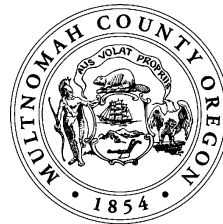


# **Review of the Multnomah County Ambulance Contractor's Compliance with the Urban Response Time Requirement**

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August 1999

Prepared Jointly by  
The Multnomah County and City of Portland Auditors





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August 11, 1999

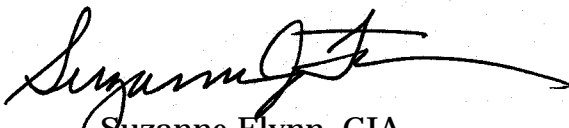
TO: Beverly Stein, County Chair  
Diane Linn, County Commissioner  
Serena Cruz, County Commissioner  
Lisa Naito, County Commissioner  
Sharron Kelley, County Commissioner  
Gary Oxman, MD, MPH, Multnomah County Health Officer

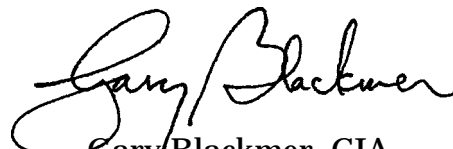
SUBJECT: Review of the County EMS Program's Compliance Review Process

We have completed our review of the County Emergency Medical Services Program's process for evaluating response time performance of the County ambulance contractor. The review was conducted within a two-week period at the request of County Health Officer, Gary Oxman. We have reviewed a draft of the report with Dr. Oxman, and we believe he is in general agreement with our findings and recommendations. Dr. Oxman's written response to our findings is included at the back of the report.

We ask that the County Health Officer prepare a written status report in six months on the progress made in implementing our recommendations. Distribution of the response should include the County Chair, the County Auditor, and the City of Portland Auditor.

We appreciate the cooperation we received from the County EMS Program, staff at the City's Bureau of Emergency Communications, and representatives of the ambulance contractor, American Medical Response, in conducting this review.

  
Suzanne Flynn, CIA  
Multnomah County Auditor

  
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# Chapter 1 Introduction

The Multnomah County and City of Portland Auditors were asked by the County Health Officer to review the County Emergency Medical Services (EMS) Program's process for assessing response time performance of the County's ambulance service contractor. The County's contract with American Medical Response specifies that ambulance units must respond to Priority-1 medical emergencies in urban Multnomah County within 8:00 minutes at least 90% of the time. We reviewed the EMS Program's process for assessing ambulance response time performance and conducted limited tests of supporting documents and records. We conducted our review in accordance with the General Standards section of *Government Auditing Standards*.

**Background** The County EMS Program is responsible for providing high quality, timely, and cost-effective response to approximately 48,000 requests a year for emergency medical service. The EMS Program has a FY 1999-00 budget of \$885,000 that includes four full-time positions plus a part-time EMS Medical Director. The EMS Program prepares a State-mandated ambulance service plan and promulgates rules and protocols that direct the County's EMS system, which

includes an exclusive ambulance contractor. The contract with American Medical Response (AMR) spans the five-year period from September 1, 1995, through August 31, 2000. In the County's EMS system, AMR is responsible for pre-hospital emergency care plus transport of patients to hospitals, whereas first response to medical emergencies is the responsibility of the Portland Fire Bureau, the Gresham Fire Department, and the Port of Portland's Airport Fire.

The County EMS Program has reported that AMR has complied with the urban response time requirement (arrive within 8:00 minutes at least 90% of the time) during each of the past four years. However, ambulance response times have increased during the past year (by an average of about 26 seconds) and the County Health Officer and the Contract Compliance and Rate Regulation Committee have expressed concerns about the contractor's response time performance. In accordance with contract provisions, County Commissioners must decide whether or not to renew the contract with AMR before the end of August 1999.

The County Health Officer convened a group of analysts and EMS system participants to review response time data and identify possible reasons for the slower response times. The group met on four occasions in June and July, 1999, and identified several factors which may have contributed to slower response times. These factors included higher demand on the EMS system, changes in dispatch procedures that occurred in May 1998, and a change in how ambulance crews report on-scene arrival times. Questions were also raised about the growing number of exceptions (i.e., EMS calls exempted from the contractual response time requirement) that were granted by the EMS Program.



**The EMS Program's  
Compliance Review  
Process**

The EMS Administrator determines ambulance response time compliance once a month based on EMS call data received from the City of Portland's Bureau of Emergency Communication (BOEC). The Administrator adjusts the call data by going through a three-step "normalization" process (see Appendix A for the EMS Program's description of the normalization process). First, cancelled calls, Code-1 (i.e., non-emergency) calls, and calls in which an ambulance did not actually respond are removed from the call data. Second, the call data is sorted by area into urban, rural, and frontier (i.e., remote). Third, corrections are made to the call data wherein wrongly coded calls are removed and certain over-8:00 minute calls are changed to under-8:00 minute calls. These include calls downgraded to Code-1, "staged" calls in which the ambulance was prevented from entering the emergency scene by police, and calls that were cancelled while the ambulance unit was en route to the scene.

The final step in the compliance review process involves the granting of exceptions. Certain calls judged to be beyond the control of the ambulance contractor are exempted from the 8:00-minute response time requirement. These include:

- calls in which a closer ambulance was, or should have been, substituted for the one originally dispatched;
- calls in which a change in location or a difficult location caused a delay in response;
- calls in which there was a problem with unit notification by the dispatcher;

- calls which occurred when there was excessive demand on the system; and,
- calls in which a delay was caused by inclement weather. (See Appendix A.)

The process of identifying corrections and exceptions actually begins with AMR staff who, on a weekly basis, obtain incident reports from BOEC and identify calls that AMR requests for exclusion. These calls are referred to the EMS Administrator who makes the final decision as to whether or not corrections and exceptions will be granted. Most decisions are based on information contained in CAD incident reports, but in some cases EMS Program staff listen to BOEC audio tapes or review maps to make a determination.

The results of the EMS Administrator's response time calculations are presented to the Contract Compliance Committee, which is charged with reviewing response times and other performance requirements of the ambulance service contractor, and making recommendations to the EMS Administrator.

**Objectives, Scope,  
and Methodology**

Because questions were raised concerning the validity of the ambulance contractor's response time compliance and the growing number of exceptions granted to the contractor, the City and County Auditors were asked to review the EMS Program's compliance review process. Specifically, we were asked to review the process for evaluating compliance with the urban response time requirement.

We conducted our review in less than two weeks, beginning on July 29, 1999. We interviewed the EMS Administrator responsible for compliance review, a representative of AMR, and staff who oversee EMS dispatch operations at BOEC. We obtained raw EMS call data for the past year from BOEC's computer-aided dispatch (CAD) system and compared it to the data set used by the EMS Program. We conducted a detailed analysis of the April 1999 call data and the EMS Program's handling of 257 requests for corrections and exceptions, including 171 that were approved.

Our objective was to determine the reasonableness of the EMS Program's compliance review process, and to obtain some assurance of the reliability of the Program's calculation of response time compliance. Our review did not include tests of BOEC CAD data or analysis of call audio tapes. We do not provide conclusions on the ambulance contractor's level of compliance with response time requirements.



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## Chapter 2 Results

We found several weaknesses in the County EMS Program's process for evaluating the ambulance contractor's compliance with the 8:00-minute response time requirement. Specifically, the EMS Program lacks well-defined procedures for ensuring consistency in their process, and criteria for making corrections and exceptions to the EMS call data are unclear. In addition, the Program lacks adequate procedures for correcting errors in the BOEC call data and for ensuring that adequate records and documentation are maintained. Because of ambiguities in the criteria used to make corrections and exceptions to the call data, we cannot provide assurance that the EMS Program's calculation of response time compliance is reliable.

We also found that members of the Contract Compliance Committee have not been appointed by the Board of County Commissioners as required by the County Ambulance Ordinance. Only four members have participated in Committee meetings held during the past year, and we do not believe the functioning members have provided the breadth of interests and expertise outlined in the Ambulance Ordinance.

**Lack of Clear Criteria  
and a Well-Defined  
Process**

While the basic steps in the compliance review process seem reasonable, the EMS Program has not developed a complete description of the steps and decisions involved in the process. For example, the data normalization sheet attached as Appendix A does not include steps for identifying duplicate or missing calls, nor does it describe the steps followed in sorting call data into urban and rural calls.

The lack of written procedures is exacerbated by the fact that the criteria for making decisions on corrections and exceptions are unclear. For example, EMS program staff and the ambulance contractor have interpreted the ambulance service contract and EMS Administrative Rules to allow exclusion of calls when there appeared to be a closer ambulance than the one originally dispatched. In addition, if a second ambulance driver states that s/he can arrive at an emergency scene faster than the ambulance originally dispatched, the “dispatch time” is re-set to the time the second ambulance began its run. Officials from the EMS Program and AMR base their interpretation on EMS Administrative Rules that state BOEC is responsible for dispatching the closest available ambulance. In addition, they interpret “dispatch computer failure” cited as an exception in the contract to include instances in which a dispatcher fails to dispatch the closest available ambulance.

We believe the exceptions described above (closer and exchanged ambulance units) are subjective in nature and can sometimes lead to an erroneous exception – sometimes to the benefit of the contractor and sometimes to their detriment. Furthermore, these two types of exceptions are significant because they represent a large number of the

exceptions granted by the EMS Program. Closer and exchanged units represented 48 (91%) of the 53 total exceptions granted in April 1999.

In our review of the April 1999 corrections and exceptions, we found one ambulance that was exchanged for an earlier ambulance when the second ambulance driver stated, "M306 gets off in 10 minutes; we're the same distance". This call was granted an exception although we are not sure it is reasonable to allow the contractor to re-set the dispatch time in this particular case.

In another instance, a call was inadvertently duplicated in the call data, and was reviewed twice for a possible exception. The EMS Program granted the exception in its first review, based on information in the text of the incident report that indicated there was an exchange of units. However, when the same call was reviewed on a separate occasion, EMS Program staff listened to the audio tape and determined that the request for an exception should be denied. These two exceptions illustrate the judgmental nature of exceptions and the difficulty of trying to correctly assess whether or not an exception should be approved.

We reviewed the 171 corrections and exceptions granted by the EMS Program for the month of April 1999. Table 1 displays the results of our review, which was conducted with the assistance of staff from both the EMS Program and BOEC. We found it was essential to involve BOEC staff because of their detailed understanding of the CAD system and EMS dispatch operations.

Of the 118 corrections granted, the group agreed that 69 (58%) were valid. The group could not come to an agreement on three corrections (3 %), and there was insufficient information for the group to come to a conclusion on the validity of 46 corrections (39%). See Table 1.

**Table 1 Results from Review of April 1999 Corrections and Exceptions Performed by BOEC, EMS Program, and Auditors' Staff**

Correction Category	Corrections				Total
	Group agreed correction was valid	Group agreed correction was invalid	Group disagreed on validity	No conclusion due to lack of info	
Code-1 Dispatch	10			2	12
Code-1 Downgrade	35				35
Canceled or Clear	9		1	24	34
Out of County	2		1		3
Redispatched Call	2				2
Rural Call	1				1
Staged	1			5	6
Time on Tape				14	14
Time in Text	9		1	1	11
Total	69	0	3	46	118

Exception Category	Exceptions				Total
	Group agreed exception was valid	Group agreed exception was invalid	Group disagreed on validity	No conclusion due to lack of info	
Access	2		1		3
Changed Location	1				1
Closer Unit	3	1	5	21	30
Dispatch Problem				1	1
Excessive Demand					0
Exchanged Unit			2	16	18
Weather					0
Total	6	1	8	38	53

SOURCE: City and County Auditors' Staff



Of the 53 exceptions granted, the group agreed that 6 (11%) were valid and that one exception should have been denied. The group could not come to an agreement on eight exceptions (15%) and there was insufficient information for the group to come to a conclusion on the validity of 38 calls (72%). See Table 1.

**Need to Improve  
Record Keeping**

The EMS Program does not keep clear and comprehensive records of corrections and exceptions. The EMS Administrator keeps a summary log for monthly corrections and exceptions. However, the log has multiple monthly tally sheets that were not consolidated. For example, there were three duplicate tally sheets for the month of April 1999, making it difficult to identify the corrections and exceptions, and the disposition of each request. In addition, the specific correction and exception codes were handwritten in the margins of the tally sheets, which in some cases were illegible.

We also found missing files during our review of corrections and exceptions for April 1999. We were told that the contractor keeps all copies of the requested corrections and exceptions for each month. However, 44 calls from April 1999 were not located in the contractor's files, but were later found at the EMS Program office.

**Need Consistent  
Procedures for  
Identifying Errors in  
the EMS Call Data**

We compared the raw call data used by the EMS Program to call data we received from BOEC for the period, September 1998 through April 1999. We found several problems with the accuracy of the data used by the EMS Program. For example, there was an average difference of 58 calls per month (1.5% of the total monthly average) between the

EMS Program's data set and the data set we received from BOEC. In all months, calls were either missing or there were duplicate calls included in the EMS Program's data set. We found 22 duplicate calls in the EMS Program's March 1999 data set and 27 duplicate calls in its April 1999 data set. In addition, our test of the EMS Program's April 1999 data set (before normalization) showed the Program had 32 more medical calls and 25 more urban calls than the data set we received from BOEC for the same month. The missing and duplicate raw data do not appear to be the result of the EMS Program's handling of the data.

Our discussions with EMS officials indicates that they lack a formal, consistent process for checking the accuracy of raw data received from BOEC each month. Without testing to find missing days or duplicate calls, monthly call volume used to determine compliance could be under or over stated, affecting the calculations of response time compliance.

**Compliance  
Committee Not  
Properly Constituted**

The County Ambulance Ordinance stipulates that the Board of County Commissioners shall appoint members of the Contract Compliance Committee upon recommendations from the EMS Program. The Committee is to be comprised of (1) a person with expertise in ambulance operations, (2) an attorney with health care expertise, (3) a person in the business of health care administration or health care financing, (4) an accountant, (5) an EMS provider other than the contractor, (6) a citizen of Multnomah County, (7) a representative from the City of Portland, and (8) a representative from the City of Gresham.

We understand that the members of the Contract Compliance Committee have not been approved by County Commissioners because a list of candidates was not submitted to the Board by the EMS Program. In addition, we do not believe the Committee includes persons with the breadth of interests and expertise outlined in the Ambulance Code. Furthermore, only four Committee members have attended meetings during the past year, and three of these four members were associated with organizations that bid on the current ambulance service contract.



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## Chapter 3 Conclusions and Recommendations

Because of the absence of clear criteria for making corrections and exceptions, and the lack of a well-defined compliance review process, we cannot provide assurance that the EMS Program's calculation of response time compliance is reliable. We make several recommendations to address the problems identified in the compliance review process:

1. ***The EMS Program should seek to establish clearer criteria and guidelines for making corrections and exceptions to the urban response time requirement.***

Absent clear criteria, the Program should provide better documentation and explanation of the rationale followed in making exceptions and corrections to the EMS call data.

2. ***To ensure the criteria for making exceptions and corrections are understood, reasonable, and appropriate, the EMS Program should ask the Contract Compliance Committee for review and comment.***

3. ***The EMS Program should develop more complete written procedures for its compliance review process.***

The procedures should include steps for ensuring the accuracy of the EMS call data, and describe consistent documentation and record keeping procedures.

4. ***BOEC staff should have more involvement in the compliance review process, including participation in the review of potential corrections and exceptions to the call data.***

This will not only help improve the accuracy of the compliance review process, but also facilitate improvements in EMS dispatch operations.

5. ***Ensure that all members of the Contract Compliance Committee are appointed by the Board of Commissioners, and that they represent the full array of interests and expertise outlined in the County Ambulance Ordinance.***

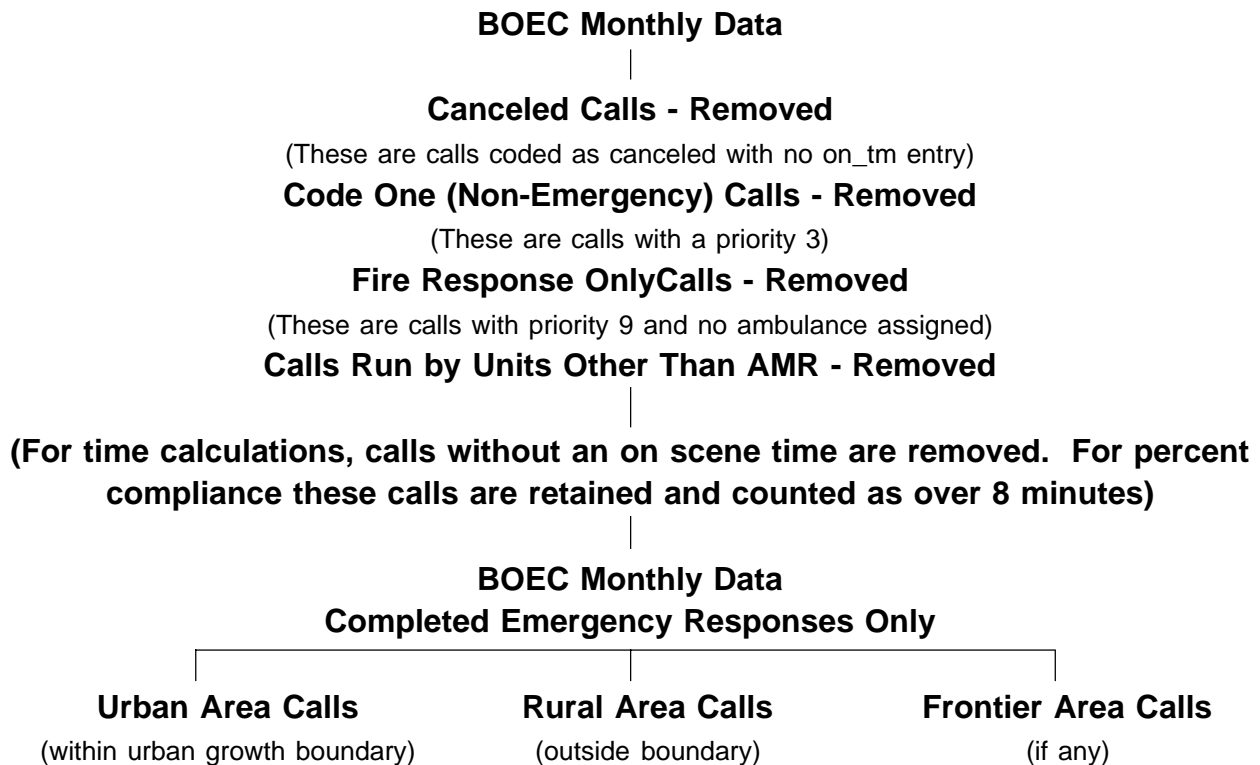
# Appendix A

## BOEC Medical Call Data

### Data Normalization Process

All data used in evaluating ambulance performance is from the dispatch computer at BOEC (911 dispatch). A data set with selected fields is provided to EMS weekly, via E-mail. The weekly sets are combined into a month that is the unit used for contract compliance. The set contains all medical calls created in the time period.

The data received must go through a considerable normalization process in order to be in a form that can be used for the evaluation:



The above process is completed by using the computer to sort the calls. The remainder of the process is completed by looking at individual call records, also obtained from BOEC. There are two parts to this phase of the process, data corrections and exception made for calls over eight minutes. Calls are identified for further review by AMR. These are only over eight-minute calls. No further review is done for calls under eight minutes.

## DATA CORRECTIONS

The following calls are removed from the data set:

1. CALLS DISPATCHED CODE ONE (non-emergency). The record shows them as code three calls but the text of the incident states they were dispatched code one.
2. CANCELED CALLS. These calls were wrongly coded and show in the incident record as a call without an on scene time.

The following calls stay in the data set. However, the record shows them to be less than eight minutes:

3. STAGED CALLS. The ambulance is prevented from entering a crime scene and the response time to the staging area is used as the response time.
4. CODE ONE DOWNGRADE. The call changes from emergency to non-emergency prior to eight minutes into the call.
5. The actual arrival time is entered IN THE TEXT of the call by the dispatcher and did not correct in the computer time stamp or the record shows an entry by the ambulance crew that indicates they are on the scene within the eight minute requirement.
6. The times for the call are obtained from the AUDIO TAPE at BOEC.
7. The call was CANCELED AND THEN RE-DISPATCHED. The correct time is from the re-dispatch to on scene.
8. The call was OUT OF THE COUNTY with the exception of a small portion of the City of Portland in Washington County.
9. The call was in the RURAL area, but did not sort out earlier. These calls are considered under the rural area standard.

## CALL EXCEPTIONS

The following calls are over eight minutes. However, there is a reason, not under the control of the contractor, that caused the call to be over eight minutes:

10. Calls with exchanged units. If a second ambulance is substituted for the original ambulance and the second ambulance was available for dispatch at the start of the call and the second ambulance runs the call in eight minutes or less, the call is excepted.



11. **CLOSER UNITS.** If an ambulance was closer to a call by time and distance and could have made the call in eight minutes or less, the call is exempted.
12. If the **LOCATION OF THE CALL CHANGED** to the extent that it caused the long response, the call is excepted.
13. If **ACCESS TO THE CALL** location is such that it caused the long response, the call is excepted.
14. If there was a problem with the dispatch such as a failure of the notification process, the call is exempted.
15. If there is an excessive demand on the system such as concurrent multiple ambulance calls, the call is exempted.

In addition, during **INCLEMENT WEATHER** such as snow or ice, the response time requirements are suspended and those calls are removed from the data set.

Source: Multnomah County Emergency Medical Services Program



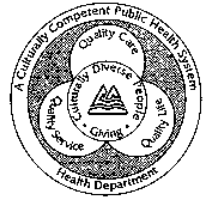
# Response to the Report

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# MULTNOMAH COUNTY OREGON



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TO: Suzanne Flynn, Multnomah County Auditor  
Gary Blackmer, City of Portland Auditor

FROM:  Gary Oxman, MD, MPH  
County Health Officer

RE: Response to Ambulance Response Time Compliance Review

DATE: August 11, 1999

This memo is in response to the report of your review of the Health Department's methods for determining ambulance response time compliance.

First, I want to thank you and your staff for the rapid and professional way in which this review was done. Despite a very short time line, and the complexities inherent in the question and the data, you produced information and insights that are will be valuable to our department, the Board of County Commissioners, and the community.

From your report, it is clear that your review focused on the *process* for determining response time compliance; it was *not* an independent determination of compliance. Therefore, I agree that the proper interpretation of your report has to do with how confident one can be regarding response time compliance.

I agree with your overall conclusion. There are weaknesses in our methodology for determining response time compliance – weaknesses in both some of the actual methods employed, and weaknesses in documentation. These weaknesses are such that it is appropriate to question how confident we can be about our ability to clearly demonstrate contract compliance.

With regard to the substance of your analysis, there is only one point I would like to clarify. In the section entitled "Lack of Criteria and a Well-Defined Process," you cite 84 calls for which there was insufficient information for your group to come to a conclusion about the appropriateness of granting an exception or data correction. I would point out that your group did not listen to BOEC radio transmission tapes or access other information that the EMS Office used in considering a good number of these calls.

I also want to reinforce the point your report made regarding the size and direction of the data discrepancies you outlined. As you discuss in the analysis of April, 1999 data, the actual number and percent of calls in question is quite small. In addition, the discrepancies run in both directions; some could degrade response time compliance, some could have no effect, and some could enhance compliance. Thus while I believe you have correctly pointed out a number of important problems and opportunities for improvement, I believe the primary questions relate to reliability, consistency and accountability – not to compliance itself.

I concur with and support your recommendations fully. When implemented, I think the changes you have suggested will ensure that the Health Department, Board and community can have a high degree of confidence in judging the contractor's compliance with response time standards. The Health Department will move rapidly to enhance its system for determining response time compliance. We will incorporate your recommendations into our work.

Thank you again for the fine job you and your staff did on this review.



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