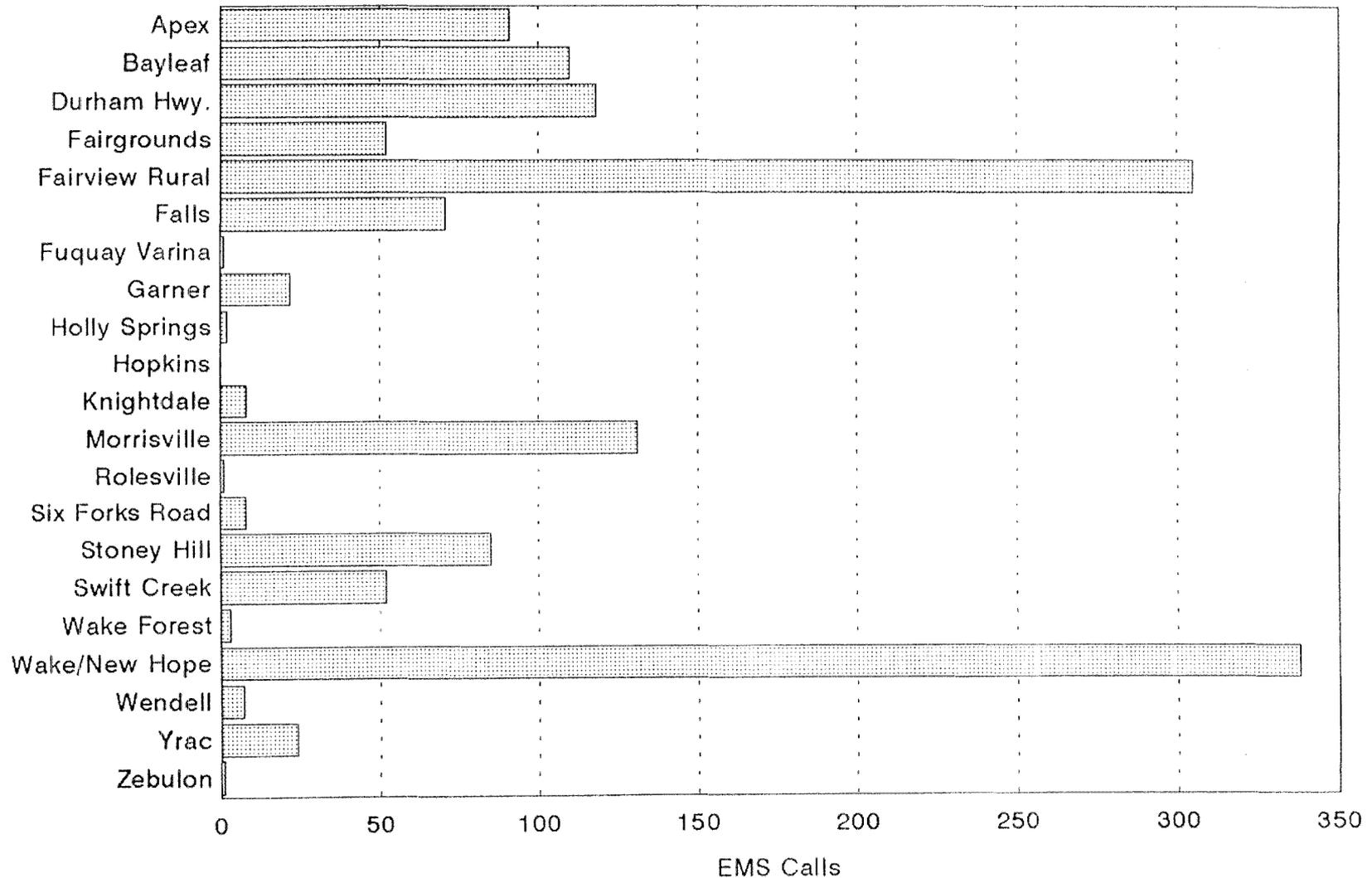
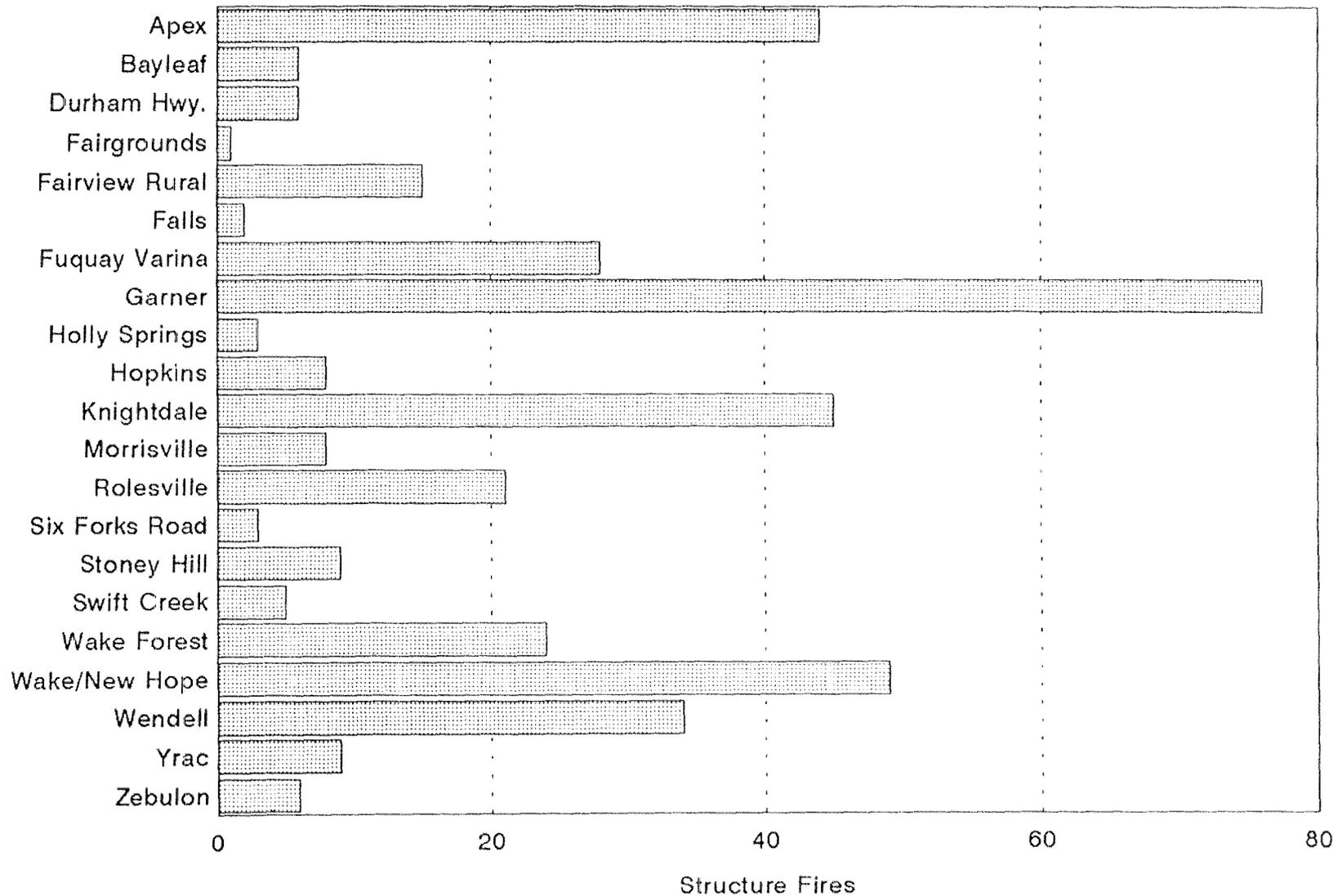


Figure 2-6: EMS Calls by District, 1993



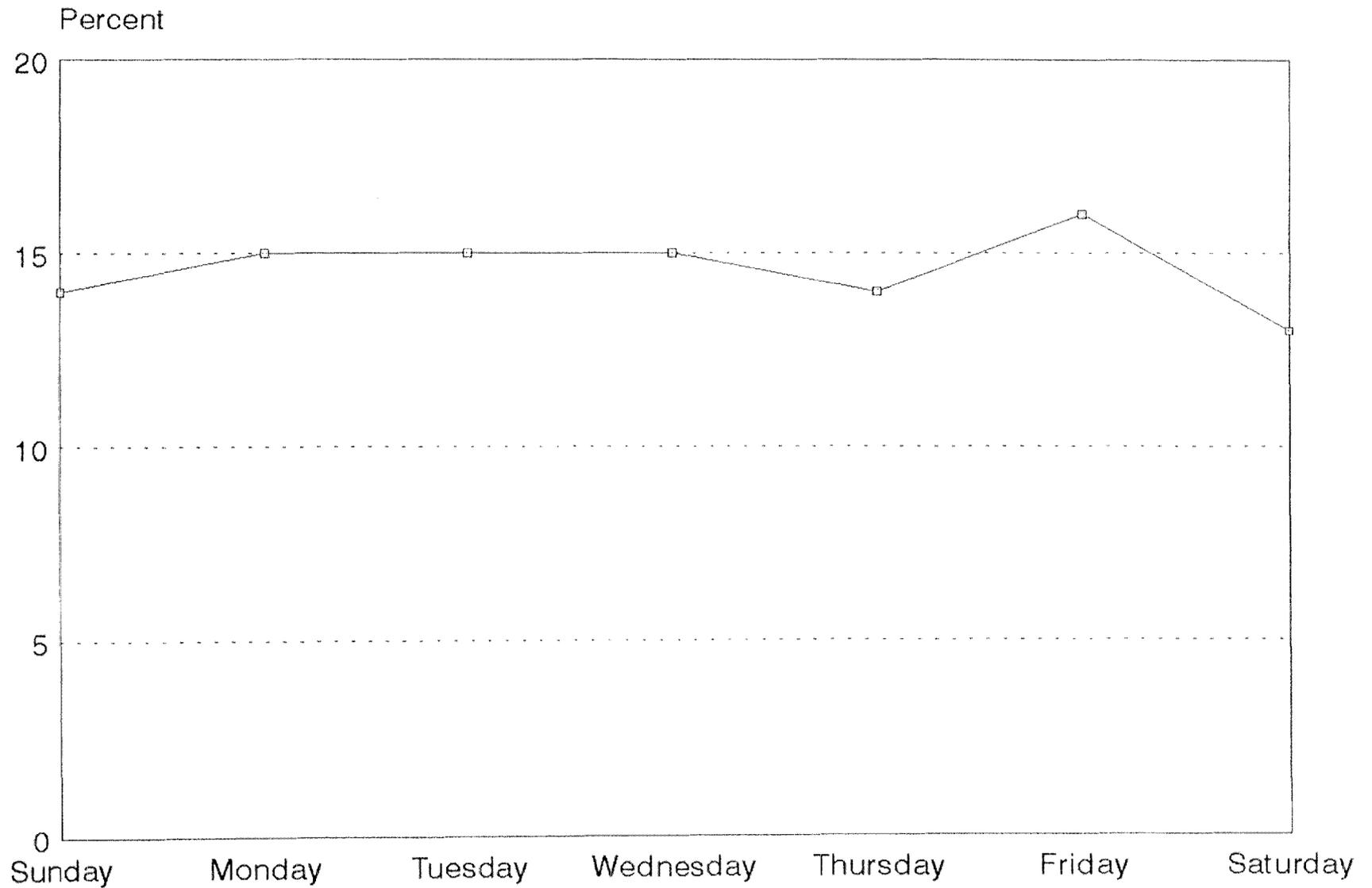
Source: Wake County Fire Marshal's Office

Figure 2-7: Total Structure Fires by District, 1993



Source: Wake County Fire Marshal's Office

Figure 2-8: Percentage of Calls by Day of Week, 1993



Source Lake County Fire Marshal's Office

- The percentage of total calls by hour of day differs slightly from the more rural departments to the more urbanized departments.
 - Most calls for fire department assistance occur between the hours of 7:00 AM and 7:00 PM (approximately 67%).
 - The highest hourly call rate, per hour, (7.1% of all calls) occurs between 5:00 and 6:00 PM (Figure 2-9).

- The number of structure fires in single family occupancies appears to be decreasing over the past three years. This is consistent with national trends.

- The average reported response times for each department to all types of incidents ranges from just under 5 minutes to 9 minutes (Table 2-7).³ It is longer during the nighttime hours (Figure 2-10).

- The average response time to all incidents is reduced in those departments that have on-duty staff and those that respond frequently to "EMS only" calls.

- All of the fire departments average more personnel responding at night and on weekends. The average number of personnel responding to all incidents varies by time of day at each of the departments. The average numbers range from 4 to 14 personnel responding during the weekday daytime hours and from 7 to 20 personnel for nights and weekends (Table 2-7).

³ The response time data is "suspect" due to the number of inconsistencies and obvious errors in the reports that are provided by the Communications Center. Actual response times may be longer than reported in some cases because of the manner that is used to record times.

- The average number of personnel responding is lower in those departments that respond frequently to "EMS only" calls. The Wake County first responder standard requires only three personnel to respond to these calls.

**Table 2-7. Number of Calls, Average No. of Personnel Responding,
Average Response Time, By District, 1993.**

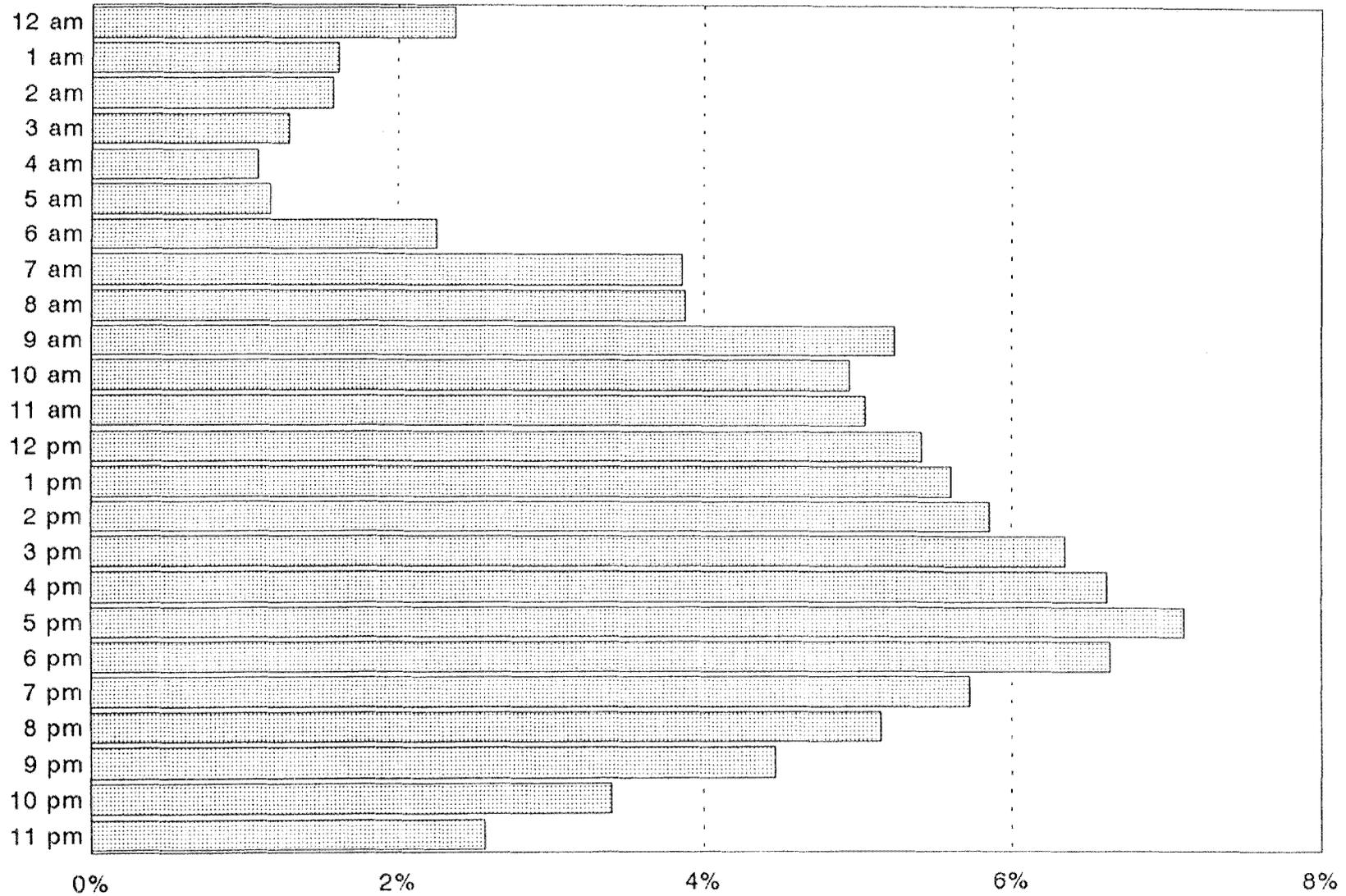
Department	Number of Calls in Dist.	Avg. # of Personnel Responding, 7AM-6PM Weekdays	Avg. # of Personnel Responding, 6PM-7AM Weekdays and Weekends	Avg. Response Time (Minutes)
Apex*	357	8	13	6.39
Bayleaf*	280	12	16	5.1
Durham Hwy.*	362	9	12	5.92
Fairgrounds*	133	4	5	5.25
Fairview*	406	9	9	7.45
Falls*	123	4	7	6.64
Fuquay Varina	275	8	11	7.74
Garner	646	14	18	5.97
Holly Springs	80	8	11	7.2
Hopkins	63	9	13	7.61
Knightdale	312	14	20	6.27
Morrisville*	391	5	7	6.96
Rolesville	158	14	16	4.68
Six Forks	114	8	11	6.97
Stony Hill*	139	6	10	9.01
Swift Creek*	215	7	10	5.64
Wake Forest	194	13	15	6.04
Wake/New Hope*	814	5	7	7.29
Wendell	320	13	17	6.39
Yrac*	87	7	11	6.49
Zebulon	120	14	18	4.84

Source: Wake County Fire Marshal's Office

Note: Total number of calls per district may vary slightly between reports.

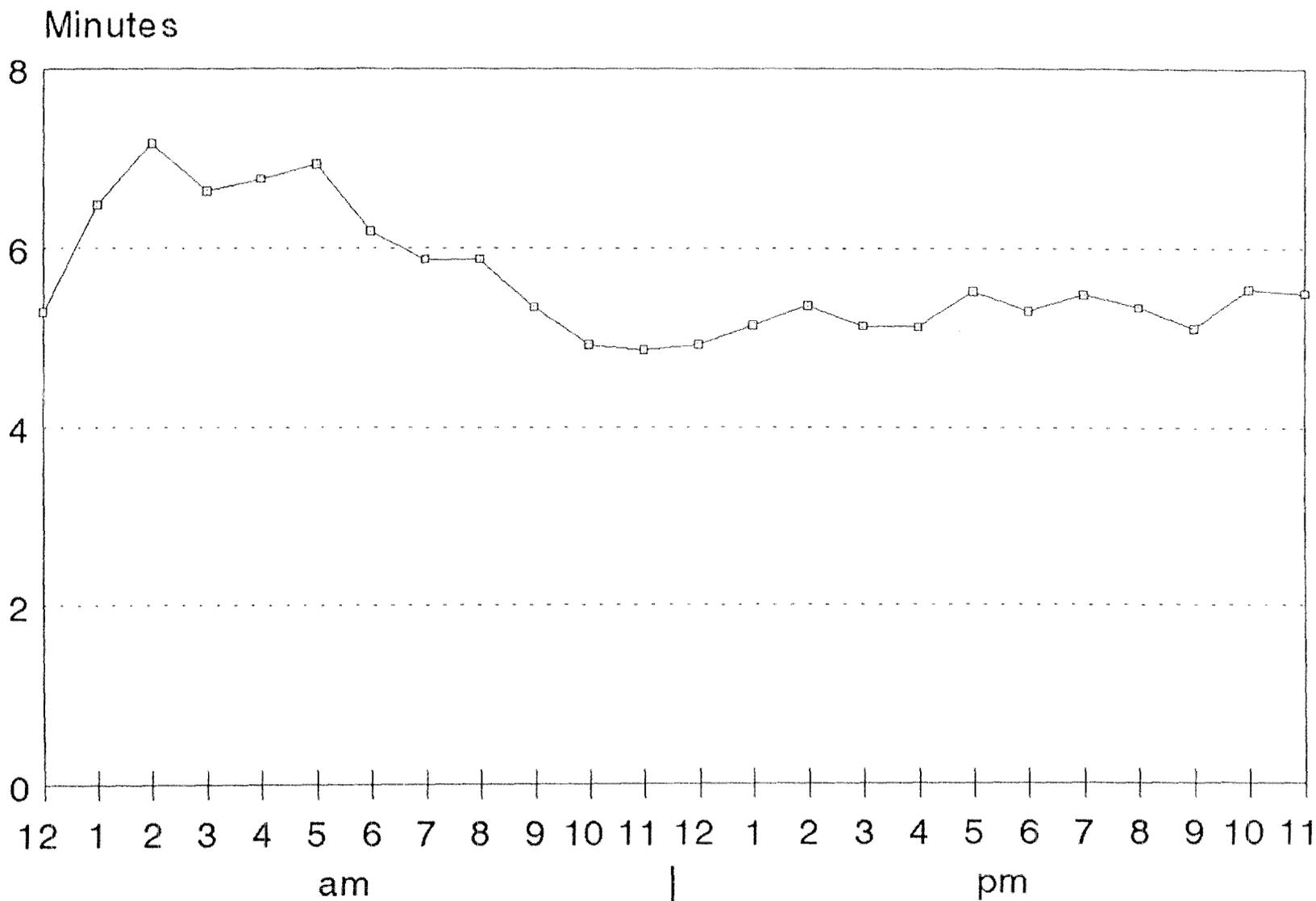
* First Responder to medical incidents

Figure 2-9: Percentage of Calls by Hour of Day, 1993



Source Wake County Fire Marshal's Office

Figure 2-10: Average Response Times by Hour of Day, 1993



Source: Wake County Fire Marshal's Office

Response times reflect responses by all volunteer and municipal departments in Wake County

Sources of Change

The volunteer fire departments that serve most of the unincorporated areas of Wake County are faced with a rapidly changing environment which impacts on their ability to provide services currently and in the future.

Changing Expectations -- The regulations and expectations that are placed upon a fire department have increased significantly over the past decade. Regulations come from that national level (OSHA and EPA) and the State of North Carolina. The regulations include mandatory health and safety regulations, higher training and equipment standards, and new service expectations. The growing area of hazardous materials and environmental protection has also changed the response and operational expectations placed on fire departments.

EMS -- One of the major changes in the recent past has been the involvement of most of the rural fire departments in the delivery of emergency medical and rescue services, a domain that was previously assigned to a parallel system of volunteer rescue squads. The volunteer rescue squads have been impacted by many of the same forces as the volunteer fire departments and most are tending to specialize in emergency medical treatment and transportation. The volunteer rescue squads are supplemented by career personnel from the Wake County Emergency Medical Services Department. The fire departments are assuming more responsibility for technical rescue and extrication as the rescue squads have fewer personnel available to handle these functions.

Most of the volunteer fire departments have become first responders to emergency medical incidents. The fire department can often provide faster response than the rescue squad to patients in urgent need of medical care. This is particularly significant during the hours when career personnel are staffing the fire stations, because they can respond immediately; there is no delay for crews to respond to the station. The

frequency of fire and medical calls is low, so there is not a major concern that providing medical care detracts from the ability to provide fire protection. Automatic mutual aid provides additional back-up resources to cover for units that are busy on medical calls or other incidents.

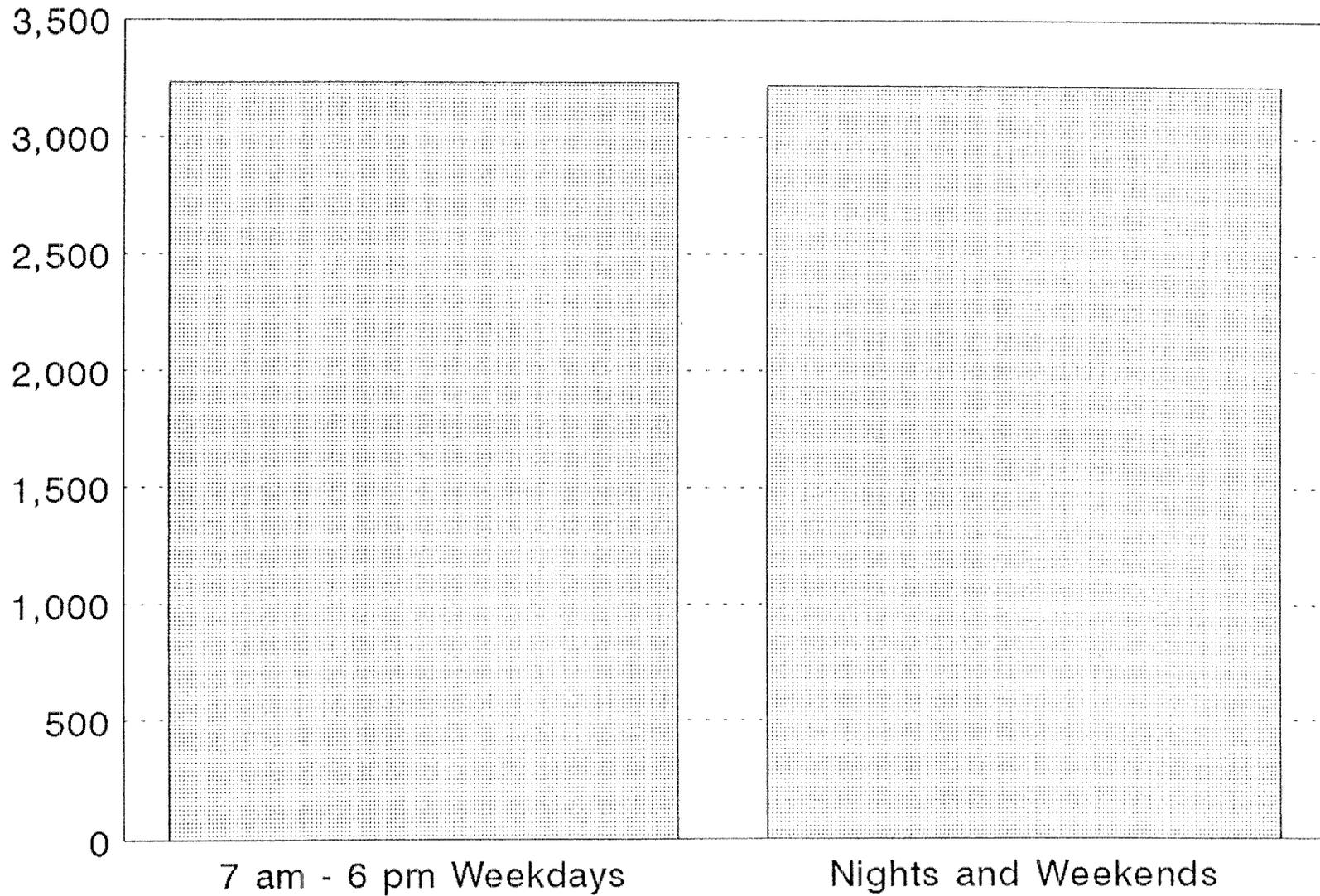
Growing Population and Expanding Workload -- The volunteer fire departments individually and collectively are faced with a complex set of challenges and problems, beginning with a rapidly expanding and diversified population that is creating an expanding workload. Several of the fire departments have also become involved in responding to emergency medical incidents through the First Responder program, which has caused a rapid increase in their call volumes.

The increasing workload is occurring at a time when the fire departments are having difficulty in providing adequate volunteer response, particularly during daytime hours on weekdays (Figure 2-11), when a large proportion of the volunteers are at their regular jobs and unable to respond. Similar problems are being faced throughout the volunteer fire service today.

The difficulty in providing crews to respond to calls during daytime weekday hours has caused several of the predominantly volunteer departments to begin providing staffing with career or part-time paid personnel. Within the past three years, these factors have motivated several of the primarily volunteer fire departments to employ career personnel for the first time, primarily for daytime weekday coverage. Full-time or part-time fire chiefs have also been employed in several of the departments. The 16 volunteer departments that utilize career personnel have a total of 82 employees (64 full-time and 18 part-time) (Table 2-4). The volunteer departments continue to depend fully on volunteers to respond from home at night and on weekends.

A slight majority of the emergency calls actually occur during the daytime hours (Figure 2-11), when the primary response force is composed of the 82 paid personnel

Figure 2-11: Total Number of Calls on Weekdays vs. Nights/Weekends, 1993



Source: Wake County Fire Marshal's Office
Total calls do not include municipal fire department responses

and a relatively small number of volunteers that are available. There are more than 700 volunteers in the County, most of whom are available to respond at night and on weekends.

The volunteer departments vary considerably in their strengths and capabilities, but they are generally good organizations managed by very dedicated individuals. The transition to partial career staffing appears to be inevitable, given the trends in population and development in the County. There will be large benefits to the taxpayers, however, if the role of volunteers as the predominant service providers at night and on weekends can be maintained for the foreseeable future.

Tax District Funding -- The special tax districts have provided the fire departments with fairly predictable funding, often combining fire district revenue from protected unincorporated areas with contractual income from an incorporated town. Until recently, the revenues for all of the districts were fairly modest. As rapid growth has occurred in the unincorporated areas, the tax base and the resulting revenues for several of the departments have increased rapidly, allowing them to add and upgrade stations and purchase new apparatus and equipment. Equipment and stations have been added without an overall plan to coordinate services among the fire departments, resulting in less-than-efficient station placement. The addition of paid personnel has a major cost impact on the budget of a volunteer fire department and generally could not have been accomplished without the increasing revenues.

Annexations -- In most parts of Wake County there has been increasing development of suburban and satellite communities and significant expansion of the incorporated areas. (Annexation to an incorporated community provides access to water and sewer systems. Wake County does not offer these services.) The annexation of additional areas by the towns and cities has changed the configuration of response areas and shifted tax revenues. In several cases, the property that caused the fire district tax base to grow rapidly over a few years were annexed into a city or town and cut from the fire district.

This rollercoaster trend is expected to continue for the foreseeable future with different impacts in different areas of the County.

The rural fire departments are being impacted by annexations of developed areas into the cities and towns. Annexation removes properties from the tax base that directly support the rural fire department; in most cases the municipality then contracts with the same fire department to provide service to the annexed area, however the municipality may pay the rural fire department at a lower rate. The municipality may also decide to provide the service through its own municipal fire department or contract with a different volunteer fire department. Several of the departments have had major portions of their service areas annexed and absorbed by other fire departments, in a few cases leaving only remnants of unincorporated areas that still require protection. This trend is expected to continue.

As annexations have occurred, significantly larger areas have come under the protection of the Raleigh and Cary Fire Departments -- the fire tax revenue from those areas is no longer collected and distributed to the volunteer organizations. These annexations have had the greatest impact on the Yrac, Fairgrounds, Six Forks, Swift Creek, Wake-New Hope, Falls, and Durham Highway fire districts. These departments have been left with diminished revenues and fragmented districts that are often very difficult to serve. Figure 2-12 displays the fragmented fire districts.

In many cases, the nearest available fire units are not dispatched to calls because of the fragmented district boundaries. Both Raleigh and Cary have added stations to serve their newly annexed areas, some of which are well-situated to cover adjacent unincorporated response areas. Units from rural fire departments must literally drive past city fire stations to reach some of these areas. In other cases, the city fire fighters must drive past volunteer stations to reach incorporated areas.

While the laws of North Carolina provide for an orderly and gradual process of reducing the tax revenue and transferring responsibilities when annexations occur, the impact of annexations has reduced the funding and service areas of some of the volunteer departments to the point that they are no longer viable or needed in their established roles as primary responders to fire incidents.

Until recently, most of the growth of the other incorporated communities (other than Raleigh and Cary) has had a relatively mild impact on the rural departments, because the funds that came from properties in the fire districts were replaced by contractual funding from the communities, although not necessarily on an equal basis. Recently, however, some of the communities have annexed into areas that were part of the tax district of a different fire department from the one that protects the town. This has caused the tax base and service area of one fire department to shrink while the adjacent fire department's service area grows. The growth and/or loss of geographic areas are not necessarily in proportion to the changes in revenues.

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Special Response Resources

Over the past decade, fire departments across the country have begun to assume new "special response" tasks, which include hazardous materials and technical rescue. Hazardous materials incidents can involve anything from catching and removing contaminants in water bodies to extinguishing complicated and dangerous chemical fires. Technical rescue calls involve the extrication of victims from automobiles, confined spaces (sewers, vats, and tanks), collapse buildings, collapsed trenches, high angle areas accessible only by rope, and water bodies. These special response tasks are strictly regulated and require more training and equipment than traditionally carried by fire departments. The growing expectation for fire departments to provide emergency assistance at hazardous materials and technical rescue emergencies will place new demands on the fire service in Wake County.

Hazardous Materials Response Teams -- Wake County currently contracts with the City of Raleigh and with the Wendell Fire Department for its Hazardous Materials Response Teams. This arrangement appears to be satisfactory for the frequency of hazardous materials that are experienced in the County and makes good use of the available resources. The capabilities of both teams appear to be reasonably good and there is a good relationship between them. (Many of the members of the Wendell Team are actually off-duty members of the Raleigh Team.) The two teams back-up each other when needed.

Technical Rescue Response Teams -- Some of the rural fire departments have become involved in the automobile extrication portion of technical rescue, having assumed a large part of this responsibility from the volunteer rescue squads. Additional technical rescue capabilities are available through the Raleigh or Cary Fire departments or through the volunteer rescue squads. Both Raleigh and Cary have confined space rescue teams which could be called to respond to calls in Wake County on mutual aid. The

technical rescue/confined space capabilities should be incorporated into a plan for the development distribution of teams throughout the County.

Apparatus, Equipment, and Water Supply

The volunteer fire departments in Wake County purchase, operate, and maintain their own fire apparatus. Most of these vehicles are titled as property of the individual organizations, although they may have been fully or partially financed from a fire district and County or municipal tax revenues. (A few of the vehicles are actually owned by municipalities, but they are all used by the volunteer fire departments.) The 21 Wake County fire departments operate a combined fleet of 179 individual vehicles of different types from several different manufacturers. The combined fleet includes 100 pumpers and pumper-tankers, 36 tankers, and 35 mini-pumpers and brush units, which is considerably more vehicles than are needed to meet the actual needs of the County (Table 2-8).

The size of the apparatus fleet reflects the perception that each department has attempted to equip itself to operate independently. The excessive number of vehicles results in higher operating and maintenance expenses, however in many cases this is not a major cost item. Many of the vehicles are older units that have been retained in the fleets when newer units were purchased instead of being retired or traded-in. They are kept in ready reserve status and require additional storage space in fire stations, but are seldom used; therefore, their operating and maintenance costs are very low. The actual difference in operating cost between keeping and disposing of an older unit is relatively minor. Some of the equipment could be distributed to substations to decrease response distances, if personnel are available to respond from those locations to incidents in their areas.

The additional expense is very significant when the fire departments want to purchase replacement vehicles for the average retained units. Only a limited number of vehicles should be funded from fire tax revenues -- an adequate number to provide the desired level of service plus a reasonable number of spares to replace units that are temporarily out of service.

TABLE 2-8. Wake County Apparatus Summary.

Department	Pumpers	Pumper Tanker	Tankers	Mini Pumpers	Heavy Equipment Trucks	Brush	Command	Aerial Appar.	Others	Total
Apex	3	1	2		1	2		1	2	12
Bayleaf	2	3	1		1	1			2	10
Cary	5				1	1		1	10	18
Durham Hwy.	2	1	2			1			1	7
Fairgrounds	1	1	2			1			1	6
Fairview	2	1	4		1					8
Falls		3				1				4
Fuquay Varina	4	1	4			1			3	13
Garner	2	4	2			3	1		3	15
Holly Springs	2		2			1			1	6
Hopkins		2	1			1			2	6
Knightdale	1	4		1		1			2	9
Morrisville		5				2			2	9
Raleigh	20			3	2		2	5	2	34
R.D. Airport									5	5
Rolesville	3		2	1		1			1	8
Six Forks	1	2	1			1			1	6
Stony Hill	1	2	1			2				6
Swift Creek	1	2	2			1				6
Wake Forest	2	1	2		1	2			2	10
Wake New Hope	2	2	5	2	1	1			1	14
Wendell	2	2	1			2	1		3	11
Yrac		3				1			1	5
Zebulon Municipal	2							1	1	4
Zebulon Rural	1	1	2			1				5
TOTAL	59	41	36	7	8	28	4	8	46	237

A "pool" of good reserve vehicles could be maintained by the County to be used by any of the departments when needed. The cost factor also becomes significant when the departments buy new apparatus to expand their fleets of first line vehicles or purchase replacement vehicles before the existing units need to be replaced. The ability of the individual departments to purchase new apparatus or to replace older units depends entirely on their individual budgets. The departments with strong revenues generally have reserve fund balances set aside for new apparatus, while those with less revenues may not have any reserve funds to replace obsolete and worn-out vehicles. If a department has the cash in reserve or can obtain financing, it can purchase apparatus and equipment according to its own priorities and perceptions of need.

There is no mechanism to regulate the purchasing habits of the volunteer departments. The spending habits of the different departments range from frugal to unrestrained and are generally in proportion to their revenues. They tend to spend the funds they have available to obtain the best apparatus, equipment and stations they can afford. Some of the departments are trading-in vehicles that are newer and in better condition than vehicles that some of the less fortunate departments cannot afford to replace. There is also no requirement to offer used apparatus to the other fire departments in Wake County before selling it to another department outside the County or to a dealer.

The ability to purchase and operate the newest, largest and fanciest fire apparatus is one of the intangible incentive factors in many volunteer fire departments; this is often justified by comparing the additional cost of "top of the line" fire apparatus with the cost of paid crews to staff the units. Most of the departments in Wake County have been fairly conservative in the purchase of apparatus, but the departments with more funds have acquired newer and higher quality apparatus than those with more restricted budgets. This presents an inequity in service delivery among the departments.

Each fire department is currently on its own to specify apparatus and buy from dealers or manufacturers. Substantial savings could be realized by deciding on a set of basic specifications for three or four categories of apparatus, and buying multiple units under a joint purchase plan. This approach could also include Raleigh, Cary, and other fire departments in the area and could involve all types of supplies and equipment.

Many volunteer departments take great pride in their apparatus and insist that they can buy a better unit than a governmental purchasing agency would buy for them, however it is very feasible to get a group of representatives together to develop specifications for a well designed units that would satisfy the needs of several departments. There could be some allowance for individual preferences within the general specifications.

Water Supply Apparatus and Hydrants -- Fire departments rely on one of two sources for water supply: hydrant systems or mobile tankers. The majority of the geographic area of Wake County is not served by water mains and hydrants. All of the incorporated communities have water systems and hydrants in built-up areas, supported by good distribution and storage systems capable of providing adequate flows for fire fighting needs. Most of the unincorporated areas have no public water supply and depend on water delivery to the scene of a fire by fire department tankers. Some of the unincorporated areas have limited water service from private suppliers.

In new growth areas, hydrants are generally required, however, there is not necessarily an adequate water supply to support their use. The availability of water and sewers are controlled by the incorporated towns and cities, so property that is being developed is most likely to be annexed. All of the rural fire departments are oriented toward the use of mobile tanker trucks as either their primary or secondary source of supply. Most of the departments use a mixture of tanker-pumpers and single function tankers to deliver water to the scene of a fire.

Pumpers are primarily designed to move water through hose lines, primarily as a means of directly attacking a fire. They are sometimes used as part of a relay operation to deliver water through hose lines from a remote source to other pumpers at the scene of the fire. Pumpers may also be used to refill tankers at water source locations; the tankers shuttle water to the scene of the fire. Most pumpers used in urban areas have on-board water tanks of 500 to 700 gallons, which are used to attack small fires or to begin the attack on larger fires while a sustained water supply is established. The sustained water supply may come from a hydrant, or via hoseline relay or tanker delivery to the scene. Many of the pumpers in Wake County carry up to 1,000 gallons of water.

A **pumper-tanker** has a regular fire pump and attack hose lines to operate in a direct attack mode, in addition to a water tank of more than 1,000 gallons capacity. A tanker-pumper can be used as a pumper, as a water delivery vehicle to support other pumpers, or with other tankers and tanker-pumpers to "shuttle" water to the scene of the fire.

A **tanker** is designed for the primary purpose of delivering water and generally has very limited fire attack capability. The water carrying capacity of tankers in Wake County ranges from approximately 1,200 gallons to in excess of 3,000 gallons. Several tankers may be used to "shuttle" water from a source to the scene of a fire, then return to the source for additional water.

Each of the rural fire departments in Wake County has built its fleet of vehicles around its own circumstances, concepts, and preferences of water supply. Some use all pumper-tankers, some use pumpers supported by tankers, and some plan their operations around the use of large diameter hose to obtain water from hydrants or other sources. Most of the tankers have relatively small capacities, usually varying from 1,500 to 2,000 gallons (refer to Appendix B for a list of apparatus).

The best improvement in the water supply system would result from extending municipal water service to larger areas, particularly any new development areas. Three or four large capacity (3,000 gallons or more) tankers strategically located in the County would improve the water delivery capability, however, many of the roads and bridges in different areas will not support the weight of the larger vehicles. These would have to be evaluated on a local level.

Some of the departments that respond in areas that have hydrants appear to make good use of large diameter (four or five inch) hose, however, some are reported to be more comfortable with water supplied from tankers than from hydrants, even when hydrants are available. Large diameter hose is very efficient for delivering water at distances of up to one-half mile from a water source, particularly when a large, constant supply of water is needed, such as for a warehouse or industrial fire. The system could work much more efficiently if all of the participating departments used the same standard operating procedures for water supply and carried compatible hose.

The varying water supply preferences and philosophies among the different departments is evident in the range of vehicles they operate. Several of the volunteer departments have accumulated fleets of vehicles with water carry capacities, based on their independent judgements of how much water they will need, how far they will have to respond to a fire to deliver the water, how far they will have to go to refill their tankers (in a shuttle mode of operation), and how much water they can practically carry on one vehicle because of size and weight limitations. Because of this independent approach, several of the departments have more vehicles than it is practical for them to operate.

Several large fire stations around the County are filled with seldom used water transporting vehicles. Most of the departments appear to have adopted the philosophy of owning and operating a fleet of water delivery vehicles to be self-sufficient for most

situations, and only occasionally utilize mutual aid to obtain assistance from surrounding departments.

Specialized Apparatus -- There is a tendency among the volunteer departments to purchase more specialized apparatus, such as rescue units and equipment vehicles, than the system would need if these vehicles were shared and distributed under a Countywide plan. Several new specialized equipment vehicles have been purchased in a short time period, some of which could have been shared among departments instead of buying duplicate units. A new deployment plan should consider redistributing these units for balanced Countywide coverage before any additional units are purchased.

The Countywide system would benefit from the addition of two or three lighting and breathing air refilling units, elevated stream units, large diameter hose units, and pumpers with foam capabilities. The reliance on tankers for water supply in many areas suggests that the departments should be looking into the use of Class A foam and compressed air foam (CAF) systems to increase the efficiency of limited water supplies.

There are only two aerial devices in the County; an aerial ladder in Apex and an aerial platform that belongs to the Zebulon Municipal Fire Department. Raleigh and Cary have a combined total of six aerial units, which are available to respond on mutual aid. The need for aerial equipment outside the cities is very infrequent, however two additional aerial devices, strategically located within the system, would improve the overall resource distribution and aid in improving the ISO classification countywide.

Fire Stations

The volunteer fire departments currently operate from 29 separate fire stations. Several of the stations are in immediate need of renovations, repairs, or replacement in order to meet code requirements. Most of the stations will require modifications to properly accommodate paid personnel, "sleep-in" crews, and other uses (Table 2-9).

All of the existing fire stations have been built by the individual departments according to their own judgement as to location and construction details. Their size, type of construction, and improvements reflect funds that have been available from their individual tax levies. Many of the departments also use self-generated funds to support building projects.

A very significant capital investment will be needed in Wake County's fire stations over the next five to ten years. Several of the existing stations will have to be renovated, expanded, or replaced to meet the needs of the fire departments. It would be much more feasible to provide the funding for these projects through a Countywide tax levy than through the individual fire district levies for individual projects. The recommended Fire Advisory Board should develop a capital improvements budget and make recommendations to the Board of County Commissioners on the projects that should be funded each year.

Table 2-9. Considerations about Future of Fire Stations.

Current Contract	Number of New Stations Needed	Number of Existing Stations to Close	Alterations or Renovations Needed for Existing Stations	Current Number of Stations	Future Number of Stations	Comments on Stations*
Apex	2	0	yes	1	3	New station in New Hill and southern area. Fire code.
Bayleaf	0	0	no	2	2	
Durham Hwy.	0	1	no	2	1	Close Station 2
Fairgrounds	0	0	no	1	1	Consider Raleigh/State contract
Fairview	1	1	yes	2	2	Relocate existing Station 1. Fire code.
Falls	0	1	yes	1	0	More storage space necessary. Fire code.
Fuquay Varina	1	0	no	2	3	Future stations for the south and east of district.
Garner	1	0	no	2	3	Future stations for the north and west of district.
Holly Springs	1	1	no	1	1	Future station in town, to the north and west.
Hopkins	0	0	no	1	1	
Knightdale	1	0	yes	1	2	Future stations between Knightdale and Gamer. Fire code.
Morrisville	1	1	no	2	2	
Rolesville	0	0	yes	1	1	Additional storage space necessary. Fire code.
Six Forks	0	1	no	1	0	
Stony Hill	2	1	yes	1	2	New station in northern area. Fire code.
Swift Creek	0	1	no	1	0	
Wake Forest	0	0	no	1	1	
Wake New Hope	1	1	no	2	2	Close station 1, new station in northern area.
Wendell	0	0	yes	2	2	
Yrac	0	1	no	1	0	
Zebulon	0	1	yes	1	1	Fire code.
Zebulon Rural	0	0	yes	1	0	

* Fire code = Alterations and/or renovations are necessary for station to meet fire code.

System Summary

The existing "fire suppression system" in Wake County works fairly well, but there is considerable room for improvements. Instead of a unified "system," it must be regarded today as a network of independent components — municipalities and fire districts, volunteer and career fire departments, the County Fire Marshal's Office, and the Emergency 9-1-1 communications system are all key elements. The components are not unified by plans or standard operating procedures and the number of component organizations and jurisdictional areas presents a major problem. One of the major objectives should be to structure a more efficient and better coordinated system for the future.

The capabilities of the individual fire departments range from high to low, based on several factors including funding, leadership, experience, local traditions, circumstances, and motivation. The higher capability departments respond reliably with sufficient, well-trained members to handle most situations, while others have a difficult time assembling even a small crew. The objective of the system should be to identify, reinforce, and duplicate the positive factors that make some of them top performers and to utilize those factors to bring all of the departments up to a higher capability level.

The circumstances of several of the departments are changing rapidly or have already changed. For some, these changes include new developments within their areas that have provided more funding and along with an increasing demand for service. In other cases, annexations of property by incorporated towns and cities have reduced funding and diverted the demand for service to other providers. Some areas with expanding needs are protected by inadequate fire departments, while in other areas function and well-equipped fire departments no longer have significant service areas to protect.

The system could be improved by reducing the number of individual fire departments and building on the success of the most capable organizations. The low performance departments should be brought to a higher level and response areas should be reconfigured to provide the best possible protection with the current and planned changes in jurisdictional areas. The personnel, apparatus, and equipment from the displaced organizations should be redirected to areas and functions where they can continue to serve productively.

The overall system should also be improved by providing a functional system for the individual fire departments to coordinate their training, resource deployment, response plans, standard operating procedures, and other components, so that they may routinely operate within a strong Countywide system. The career fire departments in Raleigh and Cary, as well as RDU Airport, should be equally involved in this countywide approach.

It is no longer feasible in many areas of the County to rely on volunteers as primary daytime responders. The current trend of adding career personnel to staff the stations during daytime weekday hours is a major change for fire departments that have in the past been exclusively volunteer. This trend can be expected to continue until career crews are in place in most of the stations to operate at least one fire suppression unit with four personnel during daytime weekday hours. Volunteers can and should be used as back-up responders during the day and should be able to provide the primary responders at night and on weekends. Even the stations in rural areas can be expected to require some daytime personnel within a few years.

The career personnel who come into the system should be expected to perform a full range of tasks, including maintenance functions, training, fire prevention, and public fire safety education, as well as emergency response. They should be directed toward objectives that support and supplement the volunteer system, as opposed to displacing volunteers and creating an all career system.

The fire department should continue to expand their participation as the first responder emergency medical service. Most of the departments have already implemented this service or are planning to move in this direction. This added service meets a need in the County, since the EMS call volume is increasing and the volunteer rescue squads are experiencing the same difficulties as volunteer fire departments in providing adequate crews. The career fire personnel can meet the need for rapid EMS response with very minor added costs. The expanded service should also carry over to night and weekend response as volunteer fire personnel obtain the training to provide emergency medical care.

Many of the fire departments are increasing the capabilities for vehicle extrication and establishing their expertise in other forms of technical rescue. The role of the volunteer rescue squads is changing and the evolution is moving toward combining and/or developing close working relationships between the fire departments and rescue squads.

The County already contracts with the Raleigh and Wendell fire departments for hazardous materials response. (These assignments may change when the State of North Carolina implements a Statewide plan for regional hazardous materials teams).

One of the priority areas to address is confined space rescue operations -- Wake County should designate and fund at least three strategically located fire departments to work toward training and equipping confined space teams. Each of these teams should be responsible for a portion of the County and all should be funded from a combined revenue source. The overall plan should integrate the capabilities of these teams with the existing Raleigh and Cary teams.

Fire prevention, which includes code enforcement, risk management, public fire safety education, and fire cause investigation, has been the primary responsibility of the Fire Marshal's Office. This role has expanded very significantly within the past two

years, primarily due to the imposition of mandatory inspections by the State of North Carolina. The Fire Marshal and his staff are doing an excellent job, however it is not a realistic expectation for the small staff to meet all of the challenges that have been presented.

As the Countywide system evolves, part of the responsibility for fire prevention functions should shift to the career personnel assigned to fire stations. All of the career personnel should be trained in multiple specialties and their time should be used productively to identify and reduce fire risks, educate the public on methods to prevent fires, prevent injuries, and improve their preparedness for emergencies. Volunteer personnel should also be encouraged to participate in these programs, including non-operational volunteers who could be recruited specifically for fire prevention and public fire safety education programs.

All of these areas should be major concerns, based on the consulting team's overall analysis of the existing fire protection system in Wake County.