**
- **improve safety performance**
- **safer workplace**
- **time and cost savings**

The Education Safety Association of Ontario Conference 2002 – Painting the Road to Safety

The impact from failing to adhere to the standards could range from financial liability as a result of legal action to loss of lives. The requirement to comply with the standards is applicable not only during the acquisition of new apparatus, but also during its on-going maintenance. Considering the potential effects of using non-compliant apparatus, it is essential that personnel with the appropriate knowledge and experience are involved in the early stages of the decision-making process regarding apparatus acquisition. A very significant phase of this process relates to the apparatus design and specification. During this phase, the key concerns will not only be safety issues but also the cost-effectiveness and critical maintenance considerations.

In addition to having the appropriate team involved in the acquisition process, it is also important to have an

adequate quality assurance system at the maintenance facilities to ensure continued compliance with the safety and maintenance standards.

1. EMSB is in compliance with all applicable recognized safety and maintenance standards.

Our external consultant visited EMSB's facilities and conducted an audit to determine whether the Branch was in compliance with the relevant standards. Appendix 2 provides a listing of the standards used in the analysis. The consultant interviewed EMSB's staff, conducted a detailed examination of the records for a typical pumper and quint, checked other vehicle records for completeness and reviewed the documentation relating to the testing of aerial devices.

"We found that the actual areas overseen by the Emergency Mechanical Services Branch (EMSB) were well organized, timely in work carried out and meeting all applicable recognized standards."

Michael McKenna & Pete Rose, CGI, Insurance Business Services Municipal Consulting Section

The consultant's report indicated that EMSB complied with all applicable recognized standards. However, in addition to the compliance aspect of the audit, the consultant also examined other areas of EMSB's operations and highlighted various concerns that could affect EMSB and the overall operations of WFPS. We will address these concerns later in the relevant sections of the report.

2. EMSB should be actively involved in the apparatus specification and acceptance processes.

Currently, the Equipment Specification Technologist in FMA is responsible for the specification and acceptance of new fire apparatus. EMSB's primary role with respect to the acquisition of new apparatus consists of inspecting the apparatus to ensure that it satisfies all the safety regulations. This occurs after FMA accepts the apparatus and delivers it to the Training Academy.

Our review found that from 1998 to most of 2003, EMSB had no input in the specifications process for the acquisition of new apparatus. Although EMSB was consulted on some issues during the last few months of 2003 for some acquisitions, we observed that this has not been consistent, as the Branch had no input in drafting the specifications for some recent acquisitions. It is worthwhile to note that when we interviewed the staff from the Operations Division, there were some who believed that EMSB was responsible for the apparatus specifications process. They mentioned that improvement was needed in this area, as there were problems with some of the recent acquisitions.

"Even the smallest decisions that we make during this planning process can have significant impacts down the line. Our goal is to buy apparatus that will provide maximum service while minimizing downtime and maintenance costs."

Deputy Chief Steve Striessguth, Vancouver Fire Department, Washington

This issue was also addressed in the consultant's report, which highlighted the fact that two recently accepted rapid response units required modifications because they did not satisfy either the lighting or electrical requirements. The consultant recommended that apparatus specification and acceptance should be under EMSB's control.

We are not suggesting that these functions are being done inadequately by FMA. However, we believe it would be more appropriate for EMSB to be actively involved in the process based on the staff's knowledge and experience in dealing with fire apparatus. Consideration should be given to both the operational needs and how to control the on-going maintenance costs.

Our survey information indicates that it is best practice for the fire maintenance divisions to be responsible for apparatus specification and acceptance. The functions performed, include writing the specifications to the various standards, conducting pre-construction meetings at the manufacturer's facility, performing various inspections during the production process, and conducting the final inspection and acceptance of the new apparatus.

Recommendation 2

We recommend that EMSB should have greater involvement in the apparatus specification process.

EMSB should be responsible for the acceptance of the new apparatus since the staff has the technical expertise and experience with fire apparatus.

Management response

WFPS intends to establish an "Apparatus Committee" and to that end has drafted specific Terms of Reference detailing membership, roles, responsibilities and process. Reporting to the Deputy Chief of Support Services, the Committee will meet to assemble, input and draft specifications well in advance of new fire apparatus purchases being contemplated.

The membership will include, WFPS Manager of Finance, Deputy Chief of Support Services, a member of the Training Division, a Mechanic from EMSB, the Manager of Heavy Fleet, a representative Spec Writer from Fleet Management Agency and a front line Fire Officer from Operations, together with other specialists as may be required from time to time.

3. EMSB needs to formalize its quality assurance process.

In any organization, quality assurance is essential in ensuring that its outputs meet the established standards. This is not only important from the perspective of being compliant with mandatory external standards, but also that the organization's customers will be satisfied with the products and services being offered. Since EMSB functions as an internal service provider to WFPS, we would expect that appropriate systems and procedures would be implemented to monitor the daily operations and to ensure that the Branch's services are satisfactory.

Our review disclosed that the Shop Supervisor has overall responsibility for reviewing the mechanics' work and the Director sometimes conducts random checks on the shop floor. The nature and severity of the task often determine which job is actually inspected. This approach appears to be an acceptable practice in Fire Services Mechanical Divisions, especially in light of the fact that the workload can be very high and the mechanics are certified Emergency Vehicle Technicians.

We found from the interviews with the Operations staff that the quality of the work performed by the EMSB staff was rated very highly. This could be attributed to a combination of the staff's experience as well as the effectiveness of the quality control process.

One weakness that we observed, however, relates to the fact that there is no documentary evidence of the monitoring activity that is performed by either the Supervisor or Director. We believe that in light of the critical nature of the work and the associated risks, the process should be formalized by documenting the actual review process. The Director and Supervisor should record those jobs that were reviewed and note the findings.

Recommendation 3

We recommend that EMSB formalize its quality assurance process by documenting the actual jobs that were reviewed by the Director and Supervisor. The documentation should include any deficiencies found and the corrective action taken.

The Supervisor should sign off the work order form as evidence of satisfactory completion of those jobs.

Management response

WFPS management agrees with the need for a proper system of Quality Assurance and is committed to working with the recently appointed Supervisor to design and implement best practice. The Service's Quality Improvement Branch will be asked to review current practice and develop such standards as may be required. The Service will also provide such staff training as may be necessary.

Communications

Effective communication processes support the achievement of an organization's objectives by

- providing the staff with clear guidelines as to what is expected of them so they will perform effectively and efficiently;
- ensuring management obtains the required information to make appropriate decisions in a timely manner; and
- coordinating the activities of the various divisions within the organization towards the common goal.

"Communication processes support the organization's values and the achievement of its objectives."

Canadian Institute of Chartered Accountants, Criteria of Control Model (CoCo)

1. The objectives for the Branch should be formalized and communicated.

Clear objectives are essential to providing overall direction to an organization's staff. These objectives should be effectively communicated so the staff will understand how their role and performance will contribute to the overall achievement of the organization's goals.

Based on our discussions with EMSB management and WFPS senior management, and our review of the department's business plan, we determined that specific goals or long-term objectives have not been developed for the Branch. Considering the vital support role that EMSB plays in the department, we believe that this lack of specific objectives for the Branch is a shortcoming that needs to be addressed. Moreover, there is no indication as to the level of performance that is expected.

During the course of our audit, we evaluated the significant components of EMSB's functions. Accordingly, we developed the following objectives as a starting point for WFPS senior management to build upon:

- To ensure the maintenance of heavy fleet apparatus is fiscally efficient and consistent with generally accepted fire industry standards.
- To support and foster interdepartmental cooperation to ensure optimal service delivery.
- To develop and implement new maintenance and repair techniques.

Recommendation 4

WFPS senior management should establish clear goals and objectives for EMSB, as well as supporting performance targets.

Management response

Senior Management is currently seeking input from the FMA and from the EMSB Director of Heavy Fleet as to what such goals and objectives might reasonably look like. Once the objectives have been determined, the Quality Improvement Branch will establish a system for measuring the necessary performance targets.

2. WFPS senior management should maintain open and on-going communication with EMSB.

"Sufficient and relevant information should be identified and communicated in a timely manner to enable people to perform their assigned responsibilities."

Canadian Institute of Chartered Accountants, Criteria of Control Model (CoCo)

We determined throughout the course of our audit that the communication between WFPS senior management and EMSB's management has been inadequate, and this situation has existed for several years. We observed that information was not readily shared directly with EMSB's management and their involvement in the decision-making process for some maintenance related issues was kept to a minimum. Meetings were not held frequently, and when they did occur, they were often reactive in nature. We also noted that information submitted by EMSB to senior management was not well structured and sometimes it was difficult to understand.

The general perception at EMSB is that the overall department views EMSB's role as being insignificant compared to that of the Operations Division. Consequently, the relationship with senior management would definitely act as a catalyst in reinforcing this belief. This perceived lack of support will certainly have a negative impact on the work environment and cannot be ignored.

Steps have to be taken to provide opportunities for open dialogue and two-way communication between WFPS senior management and EMSB. An atmosphere of mutual

trust will support the flow of information that both groups need to make appropriate and timely decisions. It will also support the staff's commitment and cooperation required for effective performance toward achieving the objectives.

We acknowledge that some action has already been taken to improve the situation. Meetings have been held with the Deputy Chief Support Services and the EMSB staff as well with the Deputy Chief Operations to address issues that affect service performance. This is a step in the right direction and should be formalized to ensure that there is a plan in place to maintain continuous communication.

EMSB's management and staff currently meet on Thursday mornings to share information and provide updates on their work. WFPS senior management could utilize this forum to meet with the staff as required, but regular meetings should also be organized with EMSB's management.

Recommendation 5

We recommend that regular meetings between WFPS senior management and EMSB management be implemented to strengthen the relationship, to improve the communication and to address issues in a timely manner.

Management response

Senior Management agrees. To this end, the Director has been asked to devise the EMSB Budget for 2005 and beyond, and has already met several times with the Deputy Chief of Support Services and the Manager of Finance on this issue. The Director also represents EMSB at quarterly general management meetings attended by the Chief and his staff.

The mechanical staff at EMSB meets as a group every Thursday morning. In the future, the Deputy Chief of Support Services will attend as many of these meetings as possible with the goal of improving morale within the Branch. Employee feedback will be encouraged.

3. Appropriate procedures should be implemented to facilitate effective communication between EMSB and the station personnel.

EMSB's staff expressed concern regarding the timeliness of information received from the operations staff. As we mentioned earlier in the report, the station personnel is required to inform EMSB when the apparatus is approaching 100 hours of usage so that the apparatus can be scheduled in for servicing. However, we determined that the operators of the apparatus have not been consistent in performing this responsibility. In order to further validate this finding, we obtained the Schedule A logs for all apparatus on August 8, 2003 and compared the hours when the last two 100-hour inspections were conducted. We found that the difference ranged from a low of 103 hours to a high of 695 hours.

We understand that the station personnel often delay taking in the apparatus for servicing, as the assigned spare unit may not be as reliable or because they believe that their vehicles will be at EMSB for a long period. However, operating the apparatus for extended periods without servicing will only increase the likelihood of breakdowns. Appropriate procedures should therefore be implemented to ensure that EMSB receives timely communication on the apparatus hours to facilitate scheduling.

Our survey information from other jurisdictions highlights the fact that the manner in which the station personnel communicates with the mechanical division varies. In some instances, the District Chiefs receive the information from the station personnel and then submit it to the mechanical division. In other cases, the operators of the apparatus either e-mail or telephone the division directly. Regardless of the method used, the critical issue is that the mechanical division obtains the information in a timely manner.

The department has already taken steps to address this problem by requiring the District Chiefs to fax the Weekly Apparatus Status form to EMSB. This form provides information on the current hours and odometer readings and last service hours for each unit of apparatus assigned to the respective stations under the District Chief's area of responsibility. Improvements have since been reported by EMSB, as they are better able to identify and schedule the appropriate apparatus for service. Moreover, the Branch also reported that they have been able to accomplish more maintenance due to the cooperation and support of the Operations staff.

Recommendation 6

We recommend that the current process whereby the District Chiefs are required to fax the apparatus information to EMSB be continued. EMSB should monitor the process to identify any areas for improvement and report these to the relevant personnel.

Management response

Currently, the Operational Platoon Chiefs meet regularly amongst themselves. In a further effort to build communication, the Directors of Training, Fire Prevention and EMSB are being asked to participate in such meetings to identify issues of common concern.

The Director of EMSB has also contributed an article to the Service's newsletter, describing the aims of the Branch, detailing EMSB practices for Operational personnel and seeking their support for preventative maintenance practices.

From the station personnel's perspective, the concern expressed was two-fold. Firstly, they are not informed of the reason for taking the apparatus into EMSB and secondly, there is no communication regarding the status of the apparatus when it is taken in for maintenance and repairs. This lack of information frequently causes frustration and conflict. Procedures are also needed in this area to facilitate the communication process and to enhance the working relationships.

In an effort to address this problem, a whiteboard with information on the status of any apparatus at EMSB, is now maintained in the Supervisor's office. The mechanics can readily obtain the current status information and communicate with the station personnel as required.

The department has also established a Duty Office, which will help to better coordinate the scheduling of operational resources as requested by the various service areas, including EMSB. Through this office, a calendar is maintained on-line, and the department's personnel can readily access information relating to the scheduling needs for apparatus, including EMSB's requests for units to be brought in for servicing.

Recommendation 7

We recommend the continued use of the Duty Office, which is an appropriate system to provide timely information, including the repair status of the fleet, to the station personnel.

Management response

An electronic web page calendar has been established as a link between the stations and the Service's Operational Duty Office. Greater emphasis will be placed on providing fleet repair status information to the Duty Office for inclusion within the reference site.

Resources

An organization needs the right resources to support the achievement of its objectives. In addition to the financial resources, the human and technological resources are also very important. Our review focused on the staffing, technology and equipment that EMSB has at its disposal to perform its functions.

"It is imperative for the City to generate credible operational and financial information on which to make the business decisions associated with effective fleet management."

KPMG report to City of Toronto.

Staffing

1. The WFPS needs additional information to assess the adequacy of the existing staffing level.

EMSB currently has 6 mechanics who are devoted to performing preventative and corrective maintenance on the department's heavy fleet. During the months that the position for the Utility Worker remained vacant, the mechanics were also involved in equipment repairs and frequently the workload at EMSB exceeded its capacity. It was therefore necessary to contract out some of the repairs that would have normally been done in-house.

In order to assess whether the current staffing level was adequate, we needed information such as the acceptable performance standards and the workload trends. However, as we previously noted, no performance standards had been established for EMSB. In addition, it would have been extremely difficult and time-consuming to obtain information on the workload levels.

Information from other jurisdictions regarding their staffing levels, indicates that the complement of mechanics ranged from four to seven. However, we were unable to conduct meaningful comparisons due to several factors. Firstly, the

number of apparatus varied as some jurisdictions were also responsible for the maintenance of light fleet. Secondly, we noted that the hours of operation were generally longer than EMSB's. Finally, we believe that the age of the fleet would also impact the workload.

WFPS should ensure that the required information is available to conduct an objective and reliable workload assessment. This assessment is especially critical to ensure that EMSB has the required human resources to perform its functions efficiently.

Recommendation 8

We recommend that the WFPS conduct a comprehensive workload analysis to determine the number of staff that would be required. This analysis should consider factors such as:

- Fleet size,
- Service times for scheduled maintenance, inspections and typical repair jobs,
- Frequency of servicing, and
- Acceptable performance standards.

Management response

In order to make such determinations, we first need to decide which business practices should continue and which should change. In particular, decisions need to be made with regards to the volume of work performed in-house versus that which is contracted out. Similarly, a solution for small engine repair needs to be considered and the methods of inventory supply/tracking reviewed.

The Department intends to work with FMA and the Quality Improvement Branch to identify best practice in these regards while implementing such workflow measurement processes as may be necessary. Discussions with FMA will explore the feasibility of using FMA's expertise in an ongoing consultative process to identify best practice in a collaborative manner.

Technology

1. WFPS should expedite the acquisition of an automated Shop Maintenance System for EMSB.

Since EMSB currently maintains its maintenance and repairs information manually, we found that it was either

time-consuming to obtain the required information to conduct our review or the information was not available. This lack of information or the ability to retrieve it in a timely manner will certainly place EMSB's management more in a reactive mode rather than enabling them to be proactive.

Management currently lacks the means to adequately monitor inventory movement and levels, to evaluate the efficiency of the staff, or to assess the current workload levels and shop performance.

EMSB needs a management information system with the capacity to track vehicle maintenance, cost information and Branch performance data. While we will not define the particular system that should be acquired, we believe that the system should have the following minimum capabilities:

- inventory tracking;
- interactive work order entry, status and tracking, with complete details for all parts and labour charged to any work order;
- complete repair and preventative maintenance (PM) history data available on-line for the life-cycle of each piece of apparatus both in summary and detail;
- labour analysis based on complete records for all employee labour recorded;
- in-depth cost analysis for operational, repair and PM costs; and
- automated PM scheduling.

The results of our survey indicate that other maintenance shops either have a computerized system or they are in the process of implementing a system. It is well recognized that there are significant benefits to be derived, including

- reducing paper transactions;
- improving parts inventory accountability;
- monitoring mechanics' labour distribution; and
- tracking performance by individual vehicle as well as the performance goals of the shop.

We understand that FMA recently implemented a new Shop Maintenance System, which has the capability to track information such as preventative and corrective maintenance and warranties for each vehicle. It would be beneficial for the department to investigate further whether EMSB could also adopt this system and if FMA could provide the required training and technical support.

Recommendation 9

We recommend that an automated Shop Maintenance System be implemented. The Director of EMSB should clearly identify the required capabilities of the system.

Discussions should then be held with FMA to determine whether FMA' s system would be appropriate for EMSB's purposes.

Management response

The FMA has proposed that we adopt their existing system for the purpose of tracking both light and heavy fleets. At face value, this approach would seem to represent a logical solution although it is not the only fleet tracking tool currently in use within the City of Winnipeg.

It is a real time, server based, system that encompasses all traditional fleet management tracking elements. It is maintained by FMA's own I.T. specialists.

Following discussions between members of senior management in both FMA and the WFPS, it has been agreed that a demonstration of the "RTA" fleet management tracking system will be provided for the managers of EMSB and our own Information Technology and Quality Improvement Branches.

A sampling of mechanics will also be asked to assess the process and make suggestions as to its effectiveness.

2. Increased internet access is needed to obtain current and up-to-date maintenance information.

"People should have the necessary knowledge, skills and tools to support the achievement of an organization's objectives."

Canadian Institute of Chartered Accountants, Criteria of Control Model (CoCo)

One concern that was repeatedly expressed related to the fact that sometimes EMSB did not receive the maintenance manuals for new apparatus in a timely manner. Moreover, when the manuals were received, it was then discovered that the information was insufficient. Another consideration is that, with the constant changes in technology and the updating of standards, it would likely become difficult to accommodate and retrieve all the required information if it is in hard copy format.

Internet access to on-line manuals would be a means to address this problem. Furthermore, the staff would be better able to keep abreast of any technological advancement in the industry. Although there is a computer in the Director's office that the mechanics sometimes use

to obtain such information, it would be more practical to also have one in the Supervisor's office for easier access.

Recommendation 10

We recommend that the appropriate measures be taken to provide the mechanics with increased internet access to obtain all relevant maintenance information.

Management response

The Service's Information Technology Branch will be tasked with reviewing the request and implementing a solution.

Facilities and Equipment

1. EMSB's current facilities, tools and equipment are adequate, but they should be updated as necessary.

Our consultant and EMSB's management and staff considered the current facilities, tools and equipment to be adequate. In addition, the Branch compares favourably with other jurisdictions with respect to the number of bays and the type of heavy repair equipment that is available.

However, EMSB's staff emphasized that while the tools were appropriate for the older apparatus, this would not be the case for the recent acquisitions. Since the newer vehicles are under warranty, there was currently no concern in this area. However, when the warranty period on these vehicles expires, it would be extremely difficult for EMSB to function effectively with the current tool set. The acquisition of up-to-date diagnostic equipment and software could enhance the Branch's efficiency.

Recommendation 11

EMSB's management should monitor the adequacy of the mechanical tools given the new additions to the fleet.

Management response

The Director of EMSB has made suitable budget allocations for this purpose.

2. EMSB needs an appropriate mobile maintenance vehicle.

Conducting in-station servicing and maintenance of the apparatus is an accepted best practice within the industry. This is normally done so that the apparatus will not have to be taken out of service for minor repairs and routine maintenance. A mobile maintenance vehicle would therefore be necessary for this process to be effective. However, more importantly, there may be a breakdown of the apparatus at the scene of an emergency, and it would then be critical for the repairs to be effected as quickly as possible. In situations where the lives of the citizens may be at risk, it is extremely crucial to ensure that the required resources are always available.

EMSB does not have a mobile mechanical maintenance vehicle, equipped with the standard tools and basic repair parts, which would facilitate effective and efficient servicing in the field. The mechanics currently use a pick-up truck to carry the tools and parts that they believe would be needed to effect the repairs. However, this can result in not having the actual tool or part available when the problem is diagnosed, thus causing un-necessary delays.

From the results of our survey of other Fire Service Mechanical Divisions, the evidence indicates that it is best practice to have two fully equipped mobile service vehicles. The ability to conduct repairs at the stations or at the scene of an alarm helps to reduce apparatus downtime and to improve the Branch's effectiveness.

Recommendation 12

We recommend that EMSB be provided with a suitable service vehicle that is always equipped with a basic stock of tools and repair parts.

Management response

The Director of EMSB and the Supervisor will be asked to provide management with a detailed proposal outlining how a mobile mechanic might provide better maintenance service at the Station level. If the proposals have merit, the concept could be considered on a trial basis and a service vehicle provided.

Business processes

During our review, we focused on the following areas of EMSB's business processes:

- purchasing and payments,
- inventory management,
- scheduling,
- work order system, and
- contracting process

We believe that these areas are fundamental activities in EMSB's operations and are critical to the achievement of its objectives.

Purchasing & payments

1. Stock items should be purchased using the purchase order system.

Our review of the purchasing card activities revealed that this is the primary method being used to purchase stock items. We also found that several transactions relating to the purchase of similar stock items occurred on the same day.

While the purchasing card is convenient to make emergency purchases, we believe that the purchase order system provides better control in inventory management. Furthermore, a recent e–mail communication from the Corporate Finance department indicates that the intention is to eliminate the use of purchasing cards to acquire inventory items.

Recommendation 13

EMSB's purchasing authorities should use the purchase order system to purchase items that will be placed in inventory.

Management response

Management agrees that the purchase order system should be used to purchase items to be placed in inventory versus reliance on purchasing cards. The Director of EMSB will be advised to make the necessary arrangements for this to occur.

Inventory management

1. Stronger controls are needed in the parts inventory area.

The environment in which EMSB operates makes it necessary to have the appropriate parts available to expedite the maintenance and repairs processes. An adequate inventory system would facilitate the accomplishment of this goal.

EMSB's inventory management system is quite basic and unsophisticated. When the removal of an inventory item causes the stock to reach the predetermined minimum quantity on hand, the mechanics are expected to inform the Supervisor, so the stock can be replenished. However, this approach is inefficient as there is no guarantee that the Supervisor will be advised in a timely manner. Furthermore, the established minimum quantities are not documented, which is critical especially for those parts that are more frequently needed. Another feature of the current system is that the Supervisor manually records the cost on each stock item when the invoice is received.

Record-keeping is non-existent with respect to the tracking of inventory movements and therefore, there is no means of obtaining information on the type and number of inventory items on hand apart from conducting a physical count of the items. Since the purchase of automotive parts account for approximately 15% of EMSB's actual operating expenses, we would have expected that all purchases and transfers from inventory would be appropriately recorded. Although there is a form to record items taken from stock for each work order, we noted that this was not always done.

Other weaknesses that we discovered included the absence of periodic counts, and a lack of documentation with respect to the authorization to dispose of obsolete items. Although an attempt was made to count all the items in March 2003 at the time of the Peoplesoft implementation, we observed that the task was aborted, due to the large volume of items.

In light of the fact that FMA is also involved in inventory management, we believe that this is an area, which should be explored to determine if EMSB could benefit from a partnership arrangement. Consideration should be given to the fact that both organizations may have some common parts that are maintained in stock and it may be possible to

arrange for the sharing of such inventory items. In addition, FMA's computerized system could probably address some of the weaknesses noted in EMSB's inventory management.

Recommendation 14

EMSB's management should ensure that appropriate records are maintained for inventory movements and that periodic counts are conducted.

An automated shop maintenance system with an inventory module would facilitate this process. FMA should be consulted to determine the capabilities of its Shop Maintenance System and to explore the opportunities for inventory sharing.

Management response

Management strongly agrees that an adequate Shop Maintenance System is critical to the daily functioning of EMSB and will pursue the opportunity of acquiring the system used by the FMA. At the same time, we shall ascertain if the concept of inventory sharing is feasible.

Scheduling

1. EMSB needs to extend its hours of operation in order to adequately meet the needs of the Operations Division.

Our interviews with the staff from the Operations Division revealed that it was the general consensus that EMSB should operate for longer hours. Concern was expressed regarding the fact that vehicles are brought into EMSB overnight and are not worked on until the next day. Our review of communications between the Operations Division and Support Services also indicate that there have been occasions when the Operations Division did not have a sufficient number of units available on the weekends.

Our survey information from two jurisdictions indicates that the maintenance division operates 16 hours per day, Monday to Friday on a 2-shift system and 7 days per week on a 10-hour per day basis respectively. We also noted that either all the mechanics carried pagers or they rotated during the on-call hours, therefore providing coverage on weekends and after hours, in the event of major breakdowns.

We acknowledge that efforts are being made to enhance the scheduling process, but we believe that serious consideration should be given to extending the hours of operation at EMSB. Currently, business hours are Monday to Friday from 7:30 a.m. to 4:00 p.m., and the staff generally does not work overtime. We note that the Collective Agreement allows for the hours of work at EMSB to be extended from 7:00 a.m. to 10:00 p.m., Monday to Friday. The implementation of a shift system could therefore provide additional presence at the Branch to meet the needs of the Operations Division. In addition, as an emergency response service, we believe that EMSB staff should be on call after hours and on weekends.

We determined that two of FMA's repair facilities operate on a 24-hour basis, Monday to Friday on a 3-shift system. An opportunity therefore exists to utilize the mechanics at these facilities when EMSB's staff is not available.

Recommendation 15

We recommend that the hours of operation at EMSB be extended to facilitate the timeliness of its service delivery.

In addition, consideration should be given to having the mechanics on-call after hours and on weekends in the event of major incidents or accidents to provide emergency service. The staff could be rotated during the on-call hours.

Discussions should be held with FMA to determine whether FMA would be able to provide any after-hours service.

Management response

There are provisions within the Mechanic's Collective Agreement governing the working of overtime and covering the concept of after hours call in. In the past, both the authorization of overtime and provisions for accessing an 'on call' mechanic carrying a pager have been utilized. These working practices have occasionally been necessary when sufficient spare apparatus has not been available for Operational use.

Both avenues still exist at the discretion of the Director of EMSB, however in reality both represent expensive solutions to cover off crisis situations only.

If EMSB is successful in ensuring that sufficient spare apparatus is available to compensate for emergency

breakdowns, then the likelihood of having to call in mechanical staff would remain a rare event.

A long term solution first requires that a work load analysis be performed to ascertain 'best practice' in terms of EMSB's hours of operation, together with a better understanding as to what services, if any, FMA might offer, after hours, in a partnership arrangement. The Service is committed to talking with the necessary parties to find a solution.

In the interim, a summer student Utility Person has been hired to perform courier and maintenance activities within the branch to free up the mechanics' time, thereby maximizing their efforts towards preventative maintenance and repairs within the traditional work week.

2. Fully-equipped replacement vehicles will enhance the timeliness of EMSB's service delivery.

It was highlighted in the consultant's report that when apparatus is taken into EMSB for its Schedule B inspection, it is stripped of all equipment, as the replacement vehicle does not have its own equipment. Approximately two (2) hours are needed to transfer the equipment to the spare vehicle, and the procedure is reversed when the apparatus is returned to service.

"Failure to provide the vital preventative maintenance of the apparatus equipment could result in injury, death or loss of property at an emergency scene."

Michael McKenna & Pete Rose, CGI, Insurance Business Services Municipal Consulting Section

This procedure results in two (2) major problems. Firstly, the apparatus is out of service for a considerable period of time in both instances to allow the transfer of equipment. Secondly, and very importantly, the equipment is not available for preventative maintenance servicing. Consequently, EMSB receives the equipment for repair only after it has failed to function during an emergency response. It would be more efficient for EMSB to schedule the servicing of the apparatus and the associated equipment to be conducted simultaneously.

Recommendation 16

The department should have fully equipped spare vehicles available when the front-line vehicles are taken into EMSB for servicing.

CGI consultants recommend that at least two spare pumpers, one spare aerial and one spare rescue unit should be fully equipped for the sole purpose of replacing

in-service vehicles. This will allow the equipment to be serviced and maintained at the same time.

Management response

To some extent, this idea was tried in the past but failed due to a lack of policing within Operations. A suitable solution will be discussed between the Platoon Chiefs in Operations and the Director of EMSB.

3. EMSB should be responsible for the testing of pumps and ground ladders.

The Training Academy Branch is currently responsible for conducting the testing of pumps and ground ladders. Our survey information and the consultant's report indicate that this practice is not an accepted norm. This responsibility will not only impact their designated function to train the personnel, but also the amount of time available to carry out the required annual testing.

We understand that the training officers did not have sufficient time in 2003 to conduct all the required tests, and therefore, of one hundred and sixty ground ladders, only thirty-seven were tested. Although the expectation is to have all pumps and ground ladders tested in 2004, we believe that it would be more efficient for EMSB to be responsible for these functions. Apart from the fact that the EMSB staff has the expertise, it would be more efficient to coordinate these tests with the other scheduled annual inspections.

Recommendation 17

We recommend that the testing of pumps and ground ladders be carried out by EMSB, where the expertise is available to carry out the necessary repairs as revealed during the testing program.

Management response

Similarly, this is a matter that could be resolved in discussions between the Directors of Training and EMSB and the Platoon Chiefs. Best practice should govern the outcome.

Work order system

1. Work orders should be completed in a consistent manner.

Prior to the assignment of a job to each mechanic, the Supervisor initiates a general work order, noting basic information such as the apparatus number, station and date. The mechanic is then expected to complete the work order form as well as the appropriate forms or checklists for each type of inspection. The information to be recorded includes a description of the work performed, the description and cost of the parts used as well as the number of hours to complete the job.

Information from completed work order forms is critical for management to determine the level of branch performance and to develop guidelines for the performance of routine maintenance. We reviewed a sample of work order forms and observed that they were not completed in a consistent manner. We noted that some had very detailed information while others were less informative. Information relating to the parts and hours was often incomplete. In most instances, the parts description was provided but not the cost. In addition, we found that sometimes the mechanic did not sign the form as evidence that the job was completed.

We are aware of the fact that the various forms and checklists have been combined and only one form is now being used to capture all the relevant information relating to the inspections and repairs. However, in order to ensure that the purpose for redesigning the forms is accomplished, appropriate training will be required.

This is another area that could be explored with FMA, particularly if the decision were made to utilize FMA's Shop Maintenance System for heavy fleet operations. FMA could therefore provide some guidance on the type of information that is captured in their work orders.

Recommendation 18

We recommend that all mechanics receive training with regards to the completion of the relevant form(s). Periodically, the Supervisor should review a sample of the completed forms to ensure that the information is consistently recorded and meets expectations.

Discussions with FMA regarding its Shop Maintenance System should also address the training that would be required for the mechanics.

Management response

The Service is committed to obtaining an effective Shop Maintenance System hopefully with the assistance of the FMA. Naturally, the adoption of such a system will require training for all individuals associated with its use.

In the meantime, the Shop Supervisor will be encouraged to review current paper practices and ensure that mechanical staff is trained to complete the necessary documentation satisfactorily. Thereafter, random audits will be performed.

Contracting process

1. The criteria used to select contractors should be documented.

Since fire vehicle maintenance shops may not have the resources and facilities to perform all the required repairs, it is an acceptable practice to contract out specialized repairs to qualified contractors. However, for this process to be cost-effective and fair, there must be established policies and procedures to ensure that opportunities for preferential treatment and fraud are minimized.

Accordingly, the City's Materials Management Policy is in place to provide a "fair opportunity to the business community to bid on purchase opportunities in the City". The policy states that, "every supply to or by the City shall be initiated through the solicitation of competitive offers unless permitted by single source negotiations, cooperative contracts or a resolution of Council." However, emergency purchases can be made without obtaining competitive quotes.

Our review of EMSB's contracting process revealed that several contractors are used for the various types of services required. We noted that for non-emergency situations, EMSB normally obtains at least three quotes prior to contracting out the service, but there are also occasions when jobs are given to an external contractor without obtaining other quotations. On the surface, it was unclear why this occurred, but upon further review, we determined that there was only one legitimate business reason for this practice. This related to repairs that were

covered under a warranty, which would therefore be assigned to the manufacturer or the local dealer representative for the particular apparatus. On other occasions, EMSB sometimes assigned work to contractors because they have been consistent in providing quality and timely service. However, this practice does not comply with the City's policy.

We believe that the selection process would be enhanced, if quotes were obtained for all non-emergency purchases and there was clear documentary evidence of the rationale underlying the selection of a particular contractor. Documentation of the criteria used in the selection process will help to ensure objectivity and improve transparency in decision-making.

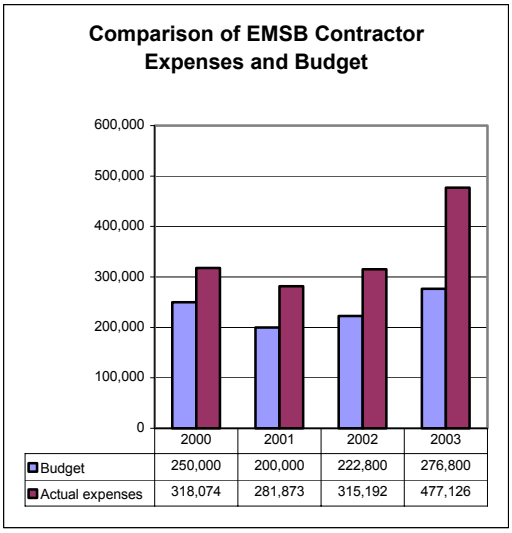
Recommendation 19

We recommend that EMSB's purchasing authorities obtain three competitive quotations for all non-emergency purchases. In circumstances where the lowest bidder is not selected, the criteria used should be clearly documented.

Management response

Agreed. EMSB's Director and staff will be reminded of this requirement.

2. EMSB is highly dependent on the services of external contractors.



Similar to other jurisdictions, EMSB contracts out several types of work including transmission and engine overhaul, suspension, radiator and tire repairs and welding. In 2003, EMSB spent approximately $480,000 on services provided by external contractors. The significant increase over prior years is attributed to a combination of factors. Firstly, there were several major repairs and modifications, including a repair job on a 100-foot aerial ladder platform, which was performed by the manufacturer in Pennsylvania. Secondly, more work was contracted out during 2003 as EMSB operated without its full staff complement for several months.

It appears that EMSB has developed valuable working relationships with various vendors over the years. Regular communication is maintained with the vendors as EMSB monitors the work in progress to ensure that the repairs are done in a reasonable time and the quality of the work is acceptable. Periodic reviews of the contractors' rates

and services are also performed, which is critical to ensure that the Branch receives the best value for money.

However, we observed that although EMSB maintains a listing of the suppliers and contractors, this listing was not up-to-date. We noted that many of the vendors on the list were currently not being used by EMSB. Moreover, there was no indication of the type of services that the current vendors offered. Considering the high reliance placed on these outside services, we believe that it is important to maintain current information to facilitate the contracting process.

Recommendation 20

EMSB should maintain a current listing of vendors by service capability. This listing should be accessible to all purchasing authorities within EMSB.

Management response

Agreed. Perhaps FMA can help construct same.

Performance measurement

"Performance should be monitored against the targets and indicators identified in the organization's objectives and business plans."

Canadian Institute of Chartered Accountants, Criteria of Control Model (CoCo)

Performance measures are important tools for objectively assessing the efficiency and effectiveness of an organization. The purpose of measuring performance is to ensure accountability and to promote continuous service improvement.

Information from measuring performance allows management to make more informed strategic decisions about operations. Management can also use such information to justify spending requests by demonstrating needs with actual data on workload, personnel and other resources used in the organization.

Effective management information systems include measurable performance targets. Quantifying targets and tracking performance will

- reduce the risk of bias in the evaluation process;
- facilitate comparisons between actual results, established targets and prior period results; and
- assist in the comparison to similar organizations.

“Benchmarking, which determines what portions of an equipment/maintenance program are effective, allows managers to compare their service and productivity to similar operations.”

Fleet Management in the 90s Requires More Than Maintenance. Wasteage.com

1. A comprehensive performance measurement system is required.

EMSB does not have any established performance measures. In order to monitor and report on the Branch’s performance, service standards and service goals that link to the objectives of the Branch should be established. Service standards establish the minimum level of performance to be delivered, while service goals describe the results that are expected to be achieved and by when. The table in Appendix 3 defines commonly used performance measures, which are linked to service goals.

Recommendation 21

EMSB should develop a comprehensive performance measurement system. The system should include a set of performance measures to track efficiency and effectiveness, performance standards and targets and regular performance reports.

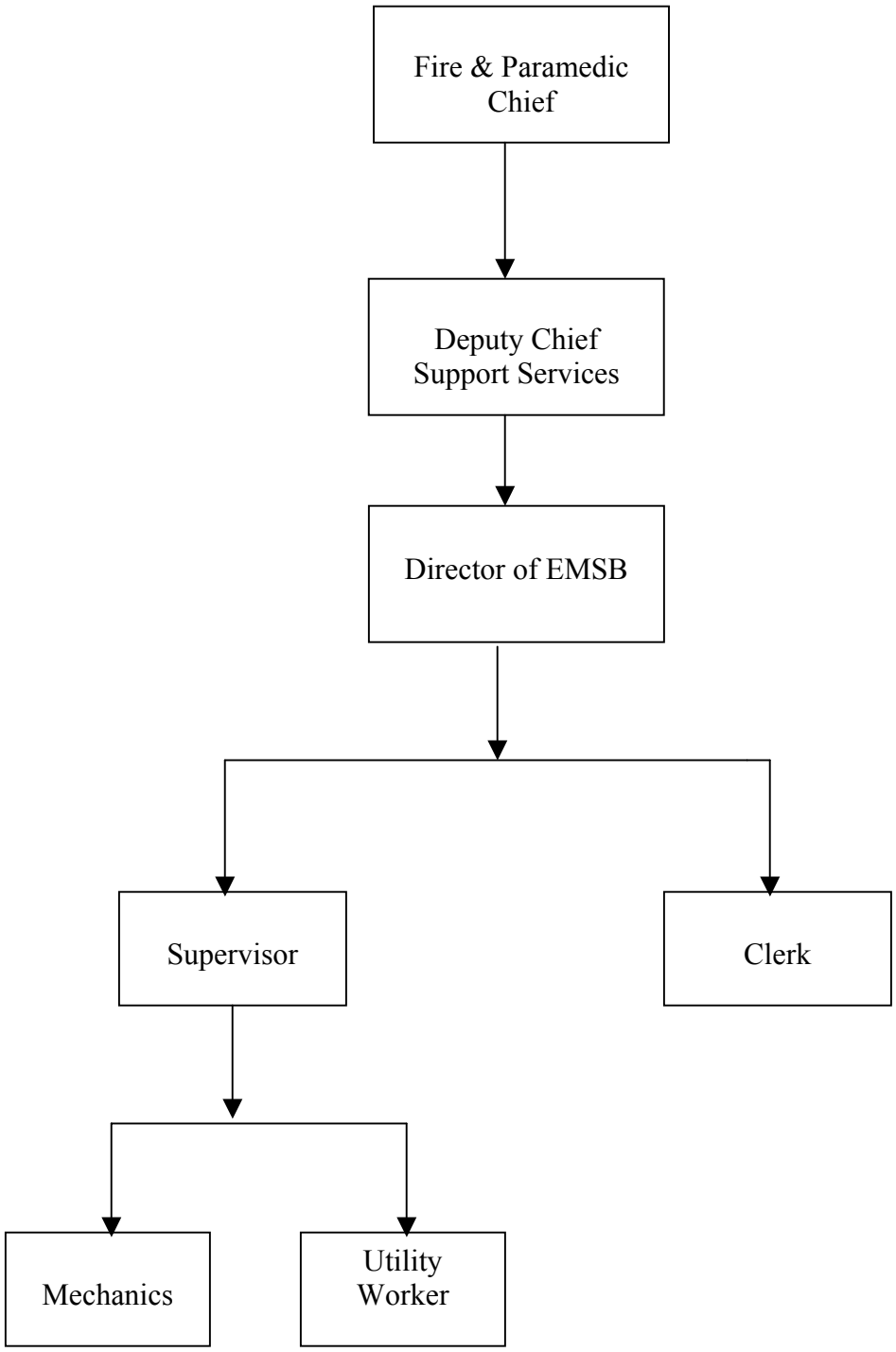
Initial indicators to be developed include vehicle availability, quality and timeliness of maintenance and repair work, and service cost and efficiency.

Management response

The Service’s Quality Improvement Branch will be tasked with establishing the necessary elements within a comprehensive performance measurement system.

Appendices

Appendix 1: Organizational Chart for EMSB



Appendix 2: External Standards

The consultant noted that there are several standards that are generally used to assess a Fire Vehicle Maintenance Shop. All these standards are listed below, but we will indicate those that are specifically applicable to EMSB based on its current areas of responsibility.

Standards applicable to EMSB

- Underwriters Laboratories of Canada (ULC)
  ULC S515-M-88 - Automotive Firefighting Apparatus

- National Fire Protection Association (NFPA)
  NFPA 1071 - Standard for Emergency Vehicle Technician Professional Qualifications
  NFPA 1901 - Automotive Fire Apparatus
  NFPA 1911 - Standard for Service Tests of Fire Pump Systems on Fire Apparatus
  NFPA 1914 - Testing Fire Department Aerial Devices
  NFPA 1915 - Fire Apparatus Preventative Maintenance Program
  NFPA 1931 - Design of and Design Verification Tests for Fire Department Ground Ladders
  NFPA 1932 - Use, Maintenance and Service Testing of Fire Department Ground Ladders
  NFPA 1962 - Standard for the Inspection, Care and Use of Fire Hose, Couplings and Nozzles and Service Testing of Fire Hose

Other Standards Used in Consultant's Analysis

- National Fire Protection Association (NFPA)

  NFPA 1201 - Standard for Developing Fire Protection Services for the Public
  NFPA 1500 - Standard on Fire Department Occupational Health and Safety Programs
  NFPA 1852 - Standard on the Selection, Care and Maintenance of Self-Contained Breathing Apparatus
  NFPA 1912 - Standard for Fire Apparatus Refurbishment

Appendix 3: Performance Measures

GOAL	MEASURE	DEFINITION
Availability	Scheduled repair rate	Proportion of jobs that are proactive in nature including but not limited to PM
	Repair turnaround time	Time it takes a vehicle entering the Shop to be serviced, ready to leave the Shop
	Average vehicle availability	Yearly average of the daily ratio of vehicles being repaired, awaiting repairs, or undergoing PM to total vehicles
Reliability	Miles per mechanic hour	Number of miles a vehicle is driven in a year divided by the number of in-house mechanic hours incurred during the year exclusive of accident repair
	Rework rate	Proportion of repairs that must be repeated within a defined time period, usually 30 to 90 days
Economy	Maintenance and repair (M & R) cost per mile	Dollar amount – fully allocated labour, parts and vendor cost –spent during the year divided by annual mileage; excludes cost associated with accident repair and warranty repair work
	M & R cost per vehicle	Cost including all PM, normal demand repairs, breakdowns; excludes accidents, abuse, and vehicle modification
	Parts cost per vehicle	Average parts cost spent during the year per vehicle
	Labour per vehicle	Labour hours charged during the year per vehicle
	Mechanic utilization rate	Percentage of mechanic hours available during a year that are spent doing maintenance and repair work ("wrench turning") as opposed to other work (cleaning, running parts, training etc.)
Environmental Responsibility	PM compliance	Percentage of PM services performed during a period out of the number of total PM services expected for that period

Source: *Fleet Maintenance and Repair Program: Selected Performance and Management Control Issues*, Office of the City Auditor, Austin, Texas, March 2001