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The Development and Organization of Ambulance  
Services in New Jersey

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THE DEVELOPMENT AND ORGANIZATION  
OF AMBULANCE SERVICES  
IN NEW JERSEY

MAJOR REPORT PREPARED FOR  
THE GEORGE WASHINGTON UNIVERSITY

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## SCOPE

The purpose of this study is to determine what types of ambulance services are provided in the State of New Jersey and the extent of their operations.

The study is limited to:

1. An historical account of the development of ambulance services, with particular emphasis on its development in New Jersey,
2. A description of the operation of the various types of ambulance services,
3. A tabulation of pertinent facts, about New Jersey ambulance services, obtained through answers to a mailed questionnaire.

Investigation was limited to:

1. An examination of readily available literature from journals, magazines, books, bulletins, the press, and research reports about ambulance services,
2. Interviews with selected key personnel in ambulance service organizations,
3. Tabulation of the results of a questionnaire sent to ambulance services in New Jersey,
4. Participation for one week as an active member of a selected rescue squad.

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## INTRODUCTION

### Earliest Developments of Ambulance Services

"And the archers shot at King Josiah, and the King said to his servants, 'Have me away, for I am sore wounded.' His servants, therefore, took him out of that chariot and put him in the second chariot that he had: and they brought him to Jerusalem..."

This extract from the Old Testament Books of the Chronicles might be the first recorded account of a vehicle being used for the transportation of the wounded. But it will be noted that no particular vehicle had been designed for the injured and the one used by King Josiah was probably a second combat chariot.

Progress in the design of vehicles used to transport the injured was slow through the centuries. Although American Indians used a stretcher arrangement of two poles pulled by a horse, the first true ambulance did not come into being until the closing years of the eighteenth century. Baron Dominique Jean Larrey first conceived the idea of an organized ambulance service while serving in Napoleon's Grand Armee when war broke out in 1792.<sup>1</sup>

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<sup>1</sup>H. H. Haynes, "Ambulance Service: Its Growth and Modern Development," Hospitals (London), XLVI (February, 1950), 109-114.

While serving with the Army of the Rhine he introduced his "ambulances volances" (flying field ambulances). Being drawn by two horses, the ambulances were capable of giving the most efficient and expeditious care yet known to the injured.

### First Modern Ambulance System

The American Civil War marked the beginning of the modern ambulance system.<sup>2</sup> At the time, any available means of transportation was used -- animal drawn carts, boats, trains, pack animals, and handcarts. The idea for an ambulance corps was conceived in the field by Jonathan Letterman in 1862 and endorsed by Congress in an act dated March 2, 1865. Letterman, Medical Director for the Army of the Potomac, planned an ambulance service for each army corps which was to be under the sole control of the medical director. His plan was first used in the Battle of Antietam in September, 1863. In this battle 300 ambulances were used to collect and shelter 10,000 casualties in twenty-four hours. Two types of horse drawn ambulances were used -- the two-wheeler nicknamed "avalanche," because they drastically jolted the sick and injured, and the more merciful four-wheeler.<sup>3</sup>

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<sup>2</sup>G. T. Curry, "The Immediate Care and Transportation of the Injured," Bull. A.C.S., XLII, (January-February, 1959), 32-.

<sup>3</sup>George W. Adams, Doctors in Blue, (New York: Henry Schuman, 1952), 63.

## Hospital Ambulances

Hospitals soon adopted the idea of ambulances for use in peacetime. In the 1890's large New York hospitals such as the Bellevue, New York, Roosevelt, Presbyterian, and others had horse-drawn ambulances. One of the first horseless ambulances, electrically driven, was acquired by Presbyterian Hospital in New York City.<sup>4</sup> The ambulance ran beautifully down hill, but when the grade was upward the driver frequently had to send for Chester. Chester was a horse kept in readiness at the hospital for such an eventuality.

The honor of having the first automobile ambulance used in this country can be claimed by Chicago. The New York Herald, under a Chicago dateline of February 24, 1899, carried the following news item.

"The first automobile ambulance ever constructed was presented today to Michael Reese Hospital of this city. It was built in Chicago and was the gift of five prominent businessmen. The ambulance weighs 1600 pounds and its speed approximates 16 miles per hour."

Shortly thereafter, St. Vincent's Hospital in New York City acquired a horseless ambulance. Ambulances, for the most part, continued to be horse drawn until advances were made in the design and production of motor driven vehicles. Most major hospitals then purchased ambulances and assumed the responsibility for the transportation of the sick and injured.

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<sup>4</sup>G. T. Curry, "Evolution of the Ambulance: From Horse to Horsepower," Trustee, XII, (1959), 28-29.

### Volunteer Squads in New Jersey

For the past century, New Jersey ambulance services have been assumed by volunteer groups, except in some large cities and government hospitals. As will be noted in the chapter on hospitals, there are five New Jersey voluntary hospitals still operating ambulance services. It seems fairly safe to state that the eventual organization of volunteer groups in those areas will bring a closing note to ambulance services operated by voluntary hospitals.

#### Belmar First Aid Squad

The Belmar First Aid Squad was the first volunteer ambulance squad formed in the nation.<sup>5</sup> According to William Briden, charter member of the Belmar First Aid Squad and secretary for the past twenty-five years; a fire supplied the initiative to organize a new service. A policeman, who was trapped in a burning building, severed an artery in his efforts to escape through a glass window and needed immediate first aid and transportation to a hospital.

The incident prompted the late Charles R. Measure, who operated an ambulance in World War I, and Arthur Davenport, who was then Fire Chief, to arrange for weekly instruction with the late Dr. Daniel Traverso and Frank W. Pyanoe.

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<sup>5</sup>Asbury Park Press, January 7, 1962, p. 4.

Although the squad was incorporated in 1927, it acquired its first "ambulance", a ton and a half motor truck equipped with a cot, first aid kits, and an inhalator, in 1928 through the efforts of 12 year old Frank Mihlon, Jr. The youth read an article in the Asbury Park Press which gave an account of the squad's work in resuscitating a West Asbury Park boy who had been overcome by gas. The late Frank Mihlon, Sr. was asked by his son to donate a vehicle which cost \$1,500. Mr. Mihlon later completely uniformed the squad and donated land at 9th Avenue and D Street in Belmar, New Jersey where their first aid headquarters was erected in 1929. It now consists of a three-bay garage, meeting room, emergency treatment room, kitchen, boiler room, and storage room.

In 1928-29, its first full year of operation, the Belmar Squad stood alone. It answered calls from Perth Amboy to Barnegat. That year there were nine hundred calls. During 1960 the squad, which now limits its activities to Belmar except for emergencies, answered approximately three hundred twenty-five calls.

#### New Jersey State First Aid Council

In 1928, ten squads in the shore area met to organize a first aid council. This was the beginning of the New Jersey State First Aid Council. The Council now has over three hundred members throughout the state.

## CHAPTER I

### HOSPITAL AMBULANCE SERVICES

Questionnaires were sent to every hospital in the State of New Jersey to determine how many hospitals still maintain an ambulance service and to obtain information on the extent of their ambulance operations. Of these, 67 returns were received. This is 50% of the total and it can be presumed that hospitals without an ambulance service thought that any sort of reply would be of little value.

From the returns, only 15 hospitals stated that they provided this service while 52 did not. Of those reporting no ambulance service, 35 specifically mentioned the use of local volunteer rescue or first aid squads. The local police and private ambulance corps were mentioned 4 times.

It became apparent that voluntary hospitals preferred to have volunteer ambulance organizations accept this responsibility. Four hospitals discontinued ambulance services slightly over a year ago while 3 terminated their ambulances 2 years ago.

One interesting development is that 3 hospitals in Patterson, New Jersey have contracted the service to a



private concern. By referring to the Membership Directory of the New Jersey State First Aid Council, Incorporated, the reason for the contracting became obvious. There are no volunteer squads operating in the City of Patterson.

All Jersey City and Orange, New Jersey hospitals must rely upon private ambulance services due to the lack of volunteer groups; although 2 hospitals also maintain their own ambulance service.

Of the 15 hospitals having an ambulance service, 5 of them maintain it solely for use on hospital property. three of the hospitals are psychiatric institutions, 1 is a training school for the retarded, and the fifth is a hospital for contagious diseases. The number of hospitals which responded to calls outside of hospital property is therefore lessened to 10. They are also the ones which completed the questionnaire.

#### Hospital Ownership

The voluntary hospitals account for the greatest number of hospitals operating an ambulance service.

TABLE 1.--Ownership of hospitals answering the questionnaire

Ownership	Number
Voluntary Hospitals .....	5
City Hospitals .....	3
Army Hospital .....	1
Veterans Administration .....	1

#### Reasons for Ambulance Services

It is of interest to note the reasons for the

hospitals to have an ambulance service. One hospital has lost the reason in history while 3 state that it is a necessary part of complete medical service. The youngest hospital admitted that it had the service because no local ambulance service was available. The military hospital has an ambulance corps to satisfy military requirements. One of the city hospitals, Margaret Hague Maternity Hospital in Jersey City, organized an ambulance service to bring maternity patients to the hospital.

#### Population of Areas Served

A breakdown by population shows that most of the hospitals with ambulance services are located in highly populated areas.

TABLE 2.--Population of areas served by hospitals with ambulance services

Ownership	Population
Army .....	17,000
Voluntary .....	50,000
Voluntary .....	75,000
Voluntary .....	120,000
Voluntary .....	200,000
Voluntary .....	266,000
City .....	280,000
Voluntary .....	400,000
City .....	1,000,000
City .....	Entire State
Veterans Admin. ....	

#### Square Miles of Service

The army hospital was excluded from the table, since its ambulances may have to transport patients to any military hospital in the States of New Jersey, New York, or Pennsylvania. Nevertheless, the other hospitals

vary in area of service from 12 to as many as 226 square miles.

TABLE 3.--Number of square miles serviced by each hospital

Ownership	Sq. Miles
Voluntary .....	12
City .....	24
Voluntary .....	70
City .....	112
City .....	226

#### Average Wait for Ambulance

Statistics on the length of time it takes for an ambulance to reach the patient are few since 2 hospitals do not keep the statistical figures. The army hospital is primarily used for transportation making speed of minor importance. Two hospitals, however, both city owned, reported that it takes anywhere from between a few minutes to a half hour to reach the patient. The remaining, 4 voluntary and 1 city hospital, averaged 10 to 12 minutes for emergencies and between 12 and 20 minutes for "routine" calls.

#### Individuals Requesting Ambulances

A hospital will accept calls from anyone in need of an ambulance or seeing the need for one. The purpose of the table, appearing on the next page, is therefore only to show those parties which hospitals consider as their main source of requests.

TABLE 4.--Parties usually requesting ambulances

Ownership	M.D.	Police	Hosp.	Other
Voluntary	.....	.....	.....	Anyone
Voluntary	.....	.....	X	.....
Voluntary	X	.....	X	.....
City	.....	.....	X	.....
City	.....	.....	.....	Anyone
City	.....	.....	.....	Anyone
Army	.....	.....	.....	Army Base
Vet. Admin.	.....	.....	.....	Med. Off.

Central Dispatcher

A central dispatcher is the individual or office responsible for dispatching an ambulance when calls are received. This system is in effect in 8 of the 10 hospitals.

TABLE 5.--Parties dispatching ambulances

Ownership	Dispatcher
Voluntary	Switchboard Operator
Voluntary	Switchboard Operator
Voluntary	Admitting Officer
Voluntary	Outpatient Department
City	Hospital Dispatcher
City	Admitting Officer
Army	Emergency Desk
Vet. Admin.	Garage Supervisor

Type of Calls

Only 2 hospitals kept any monthly statistical record of the type of calls to which they responded. One hospital listed the total as 80 for December of 1961 while the army hospital listed their 8 emergency calls as: automobile - 2, fractures - 3, and cardiac - 3.

Type of Treatment

Only one hospital ambulance service provided more

than immediate first aid. That hospital stated that a nurse may give morphine or demerol.

### Educational Requirements

The educational requirements for ambulance personnel vary but the greatest reliance is placed upon in-service training.

TABLE 6.--Educational requirements of drivers and attendants

Ownership	Requirements
Voluntary .....	In-Service
Voluntary .....	In-Service and Week of Orientation
Voluntary .....	Advanced Red Cross
Voluntary .....	Must be a Nurse
Voluntary .....	Advanced Red Cross
City .....	In-Service
City .....	In-Service
City .....	Advanced Red Cross
Army .....	Must be a Corpsman
Vet. Admin. ....	Civil Service

### Governmental Regulation of Training

The city hospitals have training regulated by their local governments while the voluntary hospitals are free from external regulation. The Veterans Administration prescribes the training of their own ambulance crews.

### Composition of Crews

The composition of ambulance crews usually consist of a driver and attendant or driver and an intern. This may change in the same hospital, however, as availability of personnel fluctuates. The following table shows combinations which are used most frequently, rather than

the number of hospitals adhering to a particular combination.

TABLE 7.--Composition of crews

Combination	No. of Hosp.
Driver and Intern .....	4
Driver and Attendant .....	3
Driver, Attendant and R.N. ....	2
Driver, Attendant, M.D. and R.N. ...	1

Seven hospitals have 2 people assigned to an ambulance, 2 have 3 people, and 1 hospital requires 4.

#### Use of Females

Five hospitals never assign females to an ambulance. Three hospitals assign nurses, 1 hospital used females only when it was known ahead of time that the patient was a female, and the last hospital makes exception for female interns.

#### Traffic Regulations

Research studies have proved that the speed of the ambulance neither quickens the patient's recovery nor prevents his death. The hospitals were therefore asked whether or not they were exempt from traffic regulations. Seven reported that they were not exempt. One hospital's ambulance may speed when accompanied by a police escort. The ninth hospital's ambulance is exempt from all regulations with the following restrictions: cannot travel faster than 35 miles per hour; must make a complete stop before going through a red light; and must slow down at

all stop signs.

### Safety Equipment

Flares are an effective device for warning oncoming cars of danger. However, only 2 hospitals reported using flares while at the scene of an automobile accident.

The Automotive Crash Research Program at Cornell University proved through experiments that serious and fatal injuries were reduced more than 1/3 by the use of seat belts.<sup>1</sup> Even with proof of their advantages, they are not widely used. Seven hospitals have restraining straps on ambulance cots, safety belts are used by one hospital, and 2 do not use either safety belts or straps.

### Vehicles Used by Hospitals

The 10 hospitals have a total of 20 ambulances among them. Seven have 1 ambulance each, 1 hospital has 2, the military hospital has 5, and the metropolitan maternity hospital has 6.

There are different makes of ambulance available. Of the 20 ambulances, 12 are Cadillacs, 3 are Internationals, 3 are General Motors Corporation, and 2 are Pontiacs.

The average age for 18 ambulances is 3½ years old. The oldest ambulance in operation is 6 years old. The age for 2 ambulances was not given.

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<sup>1</sup>National Safety Council, Public Health Service, and American Medical Association, "Seat Belts Save Lives," National Safety Council: Chicago, "n.d."

Equipment

The preparedness of hospital ambulances to provide the necessary aids in major accidents and disasters was determined by listing 7 items of importance. The following table lists various items and the number of hospitals which keep them on their ambulances.

TABLE 8.--Equipment carried by ambulances

Item	No. of Hosp.
Dressings .....	9
Splints .....	9
Oxygen .....	9
Hemorrhage Controls .....	8
Resuscitator .....	8
Fire Equipment .....	4
Two-way Radio .....	2

Each of the two-way radios, used by two hospitals, is set on a police frequency.

Average Investment in Ambulance Services

The average investment of the 5 hospitals which attached a monetary value to their ambulance service amounts to \$7,400.



## CHAPTER II

### VOLUNTEER SQUADS

The 1961 Membership Directory of the New Jersey State First Aid Council lists over 300 volunteer squads.<sup>1</sup> By February 19, 1961, 125 of them had returned completed questionnaires.

This chapter includes all volunteer rescue and first aid squads<sup>2</sup> other than those directly affiliated with police or fire departments. Since these squads comprise the largest category, most replies to the survey (113) came from this group.

One hundred eight of the independent volunteer squads are eleemosynary corporations with the rights and privileges specified by the laws of New Jersey. Of the four that are privately owned, 1 was originally the private service of a funeral director who, because his ambulance was in great demand, turned its operation over to an American Legion post.

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<sup>1</sup>New Jersey State First Aid Council, "Membership Directory," February 10, 1961.

<sup>2</sup>The word "squad" is used throughout this chapter to include volunteer first aid and rescue squads.

### Rate of Growth

The development of the independent voluntary movement was steady through the 1930's and 1940's. The greatest number of squads, 30, organized between 1950 and 1955. Although ample statistics are not available for the 1960's, discussion at council and district meetings of the New Jersey State First Aid Council indicates that the formation of volunteer squads will continue at its previous rate of growth.

TABLE 9.--Rate of growth

Years of Organization	No. of Squads
1930-1934 .....	10
1935-1939 .....	22
1940-1944 .....	16
1945-1949 .....	14
1950-1954 .....	30
1955-1959 .....	16
1960-1961 .....	4

### Reasons for Organizing

Undoubtedly, the prime reason behind the formation of each squad was the desire to perform a public and humanitarian service to individuals in need of aid. The Table which follows simply lists the factors which dramatized the need for an ambulance service and the different expressions of the service motive.

To satisfy a need was the reason given by 36 squads while the word "provide" is contained in the explanations of 43 squads.

TABLE 10.--Reasons given by squads for organizing

Reason	No. of Squads
There was a need for a rescue squad. .	36
To provide a community service. ....	15
To provide first aid. ....	13
The town's growth demanded its own ambulance service. ....	9
To provide free service. ....	9
The hospital was too distant to pro- vide proper emergency service. ....	6
To relieve fire and police departments of first aid responsibility. ....	4
Local hospital eliminated its ambu- lance service. ....	3
Another squad discontinued operations.	2
To take care of highway accidents. ..	1
Ambulance service was turned over to the American Legion by a funeral director. ....	1
Double drowning in the Delaware River dramatized the need for a first aid squad. ....	1
To recover objects lost underwater. .	1
Started as a branch of the Fire Depart- ment. ....	1
Money was given to the town with the stipulation that a voluntary ambu- lance service be started. ....	1
Started as a unit of the Civil Defense	1
Summer burden became too great for one squad. ....	1
Local Red Cross disbanded their Ambu- lance Corps. ....	1
Was requested by town officials. ....	1
Neighboring squads became too busy. .	1

Population of Area Served

Eighty per cent of the squads are in cities with populations that number less than 20,000 while those with populations of 10,000 or less account for 52% of the squads.

TABLE 11.--Population serviced by each squad

Population	No. of Squads
Under 5,000 .....	23
5,000 - 9,999 .....	32
10,000 - 14,999 .....	15
15,000 - 19,999 .....	14
20,000 - 24,999 .....	6
25,999 - 29,999 .....	6
30,000 - 34,999 .....	2
35,000 - 39,999 .....	2
40,000 and over .....	5

There are 7 squads located in resort communities with populations which vary between the winter and summer months, thus necessitating a change in squad activities. They are listed separately to maintain the validity of Table 11.

TABLE 12.--Population changes in resort cities served by squads

Winter	Summer
800 .....	10,000
1,000 .....	15,000
3,000 .....	20,000
6,000 .....	10,000
9,000 .....	60,000
18,000 .....	100,000
18,000 .....	100,000

#### Square Miles of Service

When the squads were asked how many square miles compose their service areas, many considered only their own city limits. Squads will, however, transport patients outside their immediate areas. This may explain why 15 squads listed service areas of over 50 square miles.

TABLE 13.--Number of square miles serviced by each squad

Sq. Miles	No. of Squads
Under 5 .....	31
5 - 9 .....	20
10 - 14 .....	12
15 - 19 .....	5
20 - 24 .....	6
25 - 29 .....	6
30 - 34 .....	4
35 - 39 .....	1
40 - 44 .....	1
45 - 49 .....	3
50 and over .....	15

Average Wait for Ambulance

The nature of the call has no bearing on how long it takes to reach the patient for 52 squads. Faster service for emergencies than for routine calls is claimed by 42 squads. The variance may be the result of individual interpretation of the word "routine." Some might have considered this word to mean minor injuries, other squads could have been referring to known transportation cases.

TABLE 14.--Average time spent reaching the patient by squads not differentiating between emergency and routine calls

Minutes	No. of Squads
4 .....	6
5 .....	9
6 .....	3
7 .....	6
8 .....	2
9 .....	3
10 .....	9
Over 10 .....	14

Those squads which differentiate between calls responded quicker to emergencies than routine calls. The average time to reach the patient on emergency calls is 5.8 minutes.

TABLE 15.--Time spent reaching patients on emergency calls

Minutes	No. of Squads
2 .....	1
3 .....	6
4 .....	6
5 .....	12
6 .....	3
7 .....	8
8 .....	1
9 .....	1
10 .....	5
11 .....	0
12 .....	1

On the average, more time is spent responding to routine calls than emergency calls. Excluding those squads taking longer than 15 minutes, the average is 10.3 minutes on routine calls.

TABLE 16.--Time spent reaching patients on routine calls

Minutes	No. of Squads
5 .....	3
6 .....	2
7 .....	5
8 .....	2
9 .....	2
10 .....	10
11 .....	1
12 .....	4
13 .....	1
14 .....	0
15 .....	9
More .....	5

### Individuals Requesting Ambulances

Many squads will accept calls from any individual or agency in the community. Only 22 rely upon one group of individuals--mainly police officer and/or physician. Table 18 shows that when all squads are combined to arrive at a figure showing the individuals usually requesting an ambulance, the physician and police rank nearly equal.

TABLE 17.--Number of squads accepting calls from one or more individuals

Accepted From	No. of Squads
Anyone .....	47
Physician or Police .....	31
Police Only .....	15
Physician or Civilian .....	9
Physician Only .....	7
Police or Civilian .....	1
Police or Fire Dept. ....	1

TABLE 18.--Individuals most frequently requesting an ambulance

Individual	No. of Squads
Police .....	95
Physician .....	94
Civilian .....	57
Fire. Dept. ....	1

### Central Dispatcher

Few squads have their headquarters manned around the clock. Therefore, they rely upon others (refer to Table 19) in the community to accept their calls and contact members of the squad. Since a police department usually operates on a 24 hour basis, this constant

coverage explains the reason why most calls are handled through police headquarters.

TABLE 19.--Individuals and organizations acting as central dispatchers

Dispatcher	No. of Squads
Police .....	64
Specific squad members .....	11
Squad Dispatcher .....	7
Answering Service .....	5
Fire Department .....	4
A local business .....	2
Funeral Home .....	1
Taxi Co. or Police .....	1
Police or Fire Dept. ....	1

TABLE 20.--Methods used by the police to notify squad of a call

Device	No. of Squads
Siren .....	13
Phone Call .....	8
Police Radio .....	7
Phone Relay .....	4

Central Dispatchers, other than police, notify squads by the use of sirens, phone calls, and multiple phone extentions.

#### Type of Calls

Squads answered an average of 55 calls for the month of December, 1961. A large proportion of the calls were for transportation to and from hospitals and physicians' offices. A compilation of specific illnesses was tabulated in order to determine those medical-surgical conditions most commonly attended to by squadmen.



TABLE 21.--Conditions treated by squadmen

Condition	Total No.
Cardiac Cases .....	596
Lacerations .....	468
Fractures .....	350
Maternity .....	231

The above figures do not represent a complete total for the 68 squads completing the section on medical statistics, since many maintained different statistical categories. It is apparent that automobile accidents constitute a large portion of calls because a total of 525 were responded to in one month.

#### Type of Treatment

Squads generally do not provide treatment other than first aid. Occasionally it is absolutely necessary for squadmen to deliver a baby. Oxygen is administered for asthma and cardiac conditions. Some squads maintain a supply of canes, crutches, and hospital beds to lend to patients. Only one squad administers blood; and this is done only under the direction of a physician.

#### Educational Requirements

Squads generally maintain an active educational program and establish minimum standards for its members. Although a few squads may consider only a standard Red Cross card as a basic requirement, most squads find it beneficial to require advanced training.

TABLE 22.--Minimum educational standards required by each squad

Minimum Standard	No. of Squads
Advanced Red Cross and In-Service Training .....	45
Advanced Red Cross .....	45
Standard Red Cross .....	8
Red Cross and In-Service Training ...	5
Advanced Red Cross, In-Service Training, N.J. State First Aid Council Certificate .....	4
In-Service Training .....	2
Advanced Red Cross and Instruction at the First Aid Medical College at Bergen Pines .....	1
Common Sense .....	1
Advanced Red Cross and Civil Defense Training .....	1

#### Cadet Program

Thirty-three squads have a cadet program. A cadet is a young man who desires to become a senior member upon reaching 21 years of age. The Plainfield Rescue Squad, one of the largest and most active in the state, has the following program outlined for its cadets.

A candidate must be at least 16 years of age before being recommended by a senior member. After passing a physical examination and completing a review of his background qualifications, the cadet begins his first aid education. The basic requirement is a standard first aid card, which is earned by attending five classes of two hours each. The use and operation of oxygen tanks, resuscitators, spine boards, and other equipment carried by ambulances is explained, as well as special techniques used by the squad.

During this stage of training, the cadet takes shifts with senior members and assists them by performing such tasks as carrying equipment and keeping records.

The next step is that of a probationary member. The probationary period gives the future senior member an opportunity to further increase his knowledge of first aid, procedures, and techniques. Without a cadet program, those under the age of 21 would not be allowed to participate in squad activities for state law requires that senior aidmen must be 21 years old.

The cadets have their own constitution and officers, but are under the close guidance of senior members.

#### Governmental Regulation of Education

Twelve squads claimed to have their training regulated by the county. After additional research, it became doubtful that there actually were any regulations imposed by the county upon these squads. They were found to be located in 6 different counties in which other squads did not claim county training regulation. Two squads, however, do have training regulated by the city.

TABLE 23.--Location of squads claiming county regulation of training

County	No. of Squads
Bergen .....	4
Somerset .....	2
Monmouth .....	2
Mercer .....	2
Warren .....	1
Burlington .....	1

### Composition of Crews

Prior to the end of the 1930's, it was generally considered a "must" for ambulances to have a physician assigned to them, but the thinking has since changed. Ambulances are now usually manned by trained squadmen, and hospital interns or other physicians are used by only 5 hospitals for ambulance duty.

TABLE 24.--Minimum number of squadmen permitted to answer a call

No. of Men	No. of Squads
2 .....	41
3 .....	55
4 .....	12
5 .....	3

### Squadwomen

Women members are used by 57 squads while 55 limit their membership to men. Squads that use women find them helpful when handling female patients and in staffing the day hours when most men are working. One disadvantage of squadwomen is in large cities where a great deal of strength and energy may be necessary to carry a patient down one or more flights of stairs. One woman who completed the questionnaire let it be known that the females in her squad answered more calls than the men.

### Traffic Regulations

A Michigan study conducted by Curry and Lyttle which appeared in the American Journal of Surgery in 1958, concluded after studying 2,500 consecutive ambulance runs

that in 98.2 per cent of the cases haste was needless and that a saving of five minutes would not have influenced the course of a single injury. However, 13 squads consider time of importance and therefore drivers can make exception to traffic laws in emergency situations.

#### Safety Equipment

Flares (a devise which will produce a blaze of red fire when ignited) are used by 81 squads when they work at the scene of an automobile accident. The remainder rely upon one of the following: the police, flashing ambulance lights, flashlights, or battery traffic lights.

Fifty-two squads do not use safety belts in their ambulances, while an equal number do use restraining straps on their cots. Drivers and attendants are provided safety belts by only 13 squads.

#### Squad Headquarters

Private buildings are owned by 71 squads and 4 additional private buildings are presently under construction. The 42 squads without their own buildings use a number of alternatives such as: city owned buildings, fire houses, police headquarters, municipal buildings, leased buildings, and homes of squadmen.

#### Vehicles Used by Squads

Most squads limit their vehicles to ambulances, but there are 15 squads with rescue trucks and one which possesses a boat.

TABLE 25.--Type and number of vehicles used by squads

Vehicles	No. of Squads
Two ambulances .....	58
One ambulance .....	36
One amb. & 1 rescue truck .....	6
Two amb. & 1 rescue truck .....	5
Three ambulances .....	2
Two trucks & 1 amb. ....	2
Four ambulances .....	1
Two amb. & 1 boat .....	1
Two trucks .....	1
Three trucks & 1 amb. ....	1

The Cadillac ambulance is, by far, the most popular ambulance vehicle being used. The average age of an ambulance is 4½ years.

TABLE 26.--Make of ambulance used

Make	No. in Oper.
Cadillac .....	145
Pontiac .....	7
Packard .....	5
International .....	4
Oldsmobile .....	4
Ford .....	4
Buick .....	3
Chrysler .....	3
G.M.C. ....	2
Dodge .....	1
Chevrolet .....	1
Thames .....	1

TABLE 27.--Make of emergency truck used

Make	No. in Oper.
Chevrolet .....	6
International .....	4
Dodge .....	3
G.M.C. ....	2
Ford .....	1

### Equipment

The volunteer squads are equipped to meet practically any individual emergency situation requiring first aid. Every squad has dressings, splints, resuscitators, and oxygen in their ambulances. Two-way radios are used by 96½ per cent of them. One hundred thirteen squads listed their equipment.

TABLE.--Equipment carried by an ambulance

Equipment	No. of Squads
Dressings .....	113
Resuscitators .....	113
Splints .....	113
Oxygen .....	113
Two-way radio .....	109
Hemorrhage controls .....	96
Fire equipment .....	83

### Two-way Radio

Two-way radios are essential to a squad's everyday operation and are invaluable in disaster situations. One of their chief benefits is continual contact with the dispatcher. Frequently, a busy squad will receive one call while responding to another. The two-way radio makes it possible to dispatch the ambulance to the scene of the second call while it is on the road, rather than returning to headquarters first and then being sent out again.

In time of disaster telephone communications may be out of service and because of the large number of injured, a systematic coverage of the area is necessary in order to save lives. This is possible only through

the use of radios. A central dispatcher can give the locations of injuries to an ambulance so that it may make numerous stops on route to the hospital. Concurrently, it can receive further instructions immediately after arrival at the hospital.

For these reasons, it is comforting to know that 96½ per cent of the squads do use two-way radios. Ninety-four are on a police frequency and many squads are on the same frequency with two or more service agencies. Other arrangements are also possible.

TABLE 29.--Two-way radio frequencies used by each squad

Frequency	No. of Squads
Police .....	71
Police and Fire Dept. ....	10
Fire Department .....	5
Squad Dispatcher .....	5
Police, Fire Dept., and C.D. ....	5
Fire Dept. and Squad Dispatcher .....	2
Sheriff's Office .....	2
County .....	2
Police, Fire Dept., & Sheriff .....	1
Police, Fire Dept., C.D., & Sheriff .	1
Police and Civil Defense .....	1
Police, Fire Dept., C.D. and Local Squads .....	1
City Hall .....	1
Police and Squad Dispatchers .....	1
Mobile Telephone .....	1
Police and Answerphone .....	1
Police, Fire Dept., & Squad Dispatcher	1
Police, Fire Dept., & Municipality ..	1

#### Direct Hospital Affiliation

Although squads will assist hospitals in whatever way they can, and members attend hospital lectures and seminars, only 17 squads have a direct hospital affiliation.



In 1958, volunteer squads which frequently bring patients to Muhlenberg Hospital in Plainfield, New Jersey, organized the Muhlenberg Area Rescue Squad Council. The main purposes of the Council are to create a better understanding between the hospital and area rescue squads, to discuss mutual problems, and to plan activities which will benefit the residents in the communities served by the squads.

The Council was conceived by Martin Cuccaro of the Plainfield Rescue Squad, Harry Leszchyn, Sr. of the North Plainfield Rescue Squad, and Edward J. Dailey, Jr., Associate Director of Muhlenberg Hospital.

#### Average Investment

Most squads have assets totaling between \$10,000 to \$50,000. Most of those in the lowest bracket rent, rather than own their buildings.

TABLE 30.--Total value of buildings, ambulances, and equipment

Total Assets	No. of Squads
Under - \$10,000 .....	7
\$10,000 - 19,999 .....	14
20,000 - 29,999 .....	14
30,000 - 39,999 .....	9
40,000 - 49,999 .....	13
50,000 - 59,999 .....	5
60,000 - 69,999 .....	8
70,000 - 79,999 .....	4
80,000 - 89,999 .....	2
90,000 - 99,999 .....	1
100,000 - 119,999 .....	5
120,000 - 139,999 .....	2
140,000 - 159,999 .....	2
160,000 or more .....	2

Fund Raising

All of the squads stated that they do not charge patients for ambulance services. Less than half of them receive partial assistance through money appropriated to them by their municipality. The squads must therefore employ many means to support themselves.

TABLE 31.--Techniques used to raise funds

Technique	No. of Squads
Fund Drives .....	105
Donations .....	97
Municipal Appropriations .....	46
Raffles .....	10
Dances .....	6
Community Chest .....	3
Bingo .....	2
Money received from service groups ..	2
Card Parties .....	1
Cake Sales .....	1
Picnics .....	1
Suppers .....	1
One day's proceeds from gas station .	1
Car Washes .....	1
Sale of Christmas trees .....	1
Spring Carnivals .....	1
Membership Dues .....	1
Turkey Shoots .....	1

Councils and Associations

There are many councils and associations with which a squad may become affiliated. All squads, with one exception, belong to the New Jersey State First Aid Council. Twenty-five also belong to the International First Aid Council. Many squads are members of county associations.

TABLE 32.--Councils and associations having  
voluntary squads as members

New Jersey State First Aid Council  
International First Aid Council  
Muhlenberg Area Rescue Squad Council  
Monmouth County Association of First Aid Squads  
Burlington County First Aid Council  
Civilian Defense  
Pascack Vally Mutual Aid Association  
Cape May County Ambulance Corps and Rescue  
Squad Association  
Paul Kimball Hospital Association  
American Red Cross  
Interstate Marine Association  
Glouster County Ambulance and Rescue Association

### CHAPTER III

#### AFFILIATED SQUADS

Police and fire department affiliates, as well as municipal volunteer squads,<sup>1</sup> have been separated from the unaffiliated squads because of the latters' lack of standardization. Even among the fire departments, there are those which are formed as eleemosynary corporations, private ownerships, municipal ownerships, and one paid department. The affiliated squads are presented in this paper to give a complete coverage of ambulance services in the state.

By listing the type of squad and its ownership, lack of standardization becomes apparent - especially when the following two tables are compared.

TABLE 33.--Types of squads included in this chapter

Type	No. of Squads
Volunteer Fire Dept. ....	16
Volunteer Police Dept. ....	2
Municipality .....	1
Paid Fire Dept. ....	1

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<sup>1</sup>The word "squad", as used in this chapter, refers to volunteer police and fire department affiliates as well as municipal volunteer squads.

TABLE 34.--Ownership of affiliated squads

Ownership	No. of Squads
Corporation .....	11
Municipal .....	5
Private .....	3

Reasons for Organizing

The squads' reasons for starting their ambulance services are almost identical to those of unaffiliated squads.

TABLE 35.--Reasons given by squads for organizing

Reason	No. of Squads
Service to community .....	5
To provide ambulance service .....	4
To fill a need .....	4
To render aid and transportation .....	3
Protection of life and property .....	1
Civic Asso. recommended it to mayor .	1
Hosp. discontinued ambulance service .	1
Growth of town .....	1

Population and Square Miles of Area Served

Most squads, 68.4 per cent, are in communities with populations of 10,000 or less. One city was excluded from Table 36 because its population fluctuates between 19,000 in the winter to 100,000 in the summer.

Four square miles or less is considered their area of service by 50 per cent of the squads. Transportation calls were considered in the figures of 3 squads. They listed 40, 90, and 100 square miles.

TABLE 36.--Population serviced by each squad

Population	No. of Squads
Under - 5,000 .....	7
5,000 - 9,999 .....	6
10,000 - 14,999 .....	2
15,000 - 19,999 .....	0
20,000 - 24,999 .....	0
25,000 - 29,999 .....	3

TABLE 37.--Number of square miles serviced by each squad

Square Miles	No. of Squads
Under 5 .....	10
5 - 9 .....	1
10 - 14 .....	1
15 - 19 .....	2
20 - 24 .....	1
25 - 29 .....	1
30 - 34 .....	1
35 or more .....	3

Average Wait for Ambulance

Both emergency and routine calls were answered in the same manner by 9 squads. They averaged 6.7 minutes to respond to all calls. Those squads which differentiated between the type of call averaged 6.0 minutes for emergencies and 14.8 minutes for routine calls

TABLE 38.--Average time spent reaching the patient by squads not differentiating between emergency and routine calls

Minutes	No. of Squads
4 .....	2
5 .....	1
6 .....	1
7 .....	3
10 .....	2

TABLE 39.--Time spent reaching patients on emergency calls

Minutes	No. of Squads
3 .....	2
4 .....	1
5 .....	2
7 .....	2
10 .....	2

TABLE 40.--Time spent reaching patients on routine calls

Minutes	No. of Squads
7 .....	1
10 .....	1
12 .....	3
15 .....	2
20 .....	1
30 .....	1

Individuals Requesting Ambulances

Fifty per cent of the squads will accept a call for an ambulance from anyone in the community. This gives rise to one of the unavoidable problems facing volunteer squads. Rather than using a private car or taxi, certain individuals will take advantage of ambulance services, as they would of many other free services, merely because they know there is no charge.

TABLE 41.--Number of squads accepting calls from one or more individuals

Requesting Ambulance	No. of Squads
Anyone .....	10
Physician or Police .....	5
Physician Only .....	3
Police Only .....	2

Either the physician or the police most frequently determines the need for an ambulance.

TABLE 42.--Individuals most frequently requesting an ambulance

Individual	No. of Squads
Physician .....	18
Police .....	17
Citizen .....	10

#### Central Dispatcher

Fourteen squads receive their calls through a designated department or individual. The dispatcher then contacts the squad by one of the means shown in Table 44.

TABLE 43.--Individuals and organizations acting as central dispatchers

Dispatcher	No. of Squads
Police .....	12
Fire Dept. ....	1
Boro Clerk .....	1

TABLE 44.--Methods used by the central dispatcher to contact the squad.

Method	No. of Squads
Siren .....	4
Telephone .....	3
Two-way Radio .....	1
Police informs Fire Dept. ....	1
Contacts crew chief by phone or siren	1

#### Type of Calls

A detailed statistical record of calls was maintained



by 10 squads. Automobile accidents accounted for the majority of calls.

TABLE 45.--Conditions treated by squadmen

Condition	Number
Automobile Accident Injuries .....	38
Cardiac Conditions .....	34
Fractures .....	18
Maternity .....	4

#### Type of Treatment

Service other than first aid treatment is provided by 6 of the squads answering the questionnaire. They loan crutches, hospital beds, wheelchairs, canes, oxygen units, and vaporizers.

#### Educational Requirements and Regulations

Most squads have their training regulated by their own instructors. Three squads, however, have training regulated by the city and 2 by the county. Because all of these squads are either fire or police affiliated departments, it is conceivable that first aid is considered part of their training which is required by the government.

TABLE 46.--Minimum first aid requirements for members of affiliated squads

Minimum Standard	No. of Squads
Advanced Red Cross .....	11
Adv. Red Cross & In-Service Training .	5
Standard Red Cross & In-Ser. Training	3
Standard Red Cross .....	1

### Composition of Crews

Squadmen, trained in first aid, compose the crews. Normally, between 2 and 4 men answer each call.

TABLE 47.--Average number of squadmen used by each squad to answer a call

Men	No. of Squads
2 .....	8
3 .....	7
4 .....	5

### Squadwomen

Squadwomen are used by 5 squads while the sixth has a nurse on each known maternity case.

### Traffic Regulations

Exceptions to traffic regulations are made by 4 squads.

TABLE 48.--Traffic exemptions

1. "Only by courtesy of the law may we pass red lights with caution."
2. "Must observe traffic laws when not in service with a patient and when returning from calls."
3. "When a policeman is on duty at an intersection, at his discretion, may we proceed against red lights, etc."
4. "We are allowed to go through red lights and stop signs depending on the emergency of the call but we have to slow down at these stops."

### Safety Equipment

Flares are used at the scene of an automobile

accident by 18 squads. Safety belts are not yet generally accepted as an important safety precaution for ambulances. Less than half of the affiliated squads use them.

TABLE 49.--Use of safety belts and their locations

Location	No. of Squads
None .....	11
Cot .....	5
Front Seat .....	2
Front Seat and Cot .....	2

#### Squad Headquarters

Half of the squads own their own headquarters building. Three squads of the remaining half occupy government owned fire department buildings. The other squads did not indicate headquarters ownership, but may also occupy government owned buildings.

#### Vehicles Used by Squads

Most squads own 1 ambulance, the most popular being the Cadillac. The average age of the ambulances is 3.8 years old.

TABLE 50.--Number of ambulances used by squads

No. of Amb.	No. of Squads
1 .....	13
2 .....	5
3 .....	2

TABLE 51.--Make of ambulances being used

Make	Number
Cadillac .....	20
International .....	2
Pontiac .....	2
Dodge .....	1
Chrysler .....	1
Oldsmobile .....	1
G.M.C. ....	1
Ford .....	1

Equipment

Dressings, resuscitators, splints, and oxygen are carried by all ambulances.

TABLE 52.--Equipment carried by ambulances

Equipment	No. of Squads
Dressings .....	20
Resuscitators .....	20
Splints .....	20
Oxygen .....	20
Two-way Radio .....	19
Fire Equipment .....	17
Hemorrhage Controls .....	15

Average Investment

The average investment per squad in ambulance and first aid equipment is \$23,000.

TABLE 53.--Total value of buildings, equipment, and ambulances

Investment	No. of Squads
\$10,000 - \$14,999 .....	4
15,000 - 19,999 .....	2
20,000 - 24,999 .....	4
25,000 - 29,999 .....	4
30,000 - 34,999 .....	3
35,000 or more .....	2

### Two-way Radio

Each two-way radio is usually set on the police frequency but, as the table illustrates, many squads are on frequencies utilized by more than one service organization.

TABLE 54.--Two-way radio frequencies used by each squad

Frequency	No. of Squads
Police .....	9
Police and Fire Dept. ....	5
Police and Own .....	1
Police, C.D. & Fire Dept. ....	1
Police, Fire Dept., & Boro .....	1
Fire Dept. ....	1
Fire Dept. and Own .....	1

### Fund Raising

Only one fire department affiliated squad is a paid department and is fully financed through appropriation. The other squads must rely upon the same fund raising techniques employed by non-affiliated volunteer squads.

TABLE 55.--Techniques used to raise funds

Technique	No. of Squads
Donations .....	18
Fund Drives .....	13
Appropriations .....	10
Raffles .....	1
Social Nights .....	1

### Councils and Associations

Nineteen squads belong to the New Jersey State First

Aid Council and two are also members of the International First Aid and Rescue Council. Only one squad lists no memberships in any organization.

TABLE 56.--Councils and associations having affiliated squads as members

Organization	No. of Squads
N. J. State First Aid Council .....	19
International First Aid & Rescue Council .....	2
Burlington County First Aid Council .	1
Bergen Mutual Aid .....	1
Interboro Mutual Aid .....	1
Monmouth County Association of First Aid Squads .....	1
Bogota Civil Defense Council .....	1
None .....	1

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