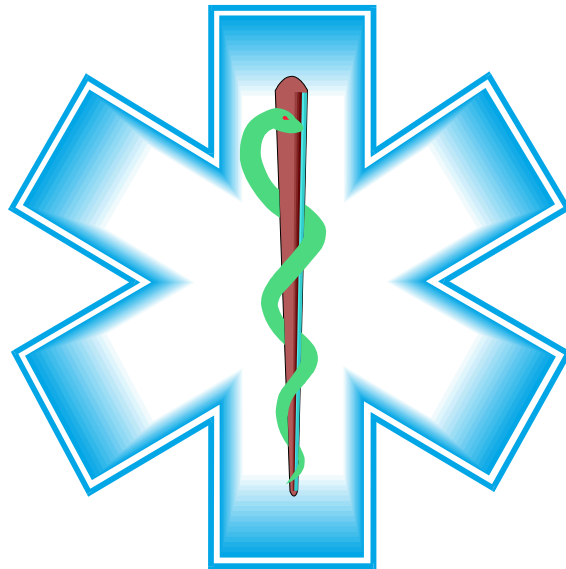

Tuolumne County
Emergency Medical Services Agency

2005 Annual Statistical Report



February 23, 2006

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INTRODUCTION

The 2005 Annual Statistical Report compiles and condenses an entire year=s worth of call volume, response time and patient demographic information about the Tuolumne County EMS system for public review. The data included in this report is derived from pre-hospital patient care records (PCRs) completed by Tuolumne County Ambulance personnel and base/receiving logs completed by emergency department personnel from Tuolumne General Hospital and Sonora Regional Medical Center.

Since July 1, 1993, Tuolumne County Ambulance has collected PCR information using the software program EMS DataProJ (formerly the EMS Database System) provided for their use by the Tuolumne County EMS Agency. Once entered in EMS DataProJ, the data is submitted in an electronic format to the EMS agency where the data is imported into a central version of EMS DataProJ. The EMS agency then validates and combines the data submitted by Tuolumne County Ambulance with patient outcome data derived from the base/receiving logs submitted by the two Base Hospitals, Tuolumne General Hospital and Regional Medical Center.

In September 2000, Tuolumne County Ambulance, with the assistance of the EMS agency, initiated a program for completing PCRs using EMS OutfielderJ (a laptop based PCR data entry program developed by CompuCounsel of Sacramento in conjunction with Manteca District Ambulance). EMS OutfielderJ has replaced hand-written PCR forms and billing tickets. EMS OutfielderJ provides immediate data availability for daily quality assurance/quality improvement reviews and imports patient billing information directly into the billing system used by Tuolumne County Ambulance.

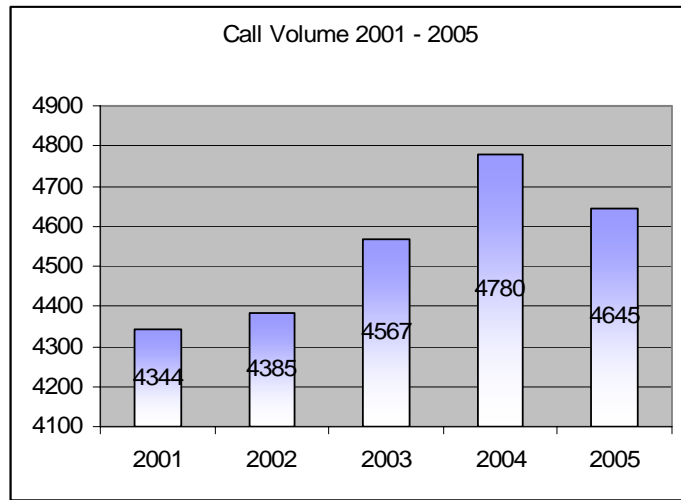
The Tuolumne County Emergency Medical Services (EMS) System is comprised of four 9-1-1 answering points including Tuolumne County Sheriff=s Dispatch, City of Sonora Police Department Dispatch, CHP Dispatch and Mariposa County Sheriff=s Dispatch; Ambulance dispatching provided by the Tuolumne County Sheriff=s Dispatch Center. Basic life support (BLS) first response services provided by Tuolumne County Fire Dept., Tuolumne City Fire Dist., Columbia College Fire Dept.; Twain Harte Fire Dist., Columbia Fire Dist., Sonora City Fire Dept., Miwuk-Sugarpine Fire Dist., Tuolumne City Fire Dist., and the Groveland Fire Dist.. Special BLS response services from U.S. Forest Service, County Search and Rescue, Don Pedro Recreation Agency, Dodge Ridge Ski Patrol. Advanced life support (ALS) service provided by Tuolumne County Ambulance Service. The Lake Don Pedro area ALS service are provided by Mercy Ambulance in Mariposa County. Air ambulance service is provided by Petroleum Helicopter Inc. (PHI) stationed at Columbia Airport and day-to-day mutual aid by air ambulance service providers from throughout Northern California.

In June of 2003 grant funds were made available to the Tuolumne County EMS Agency for the purpose of purchasing and installing EMSsystem™ communication software and related computer hardware for the emergency departments of Tuolumne General Hospital and Sonora Regional Medical Center and the EMS agency office. In early 2004 EMSsystem™ linked Tuolumne County=s EMS system with the other ten (10) counties of OES Region IV enabling Tuolumne General Hospital, as the county=s Disaster Control Facility, to view real-time emergency department availability when determining patient disbursement during a multi-casualty incident (MCI).

In 2004 The Tuolumne County Emergency Medical Services System developed and implemented a Trauma Plan, in conjunction with Memorial Medical Center, Doctors Medical Center of Modesto, Mountain Valley EMS Agency, El Dorado County EMS Agency, Fresno, Kings, Madera EMS Agency, Northern California EMS Agency, Sacramento County EMS Agency, and Santa Barbara County EMS Agency. The Trauma Plan provides a framework that assures that the citizens and visitors of Tuolumne County receive comprehensive prehospital and hospital trauma care. Tuolumne County relies on Trauma Centers throughout Northern California for in hospital trauma care. Air Ambulances are used as the primary means of transportation for patients meeting Tuolumne County's major trauma patient criteria.

OVERVIEW OF CALLS FOR SERVICE

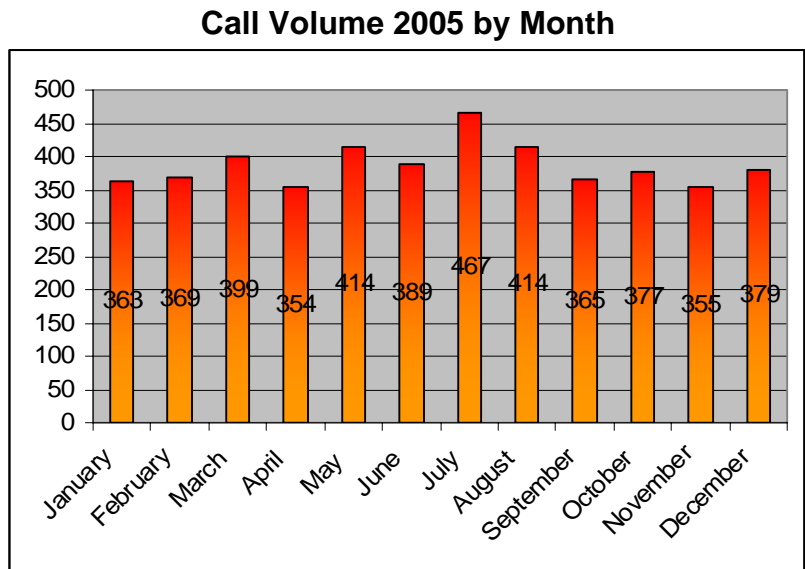
As illustrated in the graphs below, in 2005 there was a slight decrease in calls for EMS services from 2004, the busiest year on record for emergency medical service (EMS) requests in Tuolumne County. The Tuolumne County EMS system has grown approximately 77% since 1994, the first year with reliable data. Unless otherwise specified EMS requests include both scene and transfer call types.



EMS Requests by Month and Year

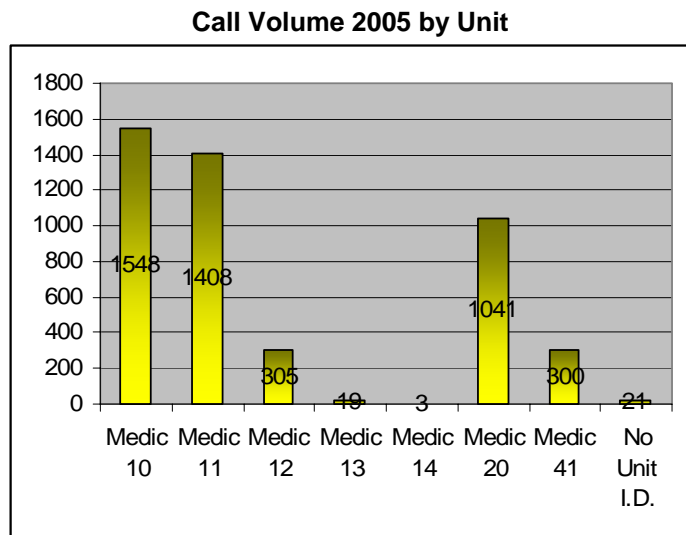
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	383	355	358	357	330	377	396	379	366	354	308	382
2002	383	327	407	344	370	330	426	436	354	352	326	330
2003	390	318	380	363	325	368	442	381	383	393	403	421
2004	392	397	385	337	391	376	453	425	390	389	376	469
2005	363	369	399	354	414	389	467	414	365	377	355	379

2005	
Month	Requests
January	363
February	369
March	399
April	354
May	414
June	389
July	467
August	414
September	365
October	377
November	355
December	379



As illustrated below Medics 10 and 11, responded to the majority of all EMS requests. The Sonora area has a call volume rate, more than three times greater than any other area of the County.

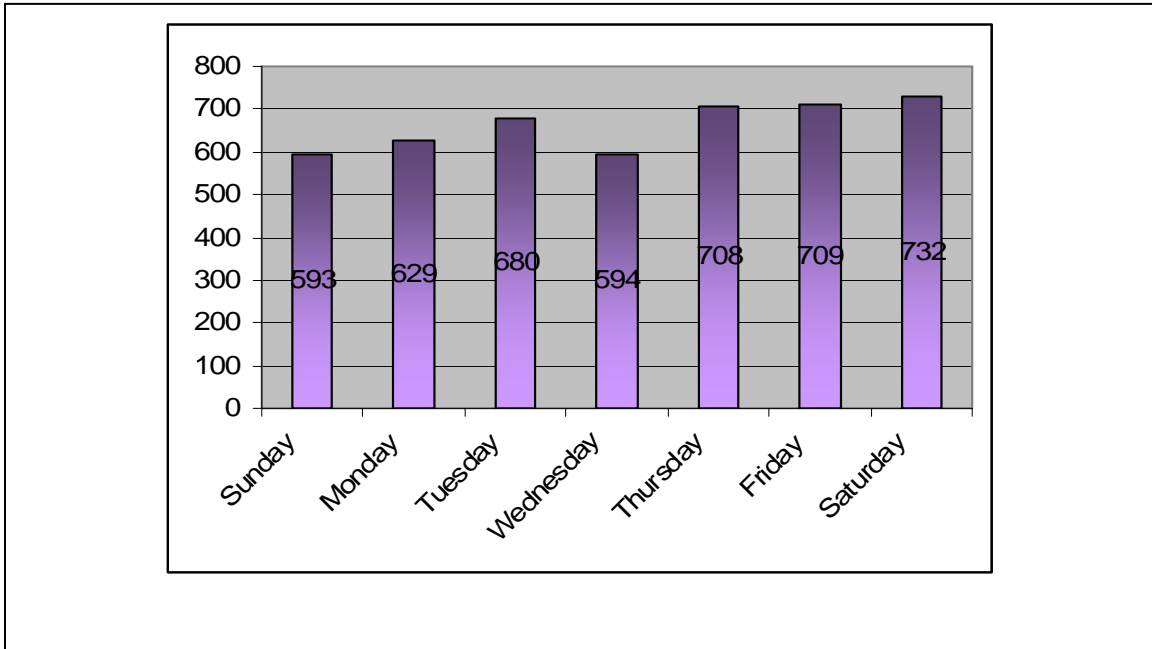
EMS Requests by Medic Unit		
Unit	Requests	Unit Location
Medic 10	1548	Sonora
Medic 11	1408	Sonora
Medic 12	305	Soulsbyville
Medic 13	19	Flexibly Deployed
Medic 14	3	Flexibly Deployed
Medic 20	1041	Soulsbyville
Medic 41	300	Groveland
Unit ID not entered	21	Unknown



Call Volume 2005 by Days of the Week

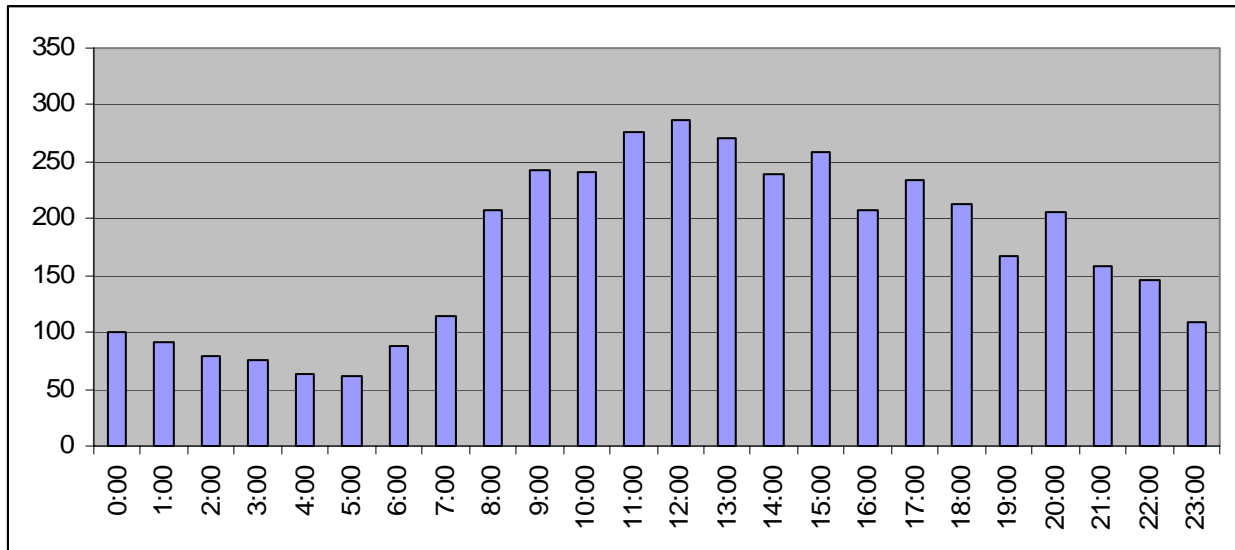
A breakdown of requests by day and time of day shows that call volume is fairly consistent during the week with the hours of 8 a.m. to 5 p.m. being the busiest hours of service, as illustrated by the graphs on the two following pages.

The chart below illustrates that Saturday is the busiest day of the week, followed by Friday and Thursday. The chart also shows that Sunday is the slowest day followed closely by Wednesday.



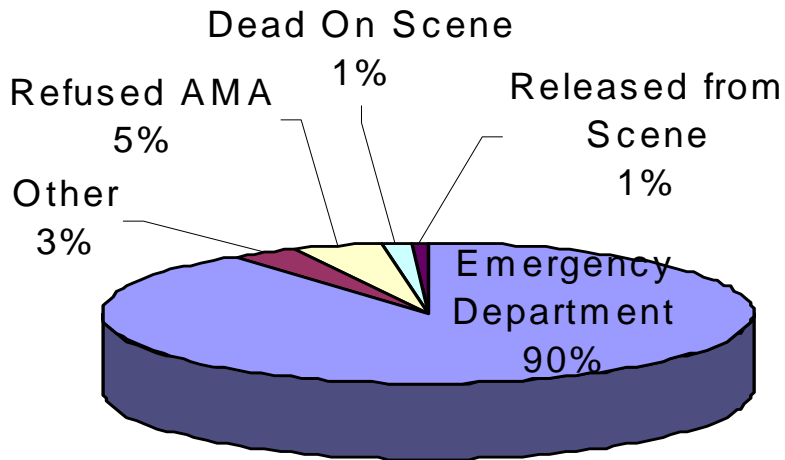
Call Volume 2005 by Hour of the Day

Hour of Day	Requests	% of Requests	Hour of Day	Requests	% of Requests
00:00-00:59	100	2%	12:00-12:59	286	7%
01:00-01:59	91	2%	13:00-13:59	270	7%
02:00-02:59	80	2%	14:00-14:59	239	6%
03:00-03:59	75	2%	15:00-15:59	259	6%
04:00-04:59	64	2%	16:00-16:59	207	5%
05:00-05:59	61	1%	17:00-16:59	234	6%
06:00-06:59	88	2%	18:00-18:59	212	5%
07:00-07:59	114	3%	19:00-19:59	167	4%
08:00-08:59	207	5%	20:00-20:59	206	5%
09:00-09:59	242	6%	21:00-21:59	158	4%
10:00-10:59	241	6%	22:00-22:59	146	4%
11:00-11:59	277	7%	23:00-23:59	109	3%

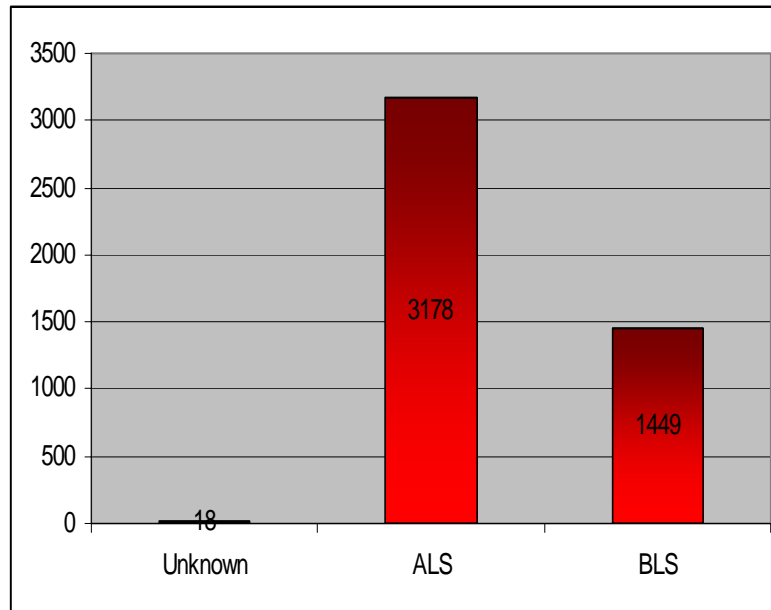


Call Disposition 2005

The tables below illustrate 90% of all scene requests resulted in the patient being transported to an emergency department, 78% of all scene requests resulted in the delivery of advanced life support (ALS) procedures and medications to the patient in the field.

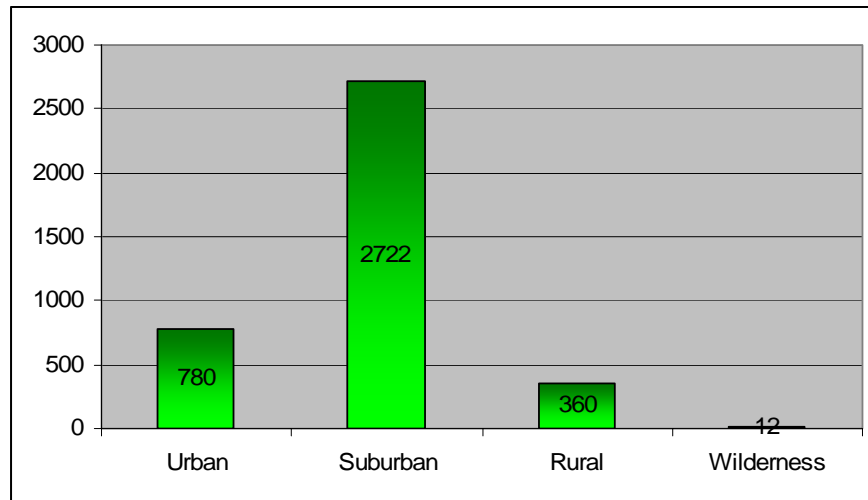


Call Volume 2005 by Level of Care

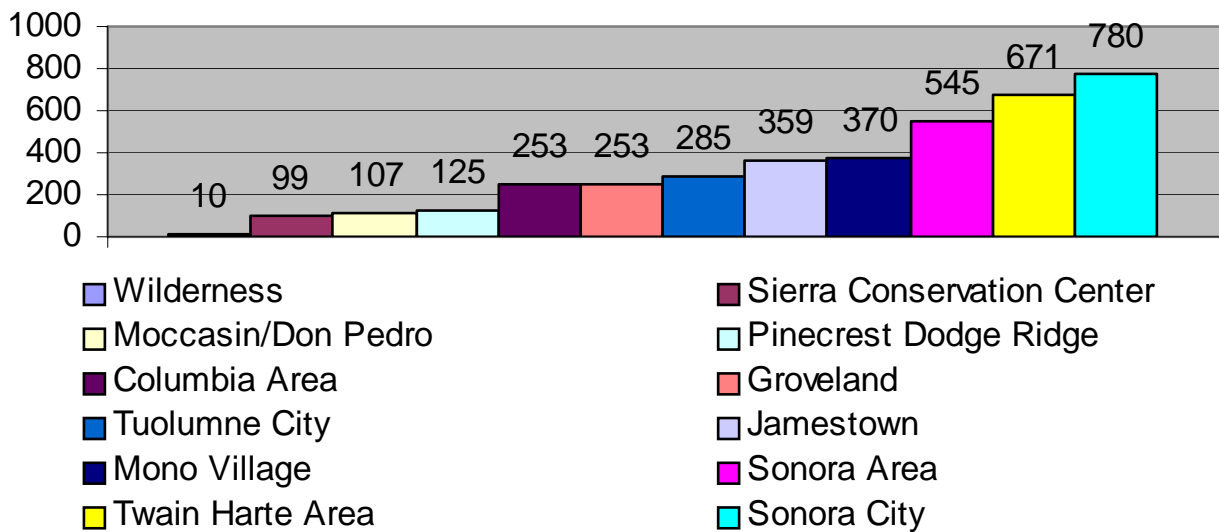


Call Volume 2005 by Map Zone Type

The breakdown of EMS requests by location reveals that the majority of requests occur in the suburban areas of Tuolumne County where the majority of Tuolumne County residents live. A closer look at the location of requests reveals that approximately 70% of all requests occur in suburban areas of the County.



Call Volume 2005 by Area



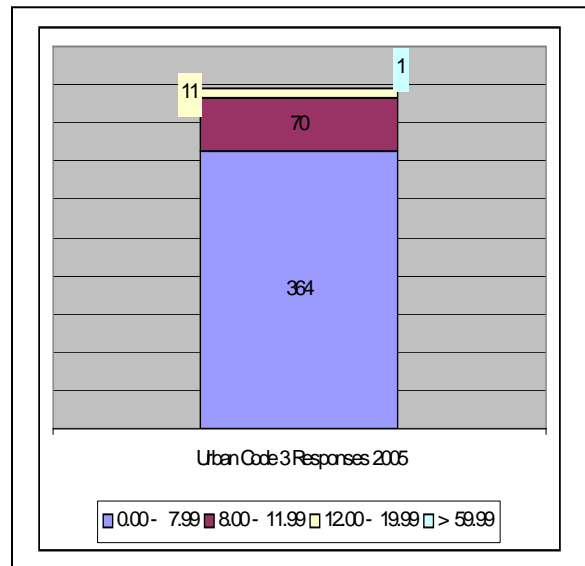
Response Times

The State of California Emergency Medical Services Authority has established guidelines for response time standards to EMS requests based on population density. EMS areas are to be designated so that ninety (90%) of EMS responses shall not exceed:

	BLS First Response	BLS AED First Response	ALS Ambulance
Urban = 101 to 500 people per square mile	5 minutes	5 minutes	8 minutes
Suburban = 51 to 100 people per square mile	15 minutes	ASAP	20 minutes
Rural = 7 to 50 people per square mile	15 minutes	ASAP	20 minutes
Wilderness = less than 7 people per square mile	ASAP	ASAP	ASAP

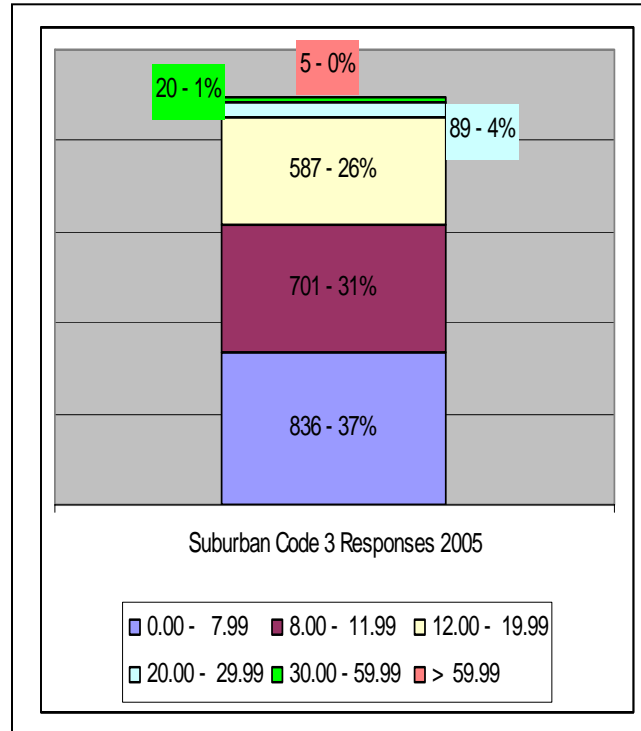
The chart below shows the 90th percentile Code 3 response time for an ALS ambulance in the **urban area** of Tuolumne County is 10.00 minutes with an average response time of 5.72 minutes. When calculated using only calls involving the response of an ambulance stationed in Zone 1, these numbers drop to a 90th percentile of 9 minutes with an average of 5.90 minutes. In Tuolumne County only the City of Sonora is classified as an urban area. *See table on next 3 pages.*

Response Time Interval in Minutes (Urban)	Code 3 Responses	% of total
00:00 - 07:59	364	82%
08:00 - 11:59	70	16%
12:00 - 19:59	11	2%
> 59:00	1	0%
Minimum Response Time	0.00 minutes	
Maximum Response Time	87.00 minutes	
Average Response Time	5.72 minutes	
Standard Deviation	4.71 minutes	
90 percentile	9.00minutes	
95 percentile	10.00 minutes	



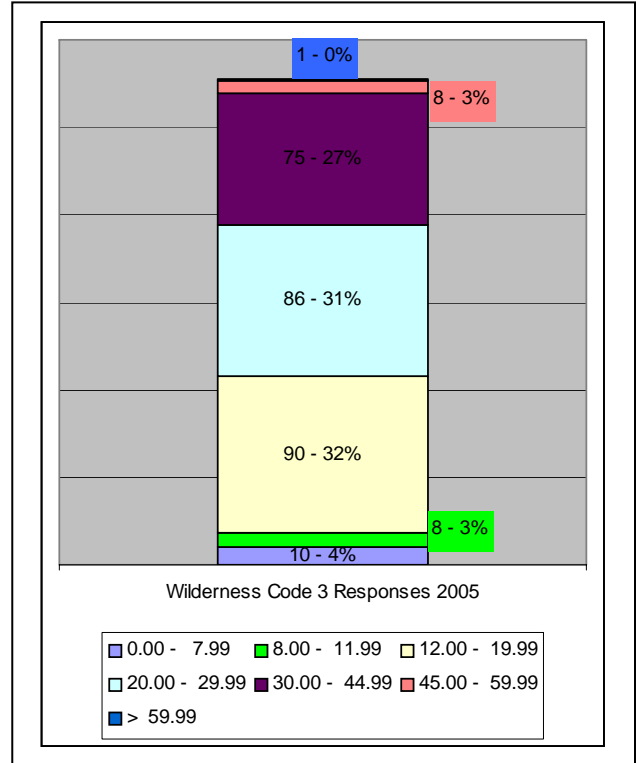
The chart below shows that the 90th percentile Code 3 response time for an ALS ambulance in the **suburban area** of Tuolumne County is 16:00 minutes with an average response time of 9.94 minutes. Suburban areas of Tuolumne County include the first response areas of Mono Village, Mono Vista, Crystal Falls, Cedar Ridge, Sonora CDF, Moccasin, Twain Harte, Tuolumne City, Columbia, Jamestown, Mi-Wuk/Sugarpine, Groveland and Columbia College.

Response Time Interval in Minutes (Suburban)	Code 3 Responses	% of total
00:00 - 07:99	836	37%
08:00 - 11:99	701	31%
12:00 - 19:99	587	26%
20:00 - 29:99	89	4%
30:00 - 59:99	20	1%
> than 1 Hour	5	0%
Minimum Response Time	0.00 minutes	
Maximum Response Time	75.00 minutes	
Average Response Time	9.94 minutes	
Standard Deviation	5.97 minutes	
90 percentile	16.00 minutes	
95 percentile	20.00 minutes	



The chart below shows that the 90th percentile Code 3 response time for an ALS ambulance in the **wilderness area** of Tuolumne County is 39:00 minutes with an average response time of 24.05 minutes. Wilderness areas of Tuolumne County include the Portions of the Immigrant Wilderness, Carson Iceberg Wilderness, Yosemite National Park, and the Cherry Lake Area.

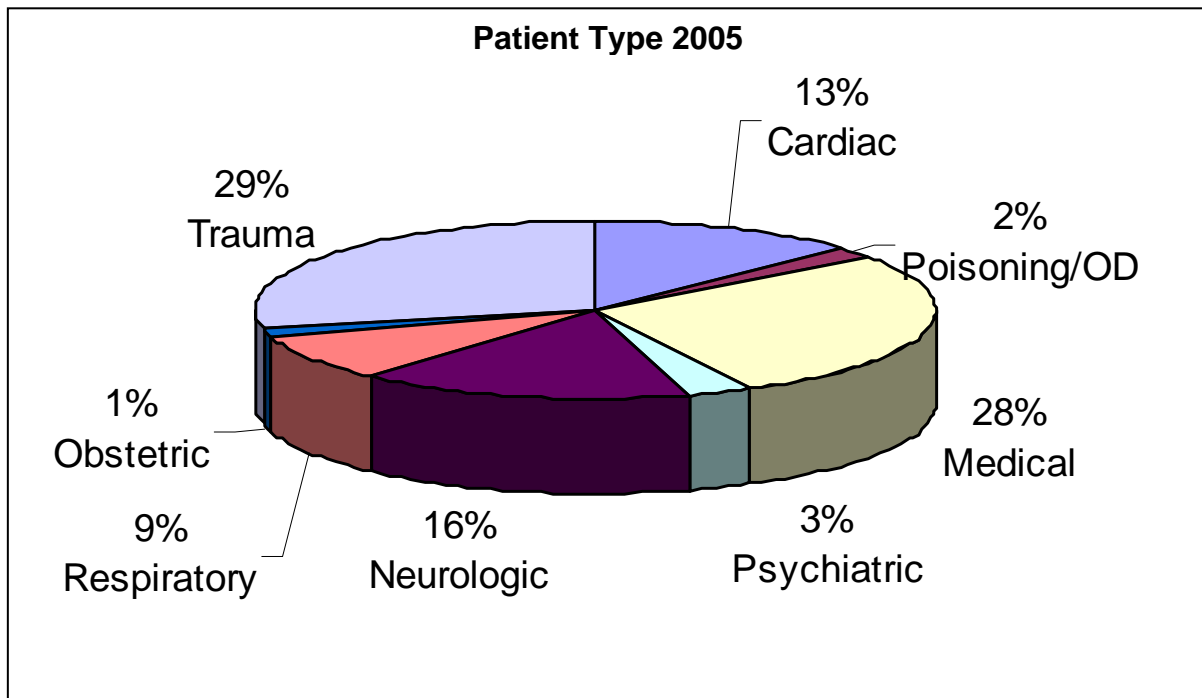
Response Time Interval in Minutes (Suburban)	Code 3 Responses	% of total
00:00 - 07:99	10	4%
08:00 - 11:99	8	3%
12:00 - 19:99	90	32%
20:00 - 29:99	86	31%
30:00 - 44:99	75	27%
45:00 - 59:99	8	3%
> than 1 Hour	1	0%
Minimum Response Time	0.00 minutes	
Maximum Response Time	61.00 minutes	
Average Response Time	24.05 minutes	
Standard Deviation	10.68 minutes	
90 percentile	39.00 minutes	
95 percentile	42.00 minutes	



PATIENT AND HOSPITAL DATA FOR SCENE REQUESTS

As in past years, patients with a traumatic injury represent the single largest patient category.

Primary Illness/Injury Type	Patients	% of total
Cardiac	602	13%
Environmental	12	0%
Medical	1283	28%
Neurologic	737	16%
Poisoning/Overdose	75	2%
Respiratory	399	9%
Obstetric	26	1%
Psychiatric	137	3%
Trauma	1348	29%



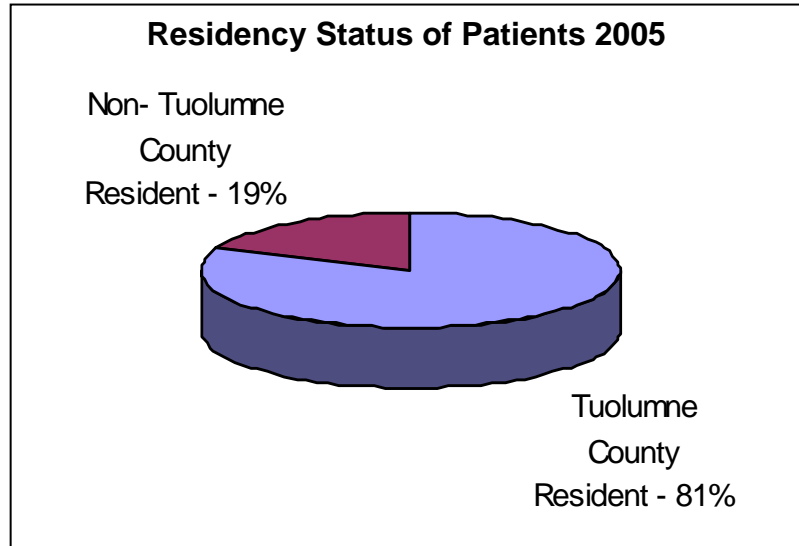
Source of EMS Service Requests

In 2005 a sampling of data shows that 81% of requests for EMS services are generated by people living in Tuolumne County and 19% are generated people who reside outside of Tuolumne County.

All Patients

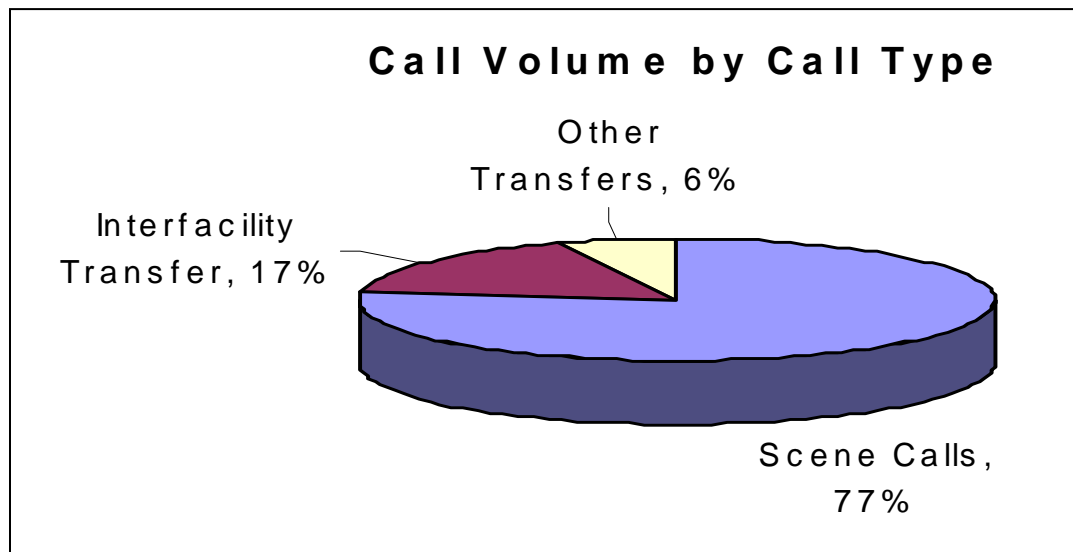
Residency Status	% of Number
Tuolumne County Resident	81%
Non- Tuolumne County Resident	19%

Service Request 2005 by Type



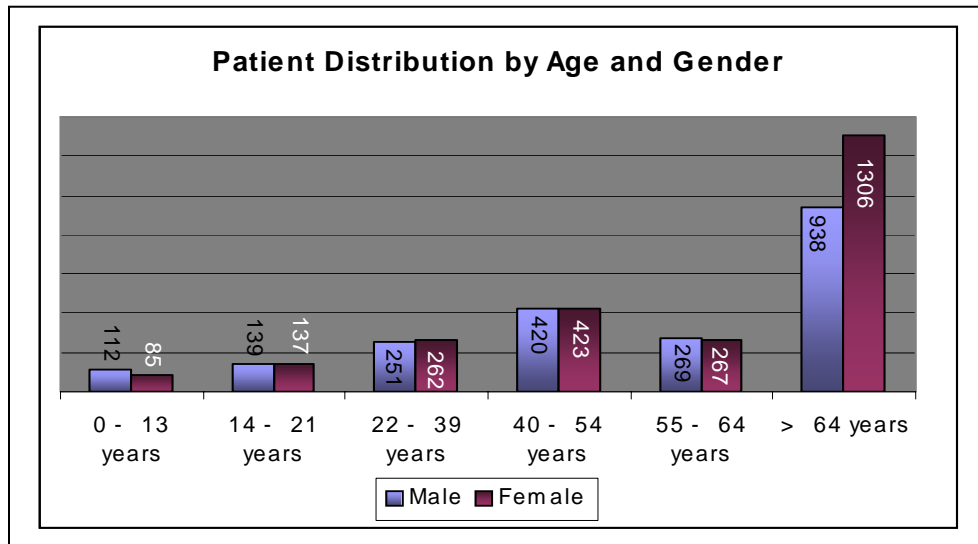
SCENE REQUESTS

In 2005 scene emergencies accounted for 77% of the total EMS requests for service. The remaining 17% of EMS requests for services consisted of ambulance interfacility transfers, air ambulance transfers from a hospital to a landing site, critical care transfers, and 6% transfers to and from a patient=s home to a hospital, transports for diagnostic service such transporting a patient for an MRI.

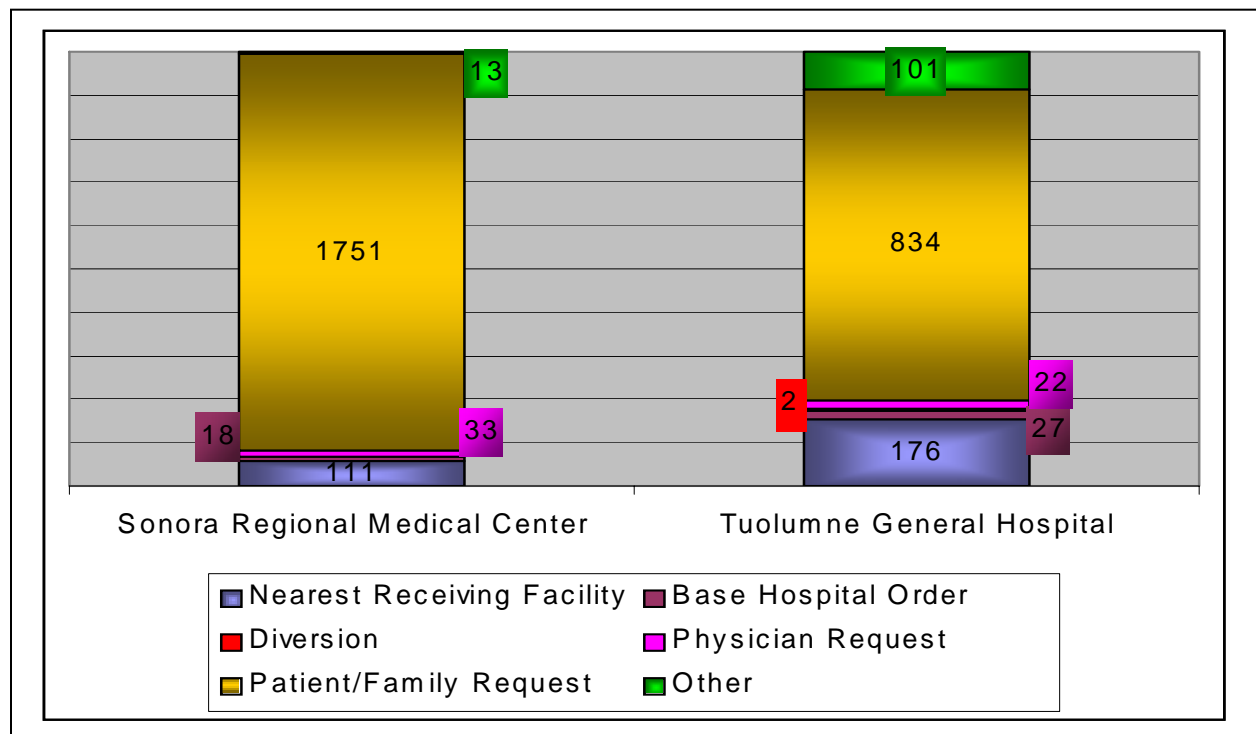


EMS Demographics

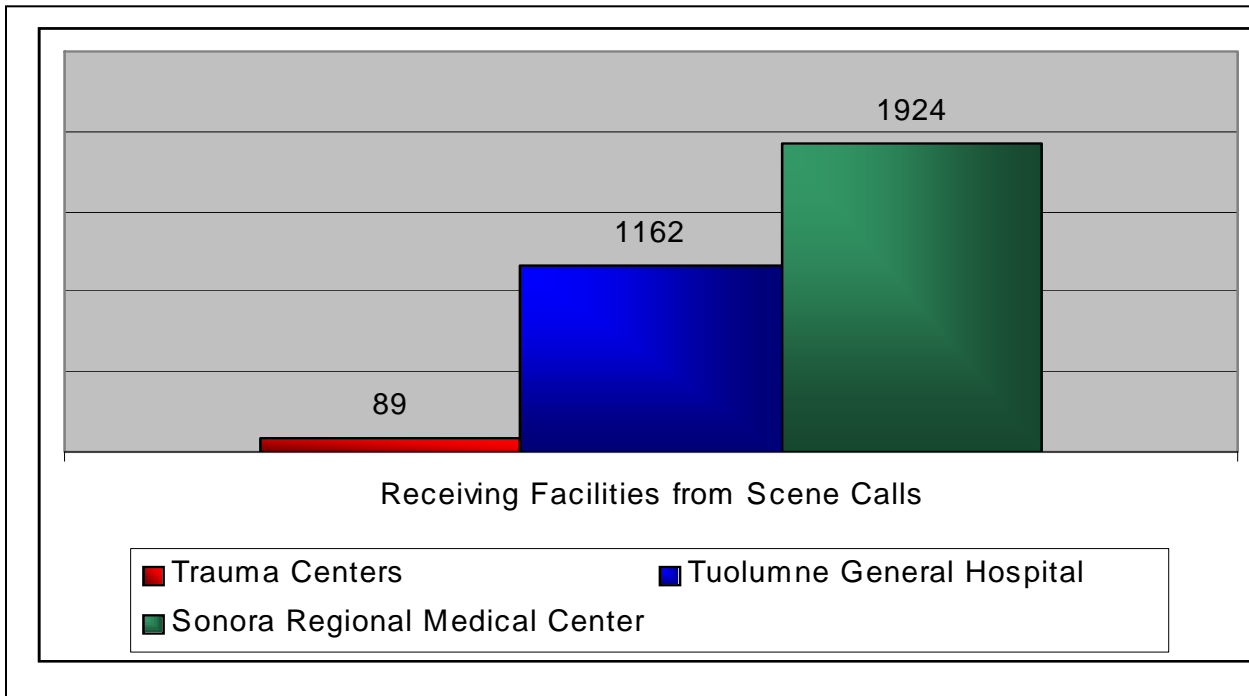
As the chart below shows, patients greater than 64 years of age are account for 49% of all scene requests and females account for 54% of all scene requests.



As shown in the chart below, for those patients transported to a hospital in Tuolumne County approximately 84% of all scene transports are made to the hospital of the patient=s or families' choice.



The chart below shows the patient distribution from scene calls by receiving facilities.

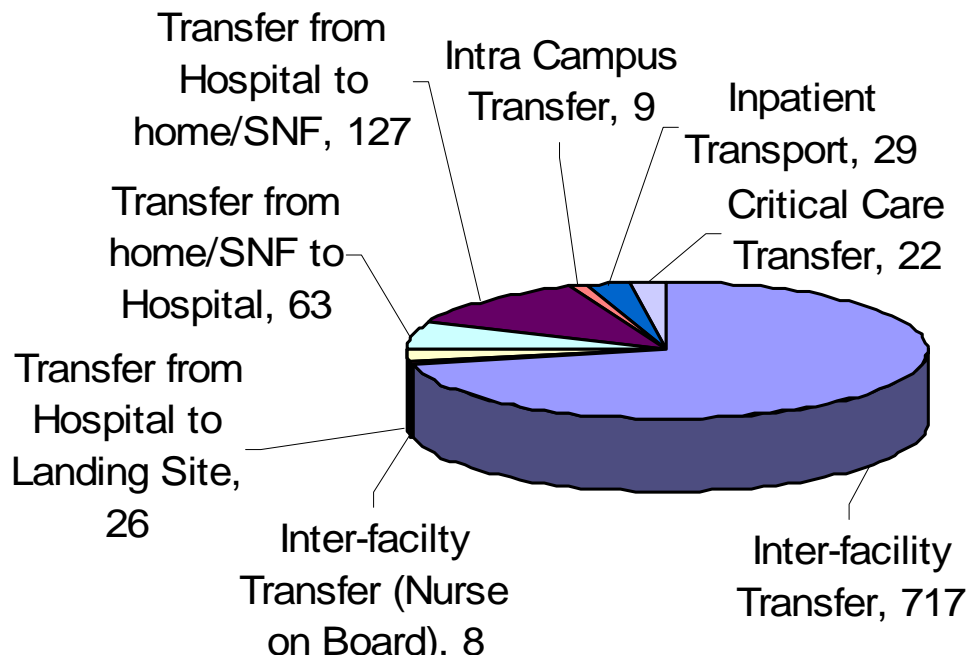


TRANSFERS

Transfers to or from hospitals accounted for approximately 23% of ambulance requests, with the inter-facility transfers making up the single largest non-emergency transport.

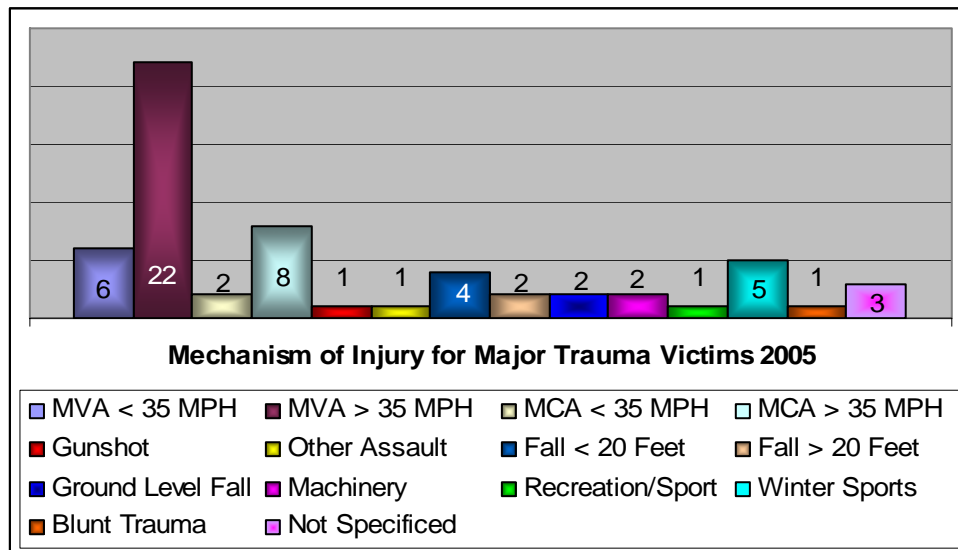
Call Type	Number	% of Total
Inter-facility transfer	717	72%
Inter-facility transfer with nurse	8	1%
Transfer from Hospital to Landing Site	26	3%
Transfer from home/SNF to Hospital	63	6%
Intra Campus Transfer	9	1%
Transfer from Hospital to SNF/Home	127	13%
Critical Care Transfers	22	22%
Inpatient Transfers	29	3%

Non Emergency Transfers



TRAUMA SYSTEM

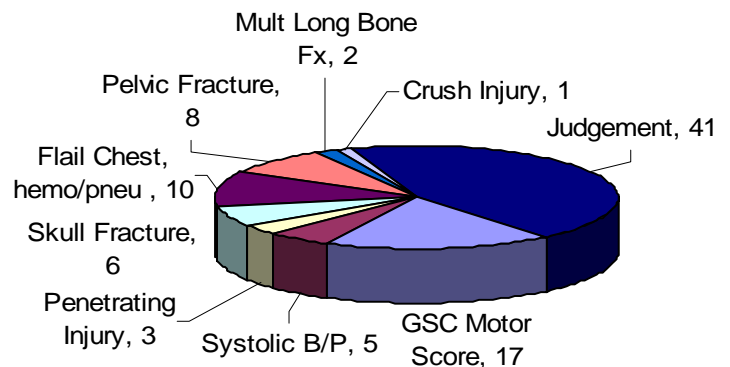
The chart below shows the mechanism of injury for major trauma victims in Tuolumne County in 2005. Motor vehicle accidents with speeds greater than 35 miles per hour are the greatest mechanism of injury for major trauma victims in Tuolumne County.



The Tuolumne County Trauma Plan has defined nine separate trauma triage criteria. The criteria is designed to capture those trauma patients with an increased risk of mortality and morbidity due to these injuries. Paramedic judgment was the criteria used 44% of the time.

Triage Criteria	Number	% of Total
GSC Motor Score	17	18%
Systolic B/P	5	5%
Penetrating Injury	3	3%
Skull Fracture	6	6%
Flail Chest, hemo/pneumo	10	11%
Pelvic Fracture	8	9%
Multiple Long Bone Fractures	2	2%
Crushing Injury	1	1%
Paramedic Judgment	41	44%

Major Trauma Patient by Triage Criteria



Trauma Demographics

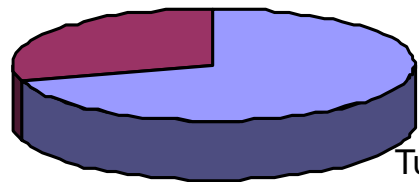
In 2005 a sampling of data shows that 70% of requests for EMS services due to trauma are generated by people living in Tuolumne County and 30% are generated people who reside outside of Tuolumne County.

Trauma Patients

Residency Status	% of Number
Tuolumne County Resident	70%
Non- Tuolumne County Resident	30%

Residency Status of Trauma Patients 2005

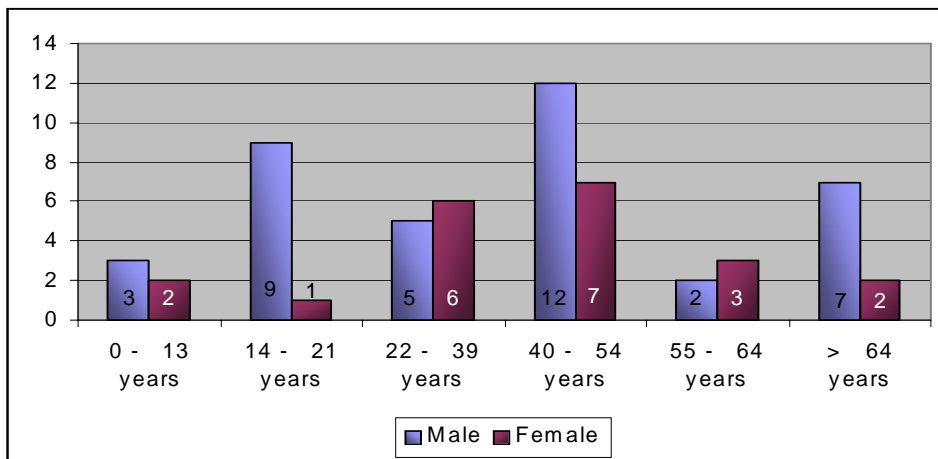
Non- Tuolumne County Resident - 30%



Tuolumne County Resident - 70%

As the chart below shows, trauma patients ages 40-54 are account for 32% of all scene requests and males account for 64% of all scene requests.

Major Trauma Patients by Age and Gender

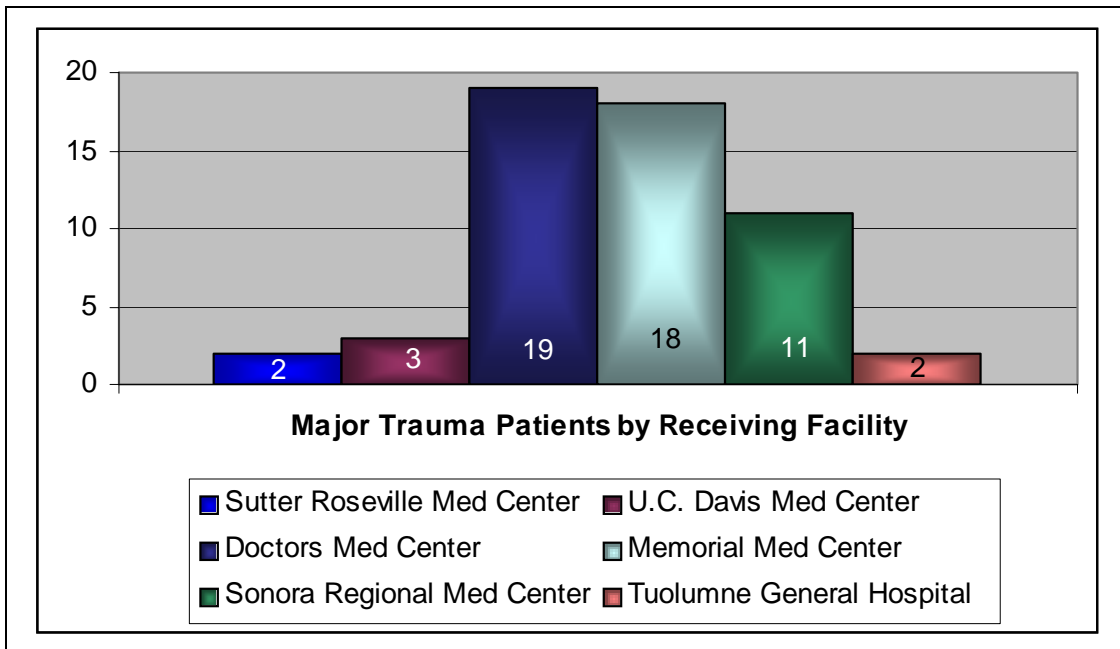


The Tuolumne County Trauma Plan has identified four major trauma patient destinations.

1. Doctors Medical Center (adult)
2. Memorial Medical Center (adult)
3. U.C. Davis Medical Center (adult & pediatric)
4. Central California Children's Hospital (pediatric)

However, under some circumstances major trauma patients may be taken to another Trauma Center, such as Sutter Roseville Medical Center, or one of our two local hospitals.

The majority of Tuolumne County's major trauma patients (37 – 68%) are flown to either Doctors Medical Center or Memorial Medical Center in Modesto; both are designated level two Trauma Centers.



ADVANCED LIFE SUPPORT SKILLS

Infrequently used skills are skills that are not likely to be used by a Paramedic once in a six month period of time.

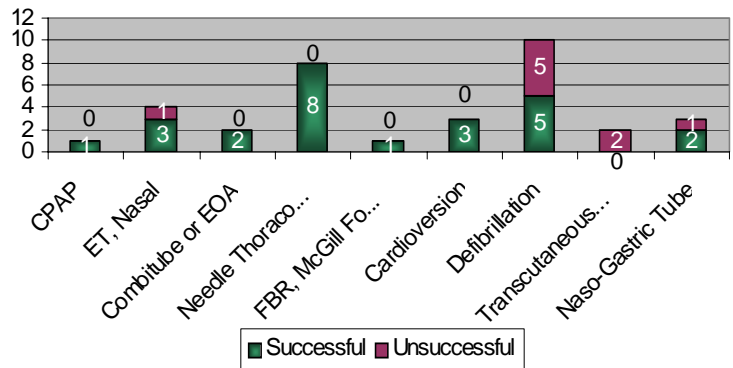
Infrequent Skills	# of Attempts	Success Rate
CPAP	1	100%
ET, Nasal	4	75%
Combi-Tube	2	100%
Needle Thorocostomy	8	100%
FBR, McGill	1	100%
Cardioversion*	3	100%
Defibrillation*	10	50%
TCP*	2	0%
NG Tube	3	66%

Commonly Used Skills are skills that are likely to be used by a Paramedic more than once in a six month period of time.

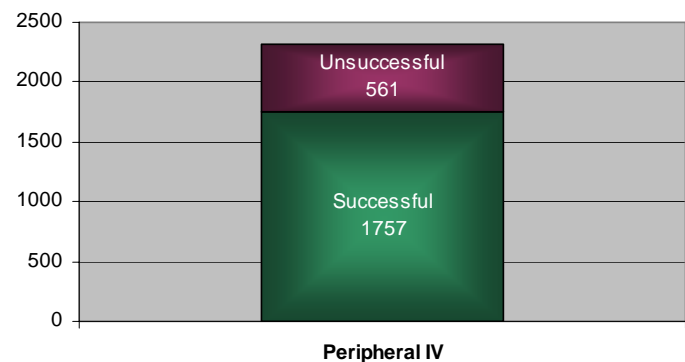
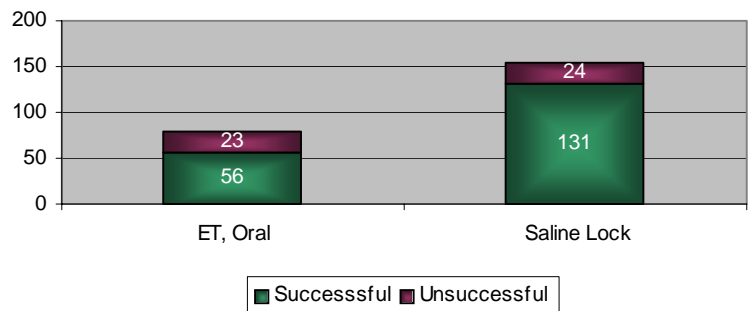
Common Skills	# of Attempts	Success Rate
ET, Oral	79	71%
Saline Lock	155	85%
Peripheral IV	2318	76%

* Cardioversion, Defibrillation, and Transcutaneous Cardiac Pacing (TCP) are considered successful when a change occurs in the patients' cardiac rhythm. The skill may be performed correctly, but if no change occurs it is considered unsuccessful.

Infrequently Used Skills

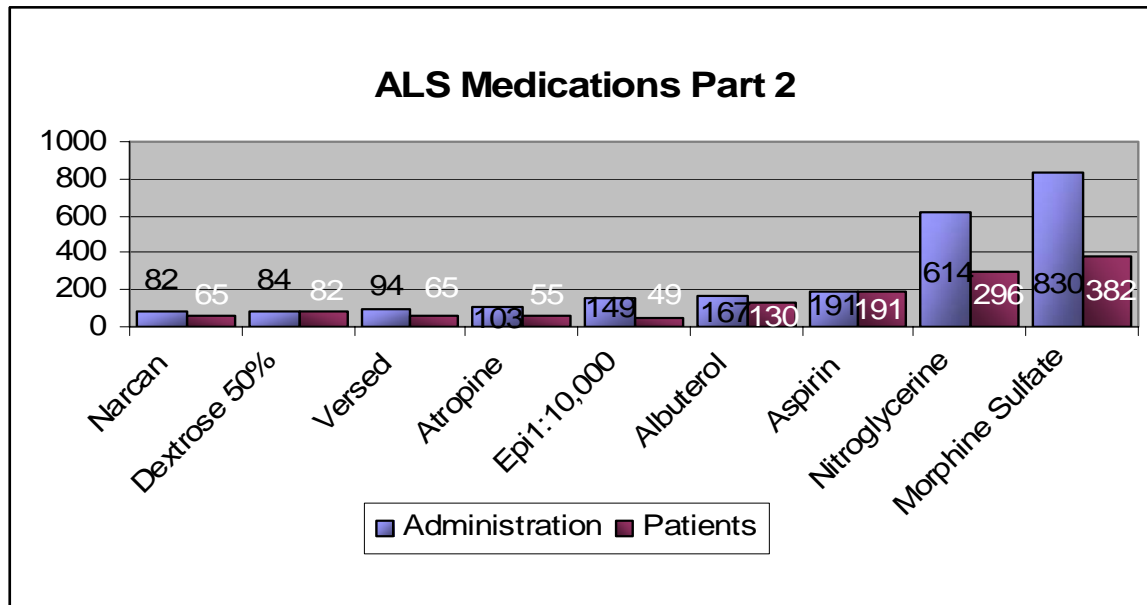
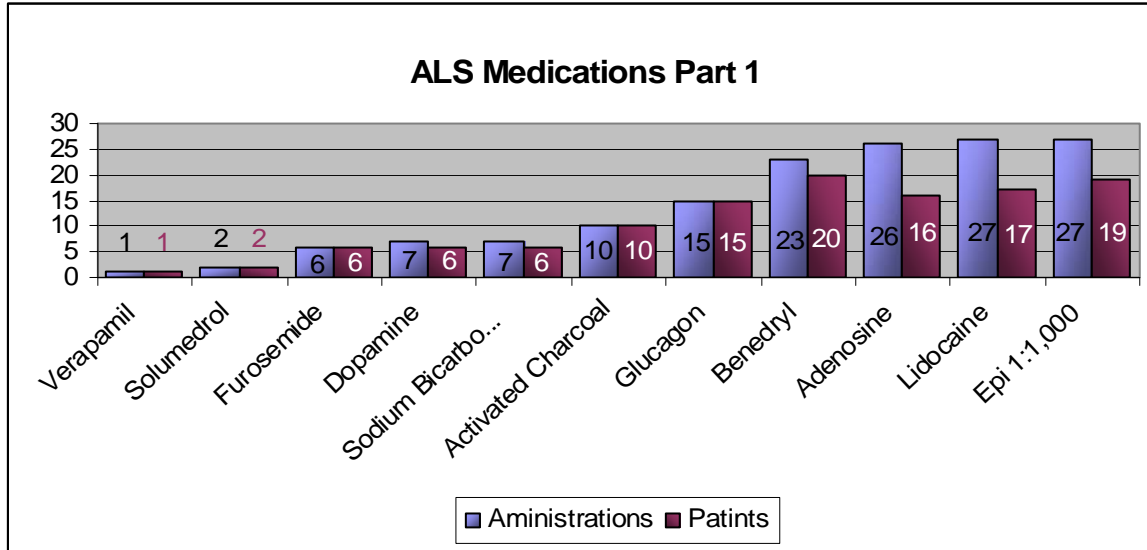


Commonly Used Skills



ADVANCED LIFE SUPPORT MEDICATIONS

The charts below represent the number of times a medication was given and how many patients it was given to.



SUMMARY

I would like to thank Tuolumne County Ambulance Service, Tuolumne General Hospital and Sonora Regional Medical Center for providing the data that made this report possible. I would also like to thank all of the First Response Agencies for the excellent service they provide to the County of Tuolumne.

The Tuolumne County EMS System remains a strong asset to the County and its citizens and visitors. Although the call volume has decreased slightly from last year the five year trend shows a general increase in calls for EMS service. The response times for scene calls have decreased since last years, delivering Advanced Life Support (ALS) to our patients faster. With the addition of a new ambulance station on Tuolumne Road, Tuolumne County Ambulance Service will have a more effective deployment pattern; I anticipate that response times will continue to decrease. The recent addition of CPAP has increased the capabilities of Paramedics to treat patients in respiratory distress; Tuolumne County Ambulance Service is only the second ground based ALS provider in the State of California to implement CPAP.

The changing environment of the upcoming years will afford us many opportunities to improve the EMS System. Changes in the American Heart Association recommendations for treatment cardiac arrest patients will require updating of treatment guidelines, training practices, and equipment. The unavailability of Valium and Bretylium has forced changes in the local scope of practice for Paramedics. These and many other pending issues will greatly affect the delivery of emergency medical services in the County of Tuolumne.