

CHAPTER IV. SPECIFIC AREAS OF RECOMMENDATION

The chapter provides detailed discussions and recommendation about several specific areas of the fire service. The areas include: fire stations, insurance protection classifications, apparatus, special response resources, and emergency medical services, training, personnel, communications, and code enforcement/inspection.

Fire Stations

New fire stations and improvements to existing stations will require a significant capital investment in the next five to ten years. The County and the appropriate municipalities will have to develop a formula to share the cost of each of these projects.

Most of the fire stations that have been built by the rural volunteer fire departments did not contemplate occupancy by career personnel or by sleep-in volunteer personnel. They were built simply to house fire apparatus -- most lack sleeping, living and work areas. Only a handful of the newer and larger stations are suitable for long term needs. Most of the existing fire stations will require additions, rehabilitation, or total replacement to meet future needs.

It is important to recognize that fire stations (as well as fire apparatus) can have a direct impact on the feelings of autonomy and pride in volunteer fire departments. The districts that have a strong and expanding tax bases can afford facilities that assist in attracting and retaining volunteer personnel. The districts with limited or shrinking tax bases are often hard-pressed to properly maintain their existing vehicles and stations.

The Fire Advisory Board should develop a countywide capital improvements budget, and make recommendations to the Board of County Commissioners on projects that should be funded each year, based on input from a Capital Improvements Project Planning Committee (discussed further below).

Capital Funding for Stations -- Several of the fire stations that will need work are likely to transfer from rural fire department ownership to the municipalities if the recommendations in other parts of this study are followed. The funding of capital expenditures for modifications and for new construction may include both municipal and county tax district funds. The individual projects will have to be prioritized along with the plans for additional stations.

The number of projects that must be addressed will require a very thorough analysis of capital funding alternatives. Different funding mechanisms can be used to spread the cost over a reasonable period of years. The consolidation of all of the unincorporated areas into a single fire tax district should provide the largest possible tax base to support the cost of the capital projects, if the fire district tax is the most appropriate funding mechanism for the capital improvement projects.

Recommendation

Funding allocations for capital projects should be based on countywide priorities, with money coming from a single fire tax district.

Capital Projects Planning Committee -- One of the tasks that should be addressed in the first year is to establish a committee underneath of the Fire Advisory Board to develop a facilities plan and a priority list for capital projects. The committee should be responsible for the review and approval of all capital construction requests submitted by departments providing fire protection within the County. The Fire Advisory Board should review and approve the recommendations of this committee.

The committee should include representatives from the County and from the municipalities that need to be involved in planning capital projects. It should include one member from the Fire Administrator's Office, and a maximum of four representatives from the municipal and rural volunteer fire departments. Representatives from the Raleigh and Cary Fire Departments should also be invited to participate with the committee. The role of this committee should become an ongoing committee project.

Recommendation

Establish a Capital Improvements Project Committee under the Fire Advisory Board to assist with developing countywide facility plans.

Fire Station Plan -- A fire station plan should be developed by the Capital Projects Committee, and regularly updated to identify needs, prioritize projects, coordinate station locations, and develop design requirements. The Cities of Raleigh and Cary, the incorporated towns and the County rural fire departments should all participate in the planning process. The planning process should look at the following considerations:

1. **Joint Use of Facilities.** Future fire stations could serve as multiple use facilities, possibly shared by police, fire, EMS, or another agency, potentially providing space for other functions that can be reasonably blended into the fire station environment. It should be feasible to work with an architect to develop a reasonably standard design that can be adapted to several specific fire station sites and requirements with considerable savings in design and construction.
2. **Station Location.** Specific criteria for locating and equipping fire stations within the County. In establishing locations for station, the plan should be based on the premise of the closest unit responding to an emergency. The location planning process should take into account an enhanced utilization of mutual aid and

automatic mutual response from all departments within the County, including the Cities of Raleigh and Cary.

3. **Station Design.** Specific criteria addressing station design and construction should be included in the plan. Design plans should include considerations for sleep-in or live-in crews, and career personnel.

Automatic mutual aid response agreements with fire departments adjacent to the County should also be developed.

Recommendation

The Capital Improvements Project Committee should identify and prioritize fire service capital projects in the County. It should consider the creation of joint-use facilities, automatic mutual aid when evaluating the location of new facilities, and future design needs for sleep-in, live-in, or and career personnel.

Station Locations in Unprotected Areas -- There are still some unincorporated areas that are not within a fire tax district because the response distance is more than five road miles from the nearest fire station. The closest rural fire department responds to calls in these areas; one of the departments reports that more than 20 percent of their calls are to properties outside their tax area.

The County should attempt to provide a fire station within a maximum of five road miles of all developed areas of the County, to provide a minimum level of service. Two large unprotected areas could be covered by adding two new stations; one each for the Apex and Knightdale Fire Departments. Both fire departments are ready to proceed with these projects within one year. In both cases, the unprotected areas may not generate enough revenue to fully support the construction and operation of an additional

station at the present time, however, the fire districts can afford to support the investments until the tax base in the added service area matures.

The third significant unprotected area is served by the Stony Hill Fire Department and is north and west of their tax district. A new station for this area is not likely to be built without financial support from an outside source, since the existing tax district barely supports the fire department's current expenses and the unprotected area is sparsely populated.

The existing Stony Hill station should be replaced with a more suitable facility, which could be built north and west of the present location to alleviate part of the need for a second station. Mutual aid companies from outside the county can cover part of the extreme northwest corner of Wake County faster than Stony Hill, however, at some point in the future another station will be needed to cover the unprotected area.

The remaining unprotected areas are small gaps between districts, which do not in themselves merit additional stations. Most of these areas can be covered within five miles by additional stations that are already planned or by minor adjustments in response areas.

Building a fire station within five miles does not in itself provide fire protection. Some of the rural departments have built substations and placed apparatus in remote areas where there may not be any personnel to respond with the vehicles. The departments need to develop a cadre of personnel in the areas where stations are located to respond promptly when they are dispatched. Even when trained personnel are available in the area, a station within five miles only provides the minimum level of service that is recognized for insurance purposes. (Class 9S)

Recommendations

At a minimum, provide a fire station within a maximum of five road miles of all developed areas of the County.

Establish a cadre of "duty crews" who rotate to ensure that volunteer personnel will be available to respond and operate equipment at unstaffed stations at all times.

Insurance Protection Classifications

Rural fire districts are rated for insurance purposes, primarily based on the operational capabilities of their fire departments and the availability of water for fire suppression. The classification system is on a one to ten scale: Class 10 indicates unprotected property, while Class 1 is considered as very highly protected. Most large cities are rated as Class 2 or 3 and a only a small number rated as Class 1. Rural areas are generally rated in the Classes 6 to 9.

Properties in Class 10 areas generally pay the highest fire insurance rates and lower rates apply to areas with each successive lower numerical classification (see Figure 4-1). In North Carolina, Class 10 property insurance rates are generally about twice as high as Class 1 rates. Individual insurance companies may utilize different rate structures, however, the largest reduction in premiums, almost 20%, generally occurs between Class 10 and Class 9S. There are additional savings in insurance premiums for each step from Class 9 down to Class 6. All properties in Classes 1 through 6 generally pay the lowest rate. (In many other states, the difference in insurance premiums is only significant when the level of service provided by the fire department is Class 8 or lower.)

It is important to recognize that the fire insurance classification system is intended only to establish a base rate for setting fire insurance premiums for property - it does not consider any other aspects of fire protection or fire department services. It cannot be directly translated into premium dollars, because of competition between insurance companies and because most fire insurance is sold as part of an insurance package and makes up a small proportion of the total premium.

Most of the rural volunteer fire districts in Wake County are rated with a split classification 6/9S, which indicates that the fire departments provide Class 6 service in the areas where a water is available from hydrants (generally incorporated and

Figure 4-1

Example of Fire Insurance Premiums versus Fire District Taxes

To provide a cost comparison for home owners, the Wake County Fire Marshal's Office conducted a survey of homeowner's insurance premiums for single family homes under different protection classifications. The following information was obtained from seven different insurance companies, based on a wood frame single family dwelling, valued at \$100,000, insured for replacement value. The "model home" has smoke detectors and deadbolt locks and the policy includes a \$500.00 deductible amount. The following figures are the averages of those provided by the seven companies.

Protection Class	Average Premium	Class Savings	Total Savings
10	\$489	---	---
9S	\$387	\$102	\$102
8	\$360	\$27	\$129
7	\$322	\$38	\$167
1-6	\$257	\$65	\$232

The amount of fire district tax on a home in Wake County depends on the district where it is located. The rates range from 5.5 cents to 10 cents per \$100.00 assessed valuation in different districts. A home owner in the lowest tax rate area would pay \$55.00 annually; in the highest tax rate districts the cost would be \$100.00.

A home that is not currently within a fire tax district would be insured as Class 10 property and would not pay any fire tax. Using the figures provided above, the insurance premium would be \$489. If the property is included in a fire district that can provide Class 9S service, the insurance savings would be greater than the cost of the fire district tax. (\$102 insurance premium savings versus \$100 maximum fire district tax.)

immediately adjacent areas) and Class 9S in the areas where they depend on tankers for water supply. (The 9S classification indicates that the fire department meets North Carolina minimum standards for rural fire protection.)

A few of the rural districts that have no incorporated service areas and no water supply systems are uniformly rated as Class 9S. Areas beyond the five mile response distance from the closest fire station are rated as Class 10 and receive no reduction in their insurance rates.

Three districts (Wake-New Hope, Fairgrounds, and Bayleaf) are rated entirely as Class 6 and Bayleaf is working on a Class 5 rating. Wake Forest and Zebulon have Class 5 ratings in their incorporated service areas.

Recommendation

To take advantage of the insurance savings, the countywide plan for providing fire protection services should set an objective of providing at least Class 8 service to all built-up areas and at least Class 5 in urbanized areas.

It appears to be feasible to meet Class 8 requirements in most areas with relatively minor improvements in operational areas. A large part of the improvement could be achieved simply by advancing from an unstructured mutual aid system to a functional countywide automatic mutual aid response system. While the lower insurance premiums are desirable, the insurance rating system should not be the driving force behind fire protection improvements.

Apparatus

Apparatus needs in the future should be considered on a countywide basis, based on what apparatus resources each department has, where certain types of apparatus are lacking, and what is the potential staffing level for units. The overall future concept of apparatus should be premised on using mutual aid resources from the County departments.

Mutual Aid Apparatus -- 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.

In most cases, it would be more practical and efficient to dispatch one or two units from several surrounding stations than to count on having drivers and crew members for several vehicles coming out of one station. In other words, it would be more efficient to have fewer tankers placed strategically throughout the County which all of the fire departments could use through automatic mutual aid. Under this plan, tankers from two or three departments could be dispatched to fires where a water supply is needed. A few strategically located large capacity tankers would help. Substantial savings could be realized if the departments coordinated their purchasing of new apparatus and limited their fleets to a reasonable number of vehicles that each could operate as part of a coordinated plan.

There also should be a more concerted effort to plan a strategy and conduct training on the efficient delivery of water using uniform procedures for particular situations. All of the departments should be fully capable of working as a combined force according to the standard operating procedures.

Future Apparatus Plan -- In a countywide system, the individual fire departments would not have to plan their fleets around having enough water carrying capacity for every potential situation or in their district for simultaneous incidents. Units would be dispatched from the surrounding stations to assemble the combined force of personnel, apparatus and equipment, and water transport and delivery capacity to meet the needs of each situation. This is a more realistic approach in an environment where volunteer and career staffing is limited; it is usually easier to muster four or five members from each of three departments than to assemble twelve to fifteen members (a reasonable initial response team for a reported structure fire) from one department.

The countywide plan and the contracts to serve county areas should include a limitation on the number of vehicles that will be maintained through the tax revenues. The actual determination should be made by the Fire Advisory Board based on a recommendation from the Fire Chiefs, however it should include at least two primary attack units (pumpers or pumper-tankers) available to respond from each station. The combined fleet of water transporting units (pumpers, pumper-tankers or tankers) at each station should have the capacity to transport at least 3,000 gallons of water. "Surplus" equipment should be relocated to other areas of the County where they are needed.

These objectives can be accomplished with two or three primary fire suppression vehicles in each station. One brush unit or mini-pumper per station is also reasonable. If individual departments wanted to retain additional vehicles on their rosters, it would be their responsibility to pay the operating and maintenance costs with funds raised on their own.

The system should also include a reasonable number of spare vehicles to replace units that are out of service for maintenance or repairs. A ratio of approximately one spare for each five first line units should be adequate. The spare vehicles should be owned and maintained by the County and shared throughout the system as needed.

The Fire Advisory Board should determine the need for specialized apparatus and equipment and appropriate available funds to purchase these items. The cost of the specialized units should be shared and the vehicles should be county-owned, however, they could be assigned to particular departments to operate. The operation of specialized units is a potential mission for some of the volunteer departments that are no longer needed for primary fire protection. (At some future date, some of the special purpose vehicles could become "County units" staffed by 24 hour County-funded career personnel.)

Recommendation

Apparatus purchases should be coordinated and planned by the Fire Advisory Board so that all apparatus, including special apparatus, is strategically located throughout the County, and duplicate equipment purchases are eliminated. The apparatus plan must take into account the ability to have the apparatus staffed at all times.

Apparatus Replacement Budget -- The budget instructions for the volunteer departments this year include a requirement to set aside a reserve fund for apparatus replacement. This is a positive step for improved management. If the fire districts are consolidated, a certain amount of the total fire tax revenue should be set aside each year for apparatus. The actual expenditures for apparatus replacement should be planned and prioritized each year on a Countywide basis by the Fire Advisory Board. The County departments and the municipal fire departments that contract to serve County areas should be able to apply for appropriations from the County fire apparatus fund. The municipal departments could match with municipal funds to replace a vehicle or acquire an additional unit. Apparatus that is purchased with the County funds should be titled to Wake County or jointly titled to the County and another owner.

The replacement program should not be based strictly on age, but on the combined factors of mileage, condition, and suitability for each vehicle. Each unit should be evaluated annually by the County's fleet management staff. A replacement budget

based on an average of fifteen years of first line service is more realistic than twenty years, particularly if the utilization of individual units increases. Some of the fifteen year old vehicles should still be adequate for use as spares.

This approach would reduce the number of first line units that would be needed in the fleet and allow several older and obsolete units to be retired. There are some very good vehicles in the fleets of volunteer departments that are no longer needed because the districts have been annexed; these units should become available for reassignment within the countywide system to replace older and less adequate units. The apparatus reassignment process should be supervised by the Fire Advisory Board.

Recommendation

Apparatus replacement budgets and schedules based on an average of fifteen years of first line service should be planned and prioritized by the Fire Advisory Board. Each unit should be evaluated annually.

The apparatus replacement program should be based on mileage, condition, and suitability of each vehicle, not strictly age.

Apparatus Ownership -- Apparatus that is purchased with tax funds should be regarded as public property in the custody of the individual fire departments and should be turned over to the County if those departments are dissolved. If they become municipal fire departments, the County and the municipalities should reach an agreement on the ownership question.

Any sale or trade-in of apparatus should require approval of the Fire Advisory Board, which would determine if a vehicle could be used by a different department within the county system before allowing a serviceable unit to leave the system. This would not necessarily apply to any vehicles that may have been purchased by the volunteer departments with non-tax funds.

An independent volunteer organization (which could operate as a rural or municipal fire department) could continue to raise its own funds and spend that revenue according to its own constitution and bylaws. This could include the purchase and operation of "volunteer owned" fire apparatus that would not necessarily be considered as a public asset. Existing apparatus that was purchased with non-tax funds could continue to be owned by a volunteer organization.

Apparatus Maintenance -- Each fire department currently provides its own apparatus and equipment maintenance. Some of the work is performed by volunteer and career personnel and some is sent out to various outside vendors. The Wake County Fleet Services Division may be able to provide a centralized apparatus maintenance facility that would be more reliable and economical than the current system. This alternative should be explored by the County Fire Administrator and reported to the Fire Advisory Board.

Special Response Resources

Fire departments across the country have begun to take on additional "special response" capabilities in the past decade, including hazardous materials response teams and technical rescue teams. These areas are called special response because they require specialized training and equipment, beyond basic fire fighting skills.

Due to the increasing national concern to protect the environment, fire departments have assumed the role in many jurisdictions as the primary responder to stop chemical leaks, remove chemical and petroleum-based products that are found floating in local water bodies, and extinguish chemical fires. Knowledge of how to handle hazardous materials incidents requires special training and equipment.

Technical rescue is another fire department "special response" capability. It involves rescue from automobiles, confined spaces (sewers, vats, and tanks), collapsed buildings, trench cave-ins, areas accessible only by rope, and water bodies. Federal safety regulations require specialized training to conduct certain types of technical rescue operations.

Hazardous Materials -- Wake County should continue to work with the Raleigh and Wendell Hazmat teams and hold-off on making a decision in this area until the State's plans are known. If the Raleigh Fire Department Team is funded by State of North Carolina, it may become less costly for Wake County to obtain its services. If a different team is selected for the region, particularly one that responds from a more distant location, the local alternatives will have to be weighed.

Wake County should continue to support the Wendell Hazmat Team as a local resource to back-up a regional team or to provide immediate response capability when the regional team is not available.

All fire fighters, career and volunteer, are required by Federal law to be trained in basic hazardous materials operations. This is a standard and mandatory part of the training program for all fire fighters in the County. The County's Emergency Management Agency provides this training.

Technical Rescue -- The Fire Departments and Rescue Squads will have to decide which agencies will develop and maintain different technical rescue capabilities in the future, particularly if the rescue squads move in the direction of specializing in emergency medical treatment and transportation and reduce their commitment to physical rescue. A joint planning and decision-making process will have to take place to make these determinations.

Most of the volunteer fire departments have become involved in automobile extrication and reduced the responsibility of the volunteer rescue squads to perform this function. This responsibility should be officially assigned to the fire departments to resolve any question of duties and responsibilities that could arise in the future.

There are several additional areas of technical rescue expertise and capability that should be addressed by the fire departments, to determine whether or not they are needed in Wake County. These areas include cave-in and confined space rescue, water rescue, urban search and rescue, and rope/high angle rescue. Some of these capabilities may already be available through the Raleigh or Cary Fire departments or through the volunteer rescue squads.

Confined-space and Cave-in: Confined space and cave-in rescue capabilities appear to be priorities with the amount of construction and industrial activity that is occurring in Wake County. Teams to provide these capabilities should be established as part of a county-wide plan, involving the Raleigh and Cary Fire Departments with the County fire departments. These specialties require very specific training and equipment and should be geographically deployed to respond quickly to all areas of the County.

All career and volunteer personnel should be trained to recognize incidents that require these special teams and should be prepared to support their operations - only properly trained and equipped personnel should be permitted to take action on these incidents.

The Raleigh and Cary Fire Departments already have confined space rescue teams -- trained, equipped, and available to respond if needed. In the future, a network of five Fire-Rescue squads, one each from Raleigh and Cary and three from County fire departments, could be a reasonable geographic deployment of these specialties. Each team should be staffed to respond with at least four fully trained personnel for the required rescue specialty and at least two squads should be dispatched on any incident where the need for technical rescue operations is indicated. The teams could combine career and volunteer personnel, but all would have to be fully trained to work together, following standard operating procedures. All technical rescue equipment should be fully compatible.

The volunteer fire departments have purchased several special purpose vehicles which carry rescue equipment in recent years, but there is no plan in place to coordinate the equipment and advanced training for rescue specialists. The existing units can be used in the county-wide plan, with additional equipment and training. No additional heavy rescue units should be purchased until a Countywide plan has been adopted.

Recommendations

Establish a plan to strategically locate, fund, train, and equip 3 additional technical rescue teams across the County. The County teams should be part of a coordinated overall plan with Raleigh and Cary.

Continue support for the Raleigh and Wendell Hazmat Teams to serve the County.

Maintain the training of all fire fighters at the hazmat operations level.

Emergency Medical Services

Several of the fire departments have begun to offer emergency medical services (EMS) as first responders with the rescue squads to medical emergencies. Fire departments that already participate in EMS response are finding their EMS call volume is higher than their structure fire call volume (see Chapter 2). Some of the fire departments provide extrication services, and all of them work with the EMS agencies at vehicle accidents and other types of rescue incidents. Because of the distribution of 29 fire stations across the County, the fire departments have the ability to offer rapid EMS response. There are only 12 rescue squad locations outside of Raleigh to cover the same area. Fire stations that are staffed by "in-station" personnel and participating in the first responder program often can beat a rescue squad to the scene.

In the future, all fire departments should be incorporated in EMS response, especially for life threatening emergencies and all vehicle accidents. At a minimum, each fire engine crew should include at least one first responder or emergency medical technician (EMT) that could perform basic life support skills. Eventually, all fire fighters should be trained to either the first responder or EMT level. Fire engines should be dispatched to all incidents involving an immediate threat to life, such as cardiac arrest, vehicle accidents with injuries, trouble breathing, or heavy trauma calls, because the fire fighters can begin critical patient care before arrival of an ambulance.

The future plan should combine the fire departments and rescue squads into one organization. The two organizations have similar missions, could complement one another, and together could improve EMS response times in the County. Additionally, fire units could begin to carry automatic defibrillators. In the long term, several strategically located engines could be staffed with a paramedic to provide an even higher level of rapid response EMS care. A comprehensive study of the Wake County EMS system is recommended.