



*Office of the Auditor General / Bureau du vérificateur général*

**AUDIT OF THE OTTAWA PARAMEDIC SERVICE**

**2008**

**VÉRIFICATION DU SERVICE PARAMÉDIC D'OTTAWA**



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## **EXECUTIVE SUMMARY**

### ***Introduction***

The audit of the Ottawa Paramedic Service was included in the 2008 work plan of the Office of the Auditor General, which was first presented to Council in December 2005.

### ***Audit Objectives***

The 2008 audit plan for the Paramedic Service sets out eight key objectives as follows:

1. Execute Performance Data Validation (File Sample Audit) and Assess Existing Paramedic Service Measurement Framework
2. Assess and Verify Demand Trends for the Paramedic Service (Service and Budget Drivers)
3. Assess City Performance in Managing Growth Pressures via System Capacity/Design
4. Assess Paramedic Service Performance regarding Outcomes Based Business Planning, Target Setting and Achievement
5. Review Structural Paramedic Service “System Constraints” and Assess Factors Leading to Sub-optimal Resource Management
6. Assess Paramedic Service Productivity, Identify Opportunities for Implementing Business Process Improvements and Industry Best Practices
7. Assess and Review Paramedic Service Risk Management Processes, Strategies and Outcomes
8. Assess the adequacy of financial management processes

### ***Summary of Key Findings***

The Paramedic Service audit has yielded significant performance findings and has identified a number of service planning and delivery improvement opportunities:

1. After initial post-amalgamation improvement in 2001-2002, 90th percentile Code 4 emergency response times in Ottawa are now at risk of eroding to a level below the legislated service standard set out in the Ambulance Act. This response time non-compliance with the Ambulance Act is occurring across the Province of Ontario – a systemic health care system failure.
2. Patient offload delays at Ottawa hospitals are a major driver of response time erosion in City land ambulance services. Offload delays caused by complex Provincial health system patient flow problems are worsening. Meaningful

resolution of Province-wide health system patient flow problems is unlikely in the short to medium term.

3. Ottawa's current triage system used to dispatch emergency calls is flawed, ineffective and contributes to system inefficiency and eroding response times (see Table below). In 2006 and 2007 approximately 85% of emergency calls were triaged as life threatening Code 4 calls requiring a "lights and sirens" response. In fact, no meaningful triaging of calls is actually occurring and scarce ambulance resources are being exhausted in an inefficient and ineffective process. Replacement of the Province's current flawed triage tool (referred to as 'DPCI') with the North American standard Medical Priority Dispatch System (known as 'AMPDS') medically derived triage tool should be a top priority. The Province has been reluctant to approve this critical triage improvement tool, despite the AMPDS precedents already in place in Toronto and Niagara. Continued Provincial unwillingness (at the staff-to-staff level of dialogue) to allow the City to adopt AMPDS should prompt a fundamental re-examination of the City's role in operating ambulance dispatch.

*Percentage Ottawa Emergency Calls Triaged as "Lights & Sirens" Response*

CALL TYPE	2001	2002	2003	2004	2005	2006	2007
CODE 4	36,753	42,915	49,283	55,890	57,266	69,779	72,523
CODE 3	20,662	22,601	21,659	20,974	22 200	12,409	12,879
TOTAL	57,415	65,516	70,942	76,864	79,466	82,188	85,402
CODE 4 AS % OF TOTAL	64%	66%	69%	73%	72%	85%	85%

4. The City budget process has failed to supply regular and timely ambulance staffing growth increments to keep pace with ongoing call volume increases occurring between 2001 and 2008. Growth increments during this period were irregular and implementation was lagged over multiple years, thereby allowing call volume to overtake available ambulance resources. The result has been response time erosion and critical unit shortages.
5. As a result of increasing hospital wait times, substandard dispatch triaging, and a failure to supply ambulance unit growth increments to match increasing call volumes, the Ottawa Paramedic Service now faces frequent erosion of ambulance unit availability to deeply unsafe levels. Erosion in available units

below critical levels occurs daily, with frequent instances of zero ambulance unit availability. An eight-month survey conducted in 2007 identified 492 incidents of unit availability falling below seven available ambulances City-wide. In 22 cases the system reached zero unit availability. A significant public safety and liability outcome is possible unless City remediation is forthcoming. The table below features the audit analysis of response time impacts following critical levels of unit availability.

*Eroded Ambulance Response Times at Critical Resource Availability Levels*

<b>CRITICAL AVAILABILITY LEVEL</b>	<b>90<sup>TH</sup> PERCENTILE RESPONSE TIME FOR NEXT CALL AFTER PAGE</b>	<b>ADDITIONAL TIME BEYOND 2007 HIGH DENSITY SYSTEM 90<sup>TH</sup> PERCENTILE OF 12:49</b>
7 UNITS CRITICAL LEVEL	18:27	ADDITIONAL 5:38
6 UNITS CRITICAL LEVEL	20:56	ADDITIONAL 8:07
5 UNITS CRITICAL LEVEL	18:34	ADDITIONAL 5:45
4 UNITS CRITICAL LEVEL	21:09	ADDITIONAL 8:20
3 UNITS CRITICAL LEVEL	27:10	ADDITIONAL 14:21
2 UNITS CRITICAL LEVEL	30:00	ADDITIONAL 17:11
1 UNIT CRITICAL LEVEL	27:29	ADDITIONAL 14:40
ZERO UNITS CRITICAL LEVEL	19:23	ADDITIONAL 6:34
<b>ALL CRITICAL LEVELS</b>	<b>21:34</b>	<b>ADDITIONAL 8:45</b>

6. The 2007 response time analysis is troubling. In the 492 cases where critical resource levels fell below 7 available units, the next emergency call’s 90th percentile response time is more than 8 minutes slower than the 2007 system-wide 90th percentile response time of 12:49.
7. Despite these significant “systemic” performance challenges beyond its immediate control, the overall audit evidence suggests that the Paramedic Service Branch operates in an efficient and effective manner that meets or surpasses many industry standards regarding quality and best practices. Single start, use of specialty teams, unit on-the-road scheduling tools, and logistics processes are all areas of clear operational excellence displayed by the Paramedic Service. Paramedic Service efficiencies have been documented by the audit team in peer benchmarking analyses and performance data verification

calculations. Regrettably, these efficiencies have been absorbed by the Provincial and City generated systemic performance problems noted above.

## **Recommendations**

A compendium of the Paramedic Service audit recommendations appear below under the three audit themes used throughout this report:

1. Emergency Medical Services (EMS) Performance Context;
2. System-wide Performance Constraints/Core Drivers of Service Delivery Outcomes;
3. System Performance Verification and Review of Operational Processes and Practices.

### **Management Overall Response**

Overall, management concurs with the audit findings and agrees with the recommendations put forward by the Auditor with only two disagreements.

Ottawa Paramedic Service supports the acquisition of AMPDS as a tool in the Communications Centre and a more liberal dispatch communications framework would provide the Service the capacity to improve outcomes and effectiveness.

There is recognition that the Paramedic Service is managed efficiently and effectively and that it is operating in a context of a heavily regulated and complex health care system.

The Paramedic Service agrees that as a mission critical service we require sustained, consistent and predictable funding on a long-term basis to safeguard the public.

Responses to each of the 34 audit recommendations are set out below.

## **Emergency Medical Services (EMS) Performance Context**

### **Recommendation 1**

**That the City of Ottawa develop an intergovernmental advocacy strategy for major system reform that focuses on securing control over the necessary components of a high performance EMS system.**

### **Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will develop an intergovernmental advocacy strategy as part of the strategic branch review exercise in 2010.

## **Recommendation 2**

**That the Paramedic Service performance measurement and reporting framework, upcoming strategic branch review exercise and existing service planning process be focussed on the management of risk events and performance erosion trends identified in this audit's 2001-07 land ambulance system performance overview.**

### **Management Response**

Management agrees with this recommendation.

The Paramedic Service performance measurement and reporting framework, upcoming 2010 strategic branch review exercise and existing service planning process, will be focused on the management of risk events and performance erosion trends identified in this audit's 2001-07 land ambulance system performance overview.

## **System-Wide Performance Constraints/Core Drivers of Service Delivery Outcomes**

### **Recommendation 3**

**That the City adopt a clear, transparent position regarding the current DPCI triage tool and the renewal of the Ministry communications centre contract by:**

- a) Immediately petitioning the Minister of Health for a communications dispatch framework identical to the framework enjoyed by the City of Toronto;**
- b) Establishing a results-based communications contract with the Ministry of Health based on outcomes and not prescriptive processes, software tools or triage methodologies;**
- c) In the absence of a results based contract featuring operator choice of triage methodologies, petitioning for the opportunity to dispatch calls without triage; and,**
- d) In the absence of either of the above options being accepted by the province, withdrawing from consideration for the renewed communications operator contract.**

### **Management Response**

Management agrees with parts a), b) and c) of this recommendation.

The branch concurs with the acquisition of AMPDS as the dispatch tool and a more liberal dispatch communications framework. Management will continue to advocate to the MOHLTC for the implementation of this tool in Ottawa.

Management disagrees with part d) of this recommendation. In management's opinion, the audit report overlooks the operational and strategic value already realized in an integrated communications centre. The City's paramedic dispatch

unit has been recognized as the best performing dispatch centre (T0-T2) in the province as indicated in OMBI's 2007 public report.

The branch has found that an integrated dispatch team allows for several operational efficiencies such as, but not limited to:

- the availability of real time data enables staff to evaluate and adjust their performance on a daily basis; and,
- modification of the deployment plan in real time allows staff to adapt to changing situations in the community e.g., major events, road closures, etc.

In addition, management integration allows for common management objectives for the entire service, allowing us to meet Council and community expectations that would not be possible in two separate organizations.

#### **Recommendation 4**

**That, once AMPDS is in place, the City pursue a centre of excellence designation to emulate best practices from across North America, including Niagara and Toronto.**

##### **Management Response**

Management agrees with this recommendation.

Timelines and funding to pursue this designation are dependent upon negotiations with the Ministry of Health and Long Term Care.

#### **Recommendation 5**

**That the Ottawa Paramedic Service continue to participate on the provincial task force working on hospital wait times and off-load delays.**

##### **Management Response**

Management agrees with this recommendation.

The branch will continue to be an active participant on the provincial task force working on reducing hospital wait times and off-load delays.

#### **Recommendation 6**

**That the measurement of patient offload delays be refined to include a "patient transfer to emergency triage nurse" time log in order to correct for potential overestimation of offload duration.**

##### **Management Response**

Management agrees with this recommendation.

Currently the data is captured in the hospital's Emergency Department Reporting Systems (EDRS). The proposed new provincial Ambulance Call

Report will include a “transfer of care” time, which will support this recommendation.

### **Recommendation 7**

**That the Ottawa Paramedic Service annually report to Council regarding the financial impact of lost ambulance unit hours due to hospital off-load delays.**

#### **Management Response**

Management agrees with this recommendation.

Management will report to Council annually on the financial impact of lost ambulance hours due to hospital off-load delays commencing in 2010.

### **Recommendation 8**

**That the Ottawa Paramedic Service include the calculation of time on task when considering paramedic staffing enhancements.**

#### **Management Response**

Management agrees with this recommendation.

### **Recommendation 9**

**That the Ottawa Paramedic Service conduct a quality improvement pilot project around the current hospital patient transfer process.**

#### **Management Response**

Management agrees with this recommendation.

The Offload Nurse Project, which reorganizes the current hospital patient transfer process, was initiated on September 29, 2008 – by contractual agreement with the Ottawa Hospital and the Ottawa Paramedic Service. The project is completely funded by the Ministry of Health and Long Term Care. (See Paramedic Hospital Wait Time Report ACS2008-CPS-OPS-0004 received by CPS Committee at its meeting of October 16, 2008.) The Ottawa Paramedic Service will provide a one-year update on the impact of this project to Committee and Council in Q4 2009.

### **Recommendation 10**

**That the Ottawa Paramedic Service bring forward a long-term master plan and budget for additional staffing and resources required to service growth.**

#### **Management Response**

Management agrees with this recommendation.

An external consultant will be engaged to develop a long-term master plan and budget for additional staffing and resources required to service growth. Ottawa

Paramedic Service has already initiated this process (see Paramedic Trends Report ACS2008-CPS-OPS-0003 received by CPS Committee at its meeting of October 16, 2008), which includes a three-year staffing plan to be incorporated into the branch's 2009, 2010 and 2011 budgets.

### **Recommendation 11**

**That the Ottawa Paramedic Service revisit the master plan bi-annually to ensure developing and unforeseen challenges and pressures are considered and updated in the plan and reported to Council.**

#### **Management Response**

Management agrees with this recommendation.

As indicated in recommendation 10, work is already underway in this area. The Ottawa Paramedic Service reports annually to Committee and Council with its "Paramedic Trends" report that outlines results for the first six months of each year including, outlining any challenges and pressures that should be reflected in the upcoming year's budget.

### **Recommendation 12**

**That the Ottawa Paramedic Service develop a resource plan that separates annual growth from other determinants for resourcing and staffing enhancements.**

#### **Management Response**

Management agrees with this recommendation and has already implemented it.

The annual Paramedic Trends report separates growth (i.e., call volume pressures) from other factors such as hospital wait times, so that Council can readily identify the different factors affecting overall response to help isolate the resourcing requirements, which fall within the City's jurisdiction.

### **Recommendation 13**

**That the Ottawa Paramedic Service present in their annual reports the staffing approvals for the corresponding years.**

#### **Management Response**

Management agrees with this recommendation. This has been current practice since 2007.

### **Recommendation 14**

**That the City obtain a legal opinion to assess the financial and liability risk associated with the ongoing daily erosion of the paramedic system to critical levels of unit availability (this action was taken in July 2008).**

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**Management Response**

Management agrees with this recommendation and completed this work in July 2008.

**Recommendation 15**

**That the Auditor General inform the City Manager of the performance issues and risk profile associated with critical levels of resource availability in an interim briefing prior to the 2009 Annual Report (this action was taken in July 2008).**

**Management Response**

Management agrees with this recommendation.

**Recommendation 16**

**That the Chief of the Paramedic Service develop a contingency plan to address this critical unit availability shortfall on an immediate basis.**

**Management Response**

Management agrees with this recommendation. Operational processes are currently in place and will be put into a policy framework in 2010.

**Recommendation 17**

**That the Chief of the Paramedic Service report quarterly to Council on the incidence of critical resource levels and their associated next call 90th percentile response times.**

**Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service does not currently have the reporting technology necessary to implement this recommendation. The branch will solicit the Ministry of Health to assist with the acquisition of reporting technology to be able to report on critical resource levels.

**System Performance Verification and Review of Operational Processes and Practices**

**Recommendation 18**

**That the Ottawa Paramedic Service establish annual response time performance targets based on actual percentages of emergency calls achieving 8:59 and 15:59 instead of the current 90th percentile targets.**

**Management Response**

Management agrees with this recommendation.

Annual response time performance targets have been captured in the Paramedic Service 2007 Annual Report (received by CPS Committee at its meeting of August 21, 2008) and in the more recent 2008 Trends Report. This practice will continue in future annual and performance trend reports.

### **Recommendation 19**

**That the Ottawa Paramedic Service track and annually report the identified complete portfolio of performance measures set out in this audit.**

#### **Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will review the portfolio of performance measures set out in this audit for inclusion in future annual reports as part of the strategic branch review exercise in 2010.

### **Recommendation 20**

**That the Ottawa Paramedic Service include “scheduled unit counts versus actually deployed unit counts” performance data in its annual performance report to Committee/Council.**

#### **Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will review the portfolio of performance measures set out in this audit for inclusion in future annual reports as part of the strategic branch review exercise in 2010.

### **Recommendation 21**

**That the Ottawa Paramedic Service establish ongoing performance targets in its operational planning using “scheduled unit counts versus actually deployed unit counts”.**

#### **Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will review the portfolio of performance measures set out in this audit for inclusion in future annual reports as part of the strategic branch review exercise in 2010.

### **Recommendation 22**

**That the Ottawa Paramedic Service establish a target range for its key productivity ratio in the high-density system (calls per paramedic).**

**Management Response**

Management agrees with this recommendation.

Calls per paramedic ratios will be discussed as part of the strategic branch review exercise in 2010 and will also be included in the scope of work being done by the consultant in developing a long-term master plan and budget as indicated in recommendation 10.

**Recommendation 23**

**That the “calls per paramedic ratio” trend in Ottawa (and external peer ratios) be regularly reported and integrated into the recommended master planning framework and the upcoming branch strategic branch review.**

**Management Response**

Management agrees with this recommendation.

Calls per paramedic ratios and external peer ratios will be discussed as part of the strategic branch review exercise in 2010 and will also be included in the scope of work being done by the consultant in developing a long-term master plan and budget as indicated in recommendation 10.

**Recommendation 24**

**That the City of Ottawa petition OMBI to restructure its 90th percentile response time reporting to include T0-T2 data.**

**Management Response**

Management agrees with this recommendation and has already implemented it. The City of Ottawa petitioned OMBI in 2008 to restructure its 90th percentile response time reporting to include T0-T2 data. OMBI has implemented and reported this in its annual report.

**Recommendation 25**

**That the Ottawa Paramedic Service conduct an Advanced Care Paramedic (ACP) needs analysis.**

**Management Response**

Management agrees with this recommendation. An ACP needs analysis will be conducted as part of work being undertaken on the Paramedic Master Plan in 2010.

**Recommendation 26**

**That the Ottawa Paramedic Service refine and develop annual ACP capture targets based on patient transports as part of the annual business planning and reporting cycle.**

**Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will refine and develop annual ACP capture targets for inclusion in future annual reports as part of the strategic branch review exercise in 2010.

**Recommendation 27**

**That the Ottawa Paramedic Service develop a deployment policy that would see ACP resources responding only to Code 4 calls, similar to their policy for Paramedic Rapid Response (PRU) response priorities.**

**Management Response**

Management disagrees with this recommendation.

Present staffing precludes this recommendation from being implemented at this time. A change in legislation and the acquisition of a better dispatching tool (AMPDS) would be required for the branch to support and implement this recommendation.

Current legislation requires that the closest ambulance be sent to any life-threatening call; therefore, the choice of an ACP resource being sent versus a PCP resource could not be accomplished without legislative change. With the acquisition of AMPDS and appropriate resourcing, the principle could be applied by sending a second unit with ACP after the closest unit is sent. Operationally, the first unit would then clear and be available for another call. This cannot be accomplished in a service that is always at critical levels of availability.

**Recommendation 28**

**That the Ottawa Paramedic Service track and annually report utilization, response times and other relevant performance data for all specialty teams.**

**Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will review the portfolio of performance measures set out in this audit for inclusion in future annual reports as part of the strategic branch review exercise in 2010.

**Recommendation 29**

**That the Ottawa Paramedic Service expand the PRU program based on the findings of the 2005-2007 program analysis.**

**Management Response**

Management agrees with this recommendation. Enhancements to the PRU program began in May 2008 and analysis is ongoing.

**Recommendation 30**

**That the Ottawa Paramedic Service prepare a business case demonstrating the return on investment (ROI) and expected utilization associated with planned facility/base construction in the City capital plan.**

**Management Response**

Management agrees with this recommendation.

An external consultant will be engaged to develop a long-term master plan for the Ottawa Paramedic Service and the scope of work will also include the preparation of a business case demonstrating ROI. This work is expected to be complete in 2010.

**Recommendation 31**

**That the Ottawa Paramedic Service collaborate with public health and other stakeholders to research and develop a service demand-forecasting model that incorporates aging society impacts on call frequency, duration and acuity.**

**Management Response**

Management agrees with this recommendation.

An external consultant will be engaged to develop a long-term master plan for the Ottawa Paramedic Service and the scope of work will also include the research and development of a forecasting model that incorporates the impact of an aging society on call frequency, duration and acuity. This work is expected to be complete in 2010.

**Recommendation 32**

**That the annual paramedic growth staffing enhancements include proportional adjustments in support services staffing.**

**Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service presently undertakes to include proportional adjustments in support service staffing when front-line paramedics are hired and will continue to review such staffing enhancements in future. Improvements to growth staffing enhancements will be reviewed as part of the strategic branch review exercise in 2010.

### **Recommendation 33**

That the Ottawa Paramedic Service provide an annual system planning resourcing business case (i.e., reflecting the modeled required resource capacity) as part of the annual City budget process.

#### **Management Response**

Management agrees with this recommendation.

An external consultant will be engaged to develop a long-term master plan and budget for the Ottawa Paramedic Service. The scope of work will also include the development of an annual system planning resource business case. Ottawa Paramedic Service has already initiated some of this work (as indicated previously - see Paramedic Trends report), which includes a three-year staffing plan to be incorporated into the branch's 2009, 2010 and 2011 budgets.

### **Recommendation 34**

That quarterly and annual financial reporting integrate expenditure data with actual deployed units of service for the same period.

#### **Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will review the integration of expenditure data with actual deployed units of service in quarterly and annual financial reporting as part of the strategic branch review exercise in 2010.

### ***Conclusion***

The land ambulance service delivered by the Paramedic Service Branch is a "mission critical" protective service provided by the City of Ottawa. The Paramedic Service Branch annually consumes an operating budget that is now approaching \$60 million – an increase of 93% since amalgamation.

The audit has yielded significant findings and has identified a number of service planning and delivery improvement opportunities:

- After initial improvement earlier this decade, 90th percentile Code 4 response times in Ottawa are now at risk of eroding to a level below the legislated service standard in the Ambulance Act. This systemic performance problem is occurring across the Province of Ontario.
- Patient offload delays at Ottawa hospitals are a major driver of response time erosion in land ambulance services. Offload delays caused by complex Provincial health system patient flow problems are worsening. Meaningful resolution of Province-wide health system patient flow problems is unlikely in the short to medium term.

- Ottawa's triage system used to dispatch emergency calls is flawed, ineffective and contributes to system inefficiency and eroding response times. Replacement of the current triage tool with the North American standard AMPDS medically derived triage tool should be a top priority. The Province needs to be compelled to approve this critical triage improvement, recognizing the AMPDS precedents already in place in Toronto and Niagara. Provincial unwillingness to make this improvement should prompt a fundamental re-examination of the City's role in ambulance dispatch.
- The City budget process has failed to supply regular and timely ambulance unit growth increments to keep pace with ongoing call volume increases occurring between 2001 and 2008. Growth increments during this period were irregular and were lagged over multiple years, thereby allowing call volume to overtake available resources. The result has been response time erosion.
- As a result of increasing hospital wait times, substandard dispatch triaging, and a failure to supply ambulance unit growth increments to match increasing call volumes, the Ottawa Paramedic Service now faces frequent erosion beneath safe levels of ambulance unit availability. Erosion in available units below critical levels occurs daily, with frequent instances of zero unit availability. A significant public safety, liability and service level outcome appears inevitable unless aggressive City remediation is forthcoming.
- Despite these significant "systemic" performance challenges beyond its immediate control, the Paramedic Service operates in an efficient and effective manner that meets or surpasses many industry standards around quality and best practices. Single start, use of specialty teams, unit on-the-road scheduling tools, and logistics processes are all areas of clear operational excellence displayed by the Paramedic Service. Regrettably, these efficiencies have been absorbed by the systemic system performance problems noted above.
- The Paramedic Service utilizes performance measurement and benchmarking data on an ongoing basis to generate service delivery improvement and enhance operational performance. Recommendations have been made to refine and improve an already noteworthy commitment to measurement and pro-active system planning.
- The planned 2008-2010 multi-year staffing increments represent a fundamental logistics challenge for the Paramedic Service in terms of recruitment and preserving an appropriate ratio of advance care paramedics. The need to ensure advanced care paramedic capture for appropriate calls is an ongoing challenge that will require attention.
- Preparation of a twenty-year master plan is a critical priority for ensuring ongoing match of service supply to demand; thereby achieving response time and clinical outcomes.

The audit has concluded that overall, the Paramedic Service outcomes have significantly eroded across 2001-2007. This erosion has largely been driven by systemic performance constraints such as offload delays and triage tool shortcomings – problems generated by Provincial decision-making and policies. Paramedic Service delivery efficiencies and operational innovations cushioned response times from these problems for a number of years after amalgamation. However, land ambulance system performance erosion now jeopardizes public safety – as evidenced by the frequency of critical unit level shortages.

The findings of the audit confirm that increased resources are required for the Paramedic Service to respond effectively to system growth. As part of this, improvements to monitoring time-on-task and hospital transfers is required to ensure efficiencies in these areas are identified and pursued.

Most importantly, there is a need to resolve the issues associated with the current triage tool used to assess calls for service. Without a change to the more effective AMPDS tool, any increase in resources will continue to be absorbed by an unrealistically high level of Code 3 and 4 calls. There are many benefits to the City managing the dispatch centre. In order to realize the full benefits of this, however, it is imperative that the City take steps to change the dispatch protocol to the one used not only by the City of Toronto but also across North America. An aggressive City response, consistent with the recommendations in this audit, is required to safeguard the public and avoid significant legal, financial and reputational risk.

In principle, the new MOHLTC performance model is a positive development because it introduces patient centric performance reporting and target setting for land ambulance services. However, in our opinion, the new patient centric performance measurement framework will likely highlight existing performance problems without focussing attention on a key driver of these problems; an ineffective Provincially mandated DPCI triage tool.

Finally, the two case studies conducted during the audit indicate that a significant return on investment could be achieved from implementing AMPDS-based dispatch in Ottawa. Both cases have documented significant response time and public safety improvements associated with this triage system.

### ***Acknowledgement***

We wish to express our appreciation for the cooperation and assistance afforded the audit team by management and staff.

## RÉSUMÉ

### ***Introduction***

La vérification du Service paramédic d'Ottawa fait partie du plan de travail 2008 du Bureau du vérificateur général présenté pour la première fois au Conseil en décembre 2005.

### ***Objectifs de la vérification***

Pour le Service paramédic d'Ottawa, le plan de vérification de 2008 a établi huit principaux objectifs, qui sont les suivants :

1. Procéder à la validation des données touchant le rendement (vérification par échantillonnage de dossiers) et évaluer le cadre actuel de mesure du Service paramédic.
2. Évaluer et vérifier les tendances en matière de demande pour le Service paramédic (pour le service lui-même et les facteurs influant sur le budget).
3. Évaluer le rendement de la Ville en matière de gestion de la pression de croissance à l'aide de la capacité/de la structure du système.
4. Évaluer le rendement du Service paramédic en fonction d'une planification des activités fondée sur les résultats, de la mise en place d'objectifs et de leur atteinte.
5. Examiner les « contraintes systémiques » structurelles du Service paramédic et évaluer les facteurs conduisant à une gestion sous-optimale des ressources.
6. Évaluer la productivité du Service paramédic, cerner les possibilités d'amélioration dans les processus opérationnels et de pratiques exemplaires propres à l'industrie.
7. Évaluer et examiner les processus et les stratégies de gestion des risques du Service paramédic, de même que leurs résultats.
8. Évaluer le bien-fondé des processus de gestion financière.

### ***Résumé des principales constatations***

La vérification du Service paramédic a permis de dégager d'importantes constatations en matière de rendement et a permis de cerner bon nombre de possibilités d'améliorer la planification et la prestation de services :

1. Après les améliorations suscitées par la fusion, en 2001-2002, les délais d'intervention dans le 90e centile pour les appels de code 4 à Ottawa risquent maintenant de se détériorer à un niveau sous les normes de service imposées dans la *Loi sur les ambulances*. Cette non-conformité avec les délais d'intervention exigés par la Loi est un phénomène auquel on assiste à travers tout l'Ontario – il

s'agit en quelque sorte d'une lacune systémique, à l'échelle de tout le réseau de santé.

2. Les délais de débarquement des patients dans les hôpitaux d'Ottawa constituent une cause majeure de l'érosion des délais d'intervention des services ambulanciers de la Ville. Les retards causés par des problèmes complexes liés au déplacement des patients dans le réseau provincial de santé empirent. On ne prévoit pas, à court et à moyen terme, que des solutions dignes de ce nom seront apportées à ces problèmes dans le réseau provincial de santé.
3. Le système de triage utilisé présentement à Ottawa pour répartir les appels d'urgence est déficient, non productif et contribue à l'inefficacité globale du Service paramédic et à l'érosion des délais d'intervention (voir le tableau ci-dessous). En 2006 et en 2007, environ 85 % des appels d'urgence triés étaient classés comme appel de code 4 (comportant un danger de mort) et nécessitant « phares et sirène ». En fait, aucun triage digne de ce nom n'est présentement effectué pour les appels et les ressources ambulancières déjà rares sont épuisées dans un processus tout à fait inefficace et inopérant. Le remplacement des mécanismes actuels de triage de la province (que l'on appelle couramment le protocole « DPCI »), nettement déficients, par le *North American standard Medical Priority Dispatch System* (répartition des appels en fonction de leur degré d'urgence, aussi connu sous l'acronyme « AMPDS »), un mécanisme de triage issu du secteur médical, devrait être une priorité absolue. La province a toujours hésité à approuver ce mécanisme crucial pour l'amélioration du triage, et ce, malgré le fait que l'AMPDS soit déjà en place à Toronto et à Niagara. Le refus incessant du gouvernement provincial (dans le cadre d'un dialogue au niveau du personnel) de permettre à la Ville d'adopter le protocole AMPDS devrait donner lieu à un examen en profondeur du rôle de la Ville dans la répartition des ambulances.

***Pourcentage des appels d'urgence classés  
comme nécessitant « phares et sirène » à Ottawa***

<i>TYPE D'APPEL</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>
<i>CODE 4</i>	36 753	42 915	49 283	55 890	57 266	69 779	72 523
<i>CODE 3</i>	20 662	22 601	21 659	20 974	22 200	12 409	12 879
<i>TOTAL</i>	57 415	65 516	70 942	76 864	79 466	82 188	85 402
<i>CODE 4 EN TANT QUE % DU TOTAL</i>	<b>64 %</b>	<b>66 %</b>	<b>69 %</b>	<b>73 %</b>	<b>72 %</b>	<b>85 %</b>	<b>85 %</b>

4. Le processus budgétaire de la Ville n'a pas pu accroître le personnel ambulancier de façon régulière et au moment opportun pour faire face à l'augmentation continue du nombre d'appels enregistrée de 2001 à 2008. Au cours de cette période, l'augmentation de la dotation a été irrégulière, sa mise en place différée et étalée sur plusieurs années, si bien que le volume d'appels a fini par prendre le dessus sur les ressources ambulancières disponibles. Le tout a provoqué une érosion des délais d'intervention, et des pénuries au sein des unités critiques.
5. L'augmentation des temps d'attente des hôpitaux, le triage inférieur aux normes et la croissance du nombre d'ambulances qui n'a pas suivi celle du volume d'appels font en sorte que le Service paramédic d'Ottawa fait désormais face à une érosion de la disponibilité de ses unités jusqu'à un niveau nettement dangereux pour la population. Chaque jour, le nombre d'unités disponibles demeure sous les seuils critiques, et il arrive souvent qu'aucune ambulance ne soit disponible. Un sondage s'étendant sur huit mois, réalisé en 2007, a permis d'identifier 492 incidents au cours desquels le nombre d'ambulances disponibles était de moins de sept dans toute la Ville. Dans 22 de ces cas, il n'y en avait même aucune. Aucune amélioration appréciable sur les plans de la sécurité et de responsabilité n'est possible, tant et aussi longtemps que la Ville ne remédie pas au problème. Le tableau de la page suivante est une analyse de vérification des effets sur les délais d'intervention résultant d'un degré critique de disponibilité des ambulances.

*Érosion des délais d'intervention des ambulances durant les périodes critiques de disponibilité des ressources*

<b>SEUIL CRITIQUE DE DISPONIBILITÉ</b>	<b>DÉLAIS D'INTERVENTION DANS LE 90<sup>e</sup> CENTILE POUR L'APPEL SUIVANT LE TÉLÉAVERTISSEMENT</b>	<b>DÉLAIS SUPPLÉMENTAIRES AU-DELÀ DU DÉLAI D'INTERVENTION DE 12 :49 DANS LE 90<sup>e</sup> CENTILE POUR LE SYSTÈME À HAUTE DENSITÉ DE 2007</b>
SEUIL CRITIQUE : 7 UNITÉS	18:27	PLUS 5:38
SEUIL CRITIQUE : 6 UNITÉS	20:56	PLUS 8:07
SEUIL CRITIQUE : 5 UNITÉS	18:34	PLUS 5:45
SEUIL CRITIQUE : 4 UNITÉS	21:09	PLUS 8:20
SEUIL CRITIQUE : 3 UNITÉS	27:10	PLUS 14:21
SEUIL CRITIQUE : 2 UNITÉS	30:00	PLUS 17:11
SEUIL CRITIQUE : 1 UNITÉ	27:29	PLUS 14:40
SEUIL CRITIQUE : 0	19:23	PLUS 6:34
<b>TOUS SEUILS CRITIQUES</b>	<b>21:34</b>	<b>PLUS 8:45</b>

6. L'analyse de délais d'intervention en 2007 est préoccupante. Dans les 492 cas où les ressources disponibles se situaient sous le seuil critique des 7 unités, le délai d'intervention dans le 90<sup>e</sup> centile de l'appel d'urgence suivant est au-delà de 8 minutes plus lent que le délai d'intervention dans le 90<sup>e</sup> centile pour 2007 dans l'ensemble du réseau, lequel est de 12 minutes et 49 secondes.
7. Même si les défis importants relatifs au rendement « systémique » du service demeurent au-delà de son contrôle immédiat, les éléments probants dégagés dans l'ensemble par la vérification suggèrent que le Service paramédic d'Ottawa est efficace et efficient, et satisfait ou dépasse bien des normes de l'industrie en matière de qualité et de pratiques exemplaires. Un seul départ, l'utilisation d'équipes spécialisées, les outils d'établissement des horaires des unités sur la route et les processus logistiques sont autant de secteurs qui traduisent l'excellence des activités opérationnelles du Service paramédic d'Ottawa. L'efficacité du Service paramédic a été documentée par l'équipe de vérification à l'aide d'analyses comparatives entre pairs et de calculs de vérification des données touchant le rendement. Malheureusement, ces signes probants

d'efficacité sont neutralisés par les problèmes de rendement systémiques à l'échelle de la Ville et de la province, dont nous faisons état ci-dessus.

## **Recommandations**

Voici une liste des recommandations du vérificateur, regroupées sous les trois grands thèmes utilisés pour la vérification et dans le présent rapport.

1. Contexte du rendement des services médicaux d'urgence (SMU);
2. Contraintes liées au rendement de l'ensemble du service/principaux facteurs influant sur les résultats en matière de service;
3. Vérification du rendement du service et examen des processus et pratiques de fonctionnement.

### **Réponse globale de la direction**

Dans l'ensemble, la direction est d'accord avec les constatations de la vérification et les recommandations formulées par le vérificateur, à l'exception de deux points.

Le Service paramédic d'Ottawa appuie l'acquisition de l'AMPDS comme un outil du centre de communications et un cadre de répartition des communications plus ouvert donnerait au Service la capacité d'améliorer ses résultats et son efficacité.

On reconnaît que le Service paramédic est administré de manière efficace et efficiente, et qu'il fonctionne dans le contexte d'un système de santé complexe et lourdement réglementé.

Le Service paramédic convient qu'en tant que service à mission essentielle, nous devons pouvoir compter sur un apport financier soutenu, constant et prévisible à long terme, pour la sauvegarde de la sécurité du public.

Les réponses à chacune des 34 recommandations du vérificateur sont présentées ci-dessous.

## **Contexte du rendement des services médicaux d'urgence (SMU)**

### **Recommandation 1**

**Que la Ville d'Ottawa élabore une stratégie intergouvernementale de défense des intérêts pour une réforme majeure du système qui permettrait un contrôle définitif des composantes indispensables à des SMU à haut rendement.**

### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le Service paramédic d'Ottawa élaborera une stratégie intergouvernementale de défense des intérêts dans le cadre de l'exercice d'examen stratégique de la Direction en 2010.

## **Recommandation 2**

**Que le cadre de mesure du rendement et de préparation de rapports du Service paramédic, que le prochain exercice d'examen stratégique de la Direction et que le processus actuel de planification des services se concentrent sur la gestion des événements à risque et sur les tendances touchant l'érosion du rendement identifiées dans le présent rapport de vérification 2001-2007 du rendement du système d'ambulances terrestres.**

### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le cadre de mesure du rendement et de préparation de rapports du Service paramédic, le prochain exercice d'examen stratégique de la Direction en 2010 et le processus actuel de planification des services se concentreront sur la gestion des événements à risque et sur les tendances touchant l'érosion du rendement identifiées dans le présent rapport de vérification 2001-2007 du rendement du système d'ambulances terrestres.

## **Contraintes liées au rendement de l'ensemble du service/principaux facteurs influant sur les résultats en matière de service**

### **Recommandation 3**

**Que la Ville adopte une position claire et transparente sur le mécanisme actuel de triage - le protocole DPCI - et sur le renouvellement du contrat du centre de communications du ministère :**

- a) **en exigeant immédiatement du ministère de la Santé un cadre de répartition des communications identique à celle dont bénéficie la Ville de Toronto;**
- b) **en mettant sur pied un contrat de communication avec le ministère de la Santé, lequel serait fondé sur les résultats et non sur des processus normatifs, sur des logiciels ou sur des méthodologies de triage;**
- c) **en l'absence d'un contrat fondé sur les résultats dans lequel l'opérateur peut choisir la méthodologie de triage, exiger la possibilité de répartir les appels sans triage; et,**
- d) **dans l'éventualité où aucune des possibilités ci-dessus n'est acceptée par la province, envisager la possibilité de se retirer lors du renouvellement du contrat d'opérateur des communications.**

### **Réponse de la direction**

La direction est d'accord avec les points a), b) et c) de cette recommandation.

La Direction est d'accord avec l'acquisition de l'outil AMPDS comme outil de répartition et d'un cadre de répartition des communications plus ouvert. La direction continuera de défendre la cause de la mise en pratique de cet outil à Ottawa auprès du ministère de la Santé de l'Ontario.

La direction n'est pas d'accord avec le point d) de cette recommandation. De l'avis de la direction, le rapport de vérification ne prend pas en compte de la valeur opérationnelle et stratégique déjà réalisée au sein d'un centre de communications intégrées. L'unité de répartition du Service paramédic de la Ville est reconnue comme le centre de répartition au rendement le plus élevé (T0-T2) de la province, comme l'a indiqué le rapport public de l'IACSM paru en 2007.

La Direction constate qu'une équipe de répartition intégrée donne lieu à divers signes probants d'efficacité opérationnelle, y compris, mais sans s'y limiter :

- la disponibilité de données en temps réel permet au personnel d'évaluer et d'adapter son rendement au jour le jour
- la modification du plan de déploiement en temps réel permet au personnel de s'adapter à l'évolution des situations dans la communauté, p. ex. événements majeurs, fermetures de routes, etc.

De plus, l'intégration de la direction permet la mise en place d'objectifs de gestion communs à l'échelle du service, ce qui nous permet de répondre aux attentes du Conseil et de la communauté, chose impossible à faire s'il s'agissait de deux organisations distinctes.

#### **Recommandation 4**

**Qu'une fois le protocole AMPDS en place, la Ville travaille à obtenir le statut de centre d'excellence en émulant les pratiques exemplaires ayant cours à travers l'Amérique du Nord, notamment à Niagara et Toronto.**

##### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

Les délais et le financement nécessaires pour obtenir ce statut dépendent de négociations avec le ministère de la Santé et des Soins de longue durée.

#### **Recommandation 5**

**Que le Service paramédic d'Ottawa continue de participer au groupe de travail provincial sur les temps d'attente dans les hôpitaux et les délais de débarquement des patients.**

##### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

La Direction continuera de participer au groupe de travail provincial sur les temps d'attente dans les hôpitaux et les délais de débarquement des patients.

### **Recommandation 6**

**Que la mesure des délais de débarquement des patients soit perfectionnée en vue d'inclure un relevé horaire des « transferts de patients à une infirmière du triage de l'urgence » en vue de corriger toute éventuelle surestimation des temps de débarquement.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

À l'heure actuelle, les données sont saisies dans les systèmes de préparation de rapports sur le temps d'attente à l'urgence (EDRS) de l'hôpital. Le nouveau rapport d'appels d'ambulances proposé inclura le délai de « transferts de soins » à l'appui de cette recommandation.

### **Recommandation 7**

**Que le Service paramédic d'Ottawa fasse rapport annuellement au Conseil municipal sur les répercussions financières des heures perdues par les ambulances en raison des délais de débarquement dans les hôpitaux.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

La direction fera rapport annuellement au Conseil municipal sur les répercussions financières des heures perdues par les ambulances en raison des délais de débarquement dans les hôpitaux, à compter en 2010.

### **Recommandation 8**

**Que le Service paramédic d'Ottawa inclue le calcul du temps passé à la tâche au moment de prévoir des augmentations de personnel.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

### **Recommandation 9**

**Que le Service paramédic d'Ottawa mette sur pied un projet-pilote en amélioration de la qualité pour les processus actuels de transfert des patients en centre hospitalier.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le projet d'infirmière préposé au transfert, qui réorganise le processus actuel de transfert des patients au centre hospitalier, a été lancé le 29 septembre 2008 – par une entente contractuelle avec l'Hôpital d'Ottawa et le Service paramédic d'Ottawa. Le projet est financé à 100 p. cent par le ministère de la Santé et des Soins de longue durée (voir le Rapport sur les temps d'attente des paramédics au centre hospitalier ACS2008-CPS-OPS-0004 reçu par le Comité des Services communautaires et de protection (SCP) à sa réunion du 16 octobre 2008). Le Service paramédic d'Ottawa fournira un bilan de l'impact de la première année de ce projet au Comité SCP et au Conseil au quatrième trimestre de 2009.

### **Recommandation 10**

**Que le Service paramédic d'Ottawa présente un plan directeur à long terme et un budget pour la dotation et pour les ressources supplémentaires nécessaires pour assurer la croissance des services.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

On retiendra les services d'un expert-conseil de l'extérieur afin d'élaborer un plan directeur à long terme et un budget pour la dotation et pour les ressources supplémentaires nécessaires pour assurer la croissance des services. Le Service paramédic d'Ottawa a déjà amorcé ce processus (voir le rapport sur les tendances en matière de demande pour le Service paramédic ACS2008-CPS-OPS-0003 reçu par le Comité des SCP à sa réunion du 16 octobre 2008), lequel comprend un plan de dotation triennal qui sera intégré dans les budgets 2009, 2010 et 2011 de la Direction.

### **Recommandation 11**

**Que le Service paramédic d'Ottawa révise son plan directeur deux fois l'an afin de s'assurer que les pressions et les défis imprévus et en émergence puissent être pris en compte dans ledit plan et que le Conseil en soit informé.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

Comme il est précisé dans la recommandation 10, ce travail est déjà amorcé. Le Service paramédic d'Ottawa fait rapport annuellement au Comité et au Conseil municipal, par l'entremise de son rapport sur les tendances en matière de demande pour le Service paramédic, qui présente les résultats des six premiers mois de chaque année, y compris les pressions et les défis qui devraient être pris en compte dans le budget du prochain exercice.

**Recommandation 12**

Que le Service paramédic d'Ottawa prépare un plan des ressources dans lequel la croissance annuelle sera considérée séparément des autres déterminants pour l'accroissement des ressources et le recrutement de personnel.

**Réponse de la direction**

La direction est d'accord avec cette recommandation et l'a déjà mise en pratique.

Le rapport annuel sur les tendances en matière de demande pour le Service paramédic fait la distinction entre la croissance (c.-à-d. les pressions du volume d'appels) et les autres facteurs comme le temps d'attente à l'hôpital, de sorte que le Conseil peut facilement reconnaître les divers facteurs qui influent sur l'intervention globale, afin de contribuer à isoler les exigences en matière de ressources qui relèvent de la Ville.

**Recommandation 13**

Que le Service paramédic d'Ottawa présente, dans ses rapports annuels, les approbations touchant la dotation des années correspondantes.

**Réponse de la direction**

La direction est d'accord avec cette recommandation. C'est la pratique actuelle depuis 2007.

**Recommandation 14**

Que la Ville obtienne un avis juridique en vue d'évaluer les risques financiers et liés à la responsabilité associés à l'érosion quotidienne du réseau paramédic jusqu'aux seuils critiques de disponibilité des ambulances (cette recommandation a été mise en pratique en juillet 2008).

**Réponse de la direction**

La direction est d'accord avec cette recommandation et elle a terminé ce travail en juillet 2008.

**Recommandation 15**

Que le vérificateur général informe le directeur municipal des problèmes de rendement et du profil de risques associé aux seuils critiques de disponibilité des ressources dans un breffage provisoire avant le rapport annuel de 2009 (cette recommandation a été mise en pratique en juillet 2008).

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

**Recommandation 16**

**Que le chef du Service paramédic prépare un plan d'urgence visant à faire face de façon immédiate à cette lacune grave dans la disponibilité des ambulances.**

**Réponse de la direction**

La direction est d'accord avec cette recommandation. Les processus opérationnels sont actuellement en place et seront formulés sous forme de cadre stratégique en 2010.

**Recommandation 17**

**Que le chef du Service paramédic fournisse des rapports trimestriels au Conseil sur les effets des niveaux de ressources critiques sur les délais d'intervention dans le 90<sup>e</sup> centile des appels subséquents.**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le Service paramédic d'Ottawa ne possède pas actuellement les logiciels de préparation de rapports nécessaires pour mettre cette recommandation en pratique. La Direction demandera l'aide du ministère de la Santé pour ce qui est de l'achat de logiciels de préparation de rapports afin d'être en mesure de présenter des rapports sur les niveaux de ressources critiques.

**Vérification du rendement du service et examen des processus et pratiques de fonctionnement****Recommandation 18**

**Que le Service paramédic d'Ottawa établisse des cibles annuelles pour les délais d'intervention à partir des pourcentages réels d'appels d'urgence avec délais d'intervention de 8:59 à 15:59 au lieu des cibles actuelles dans le 90<sup>e</sup> centile.**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le rapport annuel du Service paramédic de 2007 (rapport reçu par le Comité des SCP à sa réunion du 21 août 2008) et le Rapport sur les tendances de 2008, plus récent, font état des cibles annuelles pour les délais d'intervention. Cette pratique se poursuivra dans les prochains rapports annuels et les rapports sur les tendances en matière de rendement.

**Recommandation 19**

**Que le Service paramédic d'Ottawa assure le suivi et fasse rapport chaque année sur la gamme complète de mesures de rendement précisées dans la présente vérification.**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le Service paramédic d'Ottawa passera en revue la gamme complète de mesures de rendement précisées dans la présente vérification, afin de les inclure dans les prochains rapports annuels dans le cadre de l'exercice d'examen stratégique de la Direction en 2010.

**Recommandation 20**

**Que le Service paramédic d'Ottawa inclue des données de rendement sur le « nombre d'ambulances prévues à l'horaire par rapport au nombre d'ambulances déployées dans les faits » dans son rapport annuel de rendement au Comité/au Conseil.**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le Service paramédic d'Ottawa passera en revue la gamme complète de mesures de rendement précisées dans la présente vérification, afin de les inclure dans les prochains rapports annuels dans le cadre de l'exercice d'examen stratégique de la Direction en 2010.

**Recommandation 21**

**Que le Service paramédic d'Ottawa établisse des objectifs de rendement continus dans le cadre de la planification de ses opérations en ayant recours au « nombre d'ambulances prévues à l'horaire par rapport au nombre d'ambulances déployées dans les faits ».**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le Service paramédic d'Ottawa passera en revue la gamme complète de mesures de rendement précisées dans la présente vérification, afin de les inclure dans les prochains rapports annuels dans le cadre de l'exercice d'examen stratégique de la Direction en 2010.

**Recommandation 22**

**Que le Service paramédic d'Ottawa établisse une étendue cible pour son indice moyen de productivité dans le système à haute densité (nombre d'appels par paramédic).**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

On abordera les indices d'appels par paramédic dans le cadre de l'exercice d'examen stratégique de la Direction en 2010, et ces derniers seront inclus dans le

mandat de l'expert conseil chargé de l'élaboration d'un plan directeur à long terme et d'un budget, comme il est précisé dans la recommandation 10..

### **Recommandation 23**

**Que la tendance en matière « d'indice d'appels par paramédic » à Ottawa (et que les indices de paramédics d'autres services) fasse régulièrement l'objet de rapports et soit intégrée au cadre du plan directeur et dans les prochaines revues stratégiques du service.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

On abordera les indices d'appels par paramédic et ceux des pairs externes dans le cadre de l'exercice d'examen stratégique de la Direction en 2010, et ces derniers seront inclus dans le mandat de l'expert conseil chargé de l'élaboration d'un plan directeur à long terme et d'un budget, comme il est précisé dans la recommandation 10.

### **Recommandation 24**

**Que la Ville d'Ottawa exige de l'Initiative d'analyse comparative des services municipaux de l'Ontario (IACSM) qu'elle restructure ses rapports sur les délais d'intervention dans le 90<sup>e</sup> centile afin d'inclure les données T0-T2.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation et l'a déjà mise en pratique. En 2008, la Ville d'Ottawa a demandé à l'IACSM de restructurer ses rapports sur les délais d'intervention dans le 90<sup>e</sup> centile afin d'inclure les données T0-T2. L'IACSM l'a fait et en a fait état dans son rapport annuel.

### **Recommandation 25**

**Que le Service paramédic d'Ottawa mène une analyse des besoins en paramédics des soins avancés (PSA).**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. Une analyse des besoins en PSA sera effectuée dans le cadre du travail effectué au plan directeur du Service paramédic en 2010.

### **Recommandation 26**

**Que le Service paramédic d'Ottawa perfectionne et élabore des objectifs annuels de mise en poste de paramédics des soins avancés à partir des transports de patients dans le cadre de son cycle annuel de planification des activités et de rapports.**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le Service paramédic d'Ottawa perfectionnera et élaborera des objectifs annuels de mise en poste de paramédics des soins avancés, afin de les inclure dans les prochains rapport annuels dans le cadre de son exercice d'examen stratégique de la Direction en 2010.

**Recommandation 27**

**Que le Service paramédic d'Ottawa élabore une politique de déploiement qui ferait en sorte que les paramédics des soins avancés ne répondraient qu'aux appels de code 4; cette politique serait semblable à celle concernant les priorités d'intervention rapides des paramédics (PRU).**

**Réponse de la direction**

La direction n'est pas d'accord avec cette recommandation.

La dotation actuelle interdit la mise en pratique de cette recommandation pour le moment. Une modification des mesures législatives et l'achat d'un meilleur outil de répartition (AMPDS) seraient nécessaires pour que la Direction puisse appuyer et mettre en pratique cette recommandation.

À l'heure actuelle, la loi exige que l'ambulance la plus proche réponde à tout appel comportant un danger de mort; par conséquent, le choix de faire intervenir un paramédic des soins primaires (PSP) au lieu d'un paramédic des soins avancés (PSA) ne peut se réaliser sans modification de la loi. Avec l'achat de l'AMPDS et des ressources adéquates, on pourrait appliquer ce principe en dépêchant une seconde unité, dotée d'un PSA, après avoir acheminé l'unité la plus proche sur les lieux. Sur le plan opérationnel, la première unité serait alors libérée et disponible pour l'appel suivant, ce qui ne peut se faire dans un service qui fonctionne constamment aux seuils critiques de disponibilité.

**Recommandation 28**

**Que le Service paramédic d'Ottawa suive et fasse rapport chaque année sur l'utilisation, les délais d'intervention et les autres données pertinentes touchant le rendement de toutes les équipes spécialisées.**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le Service paramédic d'Ottawa passera en revue la gamme complète de mesures de rendement précisées dans la présente vérification, afin de les inclure dans les prochains rapports annuels dans le cadre de l'exercice d'examen stratégique de la Direction en 2010.

### **Recommandation 29**

**Que le Service paramédic d'Ottawa élargisse la portée du programme d'intervention rapide des paramédics (PRU) en fonction des conclusions de l'analyse du programme 2005-2007.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation. L'élargissement de la portée du programme d'intervention rapide des paramédics (PRU) a commencé en mai 2008 et l'analyse se poursuit.

### **Recommandation 30**

**Que le Service paramédic d'Ottawa prépare une analyse de cas faisant état du rendement du capital investi (RCI) et de l'utilisation prévue associés aux installations prévues/à la construction d'un centre des services apparaissant dans le plan d'immobilisations de la Ville.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

On retiendra les services d'un expert-conseil de l'extérieur afin d'élaborer un plan directeur à long terme pour le Service paramédic d'Ottawa, dont le mandat inclura la préparation d'une analyse de rentabilité faisant état du rendement du capital investi (RCI). On prévoit que ce travail sera terminé en 2010.

### **Recommandation 31**

**Que le Service paramédic d'Ottawa collabore avec la santé publique et les autres intervenants en vue de rechercher et de mettre sur pied un modèle de prévision de la demande qui tiendrait compte des effets du vieillissement de la population sur la fréquence, la durée et la gravité des appels.**

#### **Réponse de la direction**

La direction est d'accord avec cette recommandation.

On retiendra les services d'un expert-conseil de l'extérieur afin d'élaborer un plan directeur à long terme pour le Service paramédic d'Ottawa, dont le mandat inclura la recherche et la mise sur pied d'un modèle de prévision de la demande qui tient compte des effets du vieillissement de la population sur la fréquence, la durée et la gravité des appels. On prévoit que ce travail sera terminé en 2010.

### **Recommandation 32**

**Que la croissance annuelle de la dotation en paramédics comprenne des ajustements proportionnels du côté du personnel de soutien.**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le Service paramédic d'Ottawa entreprend à l'heure actuelle d'inclure des ajustements proportionnels du côté du personnel de soutien à l'embauche des paramédics de première ligne, et continuera à examiner ces améliorations à la dotation en personnel à l'avenir. On se penchera sur les améliorations de la croissance de la dotation dans le cadre de l'exercice d'examen stratégique de la Direction en 2010.

**Recommandation 33**

**Que le Service paramédic d'Ottawa fournisse une analyse de rentabilité annuelle relative au système de planification des ressources (c.-à-d. qui refléterait les modèles en matière de capacité exigible des ressources) dans le cadre du processus budgétaire annuel de la Ville.**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

On retiendra les services d'un expert-conseil de l'extérieur afin d'élaborer un plan directeur à long terme et un budget pour le Service paramédic d'Ottawa, dont le mandat inclura la réalisation d'une analyse de rentabilité annuelle relative au système de planification des ressources. Le Service paramédic d'Ottawa a déjà commencé une partie de ce travail (comme il a été indiqué précédemment – voir le rapport sur les tendances en matière de demande pour le Service paramédic), lequel comprend un plan de dotation triennal qui sera intégré dans les budgets 2009, 2010 et 2011 de la Direction.

**Recommandation 34**

**Que les rapports financiers annuels et trimestriels incluent des données sur les dépenses et le nombre réel d'unités déployées pour la même période.**

**Réponse de la direction**

La direction est d'accord avec cette recommandation.

Le Service paramédic d'Ottawa étudiera l'intégration des données sur les dépenses et le nombre réel d'unités déployées dans les rapports financiers annuels et trimestriels dans le cadre de l'exercice d'examen stratégique de la Direction en 2010.

**Conclusion**

Le service d'ambulance terrestre assuré par le Service paramédic d'Ottawa est un service de protection « à mission essentielle » offert par la Ville d'Ottawa. Le Service paramédic absorbe chaque année un budget de fonctionnement qui approche maintenant les 60 millions – une hausse de 93 % depuis la fusion.

La vérification a permis de faire état de constatations importantes et a également pu déterminer plusieurs possibilités d'améliorer la planification et la prestation des services :

- Après une amélioration initiale au début de la décennie, les délais d'intervention dans le 90<sup>e</sup> centile pour les appels de code 4 à Ottawa sont maintenant à risque de se détériorés à un niveau se situant sous les normes de service imposées dans la *Loi sur les ambulances*. Ce problème de rendement systémique a cours à travers tout l'Ontario.
- Les délais de débarquement des patients dans les hôpitaux d'Ottawa constituent une cause majeure de l'érosion des délais d'intervention des services ambulanciers terrestre de la Ville. Les retards dans l'acheminement des patients causés par des problèmes complexes de déplacement de ces patients dans le système de santé provincial empirent. On ne prévoit pas, à court et à moyen terme, de solution appréciable à ce problème du système de santé provincial.
- Le système de triage utilisé à Ottawa pour répartir les appels d'urgence est déficient, non productif et contribue à l'inefficacité globale du système et à l'érosion des délais d'intervention. Le remplacement du mécanisme de triage actuel par le protocole AMPDS, issu du secteur médical, devrait être une priorité absolue. La province doit être tenue d'approuver la mise en place de ce protocole pour une amélioration cruciale des mécanismes de triage, et doit aussi reconnaître les précédents relatifs à l'AMPDS en place à Toronto et à Niagara. Le refus incessant du gouvernement provincial d'apporter cette amélioration au service devrait donner lieu à un examen en profondeur du rôle de la Ville dans la répartition des ambulances.
- Le processus budgétaire de la Ville n'a pas su accroître le personnel ambulancier de façon régulière et au moment opportun pour faire face à l'augmentation continue du nombre d'appels enregistrée de 2001 à 2008. Au cours de cette période, l'augmentation de la dotation a été irrégulière et sa mise en place différée et étalée sur plusieurs années, si bien que le volume d'appels a fini par prendre le dessus sur les ressources disponibles. Le tout a provoqué une érosion des délais d'intervention.
- L'augmentation des temps d'attente des hôpitaux, le triage inférieur aux normes et la croissance du nombre d'ambulances qui n'a pas suivi celle du volume d'appels font en sorte que le Service paramédic d'Ottawa fait désormais face à une érosion régulière de la disponibilité de ses unités, sous les seuils permettant d'assurer la sécurité de la population. L'érosion du nombre d'unités disponibles sous les seuils critiques survient chaque jour, et il arrive souvent qu'aucune ambulance ne soit disponible. Il semble inévitable que cette situation mette en danger la sécurité publique, la fiabilité et le degré de service aux citoyens, à moins que la Ville ne soit fermement résolue à mettre fin au problème.

Même si les défis importants relatifs au rendement « systémique » du service demeurent au-delà de son contrôle immédiat, le Service paramédic d'Ottawa est efficient et efficace, et satisfait à bien des normes de l'industrie en matière de qualité et de pratiques exemplaires ou les dépasse. Un seul départ, l'utilisation d'équipes spécialisées, les outils d'établissement des horaires des unités sur la route et les processus logistiques sont autant de secteurs qui traduisent l'excellence des activités du Service paramédic d'Ottawa. Malheureusement, ces signes probants d'efficacité sont neutralisés par les problèmes de rendement systémiques à l'échelle de la Ville et de la province, dont nous faisons état précédemment.

- Le Service paramédic a recours à la mesure du rendement et à des données d'études comparatives de façon continue pour favoriser une amélioration des services et accroître le rendement de ses opérations. Des recommandations ont été formulées pour bonifier et améliorer un engagement déjà remarquable en matière de mesure et de planification proactive au sein du service.
- L'accroissement graduel de la dotation prévue de 2008 à 2010 constitue un défi logistique fondamental pour le Service paramédic en termes de recrutement et de sauvegarde d'une proportion adéquate de paramédics des soins avancés. La nécessité d'assurer la disponibilité de paramédics des soins avancés pour faire face à certains types d'appels est un défi de tous les instants, qui nécessitera une attention soutenue.
- La préparation d'un plan directeur sur 20 ans demeure une priorité cruciale en vue d'assurer une harmonisation continue des services disponibles et de la demande; une telle harmonisation permettra d'atteindre les résultats escomptés sur le plan clinique et en matière de délais d'intervention.

La vérification a permis de conclure que dans l'ensemble, le Service paramédic s'est considérablement détérioré de 2001 à 2007. Cette détérioration est largement tributaire des contraintes de rendement systémiques telles que les délais de débarquement des patients et les lacunes dans les mécanismes de triage – autant de problèmes générés par la prise de décision et les politiques à l'échelle provinciale. L'efficacité et les innovations dont a su faire preuve le Service paramédic dans le cadre de ses opérations ont su protéger les délais d'intervention des répercussions liées à ces contraintes pendant un certain nombre d'années suivant la fusion. Toutefois, l'érosion du rendement du réseau d'ambulances terrestres met maintenant en danger la sécurité du public, comme en témoigne les fréquentes pénuries de véhicules ambulanciers.

Les constatations de la vérification confirment que le Service paramédic a besoin de ressources accrues pour répondre efficacement à la croissance systémique. Dans ce contexte, des améliorations au suivi du temps passé à la tâche et des transferts en centre hospitalier sont nécessaires pour assurer la reconnaissance et la concrétisation de signes probants d'efficacité dans ce domaine.

Plus important encore, il faut remédier aux problèmes liés à l'outil de triage actuel qui sert à évaluer les appels d'ambulances. Sans l'adoption de l'outil AMPDS, plus efficace, toute augmentation des ressources continuera d'être absorbée par un niveau anormalement élevé d'appels de code 3 et 4. La gestion du centre de répartition par la Ville comporte de nombreux avantages. Pour en profiter pleinement, toutefois, la Ville doit impérativement prendre les mesures nécessaires pour remplacer le protocole de répartition actuel par le protocole utilisé non seulement par la Ville de Toronto, mais aussi à travers l'Amérique du Nord. Une réaction ferme et résolue de la part de la Ville, conformément aux recommandations de la présente vérification, est nécessaire pour la sauvegarde de la sécurité publique et pour éviter de devoir faire face à des risques considérables sur les plans juridiques et financiers, et pour éviter de mettre en péril la réputation.

### ***Remerciements***

Nous tenons à remercier la direction et le personnel du Service paramédic pour l'aide et la collaboration qu'ils ont apportées à l'équipe de vérification.



## 1 INTRODUCTION

The audit of the Ottawa Paramedic Service was included in the 2008 work plan of the Office of the Auditor General, which was first presented to Council in December 2005.

## 2 BACKGROUND

The City of Ottawa assumed operational responsibility for Land Ambulance Services on January 1<sup>st</sup> 2001. Operational responsibility, under a contract with the Province, for the Central Ambulance Communication Centre (dispatch) followed in December 2002.

Prior to the design and implementation of an Emergency Medical Service (EMS) performance based system, the Ministry of Health and five private sector service providers delivered a “level of effort” style ambulance service featuring sub-standard response times, limited budgets and basic clinical capabilities. Response times were slow and clinical excellence characterized by advanced care paramedic capability was non-existent. Significant expenditure and service level investments were pending, yet unfunded by the Province, at the time of the Locals Services Realignment transfer of responsibility to the City.

Upon assumption, the amalgamation transition team, the City and its outside ambulance consulting firm (Fitch and Associates) designed a “high performance” EMS that was to be resourced to achieve patient centred outcomes such as 8:59 90<sup>th</sup> percentile urban response time performance and 100% advanced care paramedic on-scene clinical excellence for appropriate Code 3 and 4 calls.

Code 3 and Code 4 urgent and life-threatening call volumes for the Paramedic Service totalled 57,415 in 2001 – rising by 49 percent to a projected 85,402 calls for 2007. In 2001 Paramedic Service gross operating budget was \$29.2 million. In 2008 the proposed gross operating budget was \$56.4 million – representing an increase of 93 percent since 2001. City growth, budget requirements and associated service demand escalation continues to challenge the Paramedic Service.

In 2001 Paramedic Service assigned 166 paramedics to the high-density urban area. By 2006 the high-density urban area featured 224 assigned paramedics. The reported 90<sup>th</sup> percentile Code 4 response times in 2001 were 12:24 in the high-density urban area (reduced from 14:35 in the pre-amalgamation Provincial system). In 2006 90<sup>th</sup> percentile Code 4 response times were 12:32 in the high-density urban area. By 2007 Paramedic Service 90<sup>th</sup> percentile response times were approaching the legislated minimum requirements of the Ambulance Act. Despite staffing increases and budget increases, the expected lower response times has not occurred.

In 2001, Ottawa’s 90<sup>th</sup> percentile hospital wait times were almost 65 minutes, while *average* hospital wait times in 2001 were almost 37 minutes. However the Fitch &

Associates system design assumption for 90<sup>th</sup> percentile hospital wait times was 20 minutes. By 2007 the 90<sup>th</sup> percentile hospital wait time was over 80 minutes representing an increase of 54 percent. The City has no effective control over this type of system performance erosion driven by the patient flow failings of the Province's hospital system.

### **3 AUDIT OBJECTIVES AND APPROACH**

#### **3.1 Overview of Scope and Objectives**

In terms of scope, the 2008 audit plan for the Paramedic Service focussed on the following:

- ⇒ The Paramedic Service workload/process productivity, resource utilization and risk management;
- ⇒ On scene clinical excellence via Advanced Care Paramedic (ACP) capture;
- ⇒ Optimal EMS system design and resourcing leading to timely on scene response; and,
- ⇒ Optimal Dispatch system design, performance reporting and deployment.

The audit also considered previous independent third party performance assessments of the Paramedic Service including the following:

- ⇒ Provincial accreditations of the Paramedic Service
- ⇒ Alice V. Martin Coroner's Inquest Recommendations
- ⇒ Provincial Auditor's Reports on Ambulance Dispatch

The 2008 audit plan for the Paramedic Service sets out eight key objectives as follows:

1. Execute Performance Data Validation (File Sample Audit) and Assess Existing Paramedic Service Measurement Framework
2. Assess and Verify Demand Trends for the Paramedic Service (Service and Budget Drivers)
3. Assess City Performance in Managing Growth Pressures via System Capacity/Design
4. Assess Paramedic Service Performance regarding Outcomes Based Business Planning, Target Setting and Achievement
5. Review Structural Paramedic Service "System Constraints" and Assess Factors Leading to Sub-optimal Resource Management

6. Assess Paramedic Service Productivity, Identify Opportunities for Implementing Business Process Improvements and Industry Best Practices
7. Assess and Review Paramedic Service Risk Management Processes, Strategies and Outcomes
8. Assess the adequacy of financial management processes

## **4 OBSERVATIONS AND RECOMMENDATIONS**

For purposes of clarity in reporting, Audit analysis, observations and recommendations are grouped into the following areas:

1. Province-wide performance context and City of Ottawa historic performance trends;
2. Paramedic Service system-wide performance constraints and core performance drivers; and,
3. Management and operational processes/practices associated with “best practice” service delivery outcomes.

These reporting areas encompass all eight of the audit objectives set out above.

### ***4.1 Province-wide Performance Context and City of Ottawa Historic Performance Trends***

It is critical to understand the Ontario municipal sector performance context regarding the delivery of Land Ambulance services, in order to gain insight into the City of Ottawa’s challenges associated with achieving targeted service delivery outcomes during 2001-2007.

#### **4.1.1 Province-wide Performance Context**

##### **4.1.1.1 Province-wide Performance Synopsis**

The Ministry of Health & Long Term Care (Emergency Health Services Branch) was responsible for all aspects of land ambulance service prior to the devolution of responsibility to designated municipalities in 2001. It is important to provide a global perspective on EMS performance and cost trends across the Province.

The audit team has obtained Provincial performance data that was recently circulated to concerned municipalities via the Association of Municipal Emergency Medical Services of Ontario (AMEMSO). The Province-wide performance data provides trending of ambulance 90th percentile response times, and identifies those in compliance with the 1996 legislated standard. The Provincial performance data also documents rapidly escalating service delivery costs for land ambulance. Ontario municipalities have invested significant financial resources in an attempt to upgrade clinical service levels offered by paramedics. Escalating call volumes are

yet another factor that requires consideration when allocating additional land ambulance units and improve ambulance response time reliability.

As part of the Provincial transfer of land ambulance services, 90th percentile response time standards were set for each municipality or designated service area based on the ambulance response times that existed in that area in 1996. For the City of Ottawa the 1996 90th percentile legislated response time standard is 12:41, excluding dispatch time.

The Provincial performance data documents the following problematic trends:

- In 2004 only 36% of municipalities met their “90th percentile in 1996” legislated standard;
- In 2005 the municipal percentage complying with the 1996 standard eroded to 28 percent;
- Municipal response time compliance data for 2006 and 2007 has not yet been made available by the Province. However it is well known in the EMS community that hospital offload delays across urban Ontario have continued to lengthen in 2006 and 2007 with an almost certain erosion in 90th percentile response times for those years;
- Province-wide Code 4 call volumes have increased 54.4 percent from 2000. Call volume driven staffing translates into rapid increases in operating costs.
- Land ambulance costs have increased significantly across the Province, as many municipalities invested heavily in new performance based EMS systems by adding staff and resources to the previously under funded level of effort system. Many EMS systems also increased the level of care provided through the introduction of advanced care paramedics, while paramedic wage rate competition also drove up costs across the Province.
- The following chart shows the increasing costs pre-Local Services Realignment versus 2006:

**PRE LOCAL SERVICES REALIGNMENT VS 2006**

% RANGE INCREASE IN COST	# OF MUNICIPALITIES
0-99	6
100-199	31
200-299	11
300 +	3

The above chart reveals that 45 of 51 municipalities have seen a cost increase greater than 100%.

The following table further demonstrates the rapid escalation of costs in a cross-section of urban Ontario municipalities:

**PRE LOCAL SERVICES REALIGNMENT VS 2006**

	SPENDING INCREASE		SPENDING INCREASE
PEEL	261%	OTTAWA	213%
TORONTO	75%	DURHAM	167%
YORK	259%	NIAGARA	212%

In addition to cost escalation, the subsidy levels provided by the Province have not kept pace with the envisioned 50/50 split, putting further strain on the municipal tax base. On February 21, 2006 the Ministry of Health & Long Term Care announced a renewed commitment to provide a 50/50 funding partnership for the cost of land ambulance services by 2008. This would be accomplished via an investment of \$300 million in new Provincial subsidy. This 50/50 funding commitment by the Province is based on fiscal year 2006 operating expenditures and will not represent a truly equal sharing of the actual costs of delivering land ambulance services in 2007, 2008 and beyond.

The deterioration of response times across the Province has continued despite new municipal investments and rapidly increasing costs. Increasing demand for service and systemic hospital and long term care patient flow problems are negatively impacting overall land ambulance system efficiency and response time performance. The causes of land ambulance performance erosion are primarily associated with provincially administered components of the health care system.

**4.1.1.2 City of Ottawa/Provincial Business Relationship**

The above noted Provincial performance trends are critical in understanding the impacts of the intergovernmental relationship on the performance of the Ottawa Paramedic Service between 2001 and 2007. The City of Ottawa assumed responsibility for the provision of land ambulance services on January 1, 2001. Prior to assumption, the Ministry of Health & Long Term Care and five private sector services operated ambulance services in the Ottawa-Carleton region.

The Emergency Health Services Branch of the Ministry is responsible for dispatch, oversight of regulatory compliance and is a funding partner. The EMS system is based on the five service delivery principles established by the Province in that the service must be integrated, seamless, accountable, responsive and accessible. The City of Ottawa has local accountability, is responsible for local service delivery and is an ongoing funding partner in the provision of service.

Through the course of this audit, the audit team has explored the business relationship issues and governance implications that exist between the Emergency Health Services Branch (Province) and the Ottawa Paramedic Service. The

principles of the land ambulance system established by the Province have been met with limited success due to ongoing systemic governance and business relationship issues.

### ***Principle 1: Accountability***

The Ministry, in its system management role at the Province-wide level, is further removed from the community in which the Paramedic Service are provided. As such, their mandate in dispatch services appears to have a differing set of goals and objectives and desired outcomes than their local partners who provide the Paramedic Service. This lack of consensus is fundamentally problematic from an accountability perspective. Failed accountability is also evident in the string of Provincial Auditor recommendations that have not been implemented and the Provincial service management deficiencies highlighted in the Alice V. Martin inquest recommendations.

Members of the audit team met with staff from the Provincial Auditors Office to review the relevant reports delivered since 2000, and determine if and when recommendations in these reports to the Province would be implemented. No Ministry dates, action plans or information on the critical path for implementation were known or provided by Provincial Auditor's staff.

### ***Principle 2: Integrated***

The Province retained responsibility for providing EMS dispatch following the downloading of land ambulance services. The Ottawa Central Ambulance Communication Centre (CACC) was operated by the Sisters of Charity of Ottawa health service until 2002 when the Province issued an RFP and selected a new operator for dispatch services. In December 2002 the City of Ottawa commenced dispatching services on behalf of the MOHLTC and entered into a five-year agreement. Although dispatch operations are provided by the Ottawa Paramedic Service, communication gaps exist between Ottawa Paramedic Service operations and the dispatch centre staff. Interviews with paramedics and EMS management staff confirmed the arms length relationship. Many positive measures and processes have been implemented at the Ottawa CACC since the Ottawa Paramedic Service assumed daily responsibility. However, the restrictions in the agreement with the Province greatly inhibit technological and full integration with Ottawa Paramedic Service operations.

### ***Principle 3: Responsive and Accessible***

Outdated technology and call triaging tools regularly deplete available Ottawa Paramedic Service resources further reducing resource availability and increasing response times. The same is true of hospital offload delays, yet the Province has been slow to respond to adequately fund and address these issues that will improve EMS utilization. Cost escalation and outdated response time standards are

affecting the ability of the Ottawa Paramedic Service to provide responsive and accessible service to the public.

#### ***Principle 4: Seamless***

Responding to emergency calls should not be driven by borders, yet municipalities are responsible to commit valuable, finite EMS resources across municipal borders. To address this requirement, the Ottawa Paramedic Service has established a cross border agreement with some neighbouring EMS systems. The Province states in their definition of seamless that ambulance services are always available for response regardless of location or timing of calls. With the increasing frequency of critical resource levels in Ottawa, the reality of a seamless system is in question.

#### **Recommendation 1**

**That the City of Ottawa develop an intergovernmental advocacy strategy for major system reform that focuses on securing control over the necessary components of a high performance EMS system.**

##### **Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will develop an intergovernmental advocacy strategy as part of the strategic branch review exercise in 2010.

#### **4.1.2 City of Ottawa Historic Performance Context and Trends**

Since assuming operational responsibility for land ambulance services in 2001, the Paramedic Service has delivered regular system performance reports to Council. These reports feature performance indicator data and evolving trends. In order to provide context, and identify/position a variety of performance data issues in this audit, a broad overview of system performance trends is required. This overview is based on data reported to Council from 2001-2007. Other sources of performance data not yet reported to Council will also be utilized in upcoming components of the audit report.

##### **4.1.2.1 Initial System Design Modeling**

Prior to the Local Service Realignment (LSR) transfer, the Ministry of Health and Long Term Care operated a contracted out 'level of effort' driven land ambulance system. Budget decisions generated non-standardized service delivery outcomes across the Province. Therefore legislated response time standards at the point of municipal assumption (90<sup>th</sup> percentile in 1996) would vary widely across municipal service providers.

Planning for land ambulance transfer in 2000, Ottawa opted to create a performance-based emergency medical system focussed on the consistent achievement of service delivery outcomes such as response time reliability, clinical

excellence, economic efficiency and public accountability. The initial design of the new performance based system was undertaken by industry recognized external consultants (Fitch and Associates). System staffing and budget requirements were based on forecasts of call volumes, required paramedic “time on task”, available service hours per paramedic, and hospital offload turnaround times. The system staffing and budget model/formula was designed to generate targeted 90<sup>th</sup> percentile response time targets.

The initial system design model forecasting by the City’s external consultant significantly underestimated resources required for a high performance system that is targeting a long term 8:59 urban response time standard:

- 2001-2007 actual Code 3-4 call volumes have increased by 7 percent rather than the modeled 2 percent;
- Actual paramedic time on task in 2003 was already almost 50% higher than the modeled 60 minutes in the system design;
- Paramedics actually deliver approximately 1,500 services hours per medic rather than the modeled forecast of 1,800 hours derived from the American experience;
- The modeled hospital offload time of 20 minutes per patient had already been exceeded by more than 100 percent in 2003 – an actual average patient transfer time of 42 minutes. In 2007 this average wait time exceeded 57 minutes – almost triple the original modeled assumption.

The system design impact of these “modeled versus actual” discrepancies was an initial unit staffing/resourcing plan and budget that could not realistically be expected to achieve the City’s urban 90<sup>th</sup> percentile response time targets on an ongoing basis.

#### 4.1.2.2 2001-2007 System Performance Trends

The following table sets out key reported performance trends across 2001-2007.

	2001	2002	2003	2004	2005	2006	2007
# CODE 3-4 EMERGENCY CALLS	57,415	65,516	70,852	76,864	79,426	82,188	85,402
CODE 4 CALLS AS % TOTAL EMERG CALLS	64% HOT CALLS	66% HOT CALLS	70% HOT CALLS	73% HOT CALLS	72% HOT CALLS	85% HOT CALLS	85% HOT CALLS
# PARAMEDICS	254	268	268	276	296	312	312
OPERATING BUDGET (\$ MILLIONS)	\$29.2	\$29.5	\$36.6	\$40.7	\$43.9	\$47.3	\$51.6
T0-T4 90 <sup>TH</sup> PERCENTILE	HIGH: 12:24	HIGH: 10:50	HIGH: 11:05	HIGH: 12:06	HIGH: 12:00	HIGH: 12:32	HIGH: 12:49

	2001	2002	2003	2004	2005	2006	2007
<b>RESPONSE TIMES (HIGH &amp; LOW DENSITY)</b>	Low: 17:25	Low: 16:30	Low: 17:16-	Low: 19:14	Low: 18:18	Low: 18:46	Low: 21:15
<b>% CODE 3-4 CALLS MEETING 8:59 OR 15:59 STANDARDS</b>	12:59 STANDARD 90%	10:59 STANDARD 81.7%	8:59 STANDARD 72%	8:59 STANDARD: 68%	8:59 STANDARD: 68%	8:59 STANDARD: 65%	8:59 STANDARD: 67%
	18:59 STANDARD 90%	17:59 STANDARD 88.4%	15:59 STANDARD 76.8%	15:59 STANDARD: 70%	15:59 STANDARD: 82%	15:59 STANDARD: 80%	15:59 STANDARD: 77%
<b>HOSPITAL OFFLOAD WAIT TIMES</b>	MEAN: 36:44 90 <sup>TH</sup> P: 1:04	MEAN: 39:17 90 <sup>TH</sup> P: 1:07	MEAN: 42:27 90 <sup>TH</sup> P: 1:10	MEAN: 49:00 90 <sup>TH</sup> P: 1:12	MEAN: 49:55 90 <sup>TH</sup> P: 1:15	MEAN: 53:31 90 <sup>TH</sup> P: 1:15	MEAN: 57:38 90 <sup>TH</sup> P: 1:20

The 2007 emergency call volumes in Ottawa have increased by 49% over 2001 levels. From 2001-2007 the City of Ottawa operating budget investment in a performance based land ambulance service has increased by 77 percent. The City of Ottawa staffing investment in paramedics has increased by 23 percent over the same period. However, 2007 high-density 90th percentile response times have actually eroded since 2001. The City of Ottawa’s 2007 response time performance results were approaching a level that is non-compliant with land ambulance act service delivery compliance standards (90th percentile in 1996).

Land ambulance system performance results are largely driven by factors that are beyond the immediate, short-term control of branch management or the City (i.e., structural system constraints). Two fundamental structural constraints are located at the front end and the back end of the land ambulance service delivery model:

- Dispatch triage (front end)
- Patient offload at hospital (back end)

In 2001, the Province’s mandated dispatch triage tool identified 64 percent of emergency response calls as Code 4 “life threatening” calls requiring an immediate “lights and siren” response by the nearest ambulance. By 2007, these life threatening Code 4 “lights and sirens” calls constituted 85 percent of emergency response calls. If almost 9 out of every 10 triaged calls end up in the highest acuity/urgency triage category, then no effective triaging is actually taking place and units are being deployed immediately with no reserve response capacity. Overall system design, unit resourcing and performance reporting is being driven by a call triage system that fails to effectively triage patient acuity. A further discussion of issues related to dispatch is presented in the following section of this report.

Average hospital patient offload wait times in 2001 were almost 37 minutes. By 2007 average offload times had eroded by 54 percent to 57 minutes. 90th percentile

offload wait times were 25 percent higher in 2007 compared to 2001. The erosion in hospital offload waiting times is a province-wide phenomenon driven by the inability of hospitals to manage emergency patient flows. Hospitals are struggling with demand for care in excess of in-hospital beds, and also face a shortage of long term care beds out in the community. Rationalized and re-engineered patient flows within hospital and across the health care system are urgently needed but are not within the control of the City.

In addition to structural system constraints, City of Ottawa controlled system design, budgeting and planning decisions have also played a role in determining overall system performance. The impacts of City controlled performance drivers will be examined in depth throughout the audit report.

Ottawa currently faces public reputation risk, legislated service operator compliance risk, value-for-money risk, and civil liability risk associated with current trends in land ambulance performance results. Risk exposure and risk management responses concerning specific performance trends identified in this overview, will be examined in detail across the remainder of the audit report.

#### **4.1.3 New Ministry Performance Reporting Framework**

During the course of this audit, the MOHLTC announced a new comprehensive and mandatory Land Ambulance performance measurement and reporting framework for municipalities and dispatch authorities. The new MOHLTC performance measurement and reporting framework, while still focussed on measuring land ambulance response times, represents a significant conceptual departure from the Ministry's traditional land ambulance performance reporting practices.

The Ministry's new framework also contains important system design and planning implications for the Ottawa Paramedic Service, as well as other municipal land ambulance services across the Province. Finally, the new performance framework has implications for the key recommendations contained in this report. The affected recommendations deal with dispatch restructuring, deployment and master planning, ongoing resource allocation decisions to manage growth, and performance accountability for achieving emergency response time targets.

##### **4.1.3.1 Existing Land Ambulance Performance Reporting Requirements**

As documented above, there is no current province-wide response time performance standard for land ambulance services in Ontario. Instead, each municipal service provider has been assigned its own geographically defined legislated response time standard. Each municipality's de-facto standard is based on the Ministry's actual 90th percentile Code 4 response time when it was responsible for service delivery in 1996.

The Ministry's formula for calculating the portfolio of geographically defined response time standards is contained in the Ambulance Act. The result of the Ministry's traditional performance model is a diverse system of different 90th percentile response times for Code 4 calls across Ontario. These performance targets are based on dispatched Code 4 life threatening emergency calls as opposed to on-scene Code 4 life threatening patient acuity.

As discussed earlier in this report, there is currently widespread inability of urban and non-urban municipal service providers across Ontario to achieve their specific/unique legislated Code 4 response time performance targets – despite significant annual expenditure increases and new unit deployments. Based on the 2007 OMBI submission, only 7 of 15 (47%) municipalities met their 1996 standard.)

The Ministry also sets targets for the response time performance of the land ambulance dispatch agents across the Province. A Ministry defined two-minute performance target for dispatch response time has been in place for a number of years. The Provincial Auditor has documented wide-ranging non-compliance with the two-minute response time target across the Province (e.g. 15 of 18 audited dispatch providers were deemed non-compliant in a 2005 review).

The MOHLTC website contains the following critical assessment of the existing framework of performance standards,

“...the 1996 standard does not reflect today's patient demographics, recognize areas of growth or consider medical-based evidence that has become available since 1996 related to improving patient outcome.”

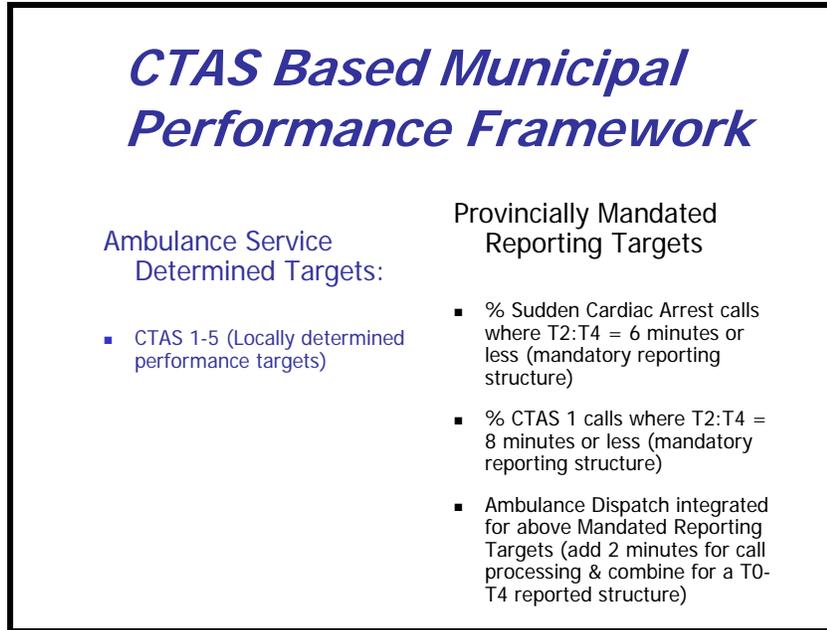
#### **4.1.3.2 Elements Of New MOHLTC Performance Measurement And Reporting Framework**

The MOHLTC has linked its new performance framework to ongoing discussions/negotiations with AMO and the Joint Land Ambulance Committee. The Ministry communication document announcing the new framework asserts that the new response time performance framework is “...founded upon principles advanced by the municipal sector representatives on the AMO Joint Land Ambulance Committee”.

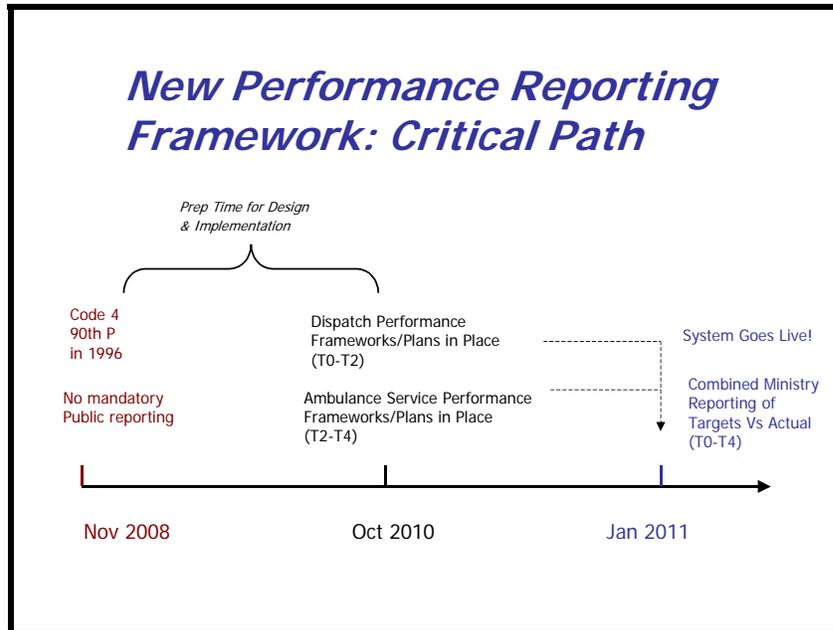
The new MOHLTC performance measurement and reporting model requires municipal land ambulance service providers to report actual 90th percentile call response time results based on the five patient defined outcome categories contained in the Canadian Triage and Acuity Scale (CTAS) triage tool. Municipal service providers are also required to set locally determined response time targets for each of the five CTAS call categories. Municipal service providers do not currently report response times in these CTAS categories.

In addition to reporting CTAS-defined response time results against locally defined targets, the Ministry has also prescribed results reporting for specific categories of emergency calls. For example, the percentage of sudden cardiac arrest call response

times from T2 to T4) meeting a six-minute standard must be reported by municipal providers. As well, the percentage of all CTAS 1 call response times (from T2:T4) meeting an eight-minute standard must be reported by municipal providers. The figure below summarizes the key features of the framework.



The figure below provides information on the MOHLTC critical path for implementing the new performance measurement and reporting framework. In 2009 no mandatory performance reporting is required. By October 2010 municipal services will have new performance plans in place, establishing response time targets and reporting frameworks for CTAS 1-5 call volume categories. Municipal service provider reporting plans will also be in place for the mandatory Sudden Cardiac Arrest and CTAS 1 prescribed standards explained above. These municipal performance plans will be submitted to the Ministry for review and approval.



MOHLTC dispatch providers will be required to submit their own separate performance plans by October 2010. Dispatch performance plans are to be prepared in close consultation with affected municipal land ambulance services. The new performance reporting system takes effect in January 2011 with integrated dispatch and response time actual results (T0:T4) reported against integrated plan targets. Municipal plan targets and results will be published annually on the MOHLTC website. The existing Ministry land ambulance certification process will adopt and address Ministry and municipal performance plan targets.

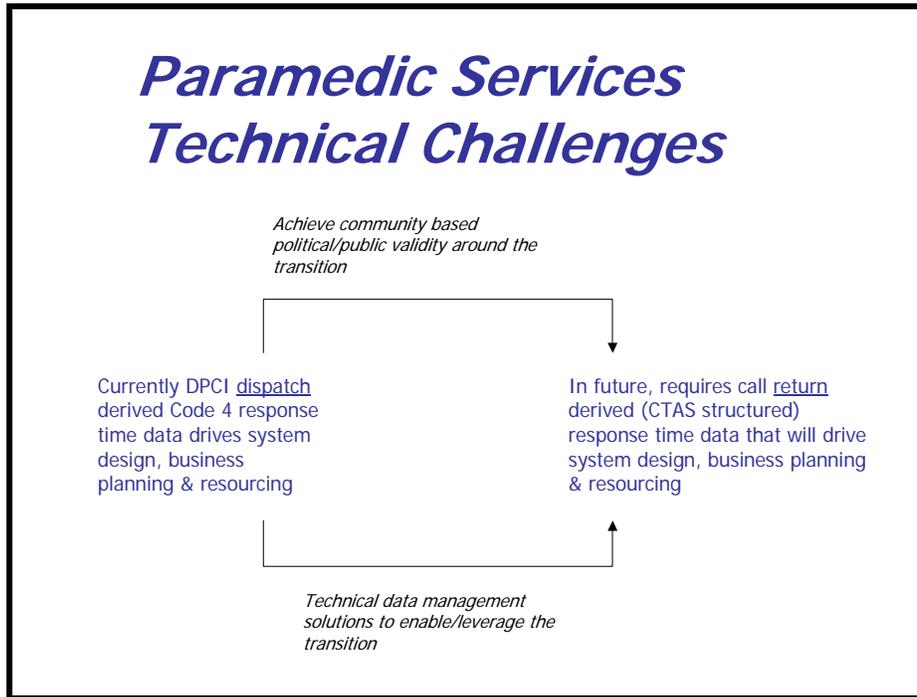
**4.1.3.3 Implications For Ottawa Paramedic Service**

This audit report makes a number of critical recommendations related to the shortcomings of the DPCI dispatch triage tool currently mandated by the MOHLTC. At present, 85 percent of annual emergency calls are dispatched as Code 4 life-threatening calls requiring an immediate “lights and sirens” response. Analysis suggests that CTAS 1 return call volumes represent a much smaller proportion of total emergency calls.

Given the reality that Ministry mandated DPCI dispatch triage tools drive overall EMS system design, resourcing and performance, the question becomes: How will the Ottawa Paramedic Service achieve appropriate new CTAS 1 response time targets when 85% of existing emergency calls are triaged as Code 4 life threatening emergencies? True life threatening calls that should drive system design and deployment decisions are obscured by the large number of currently dispatched Code 4 “lights and sirens” emergency calls. Ottawa’s 90th percentile Code 4 response times (T0:T4) are significantly higher than the Province’s newly prescribed CTAS 1 ten minute reporting standard. Using the current DPCI dispatch triage tool, a significant portion of Ottawa’s Code 4 calls (subsequently identified as CTAS

1-2 acuity calls) will fail to meet the new performance standard that will be publicly reported by the Ministry on its website. As such, the new Ministry performance model reinforces the need to convince the Minister to replace DPCI with the AMPDS dispatch triage tool already in use across North America.

The figure below summarizes the operational challenge faced by the Paramedic Service.



The technical challenge faced by the Paramedic Service in making the new performance system work is significant. The current dispatch model is based on a Code 4 triage tool that effectively fails to triage. The new response time reporting requirement will be patient acuity based on CTAS. Provincially mandated performance targets will also be patient acuity based, yet the technical translation of dispatch defined patient categories into defined CTAS categories will be complex and difficult. CTAS is determined by paramedics on scene and again in the emergency department at triage. It will be the CTAS level upon paramedic arrival to patient that will be the basis for the new performance measure.

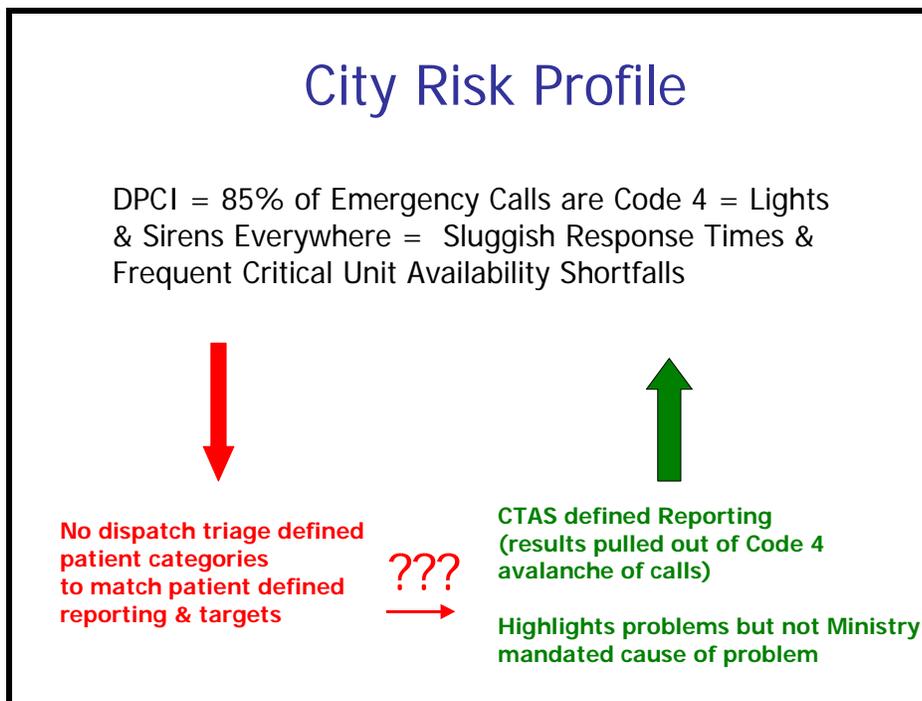
#### 4.1.3.4 Overall Assessment of MOHLTC Performance Reporting Model

In principle, the MOHLTC performance model is a positive development because it introduces patient centric performance reporting and target setting for land ambulance services. The new response time performance indicators will answer a core performance question – how long does it take for paramedic resources to reach the high acuity patient in the field?

The new model also initiates a migration from the current reality of no meaningful province-wide response time standard to an implicit “most ill” patient defined

province-wide standard. This standard will be based on the genuinely unwell CTAS 1 patient and the likely convergence over time of performance data reported to the public by the Ministry. Municipalities will also benefit from enhanced flexibility when setting performance targets in the CTAS 2-5 patient categories. CTAS related response queuing may be feasible in future, if an improved triage tool like AMPDS can be deployed to provide a better match between patient dispatch categories and patient acuity categories assigned at hospital.

On the negative side, in the absence of timely and significant restructuring of dispatch triage tools as recommended in this report, the MOHLTC new patient centric performance model will bring the Paramedic Service performance problems to the forefront without focussing attention on a key driver of these problems - an ineffective Provincially mandated DPCI triage tool. The urgency of implementing timely dispatch restructuring has now increased.



**Recommendation 2**

That the Paramedic Service performance measurement and reporting framework, upcoming strategic branch review exercise and existing service planning process be focussed on the management of risk events and performance erosion trends identified in this audit’s 2001-07 land ambulance system performance overview.

**Management Response**

Management agrees with this recommendation.

The Paramedic Service performance measurement and reporting framework, upcoming 2010 strategic branch review exercise and existing service planning process, will be focused on the management of risk events and performance erosion trends identified in this audit's 2001-07 land ambulance system performance overview.

## **4.2 System-wide Performance Constraints/Core Drivers of Service Delivery Outcomes**

### **4.2.1 Dispatch Service Delivery Model and Triage Protocols ('DPCI' versus 'AMPDS')**

#### **4.2.1.1 Dispatch**

When City of Ottawa residents and visitors call 911 and request the Paramedic Service, the call is transferred to the Ottawa central ambulance communication centre (CACC). Upon receipt of the call at the CACC, the communication staff gathers patient information and triage the call before notifying the closest paramedic unit. An emergency call is broken down and measured by time segments starting at T - zero through T - max. The following shows the sequence:

- T0 - Call received by CACC call taker asks, "What is your emergency"
- T1 - Call taker does call triage, dispatcher selects ambulance
- T2 - Paramedics notified given priority and pick up location
- T3 - Travel time to call
- T4 - Arrived scene time
- T5 - Depart scene travel to hospital
- T6 - Arrive at hospital
- T7 - Depart hospital
- T Max - Arrive at station<sup>1</sup>

On August 20, 2002 the MOHLTC notified the City of Ottawa of its successful bid for the assumption of responsibility for CACC operations. Since assumption on December 1, 2002 the Paramedic Service has implemented significant positive changes to improve service which included hiring eleven additional CACC staff in the first year of operation.

In addition to systemic improvements, a quality assurance program has been implemented in the Ottawa CACC. The program performs communication staff call audits and system performance reviews on approximately 5% of calls. It is important to note that the dispatch centre is 100% funded by the Province and all

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<sup>1</sup> The 1996 legislated response time of 12:41 relates to the T2-T4 time frame. There is currently no legislated response time for T0-T4. Actual T2-T4 response time for 2007 was 12:01, while actual T0-T4 response time for 2007 was 12:49.

capital, equipment and technology in use is prescribed and approved by the MOHLTC.

### ***Province-wide Dispatch Performance***

The Provincial Auditor General has reviewed Provincial land ambulance dispatch performance during a series of ongoing audits from 2000-2007. The results of this Provincial audit process have been consistent throughout the period:

- Fifteen of eighteen dispatch centres have failed to meet the ministry turnaround time standards;
- After being directed by the auditor in 2000 to execute dispatch performance reviews, these reviews only commenced in 2006 and a full cycle of reviews has not yet occurred;
- The ministry has not executed any public performance reporting for the dispatch function;
- The dispatch priority card index (DPCI) triage tool currently in use was deemed “...an outdated tool that no longer served its purpose well”
- Despite a commitment to evaluate the Niagara Advanced Medical Priority Dispatch System (AMPDS) triage tool in a timely fashion, the ministry has rejected the auditor recommendation to expedite the review. The ministry has scheduled final evaluation of the Niagara dispatch pilot for 2010 but has already decided to implement a revised DPCI tool across the CACC system without a pilot review or formal evaluation.

### ***Audit Performance Review***

The audit team deployed several methods of obtaining historical and real time information on the Ottawa CACC. A review of Council reports, interviews with paramedic and management staff, data analysis and site visits to the Toronto EMS and Niagara EMS communication centres provided the basis for our review. The Ottawa CACC Deputy Chief relative to CACC operations was also interviewed.

In its first year of operation the Ottawa CACC reduced call-handling time (T0-T2) by one minute. In the following years the CACC maximized efficiencies through program upgrades, however the CACC system has now reached the upper threshold of efficiency with the existing technology and equipment in use. Despite these limitations, the Ottawa CACC does meet the province’s prescribed dispatch turnaround time standards.

As stated earlier, the contract with the MOHLTC is prescriptive and in fact is a major contributing factor to inhibiting performance improvements at the CACC and with the overall patient triage system. Our review has identified two major interrelated CACC operations factors that are negatively impacting overall system response times and response time reliability: call triaging and resource availability

### Call Triage Tools

Matching resources to call demand takes into account multiple factors and deployment plans can become very sophisticated. With limited ambulance resources, the importance of a call triage tool is paramount in ensuring that finite resources are always available to respond to emergency calls. The table below outlines the increase in Code 3 and 4 calls since 2001.

CALL TYPE	2001	2002	2003	2004	2005	2006	2007
CODE 4	36,753	42,915	49,283	55,890	57,266	69,779	72,523
CODE 3	20,662	22,601	21,659	20,974	22,200	12,409	12,879
TOTAL	57,415	65,516	70,942	76,864	79,466	82,188	85,402
CODE 4 AS % OF TOTAL	64%	66%	69%	73%	72%	85%	85%

As noted in the above table, the Ottawa CACC is now assigning a Code 4 urgent “lights and siren response” to 85% of all triaged calls. The implications of this trend are critical and extremely problematic from a public safety perspective – there is no effective triaged response taking place. The triage approach to patient acuity is extremely risk averse. However, the risk is simply being transferred downstream in the form of critical unit shortages caused by frantic ambulance activity responding to all calls with equal urgency and no queuing. As is discussed in section 4.3.5 of this report, an analysis of Code 4 calls where the patient has been assessed by the paramedic and transported to the hospital reveals that the number of true emergencies is substantially lower than figures in the above table indicate. This further confirms the ineffectiveness of the current dispatch protocol.

Our visit to the Toronto EMS CACC confirms that their service is assigning “lights and sirens” calls to ambulances at a rate of 30-35 %. In Niagara, 40-45 % of calls receive a “lights and siren” response.

Toronto and Niagara CACC are using a triage tool called Advanced Medical Priority Dispatch System (AMPDS) which is widely used internationally by EMS systems. There are more than 2,600 EMS communications systems using AMPDS. There are 110 accredited centres of AMPDS excellence that have progressed through a rigorous ISO-like quality program. AMPDS features 34,500 certified dispatchers. The AMPDS tool is medically derived and features built in quality assurance capabilities. It is recognized as the North American industry standard for triage outside of Ontario. It constitutes the “framework language” for inter-jurisdictional benchmarking and emulation of best practices.

The Ottawa CACC is prohibited from using AMPDS. Instead Ottawa is contractually obligated to use a triage tool called dispatch priority card index (DPCI) which was developed by the MOHLTC staff and is used only in Ontario. All provincial communication centres, with the exceptions of Toronto and Niagara, are required by the ministry to use DPCI. DPCI is the dispatch tool associated with the 15 provincial CACC centres that are failing to meet the Province’s legislated turnaround times for T0-T2. These centres also feature 80%-90% “lights and siren” triage decisions – which in fact constitutes no effective triage at all.

**Resource Availability**

As call demand increases throughout the day and ambulance resources are tied up at area hospitals on off-load delays, limited resources are traveling longer to calls. In some cases zero ambulances are available for the next emergency call. The DPCI triage tool does not allow for call queuing when operating at critical resource levels, thereby increasing the frequency with which the Ottawa Paramedic Service is at level zero for available ambulance.

The regular and ongoing erosion of available ambulances to the zero level constitutes a significant public safety risk in the City of Ottawa. The situation is equivalent to the fire department being unable to respond to a residential house fire or the police service being unable to respond to a violent crime in progress. The evidence clearly indicates that the DPCI triage tool creates and/or intensifies this public safety problem by regularly “clearing the screen” of available units. In contrast the AMPDS triage tool allows calls to be queued. Critical resources are reserved for true emergencies, a subset of truly acute patients not identified in DPCI. Niagara EMS confirms their system has never reached level zero of unit availability. They credit AMPDS for this outcome. Critical levels of paramedic unit availability are discussed more fully later in this report.

Call triaging and resource availability are interrelated and an effective balance is required to maximize overall system performance. The following chart illustrates the major differences between AMPDS and DPCI:

	AMPDS	DPCI
QUALITY ASSURANCE	YES	NO
CENTRE OF EXCELLENCE	YES	NO
TRIAGED ACCURATELY	YES	NO
CALL QUEING CAPACITY	YES	NO
RESEARCH CAPACITY	YES	NO (ONLY ONTARIO)
RISK MANAGEMENT	YES	NO

AMPDS is used in more than 2,565 communication centres world-wide with 110 designated as accredited Centres of Excellence. Both Toronto and Niagara CAAC centres have received the Centre of Excellence designation.

The existing DPCI call triaging tool is negatively impacting system performance. By effectively not triaging differences in patient acuity, and depleting critical resources by immediately deploying all ambulances for all calls. The DPCI triage tool is subjecting the residents of the City of Ottawa and the Ottawa Paramedic Service to eroding levels of performance and increasing public safety risk. Further, the Ministry has offered no field evidence that the soon-to-be revised DPCI tool will perform significantly differently than the original DPCI.

From a risk perspective, the existing CACC dispatch contract with the Province is limiting the technological and triaging improvements required. The City and public is at risk due to the frequency with which the Ottawa Paramedic Service is operating at critical resource levels due in large part to flawed triaging. The DPCI tool fails to recognize negative public safety outcomes associated with the depletion of EMS resources. It exposes the City to the risk of non-compliance to legislated T2-T4 response time standards. It also exposes the City to litigation risk of non-compliance with coroner inquest findings in the Alice V. Martin case.

Finally, over-triaging Code 4 calls puts paramedics and the public at increased risk to motor vehicle collisions when the system runs continually in a “lights and sirens” response mode.

#### **4.2.2 Dispatch Triage Tool Case Studies**

As discussed earlier, the City’s current triage system used to dispatch emergency calls contributes to system inefficiency and eroding response times. Replacement of the current triage tool with the North American standard AMPDS medically derived triage tool is a top priority. In order to more fully understand the potential benefits of moving to the AMPDS dispatch tool, case studies of two EMS services (one Canadian and one American system) that compare to Ottawa in size and call demand volumes and/or legislative requirements was undertaken.

##### ***Medical Triage and Priority Dispatch Systems***

Medical dispatch triage tools are protocols designed to determine the medical acuity of an incoming request for paramedic services. Triage tools, by themselves, have little or no impact on system performance if they are not used as part of a wider and coordinated system design strategy. If the information obtained during the triage process has no ultimate impact on how the agency is going to respond to a request for service, it is of no value.

However, with proper policies and quality assurance processes in place, the triage process can reliably identify the urgency of incoming incidents and provide the service with the opportunity to proactively manage calls with different levels of urgency. For example, if demand is momentarily high and fleet levels are approaching critical levels, it is possible to safely delay low priority responses in favour of preserving limited resources for true life-threatening emergencies.

A number of design and policy considerations must be addressed in pursuing a move to the AMPDS dispatch tool, including:

- Specificity: The dispatch protocol must differentiate incidents into a number of specific acuity classes. 'Urgent' or 'Not Urgent' is not specific enough to be of value.
- Accuracy: The protocol must quickly and accurately identify incidents of high acuity while ensuring a very low incidence of over or under triaging of incidents.
- Medical oversight: Since dispatchers will be using the protocols to make medical decisions, it is important that medical oversight be integral to the protocol selection, configuration, policy development and quality assurance processes.
- Dispatch System design: The triage protocol must be part of an overall system design strategy that integrates technologies to create an infrastructure that ensures rapid response to high acuity incidents and effective management of paramedic resources.

#### **4.2.2.1 Case Study 1 - Mecklenburg County, North Carolina**

##### ***Background***

The Mecklenburg EMS Agency (Medic) responds to more than 90,000 calls a year for service in Mecklenburg County, North Carolina, which includes Charlotte and six surrounding towns; a coverage area of 1398.6 square kilometres. In addition to providing Advanced Life Support services countywide to a population of more than 900,000, Medic dispatches all of its own calls and those for 16 volunteer fire and rescue departments. Maximum vehicles deployed during peak hours are 38 to 40 ambulances.

Medic maintains its own communication center known as CMED (Central Medical Emergency Dispatch). CMED's three primary responsibilities are

- Dispatch and coordination of all EMS resources within Charlotte-Mecklenburg;
- Dispatch of all Mecklenburg County volunteer fire departments; and,
- Serves as the central warning point for two nuclear power facilities.

All requests for emergency service are handled via an enhanced 911 system. All 911 calls for Medic and/or County fire are routed to CMED by the Charlotte-Mecklenburg Police Department or two other communications centers, which serve as the primary public safety answering points (PSAP).

Efficient use of emergency medical resources is achieved by use of a state-of-the-art Computer Aided Dispatch System, Medical Priority Dispatch Protocols and

Emergency Fire Protocols, global positioning satellite tracking equipment, on-board mobile mapping and data systems and System Status Management.

All dispatchers are nationally certified as Emergency Medical Dispatchers (EMD's) and Emergency Fire Dispatchers (EFD's). They staff the Communications Center and provide potentially life-saving instructions to callers while paramedics are responding to their location. Typical examples of pre-arrival instructions include providing information on performing CPR, assisting with childbirth and helping a person who is choking.

### ***AMPDS Implementation***

In the mid 1990's the service responded to almost 100% of calls with "lights and sirens" and with little in the way of triaging for high priority calls. It was realized that this had a negative impact on overall response time. At that time the mean response time was 16 minutes with an estimated 90<sup>th</sup> percentile response time to emergency calls of 20 minutes.

The situation resulted in a significant amount of public and media criticism. At issue was excessively long response times to patients that had critical illness. The dispatch protocols at the time had little to no medical basis for the dispatch decisions. Growing patient care concerns drove the adoption of three main technologies:

1. AMPDS triage tool;
2. System Status Management Deployment models; and,
3. Pre-arrival patient instructions ('ProQA').

Medic contracted with the National Academy of Emergency Medical Dispatch (NAEMD), to bring AMPDS to their communications centre.

One of the primary purposes of the AMPDS protocols is to enable EMDs to determine the appropriate response to send to a given emergency. The protocols help EMDs quickly obtain the patient status and scene information necessary to determine the appropriate dispatch determinant code. The EMD then sends the response configuration that has been assigned to the code by local medical and EMS control.

AMPDS has five levels of patient triage categories: Echo, Delta, Charlie, Bravo and Alpha. Echo and Delta calls are the most urgent calls and Alpha calls are the least. When ambulance resources become low, a dispatcher can hold a Charlie, Bravo and Alpha call in the dispatch cue in order to place a priority on responding to Echo and Delta calls.

Medic also deployed "System Status Management" electronic demand analysis to determine where the best vehicle posts (locations) should be according to historic demand, by time of day and number of vehicles available

### ***Response Times and Performance Targets***

Following the deployment of these technologies, system deployment and management efficiencies soon became evident. As stated above, prior to the implementation of the new dispatch protocols and systems, 90<sup>th</sup> percentile response time to emergency calls was 20 minutes. Currently Medic is 100% compliant with its revised performance targets.

From a system that had been operating at 100% “lights and siren” response, the call distribution by priority is now:

- Echo/Delta - 37%
- Charlie - 25%
- Alpha/Bravo - 37%

Currently in the City of Ottawa, 76% of total calls are categorized as Code 4, the highest priority. Medic management indicated that it would be impossible for Mecklenberg to achieve their response time targets with an Ottawa-type dispatch model where 76% of calls sit in a single patient acuity pool. In Mecklenberg, system design and performance is driven by a smaller pool (37 percent) of the acutely ill Delta-Echo calls. In other words, genuine triaging occurs. In addition, because of greater accuracy in assessing patient acuity and the ability to re-direct ambulance units based on true priorities, Mecklenberg is not encountering the critical unit availability problems that Ottawa is experiencing.

#### **4.2.2.2 Case Study 2 - Region of Niagara (NEMS)**

##### ***Background***

Niagara EMS (NEMS) has a fleet of 33 ambulances and operates 22 ambulances daily at peak staffing. A total of 70,000 calls per year are received throughout the 1896 square kilometres of the Niagara Region. Niagara’s 70,000 calls include “Code 8” calls that are only vehicle movements. Ottawa does not count vehicle movements. OMBI data reported 36,967 Code 1-4 calls for Niagara.

##### ***Response Time History***

At the time that the Region of Niagara took over the EMS system in 2000, the 90<sup>th</sup> percentile response time for Code 4 emergencies was 11 minutes 55 seconds, whereas the Province requirement was 10 minutes 49 seconds. In an attempt to improve this response time, Niagara Region increased its EMS budget by \$3.8 million to staff an additional five vehicles between the years 2001-2002. Also at this time, NEMS retained a consulting firm to provide advice on response time targets for the area. The recommended benchmarks were 8:59 Urban and 15:59 Rural.

Following the investment in additional vehicles, the Region attained a 10:30 90<sup>th</sup> percentile response time, a 1:25 improvement in response time costing \$3.8 million.

Unfortunately, this benefit was quickly eroded to a 30 second gain largely due to a 1-minute increase the call dispatching process.

### ***Current System***

In 2005, the Region of Niagara EMS launched a revised regional communication centre as part of a 5-year pilot project. Several technologies and strategies were deployed to generate performance improvement, including:

- AMPDS.
- Mobile Area Routing and Vehicle Location Information System™ (MARVLIS) – a system of vehicle placement based on historical activity and response times. It is intended to help the dispatcher place the available vehicle in the most appropriate location in anticipation of the next call.
- Head Start – a system which receives data from the 911 call information and sends it to the closest ambulance crew at the same time the Dispatch call taker receives the data.
- Alert Line - technology which notifies the paramedic crew of changes in call information and/or danger.

Since the implementation of revised dispatch protocols and the introduction of new technology, NEMS' 90<sup>th</sup> Percentile response time to Echo and Delta calls has been reduced to 10 minutes. This 2-minute improvement from 2000 response times was achieved with an investment of less than \$1 million as compared to the \$3.8 million cost of adding vehicles in 2001 only to see the temporary response time improvement erode within one year. Other benefits cited by NEMS of the move to a new dispatch system included:

- Reduced public complaints;
- Complaints less severe in nature;
- Increase political satisfaction;
- Improved nature of media attention;
- A single MOHLTC investigation since implementation (with no recommendation);
- Decreased medical/legal exposure; and,
- Increased paramedic trust as a result of more accurate dispatching.

#### **4.2.2.3 Case Study Conclusion**

These two studies indicate that there is the potential for significant return on investment from implementing AMPDS-based dispatch in Ottawa. Both cases have documented significant response time and public safety improvements associated with the AMPDS triage system.

The fiscal impacts of AMPDS adoption are also clear when analyzed in a five-year cost-benefit scenario. Based on previous budget increases and response time impacts in Ottawa and Niagara, we estimate that an additional \$5 million per year over the next five years would likely be required (all other performance factors being stable) to generate the 2 minute response time improvement associated with AMPDS and its supporting software framework. Rather than expending \$25 million over five years, a one-time investment of approximately \$1 million for an AMPDS-based approach could generate similar response time and public safety improvements.

Contacts in both case study jurisdictions noted that the current Ottawa dispatch tools are inconsistent with achieving response time improvements at an affordable/sustainable price. Implementation of AMPDS can follow a proven industry best practice model once the MOHLTC permits the replacement of the current failed DPCI tool.

### **Recommendation 3**

**That the City adopt a clear, transparent position regarding the current DPCI triage tool and the renewal of the Ministry communications centre contract by:**

- a) Immediately petitioning the Minister of Health for a communications dispatch framework identical to the framework enjoyed by the City of Toronto;**
- b) Establishing a results-based communications contract with the Ministry of Health based on outcomes and not prescriptive processes, software tools or triage methodologies;**
- c) In the absence of a results based contract featuring operator choice of triage methodologies, petitioning for the opportunity to dispatch calls without triage; and,**
- d) In the absence of either of the above options being accepted by the province, withdrawing from consideration for the renewed communications operator contract.**

### **Management Response**

Management agrees with parts a), b) and c) of this recommendation.

The branch concurs with the acquisition of AMPDS as the dispatch tool and a more liberal dispatch communications framework. Management will continue to advocate to the MOHLTC for the implementation of this tool in Ottawa.

Management disagrees with part d) of this recommendation. In management's opinion, the audit report overlooks the operational and strategic value already realized in an integrated communications centre. The City's paramedic dispatch unit has been recognized as the best performing dispatch centre (T0-T2) in the province as indicated in OMBI's 2007 public report.

The branch has found that an integrated dispatch team allows for several operational efficiencies such as, but not limited to:

- the availability of real time data enables staff to evaluate and adjust their performance on a daily basis; and,
- modification of the deployment plan in real time allows staff to adapt to changing situations in the community e.g., major events, road closures, etc.

In addition, management integration allows for common management objectives for the entire service, allowing us to meet Council and community expectations that would not be possible in two separate organizations.

#### **Recommendation 4**

**That, once AMPDS is in place, the City pursue a centre of excellence designation to emulate best practices from across North America, including Niagara and Toronto.**

#### **Management Response**

Management agrees with this recommendation.

Timelines and funding to pursue this designation are dependent upon negotiations with the Ministry of Health and Long Term Care.

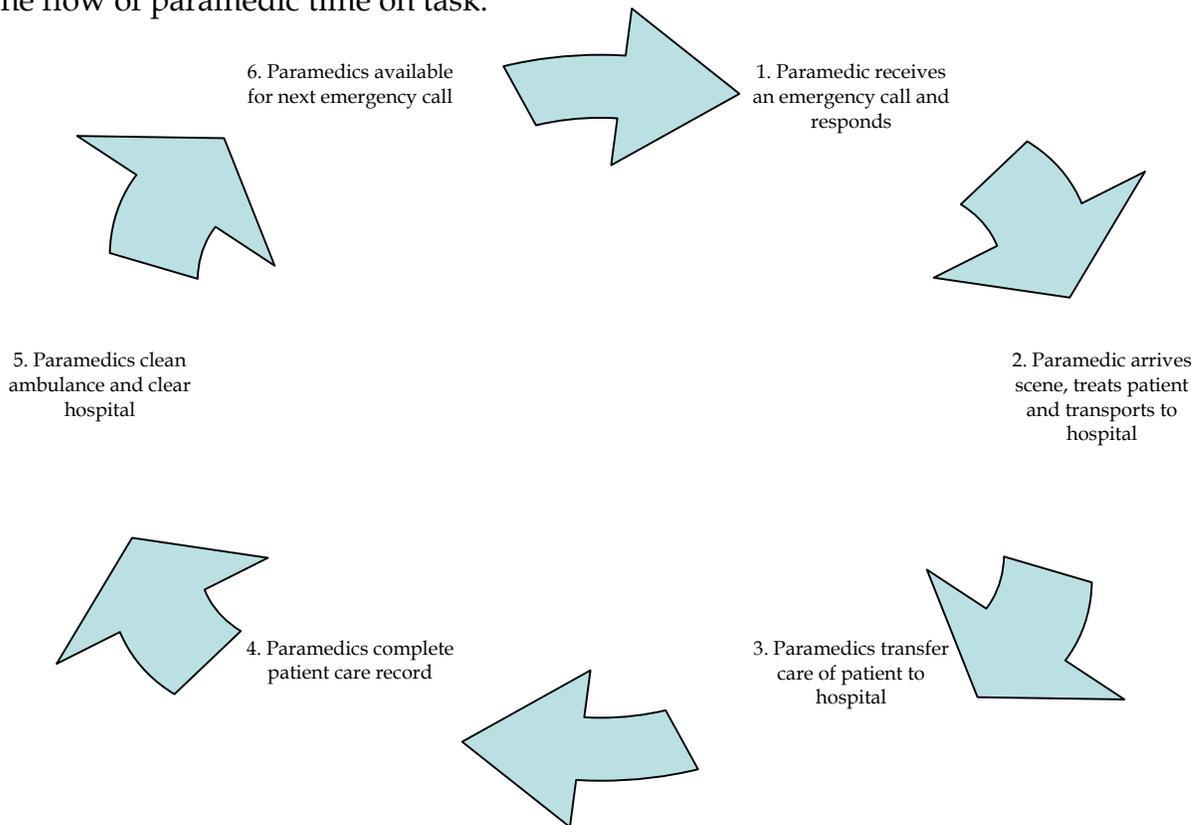
#### **4.2.3 Paramedic Time on Task and Hospital Patient Off-load Delays**

The Ottawa Paramedic Service, like other urban Ontario EMS systems, is directly impacted by systemic constraints and pressures that year-over-year are negatively increasing response times and response time reliability. Hospital patient off-load delays and paramedic time on task are two factors that are contributing to clinical performance erosion and response time leakage. During this course of the audit, the consulting team interviewed paramedics, management staff, base hospital staff and completed a site visit to the Ottawa general hospital. Information and insights gathered through the interviews and site visit reinforce the measurement data in confirming hospital off-load delays and paramedic time on task are increasing annually in Ottawa. This audit will deal with the both issues as they are intertwined operationally.

For purposes of clarity, the definition of a patient offload delay is any time in excess of thirty minutes after arriving at hospital. The thirty-minute standard has been adopted and accepted as an Ontario standard set out by the Minister of Health & Long Term Care via the recommendations of the Hospital Emergency Department and Ambulance Effectiveness Working Group report.

The definition of paramedic time on task is the amount of time it takes paramedics (when notified of an emergency call) to execute the assessment, treatment and transportation of the patient to the hospital. Time on task includes the transfer of care and subsequent clearing of the hospital. Once clear of the hospital, the

ambulance is available for the next emergency call. The following diagram shows the flow of paramedic time on task:



The following chart outlines the paramedic time on task by year for a three-month sample period (June to August for 2005-07):

	2005	2006	2007
90 <sup>TH</sup> PERCENTILE	1:56:48	1:54:24	2:03:31
AVERAGE	1:03:35	1:04:21	1:08:27

Information gathered through our performance review indicates the causes of increasing time on task are related to many factors:

- Less EMS resource availability often correlates with longer travel times to the patient, and in some cases longer travel time to the hospital;
- Specialized hospital treatments and designated centres for patient care such as the stroke centre, heart institute etc. can result in patients that fit the treatment protocol bypassing the closest emergency department and proceeding to the specialized centre for their treatment;

- Sophistication of medical treatments and delegated acts on scene by advanced care paramedics has emergency care provided to the patients side more rapidly and in some cases increased on scene times; and,
- Increasing patient off-load delays at hospitals

Hospital patient off-load delays have been highlighted and reported to Council in most Paramedic Service annual reports - commencing with the year three review in March 2004 and continuing with the six-month review in October 2004 and the 2004, 2005, 2006 annual reports. As reported in the October 2007 annual report to the Community and Protective Services Committee, the following chart illustrates the increasing hospital off-load delays:

	2001	2002	2003	2004	2005	2006	2007 JAN - JUN
90 <sup>TH</sup> PERCENTILE HRS, MIN SEC	1:04:49	1:07:02	1:10:07	1:12:14	1:15:52	1:15:48	1:20:24
AVERAGE MIN, SEC	36:44	39:17	42:27	49:00	49:55	53:31	57:38

The audit team wait time calculations confirm the overall magnitude of the hospital offload system constraint as reported by the Paramedic Service. Average wait time calculations executed by the audit team (2005-2007) conform quite closely with the corresponding data reported by the Paramedic Service. The audit team offload calculations at the 90th percentile tend to be marginally higher than those reported by the Paramedic Service.

The City and Ottawa Paramedic Service have worked diligently with the local and Provincial government stakeholders in developing and piloting strategies to mitigate the impacts of hospital off-load delays.

- Participation on the Eastern Ontario Emergency Services Committee which implemented internal hospital procedures to improve patient transfers;
- Implementation through the communication centre of a patient priority system that directs patients to area hospitals designed to equally distribute patients among the hospitals to reduce overloading one particular hospital;
- Local hospital project at the Ottawa Civic and General campuses to employ designated nurses to oversee patients brought in by paramedics in an effort to improve turnaround times for paramedics and clear ambulances;

- Participating on Provincial committees investigating options for mitigating off-load delays;
- Deploying supervisors to area hospitals when notified by the dispatch centre when significant offload delays are occurring to assist with mitigation strategies; and,
- Paramedics caring for multiple patients in hospital corridors in order to free up and make available paramedic resources.

In addition to the operational, medical and financial impacts, offload delays are a source of staff morale issues and labour relations problems. The frequency in the lack of available ambulances, and increased paramedic workloads for staff not on offload delays, causes Ottawa Paramedic Service to be unable to ensure timely meal breaks for paramedics and contributes to overtime costs.

Hospital off-load delays are a symptom of an underlying issue of patient flow problems associated with bed shortages in hospitals and long term care facilities. The simple response to complex patient flow problems is for the emergency department to function as a holding unit for patients waiting to be admitted into the hospital system. It is clear that a lack of capacity to treat patients waiting for admission to the hospital is leading to emergency department overcrowding. The mandate of the EMS system is to staff emergency vehicles with highly trained paramedics to respond to pre-hospital emergencies outside the hospital setting. Marooning paramedics in emergency departments because hospitals cannot manage patient flow and discharge patients on a timely basis from the floors is not an acceptable situation for Ottawa residents facing critical ambulance shortages on a daily basis.

The hospital off-load issue is progressively deteriorating EMS performance despite operational, Provincial and local working group efforts to mitigate the impacts. Solutions will be longer term and therefore the benefits will be spread over time. From a risk management perspective, hospital off-load delays are a Provincial and hospital administrative and management responsibility that significantly impact the performance of the Ottawa Paramedic Service. Provincial intervention, patient flow re-engineering and funding is required to mitigate the impact upon patients and the Paramedic Service.

When measuring hospital offload times, the Paramedic Service currently calculates the duration from unit arrival at hospital until the unit reports itself as clear for the next call. The Paramedic Service does not record the actual time of patient transfer to the hospital – typically understood as when the emergency department triage nurse first examines the patient. This measurement process shortcoming is important. Current measurement approaches almost certainly overstate the duration of hospital offloads. Paramedics are immediately reporting themselves as clear to dispatch once the patient has been transferred and the ambulance cleaned

and ready for redeployment. The measurement shortcoming is also indicative of a frontline staff performance culture question raised during audit interviews with outside stakeholders. That is; do paramedics consistently clear the hospital as quickly as possible for re-deployment? The perception of slow clearance turnaround times and lingering paramedics should be verified via updated measurement definitions around time of patient transfer. A quality improvement review would represent a valuable opportunity to address process shortcomings in the current patient transfer system.

### **Recommendation 5**

**That the Ottawa Paramedic Service continue to participate on the provincial task force working on hospital wait times and off-load delays.**

#### **Management Response**

Management agrees with this recommendation.

The branch will continue to be an active participant on the provincial task force working on reducing hospital wait times and off-load delays.

### **Recommendation 6**

**That the measurement of patient offload delays be refined to include a “patient transfer to emergency triage nurse” time log in order to correct for potential overestimation of offload duration.**

#### **Management Response**

Management agrees with this recommendation.

Currently the data is captured in the hospital’s Emergency Department Reporting Systems (EDRS). The proposed new provincial Ambulance Call Report will include a “transfer of care” time, which will support this recommendation.

### **Recommendation 7**

**That the Ottawa Paramedic Service annually report to Council regarding the financial impact of lost ambulance unit hours due to hospital off-load delays.**

#### **Management Response**

Management agrees with this recommendation.

Management will report to Council annually on the financial impact of lost ambulance hours due to hospital off-load delays commencing in 2010.

### **Recommendation 8**

**That the Ottawa Paramedic Service include the calculation of time on task when considering paramedic staffing enhancements.**

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**Management Response**

Management agrees with this recommendation.

**Recommendation 9**

**That the Ottawa Paramedic Service conduct a quality improvement pilot project around the current hospital patient transfer process.**

**Management Response**

Management agrees with this recommendation.

The Offload Nurse Project, which reorganizes the current hospital patient transfer process, was initiated on September 29, 2008 – by contractual agreement with the Ottawa Hospital and the Ottawa Paramedic Service. The project is completely funded by the Ministry of Health and Long Term Care. (See Paramedic Hospital Wait Time Report ACS2008-CPS-OPS-0004 received by CPS Committee at its meeting of October 16, 2008.) The Ottawa Paramedic Service will provide a one-year update on the impact of this project to Committee and Council in Q4 2009.

**4.2.4 City Performance Responding to Growth Pressures**

Upon assumption of land ambulance services by the City of Ottawa on January 1, 2001, a high performance-based EMS model was adopted and immediate staffing and resources were added to the system. Given the original system design assumptions, the staffing addition actually required to meet system response reliability performance target of 8:59 was never implemented. After the original investment in a performance based EMS system in 2002 and 2003, no additional staff was added to the 2001 approved staffing levels. However, Ottawa's emergency Code 3-4 call volumes increased by 13,000 calls during the same time period. One-time service delivery efficiencies such as mobile deployment and single start (to be discussed later in this report) generated response time dividends that compensated for the absence of growth increment staffing.

In 2004, 52 paramedics were added to the system in an effort to slow the erosion in system response times and backfill the growth in call volumes from 2002-2004. However, the 2004 staffing increment was not implemented in a timely fashion. Instead, the growth backfill for 2002-04 was implemented across three years from 2004 to 2006. Between 2004 and 2006 Code 3-4 call volumes continued to grow by an additional 5,000 calls without a corresponding growth staffing increment. Only in 2008 did the City invest in another growth increment to backfill the growth in 2005-2007 call volumes and associated City population growth. Code 3-4 calls are projected to increase by 10,000 before the 2008 staffing increment is actually deployed.

From 2001-2004 the Paramedic Service absorbed increases in call volumes and longer time on task per call without significant staff adjustments. However, response times remained fairly stable. Response time performance eroded in the years following the 2004 modest staffing increment (modest due to the three year rollout) as paramedics dealt with increasing hospital off-load delays and increasingly ineffective dispatch triaging.

The following chart provides a comparison of Code 3 and 4 call volumes and response times 2001-2006:

YEAR	CALL VOLUME CODE 3&4	NUMBER OF PARAMEDICS	HIGH DENSITY TARGET	HIGH DENSITY ACTUAL	LOW DENSITY TARGET	LOW DENSITY ACTUAL
PRE-AMALGAMATION	65,000 (ALL CODES)	157		14:35		22:41
2001	57,415	254	12:59	12:24	18:59	17:25
2002	65,516	268	10:59	10:50	17:59	16:30
2003	70,582	268	8:59	11:05	15:59	17:16
2004	76,864	276	8:59	12:06	15:59	19:14
2005	79,466	296	8:59	12:00	15:59	18:18
2006	82,188	312	8:59	12:32	15:59	18:46

The above chart shows that overall performance eroded in the years without staffing and resource enhancements. The percentage of calls per paramedic and paramedic workloads increased in 2003 over the 2002 levels.

The following chart summarizes the growth increment staffing history of Ottawa Paramedic Service:

	2001	2002	2003	2004	2005	2006	2007	2008
STAFFING INCREMENT	97 FTE	NIL	NIL	52 FTE	NIL	NIL	NIL	38 FTE
CUMULATIVE CODE 3-4 GROWTH WITHOUT A STAFFING INCREMENT				11,000 CALLS				10,000+ CALLS

The supply and demand for resources and staffing are not aligned with the corresponding annual growth patterns. With lagged implementation of multi-year staffing levels, demand has already increased beyond capacity. Under this model, the Paramedic Service will always be in “catch up” mode.

As already discussed, hospital off-load delays are a Provincial and hospital administrative and patient flow management responsibility that is directly impacting the performance of the Ottawa Paramedic Service. Provincial intervention and funding is required to mitigate the impact upon patients and the service. Dispatch performance is also a matter of Provincial accountability. However, growth planning and service delivery is squarely under the control of the City. Without annual growth increments in staffing and units tied to the actual pace of growth, response times will continue to increase, as the factors negatively affecting performance also increase. Regular growth increments in resources will improve the probability of the City achieving its 90th percentile response time compliance with the Ambulance Act on an ongoing basis.

### **Recommendation 10**

**That the Ottawa Paramedic Service bring forward a long-term master plan and budget for additional staffing and resources required to service growth.**

#### **Management Response**

Management agrees with this recommendation.

An external consultant will be engaged to develop a long-term master plan and budget for additional staffing and resources required to service growth. Ottawa Paramedic Service has already initiated this process (see Paramedic Trends Report ACS2008-CPS-OPS-0003 received by CPS Committee at its meeting of October 16, 2008), which includes a three-year staffing plan to be incorporated into the branch's 2009, 2010 and 2011 budgets.

### **Recommendation 11**

**That the Ottawa Paramedic Service revisit the master plan bi-annually to ensure developing and unforeseen challenges and pressures are considered and updated in the plan and reported to Council.**

#### **Management Response**

Management agrees with this recommendation.

As indicated in recommendation 10, work is already underway in this area. The Ottawa Paramedic Service reports annually to Committee and Council with its "Paramedic Trends" report that outlines results for the first six months of each year including, outlining any challenges and pressures that should be reflected in the upcoming year's budget.

### **Recommendation 12**

**That the Ottawa Paramedic Service develop a resource plan that separates annual growth from other determinants for resourcing and staffing enhancements.**

**Management Response**

Management agrees with this recommendation and has already implemented it.

The annual Paramedic Trends report separates growth (i.e., call volume pressures) from other factors such as hospital wait times, so that Council can readily identify the different factors affecting overall response to help isolate the resourcing requirements, which fall within the City's jurisdiction.

**Recommendation 13**

**That the Ottawa Paramedic Service present in their annual reports the staffing approvals for the corresponding years.**

**Management Response**

Management agrees with this recommendation. This has been current practice since 2007.

**4.2.5 Critical Levels of Paramedic Unit Availability****4.2.5.1 Frequency of Unit Availability Falling to Critical Levels**

The Paramedic Service deployment plan frequently cannot meet the demand for service with the current significant system constraints described above. As a result, the system's response capacity erodes to critical resource levels on a daily basis. For analytical purposes the audit has focussed on the incidence of shortfalls to seven available ambulance units or less. It should be noted that the Paramedic Service senior management staff are of the view that system capacity erodes well before this level is reached.

**4.2.5.2 2007 Critical Levels of Unit Availability: Pager Data Sample (January-August)**

The sample data underpinning this analysis is derived from 2007 (January - August) dispatch notification pages to the Paramedic Service senior management team. This paging requirement is built into the deployment plan protocols. During high call volume periods, dispatch pages may not always be delivered by busy staff, so the sample data tends to under-report the actual frequency of unit availability shortfalls below critical levels.

Paramedic Service management indicated that approximately 17 available ambulance units are required during high call volume periods of the day to meet targeted response times in the high density system. During the eight-month sample period in 2007, the Ottawa Paramedic Service was reduced to seven or fewer available ambulances 492 times. On 85 occasions there was three or less ambulances available City-wide for emergency response. On 21 separate occasions there were no ambulances available to respond to the next emergency call.

The equivalent situation in policing terms would be no City of Ottawa squad car available to respond to a 911 call reporting a violent crime in progress. The public

safety risk associated with extremely low levels of available ambulances (zero availability repeated 21 times in just eight months) is unacceptable from a taxpayer perspective and a clinical outcomes service level perspective. Public safety is being consistently jeopardized. The probability of a pre-hospital care fatality associated with zero ambulance unit availability resource levels has increased significantly since the 2004 Alice V. Martin Coroners Inquest made specific recommendations concerning ambulance unit resource levels.

**4.2.5.3 Response Time Impacts of Critical Level Ambulance Availability**

In order to understand the potential public safety risks associated with critical level ambulance unit availability, the audit team has conducted a response time analysis of the 2007 pager data sample. We have calculated 90<sup>th</sup> percentile response times for the calls that immediately follow critical level pages from dispatch. The following table summarizes this analysis.

<i>CRITICAL AVAILABILITY LEVEL</i>	<i>90<sup>TH</sup> PERCENTILE RESPONSE TIME FOR NEXT CALL AFTER PAGE</i>	<i>ADDITIONAL TIME BEYOND 2007 HIGH DENSITY SYSTEM 90<sup>TH</sup> PERCENTILE OF 12:49</i>
7 UNITS CRITICAL LEVEL	18:27	ADDITIONAL 5:38
6 UNITS CRITICAL LEVEL	20:56	ADDITIONAL 8:07
5 UNITS CRITICAL LEVEL	18:34	ADDITIONAL 5:45
4 UNITS CRITICAL LEVEL	21:09	ADDITIONAL 8:20
3 UNITS CRITICAL LEVEL	27:10	ADDITIONAL 14:21
2 UNITS CRITICAL LEVEL	30:00	ADDITIONAL 17:11
1 UNIT CRITICAL LEVEL	27:29	ADDITIONAL 14:40
ZERO UNITS CRITICAL LEVEL	19:23	ADDITIONAL 6:34
ALL CRITICAL LEVELS	21:34	ADDITIONAL 8:45

Across all critical resource levels the 90<sup>th</sup> percentile response time from the sample is 8:45 slower than the high-density system’s 2007 overall (T0-T4) response time of 12:49. At zero ambulance availability, the 90<sup>th</sup> percentile response time for the next call is 51% higher than the high-density system overall 90<sup>th</sup> percentile response time. If the next call is a stroke or cardiac event leading to a patient fatality, and the call features an ambulance response time that is 51% slower than the system-wide response the legal and reputational impacts on the City will be significant.

**Recommendation 14**

That the City obtain a legal opinion to assess the financial and liability risk associated with the ongoing daily erosion of the paramedic system to critical levels of unit availability (this action was taken in July 2008).

**Management Response**

Management agrees with this recommendation and completed this work in July 2008.

**Recommendation 15**

That the Auditor General inform the City Manager of the performance issues and risk profile associated with critical levels of resource availability in an interim briefing prior to the 2009 Annual Report (this action was taken in July 2008).

**Management Response**

Management agrees with this recommendation and has already implemented it.

The annual Paramedic Trends report separates growth (i.e., call volume pressures) from other factors such as hospital wait times, so that Council can readily identify the different factors affecting overall response to help isolate the resourcing requirements, which fall within the City's jurisdiction.

**Recommendation 16**

That the Chief of the Paramedic Service develop a contingency plan to address this critical unit availability shortfall on an immediate basis.

**Management Response**

Management agrees with this recommendation. Operational processes are currently in place and will be put into a policy framework in 2010.

**Recommendation 17**

That the Chief of the Paramedic Service report quarterly to Council on the incidence of critical resource levels and their associated next call 90th percentile response times.

**Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service does not currently have the reporting technology necessary to implement this recommendation. The branch will solicit the Ministry of Health to assist with the acquisition of reporting technology to be able to report on critical resource levels.

### **4.3 System Performance Verification and Review of Operational Processes and Practices.**

This section of the report focuses on the verification of reported performance data and reviews Paramedic operational processes and practices from both legislative compliance and continuous improvement perspectives.

#### **4.3.1 Response Time Performance and Target Setting**

The Paramedic Service Branch has monitored/measured land ambulance response time performance in both high density (urban) and low-density (non-urban) service delivery areas since 2001. Source data for reporting comes from the Province-wide communications database application. Response time performance data is reported annually to Council and the public.

The Ambulance Act establishes response time standards across municipal service providers based on the 90<sup>th</sup> percentile response times achieved in 1996. The Ottawa legislated response time standard under the Ambulance Act is 12:38. Response time improvement has been a City priority since assuming operational control in 2001. The Paramedic Service Branch operating expenditures have increased by more than \$20 million and paramedic staffing has increased by 23 percent in order to improve system response and achieve a 90<sup>th</sup> percentile performance target of 8:59 in the high density system and 15:59 in the low density system.

A key requirement of this audit was to verify the assumptions and calculation accuracy associated with annual reported response times. Calculation 'mirroring' has been undertaken for 2005-2007 by the audit team. The results are displayed in the table below:

<b>Ottawa Paramedic Service Reporting</b>			
	<u>2005</u>	<u>2006</u>	<u>2007</u>
<b>Response Percentile HD</b>	12:00	12:32	13:15
<b>Actual Percentile HD</b>	68.50%	64.50%	
<b>Response Percentile LD</b>	18:18	18:46	20:03
<b>Actual Percentile LD</b>	81.70%	79.60%	
<b>Response volumes</b>			
4	57,266	69,779	72,523
3	22,200	12,409	12,879
2	6,324	5,597	7,073
1	4,350	3,011	2,592
<b>Audit Team</b>			
	<u>2005</u>	<u>2006</u>	<u>2007</u>
<b>Response Percentile HD</b>	12:06	12:58	12:52
<b>Actual Percentile HD</b>	68.00%	63.00%	67.00%
<b>Response Percentile LD</b>	19:06	20:41	20:00
<b>Response Percentile LD</b>	1146	1241	1200
<b>Actual Percentile LD</b>	77.00%	74.00%	77.00%
<b>Response volumes</b>			
4	57261	69984	73430
3	22191	12482	12903
2	6332	5713	7020
1	4352	3086	2810

Response volumes are categorized as emergency calls (Code 3-4) and non-emergency calls (Code 1-2). The audit calculations closely approximate the volumes reported to Council by the Paramedic Service. As noted in the above table:

- ⇒ High density 90th percentile response times in 2005-2007 display minor calculation variances of 10-20 seconds between City reports and audit team calculations.
- ⇒ Actual percentiles of calls achieving the 8:59 high density standard display minor discrepancies - less than 2 percent calculation variance between City reports and audit team calculations.
- ⇒ Low-density 90th percentile response times in 2005-2007 display material calculation variances of approximately 1 minute in 2005, and 2 minutes in 2006. The audit team response time calculations are higher than City reported

response times in both 2005 and 2006. The City reporting presents a somewhat higher level of achievement compared to the audit team’s calculations.

⇒ Actual percentiles of emergency calls achieving the 15:59 low-density standard display material discrepancies. In 2005 the audit team response time percentile calculation is approximately 5 percent lower. In 2006 the audit team percentile calculation is approximately 6 percent lower. The City reporting presents a higher level of achievement compared to the audit team’s calculations.

**4.3.1.1 Response Time Trend Analysis**

Response time trends from 2001-07 are presented in the table below:

	PROVINCE	2001	2002	2003	2004	2005	2006	2007
<b>T0-T4 90<sup>TH</sup> PERCENTILE RESPONSE TIMES (HIGH &amp; LOW DENSITY)</b>	HIGH: 14:35	HIGH: 12:24	HIGH: 10:50	HIGH: 11:05	HIGH: 12:06	HIGH: 12:00	HIGH: 12:32	HIGH: 12:49
	LOW: 22:41	LOW: 17:25	LOW: 16:30	LOW: 17:16	LOW: 19:14	LOW: 18:18	LOW: 18:46	LOW: 21:25
<b>% CODE 3-4 CALLS MEETING 8:59 OR 15:59 STANDARDS</b>	-	-	-	-	8:59 STANDARD: 68%	8:59 STANDARD: 68%	8:59 STANDARD: 65%	8:59 STANDARD: 67%
					15:59 STANDARD: 70%	15:59 STANDARD: 82%	15:59 STANDARD: 80%	15:59 STANDARD: 77%

City performance reports suggest Provincial/contractor response times prior to City direct service delivery were 14:35 in the high-density system and 22:41 in the low-density system. The legislated 90th percentile T2-T4 response time of 12:41 in 1996 suggests significant erosion in Provincial performance prior to the LSR operational transfer to the City. In essence the City service model subsidized bringing the previous Provincial model into compliance with its own legislated response times.

Once the City assumed responsibility and implemented a high performance system, both high-density and low-density response times improved significantly across the 2001-2003 period. Paramedic staff believe single start, fluid deployment and increased deployed units all played a role in generating this initial improvement. Response time performance steadily eroded across the 2004-2006 period for a variety of reasons explored in depth across other audit report components. In 2007 both high-density and low-density system performance eroded below any previous response time results. In the high-density system, the legislated service T2-T4 standard is at risk of not being met.

#### **4.3.1.2 Performance Target Setting**

City response time targets have been based on the 8:59 and 15:59 90th percentile standards recommended by the system design consultants in 2000. There has been much debate in the Ontario EMS community about the medically derived viability of this standard imported from the United States. No Ontario municipality is achieving this standard.

For performance targets to generate meaningful public accountability and system performance improvement, they must be achievable and reflect the City's desired service delivery outcomes. The current system design performance targets are not achievable. New response time performance targets are required.

#### **Recommendation 18**

**That the Ottawa Paramedic Service establish annual response time performance targets based on actual percentages of emergency calls achieving 8:59 and 15:59 instead of the current 90<sup>th</sup> percentile targets.**

#### **Management Response**

Management agrees with this recommendation.

Annual response time performance targets have been captured in the Paramedic Service 2007 Annual Report (received by CPS Committee at its meeting of August 21, 2008) and in the more recent 2008 Trends Report. This practice will continue in future annual and performance trend reports.

#### **4.3.2 Performance Reporting to Council**

##### Review of Reported Performance Indicators

The Paramedic Service has reported that its system is based on the following pillars:

1. Customer satisfaction
2. Clinical excellence
3. Economic efficiency
4. Response time reliability
5. Performance accountability

The performance reporting framework therefore should encompass measurement of the first four pillars. Our review of the annual the Paramedic Service performance reports to Committee/Council (2001-2007) reveals that the following performance measures have been consistently referenced for performance accountability purposes:

- Emergency call volumes (Code 3-4)
- 90th percentile response times (T0-T4) for high density and low density response models

- Dispatch response times (T0-T2)
- Hospital offload wait times

Other performance measures have been referenced for future reporting or have only appeared sporadically across the various 2001-2007 performance accountability reports, including:

- Unit hour utilization
- Advanced care paramedic capture on emergency Code 4 calls
- Paramedic productivity ratios
- Transport time on task
- Actual percentile emergency calls meeting 8:59 or 15:59 standards

Other elements of performance reporting that we believe are critical to performance accountability have not appeared in the Paramedic Service annual performance reports, including:

- Cost per deployed vehicle unit hour (time series trend)
- Incidence of high risk unit availability shortages
- Customer relations tracking system (CRTS) satisfaction reporting

**4.3.2.1 Refinements to Performance Reporting Framework**

A “best practices” performance measurement reporting framework will address all of the Paramedic Service pillars associated with a high performance land ambulance system. This framework will encompass a consistent portfolio of performance measures that will be reported regularly across each year to Committee/Council. The performance report will not selectively choose measures across the years, thereby establishing a transparent time series for review and analysis.

The following measures would be included in a best practices framework:

<i><b>PERFORMANCE MEASURE</b></i>	<i><b>RATIONALE</b></i>
EMERGENCY CALL VOLUMES (CODE 3-4)	KEY MEASURE OF SERVICE DEMAND
90TH PERCENTILE RESPONSE TIMES (T0-T4) FOR HIGH DENSITY AND LOW DENSITY RESPONSE MODELS	RESPONSE RELIABILITY PILLAR
PARAMEDIC PRODUCTIVITY RATIOS	ECONOMIC EFFICIENCY PILLAR
TRANSPORT TIME ON TASK	ECONOMIC EFFICIENCY PILLAR
ACTUAL PERCENTILE EMERGENCY CALLS MEETING 8:59 OR 15:59 STANDARDS	RESPONSE RELIABILITY PILLAR
GROSS OPERATING COST PER DEPLOYED VEHICLE UNIT HOUR (TIME SERIES TREND)	ECONOMIC EFFICIENCY PILLAR
INCIDENCE OF HIGH RISK UNIT AVAILABILITY SHORTAGES	RESPONSE RELIABILITY PILLAR

<i><b>PERFORMANCE MEASURE</b></i>	<i><b>RATIONALE</b></i>
CRTS SATISFACTION REPORT RESULTS	CUSTOMER SATISFACTION PILLAR
SCHEDULED UNITS VS ON ROAD UNITS VARIANCE REPORT	RESPONSE RELIABILITY PILLAR
ACTUAL ON ROAD UNIT HOURS AS % FUNDED UNIT HOURS	ECONOMIC EFFICIENCY PILLAR
% CODE 4 CALLS FEATURING ACP RESPONSE (ACP CAPTURE)	CLINICAL EXCELLENCE PILLAR
% CODE 4 DISPATCHED CALLS GENERATING CODE 4 TRANSPORT TO HOSPITAL	CLINICAL EXCELLENCE PILLAR

#### **4.3.2.2 Management Team Utilization of Performance Data**

The effort Paramedic Service Branch management takes to drive operational decision-making using performance data should be recognized. The Branch management team gathers twice per month to review performance trends with real time data. This data drives brainstorming around operational and deployment issues on an ongoing basis. We are not aware of another City Branch that is utilizing similar “real time” steering tools/performance data on a monthly basis. This continuous improvement process can be expanded and refined using the portfolio of ongoing performance measures outlined above (consistent with a best practices measurement framework).

Sources of data from the Provincial communication system, as well as Branch software applications and dispatch pager data will need to be integrated into annual reporting and the twice monthly continuous improvement sessions. The complexity and ambition of the measurement agenda may be a contributing factor to the somewhat inconsistent reporting of some measures in the 2001-2007 annual reports. Failure to expand the portfolio of indicators clouds public accountability and contributes to a lack of transparency when reporting results to committee/Council. Improved reporting reduces risk by improving Council and public understanding of Paramedic Service performance issues that require intergovernmental advocacy to resolve.

### **Recommendation 19**

**That the Ottawa Paramedic Service track and annually report the identified complete portfolio of performance measures set out in this audit.**

#### **Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will review the portfolio of performance measures set out in this audit for inclusion in future annual reports as part of the strategic branch review exercise in 2010.

### **4.3.3 Scheduling and Deployment in Delivering “On the Road” Ambulances**

The Paramedic Service utilizes sophisticated schedule modeling software to determine the optimal number of deployed ambulance units at any given time, taking into account historic call volume patterns for the time of day and the various days of the week. The result is a dynamic, call demand driven scheduling process; a process captured in the software model that balances deployed unit requirements for system performance against paramedic availability variables like vacation, sick leave and statutory holidays. It is an ongoing challenge for a high performance EMS system to translate the modeled scheduled units required under the deployment plan into actual staffed units on the road.

The Ottawa Paramedic Service has devoted considerable time and energy into developing a sophisticated scheduling model and the associated measurement tools to ensure deployed units closely match optimal scheduled units. This performance measurement tool quantifies “unit leakage” and provides insight into the efficiency and effectiveness of the service’s deployment management approach.

The audit team has reviewed the Paramedic Service 2007 performance database regarding scheduled units versus deployed units. For each day of the week (month by month during 2007) the Paramedic Service analyzes actual deployment against an optimal scheduled deployment range (featuring a unit count defined “floor” and a unit count defined “ceiling”). Ideally, actual deployed unit counts fall within this scheduled range between the floor and ceiling on a shift basis each day.

From an efficiency perspective, the Paramedic Service seeks to avoid excessive deployment of units beyond the scheduling ceiling. From a clinical performance and response time reliability perspective, the service should avoid unit deployments that fail to reach the minimum floor requirement. By staying within the optimal range of scheduled versus actually deployed units, the Paramedic Service avoids clinical performance leakage and delivers an efficient “on the road” product where supply meets demand.

The following table summarizes the analysis of the 2007 Paramedic Service scheduling performance.

2007 SCHEDULED AMBULANCE UNITS	2007 SCHEDULING DAY RESULTS	% DAYS FAILING TO MEET REQUIRED # FLOOR UNITS	% DAYS EXCEEDING CEILING UNIT COUNT	% DAYS FALLING WITHIN THE DESIRED RANGE
7,202	402	13%	27%	60%
	* SOME DAYS HAVE MULTIPLE RESULTS ON THE SAME DAY, SO RESULTS EXCEED 365 DAYS			
		# DAYS FAILING TO MEET REQUIRED # FLOOR UNITS	# DAYS EXCEEDING CEILING UNIT COUNT	# DAYS FALLING WITHIN DESIRED RANGE
		50	110	242

Our data analysis demonstrates the following:

- That actual deployed units exceed the minimum floor requirement in 87% of the daily scheduling results.
- That actual deployed units exceed the ceiling count in 27% of the daily scheduling results. This finding implies planned over-deployment that sacrifices cost-efficiency but generates improved potential in response time performance.
- That 60% of the daily scheduling results fall within the floor-ceiling zone, thereby suggesting an optimal balance of efficiency and potential response time performance.

Examining system scheduling performance in terms of total units scheduled is also informative. In 2007, approximately 7,200 ambulance units were scheduled over 365 days. Total ambulance unit leakage falling below the threshold was only 64 units. This represents less than 1% leakage under the floor “on the road” requirement. The Paramedic Service scheduling performance in getting the right-modeled number of ambulances on the road (at the right times on the right days) has been very effective.

Potential leakage of deployed units versus scheduled units can be caused by the unanticipated absence of scheduled paramedics. Branch processes to compensate for unanticipated absence are currently ensuring minimum required staffed deployment levels are being consistently achieved. As well, regular review of performance data measuring scheduled versus actual deployed units can serve as a distant early warning signal, if potentially negative trends become evident.

Current levels of operational performance risk (actual deployment failure versus scheduled deployment requirement) appear to be relatively low. Performance

measurement data is currently being used on a regular monthly basis to proactively manage this risk.

**Recommendation 20**

**That the Ottawa Paramedic Service include “scheduled unit counts versus actually deployed unit counts” performance data in its annual performance report to Committee/Council.**

**Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will review the portfolio of performance measures set out in this audit for inclusion in future annual reports as part of the strategic branch review exercise in 2010.

**Recommendation 21**

**That the Ottawa Paramedic Service establish ongoing performance targets in its operational planning using “scheduled unit counts versus actually deployed unit counts”.**

**Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will review the portfolio of performance measures set out in this audit for inclusion in future annual reports as part of the strategic branch review exercise in 2010.

**4.3.4 Paramedic Service Efficiency and Productivity**

**4.3.4.1 Ottawa Efficiency and Productivity Trends**

The following table documents key service productivity and efficiency data across the 2001-2007 period.

	2001	2002	2003	2004	2005	2006	2007
# CODE 3-4 EMERGENCY CALLS	57,415	65,516	70,852	76,864	79,426	82,188	85,402
# PARAMEDICS	254	268	268	276	296	312	312
OPERATING BUDGET (\$M)	\$29.2	\$29.5	\$36.6	\$40.7	\$43.9	\$47.3	\$51.6
EMERGENCY CALLS PER PARAMEDIC	226	244	264	278	268	263	273

	2001	2002	2003	2004	2005	2006	2007
COST PER EMERGENCY CALL RESPONSE	\$509	\$450	\$516	\$529	\$552	\$575	\$604

The number of emergency calls has increased by almost 50% while Paramedic Service staffing increased by only 23 percent. The number of emergency calls absorbed per Paramedic Service has increased by 21 percent over the 2001-2007 period. The result was a significant productivity dividend, because for much of the 2001-07 period response times remained reasonably stable.

#### 4.3.4.2 Peer Municipality Productivity Comparisons

The Ottawa Paramedic Service has generated productivity comparisons with a number of urban peer municipalities. These comparisons have been reported in a number of the service's annual reports. The peers include Toronto, Montreal, Calgary, Edmonton, and Lower Mainland BC. The audit team has verified a sample of the reported peer data for 2006 and can confirm for the integrity of the reported comparisons. The data demonstrates that Ottawa's high-density system features the highest call volume supported per paramedic. Ottawa's low-density system drives the square kilometres per paramedic four times higher than any urban peer, however the high-density system features square kilometres per paramedic consistent with peers. The Ottawa system features the lowest paramedic per capita data of any of the urban peers.

The table below summarizes this comparative productivity data.

AMBULANCE SERVICE	CALLS/PARAMEDIC	CALLS PER CAPITA	KM COVERED PER PARAMEDIC
TORONTO	329	2,914	.7
MONTREAL	301	2,533	.8
CALGARY	277	2,798	2.1
EDMONTON	200	2,321	2.2
OTTAWA URBAN	391	3,709	1.9

Overall, it is clear that Ottawa is providing service with lower levels of resourcing on a population and response area adjusted basis. This higher level of productivity would be desirable in a performance scenario where response time targets were being met, or actual response times were at least stable. This was the case across 2002-2003, however since that period system response time reliability has eroded.

A productive or efficient system – in and of itself – has limited value if response time and clinical outcomes are not being achieved.

#### 4.3.4.3 OMBI Benchmarking

Ottawa Paramedic Service participates in the OMBI benchmarking initiative. The audit team has reviewed the 2005 and 2006 OMBI benchmarking data. The following observations are noteworthy:

- The publicly reported OMBI performance measures track vehicle hours of service; call volumes, response times and unit costs.
- The comparator group of peers is too diffuse to render the comparisons deeply meaningful. Data is skewed by non-urban dispersed systems such as Muskoka or Thunder Bay.
- Rather than highlight relative performance variation and seek to understand the best practices behind the data of relatively high performers, OMBI data presentation and narrative seems to compress jurisdiction results towards the mean and avoid commenting on variances in a meaningful fashion.
- There are problematic gaps in the OMBI measurement framework. For instance, it is not clear why Advanced Care data that all EMS jurisdictions track is not being presented in the Paramedics OMBI report. Even more problematic is the decision to report only T2-T4 90<sup>th</sup> percentile response times instead of complete T0-T4 response times. Dispatch response times are being suppressed from the OMBI data because some jurisdictions do not operate dispatch. This rationale is unconvincing given the OMBI objective of transparent public reporting. The superior AMPDS dispatch triage performance in Toronto and Niagara is not fully reflected, nor are the slow non-compliant dispatch times in other jurisdictions. The result is clouded accountability and a failure to meet the OMBI mandate of best practice identification.

Ottawa Paramedic Service has generated high levels of ongoing system productivity. Paramedic Service system productivity is documented by the audit team's review of appropriate ratios across 2001-2007. As well, external comparisons across Canadian urban jurisdictions confirm Ottawa's relative system productivity. However, productivity has co-existed with sub-optimal dispatch triaging, eroding response time reliability, escalating hospital wait times and intermittent staffing growth increments. The net result has been commendable staff performance resulting in strong productivity accompanied by systemic performance problems and system constraints. Response time erosion in 2007 has emphasized the reality that productivity can no longer compensate for resource shortages and systemic constraints.

System productivity associated with current resource levels appears to have reached its maximum. The erosion of response time reliability into a non-compliance zone with legislation signifies the need for ongoing staffing increments to deal with growth. It is recognized that these investments are imminent, and that productivity ratios will return to a more sustainable level. The absence of a target range for these key productivity ratios represents a business sustainability risk for the City.

#### 4.3.4.4 Internet Usage

The 2005 Audit of Internet Usage selected fifty (50) staff at random to examine Internet usage. For this 2005 sample, the spread of usage ranged from 2,106 hits per day for the highest user account to no hits for the lowest user account. The 2005 audit also revealed that there was some staff within the Ottawa Paramedic Service who had a high level of usage, a significant amount of which was for personal use. As part of the 2008 audit, a random sample of five (5) paramedic staff was selected in order to review their Internet activity. The table below summarizes the results of this analysis. In 2009, a follow-up of the 2005 Audit of Internet Usage will be undertaken by the OAG.

	Total Hits Jul 07-Jun 08	Avg. Hits per Month	Ave. Hits per Day	Personal Use	
				Hits	%
Sample 1	4,247	386	18	2,476	58%
Sample 2	6,621	552	28	3,351	51%
Sample 3	7,276	606	29	3,497	48%
Sample 4	4,686	391	19	2,316	49%
Sample 5	1,319	110	5	688	52%
<b>Total Average</b>	<b>4,830</b>	<b>409</b>	<b>20</b>	<b>2,466</b>	<b>51%</b>

### **Recommendation 22**

**That the Ottawa Paramedic Service establish a target range for its key productivity ratio in the high-density system (calls per paramedic).**

#### **Management Response**

Management agrees with this recommendation.

Calls per paramedic ratios will be discussed as part of the strategic branch review exercise in 2010 and will also be included in the scope of work being done by the consultant in developing a long-term master plan and budget as indicated in recommendation 10.

### **Recommendation 23**

**That the “calls per paramedic ratio” trend in Ottawa (and external peer ratios) be regularly reported and integrated into the recommended master planning framework and the upcoming branch strategic branch review.**

### **Management Response**

Management agrees with this recommendation.

Calls per paramedic ratios and external peer ratios will be discussed as part of the strategic branch review exercise in 2010 and will also be included in the scope of work being done by the consultant in developing a long-term master plan and budget as indicated in recommendation 10.

### **Recommendation 24**

**That the City of Ottawa petition OMBI to restructure its 90th percentile response time reporting to include T0-T2 data.**

### **Management Response**

Management agrees with this recommendation and has already implemented it. The City of Ottawa petitioned OMBI in 2008 to restructure its 90th percentile response time reporting to include T0-T2 data. OMBI has implemented and reported this in its annual report.

## **4.3.5 Advanced Care Paramedic Capture, Training and Target Setting**

The Ottawa EMS system design implemented in 2001 was based on the design and recommendations the EMS consulting firm. The design called for clinical sophistication that allows for the transition to an all-advanced life support paramedic level of care. The system design called for a ratio of 60% advanced care paramedics (ACP) and 40% primary care paramedics (PCP) by 2004.

### **4.3.5.1 Training**

In Ontario the paramedic training program is a two-year college program that provides primary care certification. To achieve advanced care certification, an additional one-year college program is required. Ontario colleges are offering training of new paramedics to the advanced care level. However, the pupil numbers are limited based on provincial demand for advanced care paramedics.

The Ottawa Paramedic Service issued an RFP for a teaching institution to upgrade fifty existing full-time primary care paramedics to the qualification of ACP. A collaborative submission was received from Durham and Algonquin colleges and classes commenced October 2002 with thirteen students. Following the first class, the next class began in March 2003 with eighteen students, followed again by the class of August 2003 with nineteen students.

Following the 2004 Alice V. Martin inquest, City Council directed that fourteen additional paramedics be hired immediately. In December 2004, these paramedics were hired. Operating costs for the funding of the positions was supported but the ACP training dollars for six primary care paramedics was reallocated to help fund these additional resources. In the following annual reports, information on advanced care paramedic ratios and training is absent, and it appears that a policy

decision was made for the employer to no longer fund the upgrading of skills to the ACP level for existing PCP staff. This policy shift was confirmed in our interviews and meetings with paramedic and management staff.

Paramedic staff are hired as a PCP on a contract basis to occupy open and approved FTE slots. Full-time PCP staff now fund their own tuition and all costs associated with upgrading their skills and classification to ACP. Following graduation the staff are converted to an ACP classification and then bid for shift platoons and designated ACP positions. The shift from employer sponsored training to employees paying their own expenses has been a source of ongoing sensitivity with paramedic staff.

The existing practice of hiring primary care paramedics on a contract basis and only filling full-time FTE positions with ACP staff is subject to ACP graduating numbers and the time of year in which they graduate. Staggered ACP class dates provide an ongoing supply of ACP staff.

The current ACP training and hiring policy has been relatively successful in achieving a desired ACP/PCP mix, given the limited and lagged FTE paramedic additions to the system. On a go forward basis, the Paramedic Service management team will need to assess the existing ACP training and hiring policy should Council provide the planned annual growth staffing enhancements in the 2008-10 budgets. Without multi-year lagged implementation times for training and hiring paramedics, adjustments to the training and hiring policy and procedures will be required. The Paramedic Service has no demonstrated historic capacity to retain the existing ACP/PCP staffing ratios in a situation where 25-35 paramedics will be eligible for annual and immediate hire in three successive years.

#### 4.3.5.2 ACP Capture

A clinical performance benchmark that many EMS systems have put in place is ACP Capture. ACP Capture is defined as: an ACP is assigned to a Code 4 emergency call as a first response or transporting unit (regardless of whether the medic's vehicle is the first vehicle on scene or not).

The 2005 and 2006 OMBI data documents Ottawa ACP capture results versus peer municipalities. This measure is based on call demand and not patient transports.

Percentage of EMS Code 4 Calls Captured by ACP		
Municipality	2006 Result	2005 Result
Sudbury (Greater)	87.9%	82.0%
Waterloo	81.8%	78.8%
Durham	80.7%	96.8%
Halton	80.7%	72.8%
Niagara	79.2%	73.1%
Ottawa	73.9%	77.4%
York	64.0%	56.3%

Percentage of EMS Code 4 Calls Captured by ACP		
Municipality	2006 Result	2005 Result
Toronto	59.7%	
Thunder Bay	57.6%	36.9%
Hamilton	55.3%	45.0%
Brant	52.4%	49.6%
London	44.8%	
Windsor	39.5%	
Peel	13.2%	
Muskoka	0.0%	
<b>Median</b>	<b>59.7%</b>	<b>73.0%</b>
<b>Average</b>	<b>58.1%</b>	<b>66.9%</b>

The following chart provides the ACP capture rates as a percentage of overall Code 4 emergency calls responded to by the Ottawa Paramedic Service:

	2005	2006	2007
ACP CAPTURE RATE	77.4%	75.90%	70.40%

The chart above shows that ACP capture is eroding over the last few years. However, an alternative measure of ACP capture is the number of Code 4 patients actually transported to hospital once a paramedic has seen the patient and the patient acuity has been determined. Code 4 emergency *transports* more closely mirror true emergencies as compared to Code 4 *triaged* calls. Still another method of measuring ACP capture rates is to review the percentage of CTAS<sup>2</sup> 1 or 2 patients receiving ACP care. CTAS 1 or 2 transports are also a more accurate indication of true emergencies. Both of these measures are not based on triage or call demand.

The following chart provides the ACP capture rate percentages based on patients *transported* to hospital:

	2007
ACP CAPTURE RATES FOR CODE 4 TRANSPORTS TO HOSPITAL	Code 4 transports = 9,124 ACP On Scene = 4,390 ACP Capture = 48 %
ACP CAPTURE RATES FOR CTAS 1 OR 2 TRANSPORTS TO HOSPITAL	CTAS 1 or 2 transports = 20,831 ACP On Scene = 12,184 ACP Capture = 58 %

<sup>2</sup> Canadian Triage and Acuity Scale (CTAS) is used by hospital emergency rooms to prioritize patient care requirements.

ACP capture rates for Code 4 and CTAS 1-2 *transports* are both significantly lower than the commonly reported rate based on Code 4 *dispatches*. This difference is critical to understanding the actual clinical performance of the Ottawa Paramedic Service in matching highly trained paramedics to calls featuring truly ill patients. On the one hand, the lower “matching” rates for ACP transports suggest Ottawa Primary Care Paramedics are not waiting for ACP units when confronted with truly ill patients; and are instead proceeding directly to hospital. This proactive judgement call by the Primary Care Paramedics seems prudent from a risk management perspective. On the other hand, the analysis confirms that ACP units have far less impact on truly ill patients than the commonly reported ACP capture rates suggest (based on dispatched calls). This analysis further confirms the ineffective call triaging performance of the DPCI triage tool. ACP units are responding to DPCI dispatched Code 4 calls that turn out not to involve true Code 4 patient acuity once the patient has been seen by a paramedic. As a result, these ACP units may not be available in timely fashion for the more critical CTAS 1 or Code 4 true emergency returns.

#### 4.3.5.3 Target Setting

In the October 2007 report to Council the Ottawa Paramedic Service has projected paramedic staffing requests for an additional 38 FTE in 2008, 25 FTE in 2009 and 27 FTE in 2010. It is expected that the majority of these FTE will be front line paramedics. These staffing requests are based on increasing call volumes and are expected to stabilize/improve response times.

The original staffing design ratio of 60% ACP is based on meeting call demand and assuming that all Code 4 calls are life threatening and require ACP intervention. With several available years of historical data on patient transports, the Paramedic Service could potentially set ACP capture rates based on patient transports instead of on call dispatch. This alternative measurement strategy would allow for a downward adjustment to the ACP/PCP staffing ratio and would reflect true ACP capture on return priority CTAS 1 and CTAS 2 patients (highest acuity).

In the absence of this adjustment, the audit team believes it is unlikely that the Paramedic Service can maintain the current ACP/PCP ratio. The system can no longer afford to dispatch ACP staff to poorly triaged Code 4 call demand and a more appropriate ratio of ACP/PCP should be deployed. The Paramedic Service should consider developing ACP deployment strategies based on clinical patient acuity ratings (CTAS) rather than overall Code 4 demand. Historical patient clinical data and call volumes such as chest pain and shortness of breath should be analyzed to better understand transport demand.

The Paramedic Service should conduct an ACP needs analysis before the end of quarter one 2009. The analysis should be based on ACP capture targets linked to Code 4 and CTAS patient transports as opposed to triaged Code 4 calls. The analysis should also address the issue of paid tuition support and other process re-

engineering options given the realities of the 2008-10 budgets and staffing plan received by Council.

Should City Council approve the annual growth staffing enhancements in the 2008-10 budget, the existing ACP recruitment, hiring and training practices will need to be reviewed/enhanced to ensure the approved annual FTE will be in place during the year in which they are approved. There currently exists a significant risk associated with the challenge of three consecutive years requiring ACP recruitment well beyond historic recruitment levels.

### **Recommendation 25**

**That the Ottawa Paramedic Service conduct an Advanced Care Paramedic (ACP) needs analysis.**

#### **Management Response**

Management agrees with this recommendation. An ACP needs analysis will be conducted as part of work being undertaken on the Paramedic Master Plan in 2010.

### **Recommendation 26**

**That the Ottawa Paramedic Service refine and develop annual ACP capture targets based on patient transports as part of the annual business planning and reporting cycle.**

#### **Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will refine and develop annual ACP capture targets for inclusion in future annual reports as part of the strategic branch review exercise in 2010.

### **Recommendation 27**

**That the Ottawa Paramedic Service develop a deployment policy that would see ACP resources responding only to Code 4 calls, similar to their policy for Paramedic Rapid Response Unit (PRU) response priorities.**

#### **Management Response**

Management disagrees with this recommendation.

Present staffing precludes this recommendation from being implemented at this time. A change in legislation and the acquisition of a better dispatching tool (AMPDS) would be required for the branch to support and implement this recommendation.

Current legislation requires that the closest ambulance be sent to any life-threatening call; therefore, the choice of an ACP resource being sent versus a PCP resource could not be accomplished without legislative change. With the acquisition of AMPDS and appropriate resourcing, the principle could be applied by sending a second unit with ACP after the closest unit is sent. Operationally, the first unit would then clear and be available for another call. This cannot be accomplished in a service that is always at critical levels of availability.

#### **4.3.6 Paramedic Specialty Teams**

Specialty teams were introduced by the Ottawa Paramedic Service to better match the Paramedic Service with specialized demand for service such as staffing large events, responding to tactical situations or responding to calls that required alternative modes of access to patients (i.e., by bike or by boat). The success of selected specialty teams needs to be understood from an evidence-based perspective. While paramedic rapid response units (PRU) operate under the regular deployed operations; for the purposes of this review PRU will be included under the specialty team stream.

The review of specialty teams included interviews with paramedic staff and management (including the Coordinator of Special Operations), a tour of the specialized equipment storage area and a review of selected performance data. The core performance data available for this review is the detailed 2005 -2007 Paramedic Rapid Response Unit Program Analysis.

##### **4.3.6.1 Specialty Programs**

In addition to the PRU, the Ottawa Paramedic Service is providing specialized teams in the following areas:

- Tactical (in conjunction with police services)
- CBRNE (chemical, biological, radiological, nuclear, explosive) teams
- Bicycle teams
- RCMP VIP program (medical coverage)
- Marine (in conjunction with police services)
- MCI (multi casualty incidents)

Specialty teams have become a North American best practice for larger urban EMS systems. As emergency response becomes more complex and dangerous, the demand for specialized training and the safety of paramedics and other allied agency personnel is a priority. The deployment of a specialty team assists in maintaining regular operations and response time reliability. An example is bike teams providing on site medical coverage at the Canada Day event. The bikes

provide paramedics the capability to manoeuvre through large crowds to access patients and reduce the commitment of an ambulance to each call at the event.

As well as response capacity advantages, specialty teams provide excellent opportunity for partnerships with allied agencies such as the police in the operation of the marine, tactical and VIP programs. The training promotes paramedics working alongside police officers and developing good working relationships between the two services while reducing training costs.

The use/not use decision for specialty teams is determined by a case-by-case risk assessment to determine the resource commitment for the event. Some specialty teams such as the tactical and CBRNE units are deployed from regular operations as events unfold. On duty paramedics who have received specialized training are redeployed from regular operations to respond to the event for the duration and are redeployed back into regular operations following the incident. With roughly 400 tactical call responses per year by the Paramedic Service, utilization and the activation deployment strategy is deemed cost effective. Ongoing costs for equipment and training are minimal as a small percentage of overall staff are participating with specialty teams.

Ottawa Paramedic Service also provides paid duty to special events. Following a risk assessment to determine resource commitments, paramedics are paid at time and one half and the resources are dedicated to the event and are not used as part of regular operations. Many deployments involve revenue recovery from the federal government.

Unfortunately, performance data for these specialty teams is limited and reported inconsistently through annual reports to Committee/Council. A detailed financial cost analysis for specialty programs should be considered as demand increases and programs expand.

#### **4.3.6.2 Paramedic Rapid Response Units (PRU)**

The PRU provides basic life support patient care by deploying a single paramedic in a car to the scene until a transport ambulance arrives. The PRU program commenced in July 2005, with the objective of reducing paramedic-to-patient response time.

The Ottawa Paramedic Service conducted a PRU program analysis for 2005-2007 to determine whether the PRU program was positively impacting response times. The program analysis also considered the question of increased PRU resources and optimal time of day deployment. 90th Percentile Response Times by PRU Vehicle are shown in the following chart:

Vehicle	<i>July 05 - June 06</i>		<i>July 06 - June 07</i>	
	<b>T3 - T4</b>	<b>T0 - T4</b>	<b>T3 - T4</b>	<b>T0 - T4</b>
<b>4361</b>	0:08:16	0:10:56	0:08:17	0:10:56
<b>4367</b>	0:06:56	0:09:55	0:06:22	<b>0:08:52</b>
<b>4368</b>	0:08:27	0:11:22	0:06:54	0:09:33
<b>4369</b>	0:06:45	0:09:07	0:06:14	<b>0:08:47</b>
<b>All PRU Units</b>	0:07:29	0:10:17	0:06:55	0:09:25
<b>ALL PTU Units</b>	0:08:51	0:11:47	0:09:12	0:12:14

The analysis confirmed that PRU calls generate response times that are far superior to normal deployed ambulance unit response times. In 2006-07, PRU 90<sup>th</sup> percentile call response times were almost 3 minutes faster. As well, the PRU “paramedic-to-patient” response time improved significantly over the two years covered in the program analysis. Two of the four deployed PRU vehicles are achieving the 8:59 high-density target while another is approaching the response time target.

As the PRU vehicles are more mobile, overall response time improves. In addition, PRU vehicles, if properly deployed and managed, are not subject to off-load delays at area hospitals since these units are not transporting patients. Staffing and capital costs for the PRU are significantly less expensive than adding a traditional ambulance.

Developing the optimal ratio of traditional ambulances to PRU will need to be calculated and phased-in annually assuming more PRU are added to the system. Paramedic Service data confirms that a large percentage of calls do not require patient transportation. Responding to call demand with an appropriate ratio of PRU and transport ambulances will optimize system capacity and efficiency. Further response time performance improvement should result. Included in the program analysis is a recommendation by the Paramedic Service to expand the PRU program significantly and to continue with the deployment in high-density urban areas on Code 4 emergency calls only.

Overall system response times continue to erode. The Paramedic Service has invested in deploying specialized teams in an effort to better utilize limited resources and to better equip and train responding paramedics to dangerous incidents. Non-traditional ambulance deployment strategies such as PRU and other strategies should continue to be piloted and possibly expanded following a detailed program analysis. Paramedic Service performance is measured by response time in the minds of taxpayers. Failure to implement best practice process improvements and deployment methodologies will negatively impact the public reputation of the service and will contribute to increasing response times.

### **Recommendation 28**

**That the Ottawa Paramedic Service track and annually report utilization, response times and other relevant performance data for all specialty teams.**

#### **Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will review the portfolio of performance measures set out in this audit for inclusion in future annual reports as part of the strategic branch review exercise in 2010.

### **Recommendation 29**

**That the Ottawa Paramedic Service expand the Paramedic Rapid Response Units (PRU) program based on the findings of the 2005-2007 program analysis.**

#### **Management Response**

Management agrees with this recommendation. Enhancements to the PRU program began in May 2008 and analysis is ongoing.

#### **4.3.7 Single Start Model**

As reported to City Council following assumption of the land ambulance service in 2001, initial high and low density response time targets had been met and improved response time reliability had been achieved. The initial performance and response time achievements were realized through:

- Establishing a single start station in the high density area;
- Increased unit hours from 141,000 in 2000 to 206,000 in 2001;
- Increased the number of front line ambulances from 31 in 2000 to 39 in 2001;
- An established network of 16 base stations; and,
- Matched unit deployment to call demand patterns.

On January 1, 2001 staff established a temporary single start station at 530 Tremblay Road in the high-density area. This conceptual deployment model was a first for EMS in Ontario however other jurisdictions throughout Canada and the United States have successfully implemented and operated a single start model.

Prior to the assumption of direct delivery of the Paramedic Service by the City of Ottawa, the Province was responsible for the delivery of ambulance services and the associated capital in operating within a "level of effort system". Ambulance bases and stations were substandard and fewer than required to operate under the high performance system adopted by the City. Considering the substantial capital investment required by the City in the start up of the Ottawa Paramedic Service, a centralized or single start deployment model in the high density area provided

several cost avoidance benefits and advantages versus operating under a station based model.

The chart below illustrates the deployment models used by the City of Ottawa emergency services.

AGENCY	MODEL TYPE	DESCRIPTION	FUNCTION
EMS	Single start and station based	High density (HD)- single or central start Low density (LD)- station based	HD - ambulances report to a centralized location at the start and end of shift & use a combination of fixed and mobile posts. Ambulance receive emergency calls when at station, fixed or mobile posts
Fire	Station based	Fire stations	Fire resources receive emergency calls and respond from fire stations
Police	Fluid deployment	Patrol dedicated areas	Report to work from a district headquarters and patrol in designated geographical areas.

The Ottawa Paramedic Service has adopted a hybrid deployment model that combines the station based and fluid deployment models. The single start location has created many efficiencies within the operating system, particularly in meeting the needs of:

- Preventative vehicle and equipment maintenance;
- Rapid and readiness deployment;
- Access to and improved staff communication;
- Inventory and tracking systems;
- Specialty teams deployment;
- Centralized training; and,
- Emergency and disaster command centre.

The Paramedic Service has a sophisticated preventative and vehicle maintenance schedule that has successfully passed Ministry certification audits in 2001 and 2004 and 2007. Rapid and readiness deployment allows reporting paramedics to complete administrative details such as emails and receive a start of shift verbal briefing from EMS management that ensures consistent and frequent

communication on evolving situations and important system updates. Shift times for paramedics are staggered to ensure maximum vehicle and staffing coverage. The centralized location also provides access to staff and management for ongoing training for paramedics and other City staff participating in the first aid and public access defibrillator training facilitated by the Paramedic Service.

The single start deployment model allows for all vehicles to be appropriately stocked by equipment and supply technicians that utilize scanners to provide detailed information on equipment service and preventative maintenance history. The system also provides inventory counts and tracking of equipment and supplies, a centralized location of equipment, vehicles and staff. The single start location also provides for rapid deployment of specialty teams and equipment such as the multi patient transfer unit, mobile command post, or the multi casualty units that support large incident or disaster type situations. The Paramedic Service also has a dedicated command and operations centre to support a coordinated response to any unforeseen incident or large-scale situation.

The centralized/single start model has provided efficiencies and benefits in many areas. Centralizing operations in the high-density area has reduced the requirement to build larger multi vehicle stations that require daily stocking of supplies and equipment. Efficiencies in logistics, staff communication, operations management, training, rapid disaster and specialty team deployment have been benefits of the centralized model. The adoption of the centralized single start model by City Council contributes to the Paramedic Service high performance system. The single start system also offset system performance erosion from sub-optimal dispatch and patient offload delays, otherwise response time performance could have eroded further. Unfortunately, the on-going challenges related hospital off-loads, dispatch protocols and staffing for growth have now overtaken the gains made from establishing the single-start model.

#### **4.3.8 High Density versus Low Density Delivery Models**

Deployment modeling for larger EMS systems is very sophisticated and requires consistent compliance to the services deployment plan. Ottawa Paramedic Service has developed a day and night time deployment plan that considers staffing and available resources. It also identifies the posting of resources and other conditions such as eating periods, end of shift protocols, and management notification triggers. Many EMS services utilize software tools that can predict the time and location of the next emergency call based on the input of years of historical call demand, travel times, time of day, resources etc. The Paramedic Service has utilized these software tools to assist in the development and adjustment of their deployment plan. The challenge is the frequent absence of sufficient deployed/available units during peak demand periods to actually execute the deployment plan

The Ottawa Paramedic Service reported on proposed system design (year one review) at the Emergency and Protective Services Committee on March 28, 2002. Outlined in the report was the recommendation on system design that the City be divided into two areas, a high-density (HD) call area and a low-density (LD) area based on historical call demand patterns. It was further reported that the HD area would initially represent 94% of the call volume and 14% of the geographic area, while the LD would represent only 6% of the call volume yet 86% of the geography. The City of Ottawa spans 2,779 sq kilometres and is made up of rural, suburban and urban built forms. This vast area poses significant challenges from an EMS coverage and deployment perspective.

On January 1, 2001 the Paramedic Service assigned additional resources to the LD area. Prior to assumption, the LD area was serviced by two (2) ambulances working twelve (12) hours per day. The additional resources were added and the LD area was staffed with eight (8) ambulances working twenty four (24) hours per day/seven (7) days a week. The additional resources were deployed to ensure adequate coverage and timely response for the LD area. No additional ambulance resources have been added to the LD area since the 2001 resource commitment.

The Paramedic Service has defined a HD area where twenty four (24) or more calls per year occur within not less than six (6) adjoining square kilometres. The borders of the HD area have changed over time according to this definition. The LD area has been defined as any area that does not meet the HD definition.

On any given day, as call demand increases and resource availability declines, LD resources are pulled into HD areas to service high call demand. It should be noted that the approved deployment plan allows for five of eight LD resources to be reassigned to HD areas during busy periods of call activity. Resource capacity and response time reliability is also diminished with the challenge of hospital off-load delays, which usually occur simultaneously with peak call volume times.

To meet the challenges of its population distribution and vast geography, the Paramedic Service uses a flexible deployment model that integrates the HD and LD areas from a coverage perspective. The HD areas are subject to high call volumes and ambulances receive requests for service from mobile and stationary posts - in addition to the logistical challenge of clearing hospitals from extensive off load delays. LD areas have a lower call volume than the HD areas and receive requests for service from stations, fixed or mobile posts. It should be noted that the LD areas provide a high number of standbys to provide balanced emergency coverage in both the LD and HD areas.

Emergency call assignment and triaging is an important factor in the management and utilization of EMS resources. The frequency with which the Paramedic Service is operating at critical resource levels directly correlates with their ability to provide coverage and response time reliability. During peak periods of call volume and when resource availability is reduced, many ambulances are mobile for extended

periods of time and in fact can continuously be reassigned from post to post without ever arriving at the destination post due to reassignment. This trend was confirmed through consultation and interviews with paramedics and operational management staff. The net result is most calls are deployed 'on the fly', and the response time benefit of the carefully crafted deployment plan (based on historic call location patterns) is not realized.

The reality that only a minority of calls feature a station-deployed response should influence the Paramedic Service's long-term capital plan. It is not clear that planned station construction by the Paramedic Service will yield an adequate service delivery and utilization return on investment as compared to other capital projects competing for funding. This return on investment business case should be transparently addressed by the Paramedic Service during the 2009 budget and the development of a master plan.

As stated earlier, deployment modeling is sophisticated and influenced by many factors. The most sophisticated deployment software and management planning will not improve response times and response time reliability if resources remain tied up at hospital emergency departments and the service is operating under critical resource levels too frequently. Longer response times translate into public perceptions and confidence in the system. It will also reflect in customer satisfaction and an increase in service complaints. Paramedic morale issues will increase due to unresolved systemic pressures. Paramedic station and capital planning will also need to consider the impacts of fluid deployment and "on the run" call response realities.

### **Recommendation 30**

**That the Ottawa Paramedic Service prepare a business case demonstrating the return on investment (ROI) and expected utilization associated with planned facility/base construction in the City capital plan.**

#### **Management Response**

Management agrees with this recommendation.

An external consultant will be engaged to develop a long-term master plan for the Ottawa Paramedic Service and the scope of work will also include the preparation of a business case demonstrating ROI. This work is expected to be complete in 2010.

### **4.3.9 Aging Society and Call Volume Demand**

Code 3-4 emergency call volumes in Ottawa have increased at a rate that exceeds assessment growth and population growth. Paramedic Service reports to Committee have argued that population aging is largely responsible for call volume growth rates beyond population growth. The following chart is instructive in this regard:

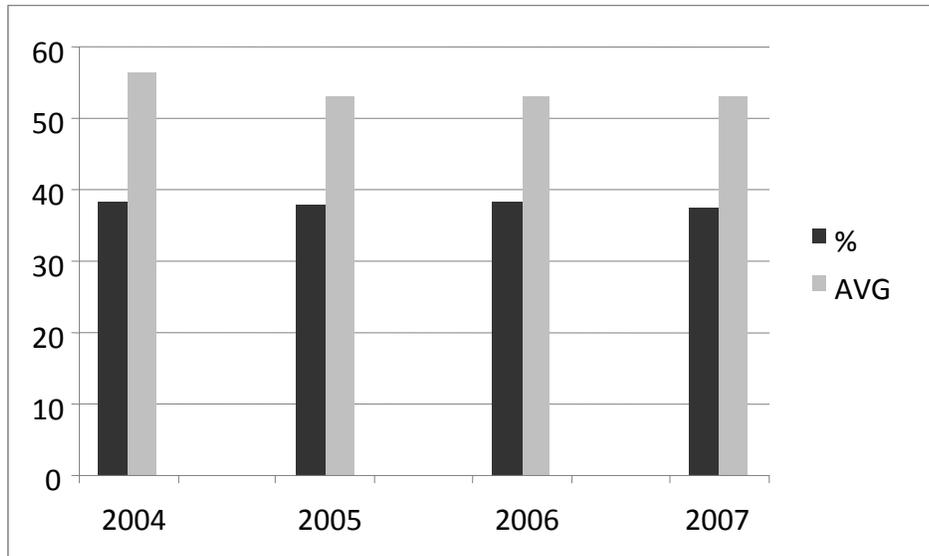
AUGUST 2005 COMMITTEE REPORT	REPORT QUOTED PLANNING DEPARTMENT FORECAST SHOWING POPULATION > 65 INCREASING FROM 11 PERCENT IN 2001 TO ALMOST 15 PERCENT BY 2016
SEPTEMBER 2006 COMMITTEE REPORT	"...IN ADDITION TO GENERAL POPULATION GROWTH, THE POPULATION IS ALSO AGING AT A DISPROPORTIONATE RATE WITH THE ELDERLY MAKING USE OF THE SERVICE FAR MORE OFTEN THAN YOUNGER PEOPLE. IN 2005, STROKE, HEART PROBLEMS, SHORTNESS OF BREATH AND FALLS AILMENTS NORMALLY ASSOCIATED WITH THE ELDERLY ACCOUNTED FOR APPROXIMATELY 30% OF ALL CALLS."
OCTOBER 2007 COMMITTEE REPORT	...IN 2006 A 1300 CALL INCREASE IN CALLS ASSOCIATED WITH THE ELDERLY... 85+ ELDERLY WILL INCREASE BY 25% IN NEXT FIVE YEARS, ACCELERATING DEMANDS ON THE PARAMEDIC SERVICE

Interviews were conducted with the Paramedic Service staff and Public Health staff concerning this reported hypothesis that call volume demand and acuity will be driven by increasing numbers of older people. Patient ageing reports on the Ottawa patient information database to attempt were also generated to validate this hypothesis.

There is a widespread anecdotal belief among paramedics that elderly citizens represent an increasing proportion of patients, and that these patients represent higher levels of system utilization and acuity. The audit confirms (not surprisingly) that Ottawa's population features aging trends largely identical to those across the Canadian population. Ottawa will feature a growing population share >65 years old and >85 years old. The audit team would note however that aging, in and of itself, does not signify increased service utilization.

The Paramedic Service reports attempt to anecdotally link certain call types (strokes, heart problems) with elderly citizens. Public Health epidemiologists interviewed during the audit rejected this anecdotal link in the absence of statistical analysis linking call types to patient aging data. This data link does not currently exist in a relational database that could be accessed for review and analysis. Instead an analysis on patient age and relative shares of annual patients that are seniors was conducted. The results appear below:

Summary	2004	2005	2006	2007*
% Senior	38.4	37.9	38.3	37.6
AVG Age	56.4	52.9	53.1	53.1



The average age of Paramedic Service patients has not increased during the 2004-07 period. The percentage of Ottawa Paramedic Service patients that are greater than 65 years old has not increased during the 2004-07 period.

If elderly residents were driving call volume demand as hypothesized in Paramedic Service reports, average patient age would be trending upwards, as would the share of patients greater than 65 years old. These results do not necessarily disagree with the Paramedic Service hypothesis as societal aging intensifies in the next twenty years. For instance, there is ample evidence in health utilization research that the North American elderly generate higher than average utilization of hospital services. It should be noted, however, that no any compelling evidence has been presented to confirm the current or historic impact of the aging society hypothesis regarding caseload growth.

It is critical for the Paramedic Service to be able to forecast demand over a multi-year time horizon in order to coordinate resource planning with demand; thereby improving the probability of response time reliability and clinical performance. The impact of societal aging on call volume demand has been used to explain current call volume growth rates that exceed population growth. An enhanced understanding of the likely timing of aging society impacts on call volumes may be critical to system planning. A failure to properly understand and model the potential impacts of an aging society on future call volumes will expose the Paramedic Service to a potential mismatch of demand versus required resources; with potential adverse impacts on response time reliability and clinical performance.

### **Recommendation 31**

**That the Ottawa Paramedic Service collaborate with public health and other stakeholders to research and develop a service demand-forecasting model that incorporates aging society impacts on call frequency, duration and acuity.**

#### **Management Response**

Management agrees with this recommendation.

An external consultant will be engaged to develop a long-term master plan for the Ottawa Paramedic Service and the scope of work will also include the research and development of a forecasting model that incorporates the impact of an aging society on call frequency, duration and acuity. This work is expected to be complete in 2010.

#### **4.3.10 Support Processes and Logistics Documentation**

The EMS system in Ontario is governed by the Ambulance Act, regulations and many other provincial acts and legislation. The MOHLTC provides oversight and certification of operators to provide land ambulance services in Ontario. Strict mandatory compliance standards are measured through a compliance audit conducted every three years by the Ministry which includes a detailed review of logistical and support services. The Ottawa Paramedic Service successfully passed Ministry reviews in 2001, 2004 and 2007 - reducing risk from a public, compliance, and civil liability perspective. Compliance and performance risk are minimal.

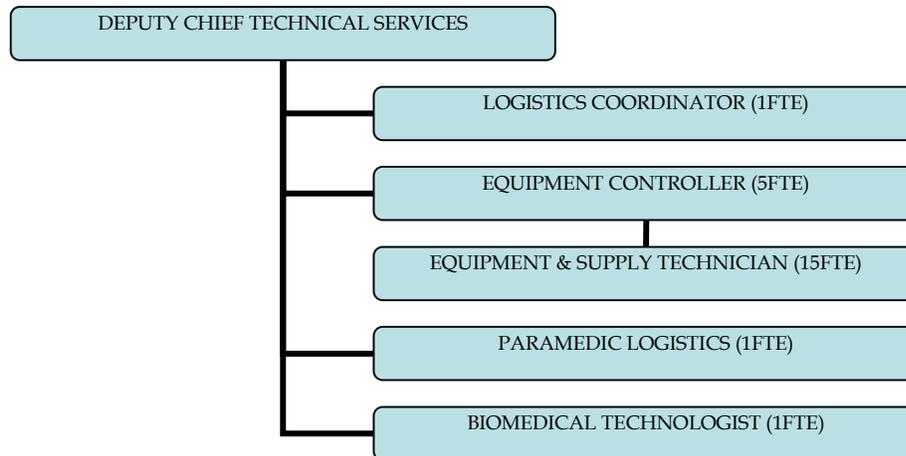
The audit of the support and logistical services of the Paramedic Service included a series of staff interviews and a site visit/tour through the paramedic technical services stores, garage and maintenance facility. The site visit included detailed explanations and demonstrations by paramedic staff and management relative to equipment and vehicle processes.

These systems are monitored and supported by staff and computer programs that document and track equipment in the system and give detailed preventative and service maintenance history. The staff provided detailed process maps for each area within the garage facility that is continuously reviewed and adjusted. Preventative maintenance documentation and service records were provided that demonstrate compliance with ambulance act regulations and vehicle and equipment provincial standards. Certification in 2001 and recertification in 2004 and 2007 by the MOHLTC review team confirms the Ministry standards are being met, but in most cases the Paramedic Service far surpasses the Ministry standard in efficiencies.

The technical services unit includes the special operations unit, logistics and training and development. The single start deployment model in the high-density area required a logistical model that could supply and maintain the high volume of

staff and equipment while ensuring fleet and service readiness for rapid deployment.

The following chart shows the staffing support of the logistics area:



An area of great risk to any EMS system is the tracking and storage of narcotics. The Paramedic Service has process mapped the handling, storage, distribution, and process for the handling of narcotics and all medications. Daily audits of medication counts are performed and processes for reporting and acting upon discrepancies is well understood and documented by staff.

The Ottawa Paramedic Service is the only centralized/single start model of its size operating in Ontario, which makes it unique and difficult from a comparator perspective. Urgence Sante in Montreal has been operating a single start model for many years, and provided valuable insight to the Ottawa design team.

The single start design model breaks down each process within the assembly line of preparing and maintaining EMS resources and equipment. From a staff utilization perspective specialized staff are experts in their areas and the system benefits from a focussed skill set performed daily by that staff member. At the start of their shift paramedics need spend little time on the support processes and can focus on receiving the verbal briefing from management and are then rapidly deployed.

Staff is to be commended on the best practice logistical and support processes model implemented in Ottawa. As discussed earlier in this report, many efficiencies and cost avoidance strategies are supported through centralized storage and distribution. It is important to note that any future growth-related increases to paramedic staff must include a corresponding increase in support resources to ensure the provincial recertification, regulations and standards are maintained. Risk exposure increases to the city and Paramedic Service should an appropriate staffing balance not be maintained between front line and support services.

## **Recommendation 32**

**That the annual paramedic growth staffing enhancements include proportional adjustments in support services staffing.**

### **Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service presently undertakes to include proportional adjustments in support service staffing when front-line paramedics are hired and will continue to review such staffing enhancements in future. Improvements to growth staffing enhancements will be reviewed as part of the strategic branch review exercise in 2010.

## **4.3.11 Multi-year System Budgeting and Master Planning**

### **4.3.11.1 Budget and System Planning**

The City of Ottawa 2008-2010 multi-year budget contains significant new staffing and service increments for the Paramedic Service. It is critical from a management and accountability perspective to determine the existing capacity of the Paramedic Service to prepare a results based business case in support of the budget process and the associated multi-year resource-planning horizon.

If the capacity to build a multi-year business has been well developed, then proposed 2008-2010 resource requirements could be weighed against existing service level standards and financial affordability constraints. The resulting performance versus affordability decisions could therefore be made in an informed fashion. If this capacity does not exist, then there is no ability to meaningfully evaluate resourcing scenarios against performance impacts and affordability.

Interviews with management staff and finance staff regarding the Paramedic Service budget process and the associated resource planning capacity of the Service were undertaken as well as a review of the Paramedic Service resource planning model and associated information management tools. The following conclusions are noteworthy:

- The Paramedic Service has developed modeling formulae to determine the appropriate ratios of additional frontline paramedics and required logistical support staff. These operational ratios allow for technically appropriate long-term resource projections.
- The Paramedic Service resource planning tools allow for catch-up requirements from previous years (not staffed) to be integrated into current resource planning
- The Paramedic Service resource requirement forecasting model is driven by multiple variables such as:
  - Hour of the day and associated historic calls per hour data;

- Ongoing cumulative call demand for each hour of the day;
- Required units for adequate response capacity;
- Existing units for status quo response capacity; and,
- Net increase in units and paramedics to upgrade status quo capacity to required capacity.

Sufficient modeling capacity exists for the Paramedic Service to supply City senior management with a due diligence business case supporting the 2008-2010 budget. Therefore we conclude that the affordability versus system performance tradeoffs of the proposed 2008-2010 staffing increments have been properly considered by City management. Annual system performance reporting will determine whether the budget's affordability and performance tradeoffs have generated positive system performance results and halted recent year's erosion in response time reliability.

#### **4.3.11.2 Budget and Financial Reporting**

Interviews were conducted with finance staff on Paramedic Service performance in monitoring budget versus actual expenditure, meeting budget requirements and complying with purchasing and financial control policies. The audit team also independently reviewed the Paramedic Service actual versus budget financial data from fiscal years 2001-2007. The following conclusions are noteworthy:

- Overall strong professional relationship between Finance and the Paramedic Service, who are considered a low risk division by finance in terms of budget and corporate policy compliance;
- The Paramedic Service budget has been "calendarized" to improve relevance of budget versus actual reporting comparisons;
- The Paramedic Service has consistently met budget at year end without unbudgeted reductions in service levels;
- Expenditure variances at the line item level are not eliminated via restatement – instead importance is put on bottom-line expenditure management; and,
- No major incidents of financial or purchasing policy non-compliance have occurred according to finance staff. Minor compliance issues have always been resolved quickly and have not re-occurred.

Finance oversight is purely financial. Currently there is no attempt to track actual unit hours of deployed service to verify that expenditures equate with budget levels of service (i.e., deployed vehicle hours) associated with those expenditures.

### **Recommendation 33**

**That the Ottawa Paramedic Service provide an annual system planning resourcing business case (i.e., reflecting the modeled required resource capacity) as part of the annual City budget process.**

**Management Response**

Management agrees with this recommendation.

An external consultant will be engaged to develop a long-term master plan and budget for the Ottawa Paramedic Service. The scope of work will also include the development of an annual system planning resource business case. The Ottawa Paramedic Service has already initiated some of this work (as indicated previously - see Paramedic Trends report), which includes a three-year staffing plan to be incorporated into the branch's 2009, 2010 and 2011 budgets.

**Recommendation 34**

**That quarterly and annual financial reporting integrate expenditure data with actual deployed units of service for the same period.**

**Management Response**

Management agrees with this recommendation.

The Ottawa Paramedic Service will review the integration of expenditure data with actual deployed units of service in quarterly and annual financial reporting as part of the strategic branch review exercise in 2010.

**Management Overall Response**

Overall, management concurs with the audit findings and agrees with the recommendations put forward by the Auditor with only two disagreements.

Ottawa Paramedic Service supports the acquisition of AMPDS as a tool in the Communications Centre and a more liberal dispatch communications framework would provide the Service the capacity to improve outcomes and effectiveness.

There is recognition that the Paramedic Service is managed efficiently and effectively and that it is operating in a context of a heavily regulated and complex health care system.

The Paramedic Service agrees that as a mission critical service we require sustained, consistent and predictable funding on a long-term basis to safeguard the public.

Responses to each of the 34 audit recommendations are set out above.

**5 CONCLUSION**

The land ambulance service delivered by the Paramedic Service Branch is a "mission critical" protective service provided by the City of Ottawa. The Paramedic Service Branch annually consumes an operating budget that is now approaching \$60 million - an increase of 93% since amalgamation.

The audit has yielded significant findings and has identified a number of service planning and delivery improvement opportunities:

- After initial improvement earlier this decade, 90th percentile Code 4 response times in Ottawa are now at risk of eroding to a level below the legislated service standard in the Ambulance Act. This systemic performance problem is occurring across the Province of Ontario.
- Patient offload delays at Ottawa hospitals are a major driver of response time erosion in land ambulance services. Offload delays caused by complex Provincial health system patient flow problems are worsening. Meaningful resolution of Province-wide health system patient flow problems is unlikely in the short to medium term.
- Ottawa's triage system used to dispatch emergency calls is flawed, ineffective and contributes to system inefficiency and eroding response times. Replacement of the current triage tool with the North American standard AMPDS medically derived triage tool should be a top priority. The Province needs to be compelled to approve this critical triage improvement, recognizing the AMPDS precedents already in place in Toronto and Niagara. Provincial unwillingness to make this improvement should prompt a fundamental re-examination of the City's role in ambulance dispatch.
- The City budget process has failed to supply regular and timely ambulance unit growth increments to keep pace with ongoing call volume increases occurring between 2001 and 2008. Growth increments during this period were irregular and were lagged over multiple years, thereby allowing call volume to overtake available resources. The result has been response time erosion.
- As a result of increasing hospital wait times, substandard dispatch triaging, and a failure to supply ambulance unit growth increments to match increasing call volumes, the Ottawa Paramedic Service now faces frequent erosion beneath safe levels of ambulance unit availability. Erosion in available units below critical levels occurs daily, with frequent instances of zero unit availability. A significant public safety, liability and service level outcome appears inevitable unless aggressive City remediation is forthcoming.
- Despite these significant "systemic" performance challenges beyond its immediate control, the Paramedic Service operates in an efficient and effective manner that meets or surpasses many industry standards around quality and best practices. Single start, use of specialty teams, unit on-the-road scheduling tools, and logistics processes are all areas of clear operational excellence displayed by the Paramedic Service. Regrettably, these efficiencies have been absorbed by the systemic system performance problems noted above.
- The Paramedic Service utilizes performance measurement and benchmarking data on an ongoing basis to generate service delivery improvement and enhance operational performance. Recommendations have been made to refine and

improve an already noteworthy commitment to measurement and pro-active system planning.

- The planned 2008-2010 multi-year staffing increments represent a fundamental logistics challenge for the Paramedic Service in terms of recruitment and preserving an appropriate ratio of advance care paramedics. The need to ensure advanced care paramedic capture for appropriate calls is an ongoing challenge that will require attention.
- Preparation of a twenty-year master plan is a critical priority for ensuring ongoing match of service supply to demand; thereby achieving response time and clinical outcomes.

The audit has concluded that overall, the Paramedic Service outcomes have significantly eroded across 2001-2007. This erosion has largely been driven by systemic performance constraints such as offload delays and triage tool shortcomings – problems generated by Provincial decision-making and policies. Paramedic Service delivery efficiencies and operational innovations cushioned response times from these problems for a number of years after amalgamation. However, land ambulance system performance erosion now jeopardizes public safety – as evidenced by the frequency of critical unit level shortages.

The findings of the audit confirm that increased resources are required for the Paramedic Service to respond effectively to system growth. As part of this, improvements to monitoring time-on-task and hospital transfers is required to ensure efficiencies in these areas are identified and pursued.

Most importantly, there is a need to resolve the issues associated with the current triage tool used to assess calls for service. Without a change to the more effective AMPDS tool, any increase in resources will continue to be absorbed by an unrealistically high level of Code 3 and 4 calls. There are many benefits to the City managing the dispatch centre. In order to realize the full benefits of this, however, it is imperative that the City take steps to change the dispatch protocol to the one used not only by the City of Toronto but also across North America. An aggressive City response, consistent with the recommendations in this audit, is required to safeguard the public and avoid significant legal, financial and reputational risk.

In principle, the new MOHLTC performance model is a positive development because it introduces patient centric performance reporting and target setting for land ambulance services. However, in our opinion, the new patient centric performance measurement framework will likely highlight existing performance problems without focussing attention on a key driver of these problems; an ineffective Provincially mandated DPCI triage tool.

Finally, the two case studies conducted during the audit indicate that a significant return on investment could be achieved from implementing AMPDS-based

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dispatch in Ottawa. Both cases have documented significant response time and public safety improvements associated with this triage system.

## **6 ACKNOWLEDGEMENT**

We wish to express our appreciation for the cooperation and assistance afforded the audit team by management and staff.