FITCH-RONA EMERGENCY MEDICAL SERVICE DISTRICT

5 YEAR PLAN

2007 to 2011

Adopted by EMS Commission
August 10, 2006

Approved at

A Joint Municipal Meeting

October 26, 2006

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EXECUTIVE SUMMARY

This is the second time Fitch-Rona Emergency Medical Services has undertaken the development of a five year plan. The purpose is to outline the foreseeable next steps in the continued development of emergency services in the district.

During the course of the first plan, July 2001 to June 2006, the objectives, while not totally evident, were somewhat predictable. The service was in the process of moving from a semi-volunteer program to one with paid staff and improved capabilities. The result was a document that outlined a path from volunteer to career staff, from EMT-Intermediate to Paramedic, from one ambulance to two ambulances and from one location to two locations (Fitchburg and Verona, see appendix B).

The five year plan that is represented by this document is somewhat less definitive. We have outlined the critical measurements of a successful EMS program trying to create the mechanism to insure our service capabilities are maintained at the highest level without unnecessary expenditures.

This is a living document. It will be adjusted annually based on analysis of the many factors outlined here and additional information that is determined significant. A companion piece to this document is the Fitch-Rona Annual Report compiling the facts and figures of the service. The Annual Report, with numbers compiled from the previous year, will be presented to the EMS Commission for approval.

Fitch-Rona EMS District Charge and Responsibilities

Fitch-Rona EMS District is to provide efficient, effective, and timely emergency medical services to citizens and visitors to our communities through highly motivated and competent career and volunteer staff. Furthermore, since Fitch-Rona EMS District is a three-community joint venture (City of Fitchburg, City of Verona and Town of Verona), Fitch-Rona has a special obligation to actively engage our elected officials and citizens in planning, evaluating, and making changes in the service to meet their needs.

Study Committee Charge

As part of the Annual Joint-meeting (budget approval) on October 22, 2005, the Fitch-Rona EMS District was asked to develop a second edition 5-year plan. As part of the development process, it was the intent of the communities to involve each community in the discussion and development process through a study group.

Following is the study committee charge, expectations and schedule:

It is the charge of this study committee to develop a second edition final draft 5-year plan. When the plan is in a final draft form, the committee will share the plan with our communities, providing some time for review and discussion by the communities. The Fitch-Rona EMS District chairperson will then present the final report at the annual joint community meeting, held in October, for final approval.

Study Committee (continued)

Study Committee Members

Fitch-Rona Commission	John Melby (Fitchburg)
	John Troia (Fitchburg)
	Josh Klein (Town of Verona)
Fitch-Rona EMS	Brian Myrland (Chief)
	Cindy Diedrich (Deputy Chief)
	Paul Roherty (Paramedic)
City of Verona Representatives	
	Larry Saeger
	Rich Streich
Town of Verona Representatives	
	Rose Johnson
City of Fitchburg Representatives	
	Jack Martz
	Steve Wunsch
	Chris Peterson (Business Representative)

Existing Situation

Fitch-Rona EMS District has been providing emergency medical services to the Cities of Fitchburg and Verona, and the Town of Verona since 1977. Our service area encompasses over 70 square miles.

Fitch-Rona became a paramedic level service in July 2001. Staffing level at that time was eight full-time Paramedics. In May of 2002, four additional paramedics were hired and began staffing the backup ambulance 12 hours a day, seven days a week. In January of 2005, two additional paramedics were hired which allowed the staffing of two, full-time, paramedic ambulances. Volunteers continue to be utilized, riding as a third crew member.

In April of 2006, a second station in the City of Verona was opened. The new station is operational 24/7 and has improved our response times to the City and Town of Verona. In addition, it has shortened our response times to the southern portion of our district.

A Collective Bargaining Agreement between Fitch-Rona EMS District and International Association of Firefighters Local 311 was signed in February of 2005, effective January 1, 2005 to December 31, 2006. Contract negotiations must be taken into consideration throughout this and any other planning process.

Call volumes continues to rise, increasing from 1423 calls in 2000 to 2277 in 2005, a 60% increase. Based on current projections, we anticipate reaching 3000 calls per year as early as 2008.

There are times that our services are requested outside our district. The assistance provided is broken down into two response types. One such response is referred to as an Intercept. An intercept is a request for a paramedic service, by a non-paramedic service, due to the nature of the call. Fitch-Rona currently responds to approximately 100 intercepts per year.

Existing Situation (continued)

The other response type outside of our district involves an agreement among the Advanced Life Support (ALS) services in Dane County. It is agreed that the Dane County Communications Center will send the closest ALS ambulance to the most serious calls, regardless of jurisdiction. This is obviously in the best interest of all patients in Dane County. As part of a Homeland Security grant, in 2005, Dane County EMS was able to equip our ambulances with Automatic Vehicle Locators and laptop computers. This equipment assists the Communication Center in locating and communicating with the nearest ALS ambulance that will be dispatched.

Budget Process

Fitch-Rona EMS is governed by the three communities that comprise the Fitch-Rona District. Each community selects three residents, two citizens and one elected official, to serve on the Fitch-Rona EMS Commission. This commission is responsible for oversight of Fitch-Rona EMS.

The funds necessary to cover operating expenses over and above the revenue generated from the EMS billing are covered by each of the three communities according to a calculation of equalized valuations.

The annual budget process culminates in a collective municipal meeting in October of each year.

Billing and Funds Management

Direct revenues generated from patient care cover just over fifty-percent of our annual expenditures. Our in-house billing department works with individuals as well as public and private insurance companies to collect the invoiced revenue. Invoices are processed and mailed within a few days of the incident.

Our payables are managed according to generally accepted accounting principles. In addition to the Management Staff, the EMS Commission has oversight responsibility on all drawn checks. One or two signatures are required on all checks depending on the payment amount.

The financial records of Fitch-Rona EMS are audited annually by a recognized accounting organization with a report submitted to the commission and shared with the three communities..

General Governing Practices

Fitch-Rona is committed to maintaining a cooperative alliance with our neighboring ambulance services, Dane County Emergency Management and surrounding educational facilities. This cooperative effort is demonstrated in several ways.

There is an automatic mutual aid agreement in place that states Fitch-Rona EMS will support neighboring services should their ambulance(s) be unable to respond to a call. This same mutual aid agreement covers our district when we are in need of additional ambulances to cover our call volume. Also, in place is an automatic aid response for critical EMS calls regardless of district boundaries. The closest Paramedic-level ambulance will automatically be dispatched along with a Basic Life Support (BLS) ambulance into surrounding areas should a serious emergency call come in to the Dane County 911 system. The paramedics will assist the BLS ambulance crew with patient care and transport.

General Governing Practices (continued)

Dane County Emergency Management is promoting consistent protocols throughout the County at the paramedic level. Our Medical Director, Dr. Mark Bogner, understands and agrees with the importance of this concept and is very supportive. He has been working with the other medical directors in the county over the past several years to help craft and implement progressive protocols that will be used by Paramedic services throughout Dane County. This not only simplifies training across the County, it also makes it easier for receiving hospitals. As the concept of identical protocols evolves, we expect to see and look forward to joint training opportunities between Dane County ambulance services.

Finally, Fitch-Rona has agreements with surrounding teaching institutions to field precept emergency medical technician students. We currently are working with Madison Area Technical College, UW Hospital Paramedic Program and Gateway Technical College students with their paramedic ride-along requirements. Over the past few years, we have had eight students for a total of 960 hours of student ride time and hands-on educational experience.

Fitch-Rona Paramedic Standards

Ambulance Utilization.

There is an optimum range of number of runs per ambulance. The challenge is to balance non-availability (too many runs) with lack of continued practice (practice and experience improves effectiveness of staff) and inadequate use of equipment (costs). Many services use the standard figure of 1500 runs per year per vehicle. While that number has been effective in some situations, the many variables involved (distance to hospitals, geographical size of coverage area) indicate the need for a calculation that accounts for the diverse nature of EMS. The result is a formula known as Unit Hour Utilization or UhU. UhU was initially developed to compare total available hours (ambulance and crew) with patient transport hours. It has also been used to calculate total hours the rig and crew are busy on calls. The calculation takes the total hours out on calls (or otherwise unavailable) divided by the total number of hours the ambulance and crew are in service. The result is expressed as a percentage, indicating the percentage of time an individual ambulance or group of ambulances is managing a call and therefore unavailable for another call. In private systems with inter facility call volume, an acceptable UhU's value of 35-40% are necessary for profitability. In municipal services like Fitch-Rona a value of 35 percent suggests the need for additional capacity. In neither case is it fair to simply examine the result of the UhU calculation. It must be followed over time and viewed within a more dynamic framework. (See APPENDIX E for more information on Unit Hour Utilization, and APPENDIX F for 2005 UHU figures).

Response Time

Response time is a crucial issue to patient well being. Approximately 10 to 15% of our runs are truly "life or death" situations. In these situations the time interval between when a request for our services is made and arrival of an ambulance is a critical factor in patient outcome. Response time is measured from the time an ambulance leaves the station until the time it arrives at the scene of the incident.

Nationally, the closest thing to a response time standard for paramedic (ALS) transport units in an urban / suburban EMS system is eight minutes in 90 percent of the critical (i.e. life-threatening) calls. This de facto standard is an amalgamation of generally accepted criteria of rules-of thumb. No standards-making consensus group has ever formally defined a standard for ambulance response times. (Taken from the Portland Fire and Rescue Service Delivery System Study, March 2006.)

Fitch-Rona Paramedic Standards (continued)

Although it falls short of a true national standard, the National Fire Protection Agency publishes a standard response time of no more than 8 minutes 59 seconds.

Response times are usually calculated using one of two methods. The first is a simple average, taking a sum of the total response times divided by the number of runs. The more general accepted method of calculating response times is known as fractile time analysis. This form of response time measurement is referred to as fractile because it is stated in terms of the fraction of calls responded to in a specified time. A fractile response time standard specifically acknowledges that there will be some response time outliers in even the best1performing EMS systems. (see Appendix C for more details on Fractile Time and APPENDIX D for Fitch-Rona's 2005 Fractile Data).

On Scene Time

On scene time is a clear demonstration of our proficiency and is especially critical for the "life and death" calls. Of the 3 elements in the transport process (response time, on scene time and transport time), the on scene time is the one most under the control of the Paramedics. Our medical director's goal for Fitch-Rona EMS is to keep our average on scene time to 18 minutes or less because, ultimately, the patient is need of hospital definitive care. One of the concerns of our communities was that as the numbers of skills Paramedics are able to perform increases, our on scene time would also increase. Statistics have shown just the opposite. As our assessment and team skills improve, our on scene time has decreased from an average of 22 minutes in 1999 to approximately 14-15 minutes in 2005. See appendix D for more detail concerning the on scene time issue.

Organizational Standards/Opportunities

Location and number of in-service ambulances

The district is expanding geographically and demographically. The planned annexation of Town of Madison territory by the City of Fitchburg will stretch our district to the east. The City of Verona is adding residential and commercial developments to the western edge of our district. There will come a time when relocating our ambulances or adding an additional ambulance will become necessary.

At the time of this report, Fitch-Rona EMS has just expanded into a second station to better serve the western and southern areas of our district. We must evaluate both the location of our existing stations and the need for additional stations annually based on Unit Hour Utilization and Response Time, and the emergency planning / development of our three municipalities and those of surrounding communities.

Staffing and service levels

Due to run volume and complexity of calls, Paramedics will continue to be the backbone of Fitch-Rona EMS. Both state law and our own paramedic operations plan require a minimum of two paramedics on each ambulance crew. Fitch-Rona recognizes the importance of a third crew member when available. Volunteers are an effective method of adding the third crew member position and will continue to be desired and welcomed at Fitch-Rona. It is desirable for the third member to be licensed at the Intermediate Technician level or above.

Organizational Standards/Opportunities (continued)

As the district population and demographics change it will become necessary to increase our service capacity. One such change that will directly affect the district is an increasing percentage of senior citizens. As a population ages, call volume and call type is influenced by a variety of factors. In addition to a third front-line fully stocked ambulance the district will need to add additional (expected to be seven) paramedics to adequately staff the additional rescue unit. An increase in the volunteer numbers is also anticipated.

Partnering with neighboring communities

Fitch-Rona will continue to participate in Dane County's ALS Agreement providing paramedic intercepts to neighboring communities as requested. As the county continues to centralize EMS operations, Fitch-Rona will evaluate the advantages of the process and work with the county where feasible.

While it is very important for Fitch-Rona to move to implement this District 5-Year Plan, Fitch-Rona is expected to view the 5-Year Plan as a living document. As significant changes occur in and around the District, Fitch-Rona EMS will propose adjustments to current operations and incorporate them into our planning documents.

Mutual Aid Responsibilities

No service can or should plan to provide service for any and all circumstances in their district. It would be costly and a poor use of assets. Mutual aid is designed to allow services to work together and provide those extra needed services during critical times. While this dependency on neighboring services reduces our need for additional capacity, it must be recognized that we too must be available to assist our neighboring services as the need for service exhausts their capacity. Fitch-Rona will continue to provide mutual aid to our neighboring EMS districts and expect they will assist us when emergency services beyond our capacity are required within the district.

Annual Report to the Communities

Fitch-Rona EMS will create an annual report to the communities. A preliminary report is due each year for the annual October meeting. A final report will be presented to the EMS Commission for approval in March of each year. The plan will then be sent to each of the communities for final approval by their councils. A portion of this report will be devoted to a review of the current District 5-Year Plan with recommendations for changes or updates. With the input and authorization of the communities, the District 5-Year Plan should be updated to maintain a rolling five year horizon.

Near Term Expectations / Recommendations

- Replacement Ambulance in 2008
    - Direct financial impact estimate $142,000

- Work with Dane County Communications with replacement of Radio Systems
    - Direct financial impact estimate is unknown at this time

- Track Verona and Town of Verona Merger
    - Direct financial impact estimate is expected to be minimal
    - Operational impact should be minimal

- Work with Verona and Town of Verona on a Public Safety Building
    - Direct financial impact estimate is expected to be minimal

- Track Town of Madison annexation by City of Fitchburg
    - Direct financial impact estimate is expected to be minimal
    - Operational impact could include a third location

- Participate in Dane County EMS regional planning when and if it occurs

Future Discussions

- Initiate and continue discussions and cooperation with surrounding Emergency Medical Services. These discussions should be open and wide ranging.

- Participate in discussions with City of Fitchburg on location and design of a new Fire Station in Fitchburg

- Addition of a third, front-line ambulance based on response time and/or run volume.

- Changes in our management structure should be anticipated as additional service capacity is added

APPENDIX A—Run Volume 1996 - 2011

History of the number of runs from 1996 through 2005

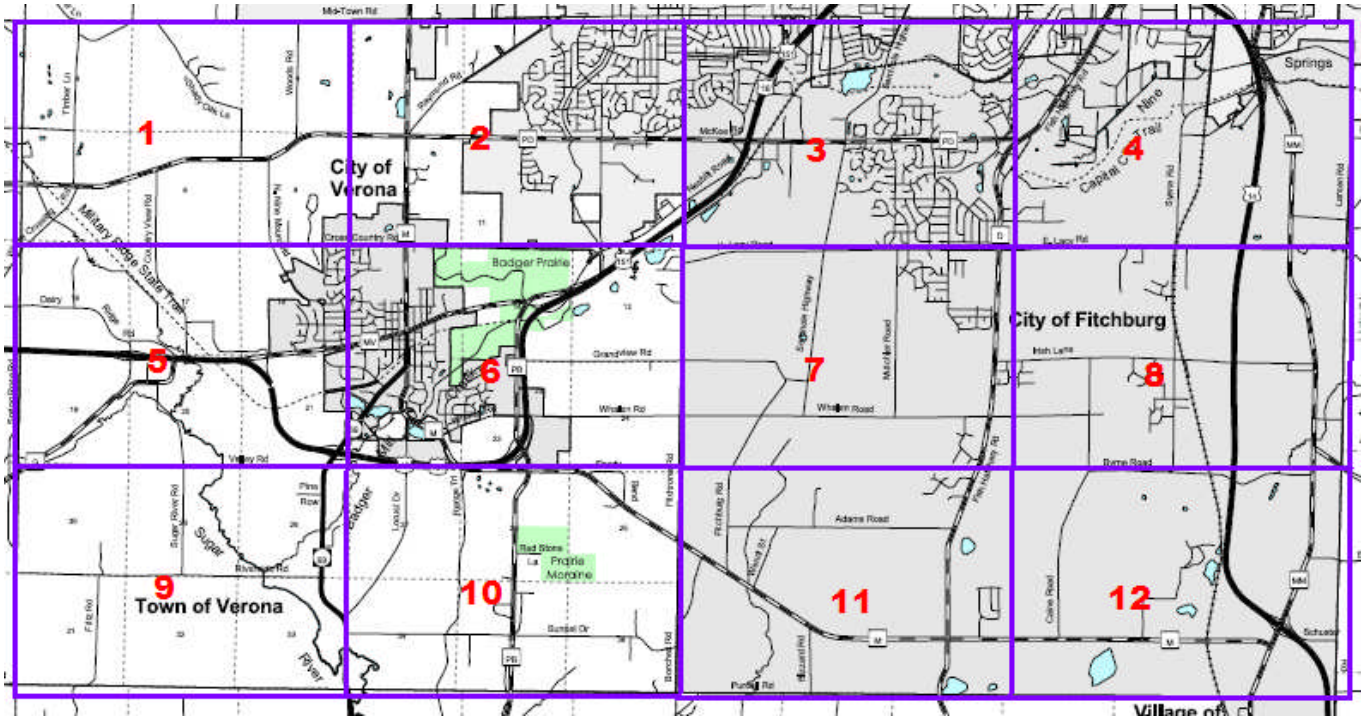
YEAR	Runs	Increase	% Change
1996	1020		
1997	1131	111	10.9
1998	1200	69	6.1
1999	1313	113	9.4
2000	1423	110	8.4
2001	1479	56	3.9
2002	1884	405	27.4
2003	2060	176	9.3
2004	2065	5	0.2
2005	2277	212	10.3

We have seen a steady increase in runs over the last ten years. In comparing 1996 to the year 2005, we realized an increase in run volume of 123%. This is a 9.54% average increase per year. Based on population growth and the aging of the population in our area, these increases are expected to continue. We have conservatively estimated run volume for the next five years as outlined below.

Projected Runs 2006 - 2011

YEAR	Runs	Increase	% Change
2006	2359	82	3.6
2007	2510	151	6.4
2008	2671	161	6.4
2009	2842	171	6.4
2010	3023	182	6.4
2011	3217	193	6.4

APPENDIX B—District Map



APPENDIX C—National Standards for Response Time

This excerpt is from *Contraction for Emergency Ambulance Services – A Guide to Effective System Design* by the American Ambulance Association, Washington DC.

Response Time Performance and Reliability

The most serious medical emergency to which an EMS system responds is a cardiac arrest. In cardiac arrest, a patient's heart stops, and therefore, blood stops circulating through the body. As oxygen normally carried in the blood is depleted the patient becomes unconscious, stops breathing and begins to turn blue. If circulation is not restored in a matter of minutes, the lack of oxygen will irreversibly damage the brain and survival is impossible.

In the l970s, Mickey Eisenberg, M.D. and other researchers studied the survival of cardiac arrest patients who were treated by paramedics. In his landmark studies, Eisenberg was able to distinguish a significantly higher out-of-hospital cardiac arrest survival rate if two conditions existed in the EMS response: first, if CPR was initiated by basic life support (BLS) level first responders within four minutes of the initial call for help; and second, if paramedic level (advanced life support or ALS) care arrived on the scene within eight minutes.

Industry response time standards were in part a product of these studies, which appeared in the *Journal of American Medical Association*. In the major finding of these studies was that if CPR was initiated within four minutes and if definitive care was provided within eight minutes, 43 percent of patients survived. If either time was exceeded the chance of survival fell dramatically. This finding became the benchmark for EMS systems across country, as administrators began measuring how frequently the "definitive care" – interpreted as medic level care - arrived within eight minutes. Response times of four minutes for first response and eight minutes for paramedics have since become an international stand for urban EMS systems.

But what does eight minutes mean? While it may seem obvious that eight minutes is 480 seconds, there has been significant variance in the standard of eight minutes. The Eisenberg studies were conducted in Seattle, and the fire department that operates the paramedic service used a "time-clock" for recording times. As a result, times were measured in integer minutes, with eight minutes actually meaning anything between seven minutes and nine minutes. Today computer aided dispatch systems can track response times to the nano-second, thus antiquating the integer minute conversion of measurement. To compensate for the increased accuracy, some EMS systems have adopted eight minute and 59 second standards, eight minute and 30 second standards or even seven minute and 59 second standards. Each increment in increased response time performance carries a price that varies, depending upon call volume, density, and other geographic factors. '

While it is clear that an eight minute ALS standard in urban areas is desirable, a faster standard is not necessarily better for the EMS system. The financial resources are not available in many communities to achieve a faster standard. The costs associated with a faster standard (e.g., going from an eight minute and 59 second standard to a seven and 59 second standard can be extreme and funds may be best allocated to some other component of the system that needs improvement. Rural areas and frontier regions that find it financially difficult to achieve this standard of ALS response have either establish higher standards (e.g., 15-minute or 20-minute standards); increased their first responder services to paramedic level; developed multi-jurisdictional systems; funded air ambulance or helicopter services; or a combination of these elements to get as close as possible to the eight-minute standard.

In urban systems in which the first responders are at ALS level, it may make economic and clinical sense to increase the transportation response time standard to 9 or 10 minutes.

Response Time Measurement. Some systems measure their response time performance against the eight-minute standard by using averages. In other words, all applicable response times are added and then averaged, and this average is eight minutes or below. With this approach, about half of the calls are answered in less than eight minutes while the remaining half take longer than eight minutes. The survival chances of out-of-hospital cardiac patients are reduced when response time performance is measured in averages as will be illustrated in an example and discussion later in this section.

High performance systems do not use average response time performance measures, but instead use ***fractile* performance measures** in which all applicable response times are "stacked" in ascending length. Then the total number of calls generating response within eight minutes are calculated as a percentage of the total number of calls (a 90th percentile or 90 percent, standard is commonly used). In other words, where a 90^{th} percentile response time standard is employed, 90 percent of the applicable calls are answered in under eight minutes, while only 10 percent take longer than eight minutes.

While the best standard would require 100 percent of life-threatening emergencies to be answered by paramedics within eight minutes, the economic impact of a 100 percent standard would render EMS unaffordable. Consequently, high-performance EMS systems have adopted a 90 percent fractile response time standard, measured in integer seconds.

APPENDIX D — Fractile Time, Fitch-Rona 2005

2001 Plan, Zones 1-7

Response Times Less than or equal to:	# Calls	% of Calls	Cumulative %
0 min. 59 sec.	4	0.3%	0.3%
1 min. 59 sec.	35	2.8%	3.1%
2 min. 59 sec.	91	7.3%	10.4%
3 min. 59 sec.	130	10.4%	20.7%
4 min. 59 sec.	204	16.3%	37.0%
5 min. 59 sec.	222	17.7%	54.7%
6 min. 59 sec.	234	18.7%	73.4%
7 min. 59 sec.	137	10.9%	84.3%
8 min. 59 sec.	86	6.9%	91.1%
9 min. 59 sec.	41	3.3%	94.4%
10 min. 59 sec.	33	2.6%	97.0%
11 min. 59 sec.	13	1.0%	98.1%
12 min. 59 sec.	9	0.7%	98.8%
13 min. 59 sec.	4	0.3%	99.1%
14 min. 59 sec.	2	0.2%	99.3%
15 min. 59 sec.	3	0.2%	99.5%
16 min. 59 sec.	3	0.2%	99.7%
17 min. 59 sec.	2	0.2%	99.9%
18 min. 59 sec.	0	0.0%	99.9%
19 min. 59 sec.	1	0.1%	100.0%
TOTAL	1254		

2006 Plan, Zones 1-7

Response Times Less than or equal to:	# Calls	% of Calls	Cumulative %
0 min. 59 sec.	15	0.8%	0.8%
1 min. 59 sec.	34	1.9%	2.8%
2 min. 59 sec.	85	4.8%	7.6%
3 min. 59 sec.	170	9.6%	17.2%
4 min. 59 sec.	225	12.7%	29.9%
5 min. 59 sec.	240	13.6%	43.5%
6 min. 59 sec.	296	16.7%	60.2%
7 min. 59 sec.	252	14.3%	74.5%
8 min. 59 sec.	183	10.4%	84.8%
9 min. 59 sec.	100	5.7%	90.5%
10 min. 59 sec.	68	3.8%	94.3%
11 min. 59 sec.	47	2.7%	97.0%
12 min. 59 sec.	20	1.1%	98.1%
13 min. 59 sec.	11	0.6%	98.8%
14 min. 59 sec.	9	0.5%	99.3%
15 min. 59 sec.	4	0.2%	99.5%
16 min. 59 sec.	1	0.1%	99.5%
17 min. 59 sec.	1	0.1%	99.6%
18 min. 59 sec.	1	0.1%	99.7%
19 min. 59 sec.	6	0.3%	100.0%
TOTAL	1768		

APPENDIX E — Unit Hour Utilization (UHU)

In addition to Fractile Time discussed in appendix C and D, Unit Hour Utilization (UHU) is a measure of ambulance service capabilities. There are several suggested methods to utilize UHU in the EMS setting. Fitch-Rona EMS is defining UHU as a measure of time an ambulance is unavailable for a call.

A unit hour is defined as a fully equipped and staffed ambulance available or on assignment for an hour. A calculation is used to determine UHU as the percentage of time the ambulance is unavailable for a call. Unavailable is defined as an ambulance that is already on a call or otherwise out of service. A bench-mark of 30 percent suggests additional capacity would benefit the service area.

UHU = Out of Service Time / Unit Hours Available

UHU Fitch-Rona EMS, 2005

Total hours in-service

24 hours / day x 365 days / year = 8760 hours / year

2 ambulances available 24 hours / day, 365 days / year = 17520 hours

Total time unavailable for calls, both ambulances in 2005 was 2297 hours

UHU = 2297 / 17520 = 13.11%

Comparison of Levels of Pre-Hospital Care

Injury/Illness	Basic	Intermediate	Paramedic
Trauma		IV	IV, pain medications, Steroids, Rapid Sequence Intubation
Respiratory Issues	Combitube	Combitube	Endo-tracheal tube, surgical cricothyrotomy Rapid Sequence Intubation
Cardiac Arrest	Defibrillation, Combitube	Defibrillation, Combitube, IV	Defibrillation, Endo-tracheal tube, IV, numerous medications
Cardiac Arrhythmias	Monitor, O_2	Monitor, IV, Nitroglycerine, Aspirin, O_2	Monitor, IV, cardioversion, pacing, numerous medications
Pulmonary Edema (Wet lungs)	O_2	IV, O_2 Nitroglycerine, CPAP	IV, O_2, CPAP, Nitroglycerine, Furosemide, Morphine
Stroke	O_2	IV, O_2	IV, O_2 ,
Seizure	O_2	IV, O_2	IV, Ativan, O_2
Allergic Reactions	Epinephrine	Epinephrine, IV	Epinephrine, IV, Benadryl, Steroids
Asthma	Albuterol, Atrovent,O_2	Albuterol, Atrovent, O_2	Albuterol, Atrovent, Epinephrine, Steroids, O_2
Diabetic Reactions	Blood sugar, oral glucose	Blood Sugar, IV D_5W, D_{50}	Blood Sugar, IV D_5W, $D_{10,}$ D_{50}

Note: Paramedics can do all of the skills of the Basic and Intermediate EMT plus additional skills and additional medications.