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**Audit Report**

**PUBLIC SAFETY SERVICE DELIVERY  
EMERGENCY MEDICAL SERVICES**

**August 2005**

**Office of the City Auditor  
Austin, Texas**

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# City of Austin

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**To:** Mayor and Council Members

**From:** Stephen L. Morgan, City Auditor

**Date:** August 9, 2005

**Subject:** EMS Public Safety Service Delivery Audit Report

I am pleased to present our report on the Austin/Travis County Emergency Medical Services Department (EMS) delivery of public safety service. This audit arises from our FY2004-05 Service Plan.

We found that EMS should move more rapidly toward offering the option of a shorter shift to paramedics, but the department continues to hire based on a 24-hour shift. EMS use of 24-hour on /48-hour off shift schedules for paramedics has become increasingly difficult to maintain in the busier stations serving the City's urban corridor due to the demands of the work and the volume of calls generated.

EMS can help reduce both paramedic stress and scheduled overtime through more vigorous analysis of other shift options. Reliance on 24-hour shifts, with its average of 16 hours of scheduled overtime per week, has helped push the department's FY 2005 budgeted overtime to 25 percent of the City's total budgeted overtime. Using other shift options could decrease the department's reliance on overtime hours to cover needs while increasing safety, although this approach would have other cost ramifications. As a result, we are encouraging the department to incorporate detailed cost analyses and plan for changes using accepted project management techniques in its examination of options. EMS has pointed to a national shortage for paramedics, and has indicated that hiring sufficient staff to shorten schedules will be a challenge. However, we believe adding shift options could potentially aid recruiting. During the course of our audit, a regulatory issue surfaced that was outside of our scope and was referred to management.

We were unable to say that EMS performance was above average on the most commonly available outcome measure we could find. However, we also noted that outcome measures were not very well developed for the EMS industry as a whole. Thus the measure used, while giving a glimpse into medical outcomes, does not represent outcomes related to the entire spectrum of EMS activities.

We have made three recommendations to help the department move along in its analysis and planning for converting shifts and improving paramedic well-being. We appreciate the cooperation that we received throughout the conduct of this audit from EMS management and staff.

Stephen L. Morgan, CIA, CGAP, CFE, CGFM  
City Auditor

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## **EMS PUBLIC SAFETY SERVICE DELIVERY COUNCIL SUMMARY**

This report presents the results of our audit of the Austin/Travis County Emergency Medical Services Department (EMS), approved by the City Council Audit and Finance Committee as part of the City Auditor's 2004 service plan. Our objectives were twofold: to compare EMS service delivery with other cities for selected performance indicators; and, to examine how the department has analyzed, planned, and implemented changes to improve paramedic shift scheduling and service delivery. We referred a potential regulatory matter that was out of our scope to City management.

EMS' reliance upon long shifts and large amounts of overtime to recruit and retain paramedics is complicating efforts to move toward shorter alternative shift options and limiting its ability to control overtime. Paramedics are scheduled to work 24-hour shifts for a total of 2,912 hours annually, which includes 832 hours of overtime (38 percent of their scheduled pay). In addition, paramedics have the opportunity to earn more pay through unscheduled overtime. As a result, the individual levels of overtime pay are routinely well above the percentage and amount that would typically cause concern in an organization. In our December 2004 audit report on citywide overtime, high levels of overtime use were connected with increased risk of safety problems and potentials for abuse, along with the problem of creating employee reliance upon the earnings. In addition, long work hours have the potential to create stress and health issues, cause absences and turnover, and add to unscheduled overtime. EMS' use of 24-hour shifts has helped push the department's FY 2005 budgeted overtime to \$5.3 million or 25 percent of the City's total budgeted overtime and exceeds overtime levels in all other departments, including Police, Fire, and the electric and water utilities.

For the only commonly available patient outcome measure, the department has reported a percentage that is "in the ballpark" with a national average for EMS providers. We did note that performance measures are not well developed for the industry as a whole, and may not provide an adequate basis for gauging service delivery. However, EMS' plan to begin funding shorter shifts in FY2005 lags behind practice in other cities where emergency medical service provision is not part of a fire department. The City's service model of providing emergency medical care independent of the fire department but using traditional fire department shift schedules is not a common one. While the Austin Fire Department has certain advantages as a civil service entity in terms of paying overtime, EMS is not covered under such an agreement. As the result of a lawsuit settlement in 2004, Austin must pay for each hour of overtime worked. The department is challenged by the difficulties of retaining paramedics and ensuring work safety in an employment climate where certified paramedics are in nationwide short supply and experienced paramedics are migrating to other healthcare professions. Other shift scenarios that can be explored may reduce scheduled overtime costs, but they entail other transition costs for recruiting and hiring more paramedics.

EMS received \$340,000 in the Fiscal Year 2005 Approved Budget to begin exploring shorter shifts, but did not carry out a comprehensive cost analysis to demonstrate that intended alternative shift conversions would maintain service, offset other costs and achieve relief for paramedics. Also, they did not use accepted project management techniques that outlined scheduling, task assignments, incremental milestones and responsible parties to plan for shift conversions. Finally, although the department has the benefit of advanced technologies and is adding more capabilities, it lacks staff dedicated to analyzing data and communicating results. In recognition of these challenges, EMS has begun a consultant acquisition process but had not completed it as of the close our audit work.

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## ACTION SUMMARY EMS PUBLIC SAFETY SERVICE DELIVERY

Rec. #	Recommendation Text	Management Concurrence	Proposed Implementation Date
01	Prior to instituting any alternative shift scheduling and to broaden management's options for effecting a safer and more efficient working environment, the Director of EMS should develop formal cost analyses showing the budgetary effects related to reducing the length of paramedic shifts. In addition to identifying transition costs for hiring new paramedics to achieve this, the analysis should factor in anticipated overtime savings as well as likely impact of staff availability to cover absences due to leave time and injuries.	Partially Concur	Late 2005
02	After completion of formal cost analysis described in Recommendation 01, the Director of EMS should revisit the anticipated planning horizon for converting shifts and lay out a project plan for timely conversion of shifts including tasks, deadlines, milestones, and responsible parties.	Concur	Late 2005
03	With the implementation of new software systems and capabilities, the Director of EMS should evaluate the department's capability to analyze new forms of data and develop a formal strategy to increase the department's data analysis capacity.	Concur	October 2005

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## BACKGROUND

Created in 1975 for emergency pre-hospital medical rescue, the Austin-Travis County Emergency Medical Services Department (hereafter referred to as EMS) is jointly funded by the City and Travis County with the City functioning as the managing partner. EMS employs 318 uniformed staff and 57 non-uniformed staff, with a total approved budget in the General Fund of \$30.1 million for Fiscal Year (FY) 2004-2005. Travis County is scheduled to reimburse about \$8.26 million to the City, leaving a net cost of just under \$21.9 million.

**EMS uses a variety of techniques to help speed transport of patients.** The department uses a dynamic dispatch approach in that paramedic units may be moving throughout the community between calls. The capabilities of the new computer-aided dispatch (CAD) software and the automated vehicle locator system use modern satellite technology to ensure dispatch according to whichever unit is closest to an emergency. The department has occasionally used a peak demand unit for specific hours of heaviest need, but a proposal for instituting such units regularly was pulled from the FY 05 budget forecast, pending analysis with the new CAD and other demand software. As needed, EMS assigns units waiting for deployment to specific locations other than stations in order to assure broader coverage when other units are tied up.

**In Austin, firefighters provide basic medical care as first responder, and EMS paramedics provide advanced care and transport.** The most basic service for pre-hospital emergency medical care is called Basic Life Support (BLS) and is provided by firefighters as emergency medical technicians (EMT–Basic). The ultimate type of support for emergency care is called Advanced Life Support (ALS) and is always provided by a trained EMT–Paramedic. The designations ALS and BLS pertain not just to training, but also types of protocols, equipment, and drugs available for administration to patients. All EMS ambulances in Austin and Travis County are staffed with two ALS paramedics. Stationed at 28 locations throughout the county, and described as urban, suburban, or rural, Austin’s EMS paramedics work on 24-hour shifts and then have 48 hours off, the same as firefighters.

**EMS has new payroll and compensation practices.** Settlement of a lawsuit in January 2004 requires EMS to now pay time and a half for each hour of paramedic time worked over 40 hours. The lawsuit determined that Austin’s EMS department is excluded from federal employment law exemptions for overtime that are afforded to fire and police departments, because the City’s EMS department does not deliver service as part of a municipal fire department. Previously, EMS had the same pay flexibility that allows firefighters to work extra hours as civil servants without necessarily incurring overtime. Also, EMS instituted pay zones based on years of experience to allow the department to better recruit and retain paramedics with experience.

**City Council approved additional funding for converting two stations to shorter 12-hour shifts.** The department secured funding in the FY 2005 budget of an additional \$340,716 to fund the addition of four paramedics and two support staff/schedulers in order to convert two stations away from a 24 hours on/48 hours off shift.

# **OBJECTIVES, SCOPE & METHODOLOGY**

## **Objectives**

- How does EMS service delivery in the City of Austin compare to other cities with respect to selected performance indicators?
- How have changes to improve paramedic shift scheduling and service delivery been thought out, planned, and implemented?

## **Scope**

We focused on planning and implementation of Council-approved changes in selected paramedic shift schedules and service delivery changes in FY 2004 and FY 2005. During the course of audit fieldwork, a regulatory matter that was outside of our scope was referred to City management. Relevant departments in Texas and national cities surveyed were asked to supply benchmark data for FY 2003, in order to insure complete year's end data for cities with differing fiscal years.

## **Methodology**

We conducted interviews with key paramedic staff, researched professional practice, and reviewed and analyzed internal documents. One auditor participated in a ride out (ride along) with a unit commander during his shift. To ascertain EMS practice in other cities, auditors conducted telephone surveys of 19 cities including 6 in Texas.

Using information from the International City/County Management Association Center for Performance Measurement, graduate students of the McCombs School of Business at the University of Texas identified cities for a telephone survey and conducted preliminary inquiries about EMS service during the audit planning phase.

In conducting this audit, auditors relied on audited and unaudited financial data as reported by the City's financial system of record. Reliability of other information could not be determined, but was not deemed a substantial risk to the conduct of the audit. Information obtained through telephone surveys was self-reported; every effort was made to obtain information from reliable sources. Inconsistent or unavailable financial data provided by survey respondents prevented our efforts to compare the impact of financial resources and budget expenditures on outcome measures.

This audit was conducted in accordance with generally accepted government auditing standards with the exception of requirements in the standards to plan for consideration of risks due to fraud.

## AUDIT FINDINGS

The Austin-Travis County Emergency Medical Services Department (EMS) service achieved acceptable performance on a key measure of patient care. However, EMS' planned conversion to shorter paramedic shifts at two stations in FY 2005 lags behind practice in other cities, where shorter shifts are routine. Despite these plans, EMS continues to hire paramedics only for the existing 24-hour shifts. EMS' reliance upon longer shifts risks possible fatigue and forces high levels of scheduled overtime expenditures. Prior to securing budget funding in FY 2005 to begin experimenting with the shorter shifts at two stations, EMS did not perform a cost/benefit analysis, yet asserted that converting more than two stations in a single year would be cost-prohibitive.

**Although EMS has provided acceptable quality of care for a common outcome measure in a national survey, the service model used is not typical and has not yielded dramatic results.**

Our research indicated there are no uniform performance standards to use in assessing emergency medical service delivery. The primary outcome measure from surveys we used showed that Austin's EMS measure of cardiac arrest outcomes was similar to other cities' performance. In terms of shift scheduling, however, the City's progress towards converting stations to shorter paramedic shifts in the urban corridor is slow when compared to other cities where emergency medical service providers are not affiliated with fire departments.

**There is no uniform standard to use in assessing emergency medical service performance.** The profession is governed by medical standards of service delivery developed nationally and usually managed through state health departments. However, we found a lack of consistency nationally in performance measurement indicators, data collection, and common definitions, all making benchmarking comparisons difficult. We did note that a national initiative is underway to develop and standardize this performance measurement, and EMS is aware of the effort.

**EMS is delivering satisfactory care to Austin's citizens at cardiac risk.** A common outcome measure for EMS service is "percentage of cardiac arrest patients delivered to a medical station with a pulse." For this measure, Austin's EMS reported 23.7 percent and 24.7 percent in FY 03 and 04, respectively, to the International City/County Management Association's Center for Performance Measurement. Annual surveys of U.S. cities by the *Journal of Emergency Medical Services (JEMS)* reported the national average for this cardiac survival measure at 20.3 percent for 2003 and 19.0 percent for 2004; however rates for individual cities are not reported. Furthermore, since both surveys computed averages based on small samples, we could not note statistical significance for Austin's percentage.

This measure is regarded as the closest "hallmark" for gauging service outcomes, since there is no national EMS standard for measuring successful patient outcomes. However, this measure is one that can be captured and reported variously and can be impacted by such response variables as bystander CPR performed and Automated External Defibrillators (AED) used.

**Comparisons with other cities are also difficult to perform because EMS uses a fairly uncommon structure called municipal third service (3<sup>rd</sup> service).** This structure means

emergency medical service in Austin is a city function not affiliated with either a fire department (which is more typical) or a law enforcement agency. Most cities have firefighters with basic EMT training, and many also have some firefighters trained as paramedics to provide ALS.

Outside the realm of municipalities, other models of emergency medical service arrangements include: other types of 3<sup>rd</sup> service providers, such as public utility models or ambulance districts; private, for-profit carriers; volunteer services, or hybrids of these. Our research found few other major cities similar to Austin's model, which further limited the comparisons we made. Information on service delivery for Austin and cities surveyed may be found in Appendix B.

**EMS' plan to begin implementing shorter shifts at two stations in FY 2004-2005 lags behind practice in other cities where EMS is not part of a fire department.** Other cities are already delivering emergency medical service using varying shift durations for EMS response and transport. The *JEMS* February 2004 survey reported that 54 percent of EMS providers that transport patients use shift durations between 16 and 8 hours. The remaining agencies that transport patients are almost all fire departments, using their traditional 24 hours on/48 hours off shift. The person responsible for currently administering the survey confirmed this trend, noting that the vast majority of non-fire transport providers are using shorter shifts.

**EMS' reliance upon 24-hour paramedic shifts for service in the urban corridor has the potential to create unsafe conditions for citizens and paramedics and these lengthy shifts result in scheduled overtime of over \$3.3 million per year.**

EMS' use of 24-hour shifts in high-volume urban stations increases the risk that paramedics may be less alert when providing emergency medical care and operating emergency vehicles. In addition, using 24-hour shifts at all stations automatically means that EMS is forced to incur overtime costs to simply work the scheduled hours and may also be causing EMS to incur additional unscheduled overtime. EMS had the highest requested expenditures for overtime in the City's Approved FY 2005 Budget. Although auditor computations demonstrate that funds could be freed to help convert paramedics to shorter shift lengths, the department's current payroll practice when converting current paramedics to different shift lengths eliminates much of the potential for overtime cost avoidance.

**24-hour paramedic shifts at the urban corridor stations are inherently riskier than shorter shifts in terms of service delivery.** Because some stations have heavier service volumes, paramedics serving in busier urban stations are subjected to stressful situations without much sleep or downtime. Paramedics frequently are ministering, lifting, transporting, and closing out each dispatch with little downtime before the next call, which can occur before a unit has returned to a station. This intensity contributes to concerns about paramedic stress and safety issues, which may affect patient care, transport safety, and other citizens. Such issues traditionally exacerbate illness, injuries, and accidents and are viewed as causes for department turnover, as well as potential for lawsuits.

Management and staff indicated during our audit that EMS paramedics usually "burn out" within five years on the job. We were unable to confirm a direct correlation between this trend and the use of 24-hour shifts, but we did note that EMS has been unable to retain, or conversely attract and hire, the approved number of paramedics just by offering 24-hour shifts. Department

management has indicated that EMS typically averages 25 paramedic vacancies throughout the year.

In FY 04, the rate of turnover in the department was 11.92 percent, compared to the City’s average of 9.14 percent; FY 03’s rate for EMS was 10.03 percent with the City average of 9.44 percent. Managers attribute turnover and recruitment challenges to shortages of certified paramedics in general, burn-out, family pressures, opportunities in the private sector, and the ability to go into nursing with only a year’s more training. At the close of audit fieldwork, there were 18 vacancies, not counting 13 paramedics in the Cadet Academy started in February.

**EMS’ use of 24-hour shifts has helped push department overtime to 25 percent of the City’s total budgeted overtime.** Overtime is now paid for all hours worked over 40 each week. As shown in Exhibit 1 below, the 24/48-hour scheduling, with shift changes at 7am, amounts to a work year of 2,912 hours (without unscheduled overtime), while employees who work 40 hours per week typically work 2,080 hours in a year.

**EXHIBIT 1  
24-Hour Shifts Force Scheduled Overtime Hours**

	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Hours Worked	Overtime Hrs
Week 1	17	7		17	7		17	65	25
Week 2	7		17	7		17	7	55	15
Week 3		17	7		17	7		48	8
Wkly avg.								56	16
Annualized Hours (52 weeks)								2912	832*

SOURCE: OCA analysis

Note\* Amount could be reduced by leave time taken during the year.

Exhibit 2 shows that EMS’ approved overtime exceeds all other departments. At the average overtime pay rate of \$23.94 (based on the average paramedic hourly rate of \$15.96), scheduled overtime amounts to just over \$3.3 million for 28 stations. The remaining \$2.0 million in excess of scheduled overtime is intended for unscheduled paramedic overtime, which includes using additional personnel to cover open shifts due to leave (personal or sick), training, vacancies, or other absences, and other departmental overtime. Additionally, the FY 05 amount is greater than in previous years because changes were made by a team of staffs from EMS, the Controller’s Office, the Budget Office, and the Human Resources Department’s Information Systems Manager over Banner to better align accounting for the straight overtime portion of paramedic pay between the Banner payroll system and the financial accounting system. Furthermore, instituting a zone compensation structure for the first time has contributed to increased overtime costs.

## EXHIBIT 2

### EMS Requested the Highest Overtime Budget in the City for FY2005

Agency Name	FY 2003 Actual Expenditures	FY 2004 Actual Expenditures	FY 2005 Approved Budget	Percent of Total (rounded)
EMS	3,456,905	3,681,883	<b>5,317,135</b>	<b>25.1</b>
Police Department	5,801,905	7,458,901	5,058,962	23.9
Austin Energy	3,153,013	2,828,000	3,356,075	15.8
Water & Wastewater	2,159,821	1,797,532	2,007,154	9.5
Fire Department	1,883,488	1,845,332	1,837,924	8.7
All other depts..	3,636,658	3,117,986	3,606,162	17.0
Citywide Total	\$20,091,790	\$20,729,634	\$21,183,412	100.0

SOURCE: Reported in Controller's Office intranet - Data through FY 03 has been audited by the City's external auditors, but not verified by OCA.

#### **The department's use of 24-hour shifts may also be driving up unscheduled overtime.**

Unscheduled overtime is necessary when paramedics are called in to work due to vacancies, vacations, sick or injured paramedics, or special events outside of regular staffing. Employees working overtime beyond their scheduled 56-hours may be driving up excessive unscheduled overtime that eventually places those employees at risk of experiencing the same health and safety issues causing absences in the first place.

An audit of overtime reported earlier this fiscal year by this office indicated that individual overtime poses the greatest risk to high expenditures and inequitable distribution of overtime earnings. Under the current 56-hour schedule, EMS paramedics earn more than one-third of their pay through overtime (see Exhibit 3). When combined with numerous opportunities to earn unscheduled overtime, a significant portion of paramedic pay becomes overtime-related. While the EMS department has controls in place to ensure that unscheduled overtime is distributed systematically, and that paramedics are not exceeding permitted hours to work, it can not control the number and types of calls while a paramedic is on duty. This raises concerns for safety. Furthermore, from a business management perspective relying upon a schedule that requires high budgeted overtime year after year is typically not a good practice.

**Other shift scenarios indicate reduced scheduled overtime expenses.** There are countless shift scenarios that can be developed, and there are certainly other associated costs of shift conversion, such as training and recruiting not reflected in sample scenarios. Our audit work considered two very simple scenarios for shorter shifts of twelve hours and eight hours that would reduce scheduled overtime paid to paramedics. Details of these scenarios are shown in Exhibit 3. Currently, maintaining 24/7 coverage in each EMS station, using the City's average paramedic hourly rate of \$15.96, requires budgeting \$119,508 in overtime per station per year (\$19,918.08 x 6 paramedics). Extended to all 28 stations, this amounts to \$3.3 million in scheduled overtime.

We selected one scenario using 12-hour shifts and eight paramedics on a different shift rotation that yields eight hours of overtime in a two-week rotation, but less regular pay in some weeks. At the same average hourly rate this particular scenario would reduce the scheduled overtime cost (\$4,979.52 x 8 paramedics) over current practice by approximately 67 percent per year at each station. In the second and simplest scenario, we calculated costs using eight paramedics per

station working 8-hour shifts. Scheduled overtime costs could be scaled back by 83 percent to just over \$39,836 per station per year (\$2,489.76 x 8 paramedics).

Assuming that each station requires 24 hour coverage per day, 7 days per week, for all 52 weeks of the year, there are 17,472 total hours of coverage per station. In Exhibit 3, using the average pay rate per paramedic (\$15.96/hour) and the average overtime pay rate (\$23.94), we compare a 12- and an 8-hour shift scenario to the current 24-hr shifts and show that overtime wages can be reduced. This reduces the reliance on overtime pay to increase base wages earned. It may also provide additional funds for other personnel options such as incentives to hire and keep experienced paramedics.

**EXHIBIT 3**  
**Comparison of Personnel Costs for Sample Scenarios**  
**Calculated On the Average \$15.96 Hourly Rate**

Annual Personnel Costs	(Current)		Example		Example	
	24-Hr Shifts		12-Hour Shifts		8-Hour Shifts	
	6 Paramedics/station		8 Paramedics/station		8 Paramedics/station	
Regular Pay per Paramedic	(2,080 hrs)	\$33,196.80	(1,976 hrs)	\$31,536.96	(2,080 hrs)	\$33,196.80
1.5 OT Pay per Paramedic	(832 hrs)	<u>19,918.08</u>	(208 hrs)	<u>4,979.52</u>	(104 hrs)	<u>2,489.76</u>
Total Pay per Paramedic	(2,912 hrs)	\$53,114.88	(2,184 hrs)	\$36,516.48	(2,184 hrs)	\$35,686.56
Total Pay / Station	(17,472 hrs)	\$318,689.28	(17,472 hrs)	\$292,131.84	(17,472 hrs)	\$285,492.48
Total Benefits/ Sta.*		<u>81,462.49</u>		<u>97,396.13</u>		<u>97,950.52</u>
Total Paramedic Costs/Sta.		\$400,151.77		\$389,527.97		\$383,443.00
Percent of Pay as Scheduled OT		38%		14%		7%
Annual Difference for One Station Conversion				\$10,623.80		\$16,708.77
Annual Systemwide Difference for 28 Stations				\$297,466.40		\$467,845.56

SOURCE: OCA Analysis.

NOTE: Benefits includes the following: FICA (6.2%), Medicare (0.145%), retirement (8.0% of base pay), and insurance (\$6,858.05 per paramedic).

**The department’s payroll practice eliminates much of the cost avoidance that could be derived from reducing scheduled overtime by scheduling for shorter shifts.** EMS department practice adjusts hourly rates for paramedics who temporarily change from a 24-hour shift work week to ensure that annual earnings totals remain the same. This strategy implies that the department regards its hourly paramedic employees in the same manner as salaried employees who expect uniform consistent earnings.

**EMS continues to hire for 24-hour shifts and treats the hourly pay much like a salary.**

Although the department is advancing its intentions to pilot scheduling and shift changes, the EMS department continues to hire cadets for the traditional 24/48 shift schedule and envisions a mix of shift schedules, rotating paramedics in and out of varying shifts. The department posts all its open positions for 24-hour shifts, and will continue to do so until any long-term plans for shorter schedules are finalized.

**EMS envisions a mix of shift schedules in the future, based upon paramedic ability to rest.** Department management foresees an eventual scenario, where busier stations or units, would be

staffed with shorter shift schedules, and paramedics could rotate between longer and shorter shift lengths. Paramedics would thus obtain some relief from fatigue and stress, although they would still be incurring overtime.

Less-busy stations where paramedics can get more rest and downtime would retain the 24/48-hour shift schedule with its built in overtime of 832 hours because such a schedule only requires six paramedics to staff an ambulance 24 hours all year. Currently to maintain the necessary medical and technical skills for paramedics in the less busy stations and provide relief to over-worked paramedics, paramedics in outlying areas are rotated into the busier stations, and the department expects to continue this practice for the alternative shift stations as well. A Request for Proposals (RFP) has been submitted to the purchasing office in order to hire a consultant to assist with the review of workload data and design a long-term implementation plan which includes trigger points for expansion of shift change deployment.

**Despite practice in other cities and its own plans to pilot scheduling and shift changes, the EMS department continues to hire cadets for the traditional 24/48 shift schedule.** Although many other communities hire paramedics using 48-or 40-hour shifts, the City's paramedic position is always posted as a 56-hour position, and the department director intends to continue to do so until shorter schedule positions are approved by Council.

Management believes it must advertise and hire on the basis of the 56-hour schedule to recruit successfully, although some staff reported that they thought the shift hours discouraged some potential candidates. Furthermore, many staff reported that overtime hours frequently exceed the currently scheduled 832, as the department fills shifts left open due to various types of leaves, vacancies, shift transitions, and special events. Several employees speculated that some new hires, and even seasoned paramedics, might consider volunteering for shorter shifts, even with the prospect of lower annual earnings. Moreover, some department managers were confident that the pay offered to cadets was competitive.

**EMS may be unnecessarily creating an expectation of continued overtime earnings for paramedics.** By posting all paramedic job openings for 56 hours per week, the department has formed an expectation of annual earnings much like a salary, and management maintains that it now cannot pay an amount lower than the quoted 56-hour rate. Letters to all paramedics accepted as cadets include an estimated annualized earning rate based on 56 hours of work per week times 52 weeks or 2,912 straight hours multiplied by the hourly rate.

Although departmental human resources personnel said that they can only quote the pay for 56 hours of straight time and not the half-time overtime premium in their offer, an attachment to the offer letter for a cadet earning \$13.61 (Exhibit 4) does show hours worked and potential gross scheduled earnings including overtime for each pay period. The document fails to note that the department is at liberty to adjust shift lengths, possibly resulting in *less* scheduled overtime which could yield lower annual earnings. A footnote does advise that annual earnings will depend on benefit/leave time used and productive hours worked and that additional overtime is not guaranteed. The attachment shown in Exhibit 4 reflects the requirement from a lawsuit in 2003 that overtime be paid for each week as it is earned and thus shows the 24/48 shifts being paid differently during each of three pay periods.

**EXHIBIT 4**  
**Cadet Hiring Offer Attachment Facsimile**  
**Potential Estimated Annualized Earnings for First Year Paramedics**

(Hours worked vary from pay period to pay period, as does earnings.)

*The standard work week for field Paramedics involves working a 24-hour shift followed by 48-hours off. A standard shift runs from 7:00 a.m. to 7:00 a.m. It takes a total of six weeks (or three pay periods) before the number of hours worked repeats; therefore, the example below covers this full cycle. All calculations are based on the assumption that an employee has worked all scheduled hours, within a standard work week. Premium pay or overtime is paid for all hours worked over 40 hours in a 7 day period (Sunday to Saturday) at the rate of 1.5 of the employee's hourly rate.*

Potential Estimated Paramedic Annualized Earnings								Hourly Rate: \$13.61				
Pay Period 1	SUN	MON	TUES	WED	THUR	FRI	SAT	Total Hrs	Hr Pd @ 1.0	Hr Pd @ 1.5	Wkly Earnings	Gross Earning
Work Week 1	17	7		17	7		17	65	40	25	\$ 1,054.78	
Work Week 2	7		17	7		17	7	55	40	15	\$ 850.63	\$ 1,905.40
<b>Pay Period 2</b>												
Work Week 3		17	7		17	7		48	40	8	\$ 707.72	
Work Week 4	17	7		17	7		17	65	40	25	\$ 1,054.78	\$ 1,762.50
<b>Pay Period 3</b>												
Work Week 5	7		17	7		17	7	55	40	15	\$ 850.63	
Work Week 6		17	7		17	7		48	40	8	\$ 707.72	\$ 1,558.35
<b>Potential Estimated Paramedic Earnings Annualized*</b>											<b>\$45,294.08</b>	

\* Your overall annual earnings will be dependent on the amount of benefit time used and productive hours worked during the year; however, additional overtime is not guaranteed.

**\*\* EXAMPLE CALCULATION ONLY \*\***

SOURCE: Facsimile provided by EMS Human Resources.

The department does not state that shift lengths could change, resulting in lower earnings, or include an acknowledgement for sign-off by newly hired cadets. Such sign-off would be meaningless, however, if paramedics continued to be compensated based on their 56-hour rate expectations. Nevertheless, department personnel stated their intention to add a document to the hiring packet that would include sign-off acknowledging that shift lengths and work hours were subject to change.

**EMS management has not performed a comprehensive analysis of the department's shift scheduling and service delivery in preparation for proposed changes.**

Department managers were unable to show that any cost analysis had been performed to show that FY 2005-funded alternative shift conversions would maintain service levels, while maximizing efficient service and achieving the desired paramedic well-being. EMS staff lacked planning documentation showing schedules, assignments or other project management documentation for the new shift conversions, and the distinction whether the conversion is only a pilot study or implementation of an alternative shift is unclear. Finally, although the department has enhanced analytical capabilities from new software and technology, it has no full-time data analyst to interpret the data and help develop strategies, as in other public safety agencies.

**Managers did not perform a cost analysis to demonstrate that FY 2005-funded alternative shift conversions would maintain service, offset other costs and achieve relief for paramedics.** Sound planning and analysis methodologies to support making changes in service would examine shift lengths, number of staff necessary for covering absences, and finally, the mechanics of using extra staff to augment heavy call areas with floating service to fill in. The department could not demonstrate through cost/benefit analysis or other means that they had considered conversion options that would maximize efficient service, while maintaining service levels. Documents provided by management lack dollar cost computations and fail to show budget impact against the current shift schedules, preventing comparative analysis. Furthermore,

with little cost analysis setting the stage for these conversions, the department proceeded on the assumption that only one shift scheduling scenario, based on current practice would provide equal service, while mitigating paramedic fatigue and stress resulting in accidents, injury, and turnover.

The department secured funding in the FY 2005 budget to convert two stations to a 12-hour alternative shift mode with the addition of four paramedics and two supporting schedulers with only rudimentary analysis. The computations provided to support the budget request focused solely on a rough estimate of some associated costs without reviewing any reduced expenditures or benefits that might accrue.

**In addition to a lack of cost analysis, staff could not produce planning documentation showing schedules, assignments or other project management documentation for the new shift conversions.** EMS management says they are using an informal approach to implement the FY 2005 alternative shift changes, rather than laying out the changes and steps using project, management techniques. Sound planning, analysis, and management oversight typically supports implementation of service changes. In spite of securing funding for converting two stations using four paramedics on an alternative 12-hour shift schedule in the FY 2005 budget, the department could not demonstrate that it had laid out a plan showing a strategy for timely conversion to the alternative shift, including tasks outlined, deadlines, incremental milestones, and responsible parties.

EMS management indicated that putting new shift schedules in place requires great effort and momentum to create new service models, and that the early stages of analysis and planning are ongoing, but have not produced any formal results. In December, they were awaiting results from a survey of field personnel interest in alternative shifts and the recommendations for initial shifts to study and had carried out extensive research on available alternative schedules. The department would then be ready to narrow the focus of implementation based on wage and hour limitations, employee preferences, and operational considerations.

**Efforts to put the shorter shifts in place have been hampered by technology and staffing.**

The department is optimistic about the implementation of the new computer-aided dispatch (CAD) software system and the capabilities of the new records management software, but has had to await the completion of basic data reports. The data are now reported to be complete and stable, although some CAD data reports are still being created. By the end of June, communications staff will have a new visual predictive and real-time software tool called Deccan that uses the CAD data to help make dispatch decisions more objectively, based on advanced knowledge provided by the data. Historical data captured by this system will enable more accurate planning and forecasting.

Although management acknowledges a cultural shift in using data, the department lacks staff for analyzing the data from new systems to improve performance. While management personnel are pleased with these new tools, these improvements require skill in data analysis to support, analyze, and communicate results. The department's principal planner facilitates business planning, the relationships with Travis County, and financial forecasting processes and serves primarily in an administrative capacity. A senior division commander in charge of planning is also responsible for the department's homeland security involvement.

## **Recommendations:**

01. Prior to instituting any alternative shift scheduling and to broaden management's options for effecting a safer and more efficient working environment, the Director of EMS should develop formal cost analyses showing the budgetary effects related to reducing the length of paramedic shifts. In addition to identifying transition costs for hiring new paramedics to achieve this, the analysis should factor in anticipated overtime savings as well as likely impact of staff availability to cover absences due to leave time and injuries.
02. After completion of formal cost analysis described in Recommendation 01, the Director of EMS should revisit the anticipated planning horizon for converting shifts and lay out a project plan for timely conversion of shifts including tasks, deadlines, milestones and responsible parties.
03. With the implementation of new software systems and capabilities, the Director of EMS should evaluate the department's capability to analyze new forms of data and develop a formal strategy to increase the department's data analysis capacity.

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**APPENDIX A**  
**MANAGEMENT RESPONSE AND ACTION PLAN**

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## MEMORANDUM

**TO:** Stephen L. Morgan, City Auditor  
Office of the City Auditor

**FROM:** Richard Herrington, Executive Director  
Austin-Travis County EMS

**DATE:** June 23, 2005

**SUBJECT:** EMS –Public Safety Service Delivery Audit

We have reviewed the draft report of the EMS-Public Safety Service Delivery audit. While we are mostly in concurrence with the recommendations, we feel that many of the assumptions and statements included in the text of the document itself are incorrect, misleading or are predicated upon unrealistic assumptions.

There are references throughout the report that allege that no cost/benefit analysis was conducted prior to converting our two busiest stations to a shorter work cycle. This is not the case. It is factual that we did not conduct a detailed analysis of the impact of converting a large number of EMS stations to a shorter alternative to the 24/48 hour schedule. However, we did a cost analysis for converting the system's two busiest stations. The two stations selected were converted on schedule and with significant input from the employees that would be working the shorter 12 hour shifts. The focus of the two shift conversions was completely predicated on paramedic workload reduction, and not intended to provide a comprehensive project plan for shorter shifts for a large number of stations.

EMS has been working since August, 2004 to develop an RFP to hire a consultant. The consultant's role will be to provide the experience, technology and objectivity required to conduct a Fatigue Risk Assessment of the EMS Department's Operations Division (emergency services and emergency communications), to make scientific correlations with the resultant data relative to key performance indicators, and to utilize that information to develop and help implement a comprehensive scheduling program to reduce the identified costs, risks, and liabilities. The bidding process is complete and a RCA is being prepared for Council action on July 28.

The report also indicates that EMS can significantly reduce its overtime expenditures by paying the same hourly rate regardless of the schedule being worked. In concept this is fine, but in the EMS world it is an impractical assumption.

In today's extremely tight paramedic hiring environment, paramedics have to be aggressively recruited and competitively compensated. Presently starting paramedics at Austin-Travis County EMS working the 24/48 hour cycles earn \$44,294. Using the scenario presented in the report for 12 hour schedules, this same starting paramedic would only earn \$31,139, a decrease in basic earnings of \$13,155. Given that EMS is having an extremely difficult time hiring at \$44,000; it is improbable that we could hire any qualified paramedics at \$31,000. For comparison purposes, Williamson County EMS, another Third Service EMS provider, starts their paramedics at \$46,000.

Below are the EMS responses to the three Audit recommendations.

### **Recommendation #1**

*Prior to instituting any alternative shift scheduling and to broaden management's options for effecting a safer and more efficient working environment, the Director of EMS should develop formal cost analyses showing the budgetary effects related to reducing the length of paramedic shifts. In addition to identifying transition costs for hiring new paramedics to achieve this, the analysis should factor in anticipated overtime savings as well as likely impact of staff availability to cover absences due to leave time and injuries.*

Staff Response: Partial Concurrence

EMS agrees that prior to implementing alternative schedules at a large number of EMS stations, detailed analyses and planning are required. The scope of services of the Scheduling RFP will provide the formal cost analysis and recommend optimum shift configuration to meet the increasing work load and improve employee and patient safety.

### **Recommendation #2**

*After completion of formal cost analysis described in Recommendation 01, the Director of EMS should revisit the anticipated planning horizon for converting shifts and lay out a project plan for timely conversion of shifts including tasks, deadlines, milestones, and responsible parties.*

Staff Response: Concurrence

This is a deliverable required in the RFP.

### **Recommendation #3**

*With the implementation of new software systems and capabilities, the Director of EMS should evaluate the department's capability to analyze new forms of data and develop a formal strategy to increase the department's data analysis capacity.*

Staff Response: Concurrence

EMS' ability to analyze and use response data has improved significantly with the implementation of the new Computer Aided Dispatch system (CAD). In conjunction with the new CAD, EMS and Fire have purchased through grant funding, a modeling and predictive software package that will allow planning based upon historical and current response data. It is anticipated that this capability will be available by July.

EMS agrees that, given the volume of data that exists, the Department does not have the necessary staff required to properly take full advantage of the data available for planning purposes. Presently, the two positions that are assigned to planning and data collection are also responsible for multiple other tasks.

Please feel free to contact me if you should have any questions.

Richard Herrington, Executive Director  
Austin-Travis County EMS

Reviewed by:   
Rudy Garza, Assistant City Manager

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<b>Rec. #01</b>	<b>Recommendation Text</b>	<b>Proposed Strategies for Implementation</b>	<b>Status of Strategies</b>	<b>Responsible Person/Phone Number</b>	<b>Proposed Implementation Date</b>
	<p>Prior to instituting any alternative shift scheduling and to broaden management’s options for effecting a safer and more efficient working environment, the Director of EMS should develop formal cost analyses showing the budgetary effects related to reducing the length of paramedic shifts. In addition to identifying transition costs for hiring new paramedics to achieve this, the analysis should factor in anticipated overtime savings as well as likely impact of staff availability to cover absences due to leave time and injuries.</p>	<p>EMS presently has an RFP out for bid for the development of long range fatigue reduction and scheduling options. This proposal will provide the Department with a blueprint for future conversions from the current 24/48 hour schedule to work schedules of shorter duration. The scope of this analysis includes employee workload load issues, overtime, injury reduction, and detailed cost comparison between the different schedules.</p>	Underway	Richard Herrington 972-7048	Late 2005
<b>02</b>	<p>After completion of formal cost analysis described in Recommendation 01, the Director of EMS should revisit the anticipated planning horizon for converting shifts and lay out a project plan for timely conversion of shifts including tasks, deadlines, milestones, and responsible parties.</p>	Included in the Request for Proposal.	Planned	Richard Herrington 972-7048	Late 2005
<b>03</b>	<p>With the implementation of new software systems and capabilities, the Director of EMS should evaluate the department’s capability to analyze new forms of data and develop a formal strategy to increase the department’s data analysis capacity.</p>	<p>The new CAD system recently implemented by the City should, when fully operational, provide the Department with superior planning resources. However, the personnel necessary to analyze and recommend actions based upon the data will have to be approved through the City’s Budget process.</p>	Planned	Gordon Bergh 972-7202	October 2005

Status of strategies: planned, underway, or implemented.

Reviewed by: \_\_\_\_\_  
 Rudy Garza, Assistant City Manager

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**APPENDIX B**  
**AUDITOR TELEPHONE SURVEY**

**Survey Results – Texas Cities**

	<b>Austin</b>	<b>Corpus Christi</b>	<b>Dallas</b>	<b>El Paso</b>	<b>Ft. Worth</b>	<b>Houston</b>	<b>San Antonio</b>
<b>Square Miles</b>	244	460	387	251	345	600+	408
<b>Population</b>	675,710	277,318	1,100,000	626,506	585,000	2,000,000	1,161,254
<b>EMS Delivery Model</b>	3rd service	Fire Dept	Fire Dept	Fire Dept	Public Utility Model	Fire Dept	Fire Dept
<b>Medical Director</b>	Full Time	Part Time	Part Time	Full Time	Full Time	5 F-T / 1 P-T	Full Time
<b>First Responder</b>	Fire Dept	Fire Dept	Fire Dept	Fire Dept	Fire Dept	Fire Dept	Fire Dept
<b>No. of Sworn Paramedics</b>	227	95	Not Reported	Not Reported	0	Not Reported	323
<b>No. of Civilian Staff</b>	51	Not Reported	263	Not Reported	134	Not Reported	77
<b>Shift Schedule</b>	24 on / 48 off	24/48	24/48	24/48 Medic units 4x10s	variable/12 hrs.	24	24/72
<b>No. of Fire Stations</b>	41	16	54	31	40	81	25
<b>No. of Fire Stations w/EMS Medic Transport</b>	15	8	32	14	0	73	25
<b>No. of Separate EMS Stations</b>	5	0	0	0	0	0	0
<b>No. of Ambulances Not at Fire/EMS stations (Circulating)</b>	variable "assigned to post" as needed	Not Reported	0	0	42 variable	0	0
<b>Regular Ambulance Units for EMS Transport</b>	20	8	32	14	42	73	25
<b>Standby/ Part-time Units for EMS Transport</b>	16 (includes County units)	5 Reserve / 1 P-T	8	0	0	0	9
<b># of ALS (Advanced Life Support) Units</b>	20	8	32	14	Variable	22 / 15 nontransport	25
<b># of BLS (Basic Life Support) Units</b>	All ALS	16	All ALS	Not Reported	All	51	0
<b>Total # of EMS Responses</b>	65,773	26,873	151,471	51,469	79,000	301,208	105,594
<b>% of Cardiac Arrest Patients with Pulse on delivery to medical station</b>	23.7	21.0	18.0	14.0	17.0	Not reported	29.0

**Survey Results - Cites Outside of Texas**

	<b>Colorado Springs</b>	<b>Denver</b>	<b>Mesa</b>	<b>Oklahoma City</b>	<b>Portland OR</b>	<b>San Jose</b>	<b>Tucson</b>	<b>Seattle</b>
<b>Square Miles</b>	190	155	126	695	150	178	226	84
<b>Population</b>	377,812	660,000	450,000	575,607	530,000	927,000	525,936	572,500
<b>EMS Delivery Model</b>	Fire Dept/ AMR Transp.	3rd service	Fire Dept / SW Ambul Transp.	Public Utility Model	Fire Dept / AMR Transp.	Franchise Fire Dept / AMR Transp.	FD / BLS Rural Metro Transp	Fire Dept
<b>Medical Director</b>	Full Time	Not reported	Part Time	Full Time	Full Time	Part Time	Full Time	Full Time
<b>First Responder</b>	Fire Dept	Fire Dept	Fire Dept	Fire Dept	Fire Dept	Fire Dept	Fire Dept	Fire Dept
<b>No. of Sworn Paramedics</b>	Not Reported	180 (3rd svc)	Not Reported	Not Reported	Not Reported	Not Reported	175	Not Reported
<b>No. of Civilian Staff</b>	65	6	Not Reported	Not Reported	60	114	46	66
<b>Shift Schedule</b>	24/96	4x10s	3 on/4off	4x12s	24	24/96	5-24 hour shifts/6 off	24 (four platoon)
<b>No. of Fire Stations</b>	19	32	17	35	29	31	18	34
<b>No. of Fire Stations w/EMS Medic Transport</b>	1	0	0	0	0	5	13	10
<b>No. of Separate EMS Stations</b>	0	0	0	0	0	0	0	0
<b>No. of Ambulances Not at Fire/EMS stations (Circulating)</b>	variable 4-12	15	15	36	18	Not Reported	0	No Response
<b>Regular Ambulance Units for EMS Transport</b>	variable 4-12	15	15	36	18	5 Fire Ambul.	13	10
<b>Standby/ Part-time Units for EMS Transport</b>	2 reserve medical squads	0	as needed	0	0	1 Fire Ambul.	8 reserve fully equipped (staffed by call back)	0 / 1 ALS
<b># of ALS (Advanced Life Support) Units</b>	4 to 12	14	15	36 / 17 FD	18	5 / (Not known for AMR)	All 18 ALS capable, 13 ALS transport	7
<b># of BLS (Basic Life Support) Units</b>	5 to 12	1	17 FD	18 FD	0	Not Reported	contract with Rural Metro	4
<b>Total # of EMS Responses</b>	29,976	66,049	40,000	58,361	43,000	Not Reported	56,650	57,411
<b>% of Cardiac Arrest Patients with Pulse on delivery to medical station</b>	Not Known	Not Known	Not Known	22.0	25.0	Not reported	Not reported	47.0