

ARTICLE 33

# Fire Protection

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THE RESPONSIBILITIES of modern city, county, and rural fire departments encompass far more than the traditional duty of preventing fires when possible and suppressing fires when they occur. In addition to continuing to provide core fire prevention and suppression services, today’s fire departments respond to serious traffic accidents and emergencies involving hazardous materials; deliver emergency medical services, rescue persons from trenches, confined spaces, and collapsed structures, dispatch other public safety emergency services; inspect buildings; and enforce fire prevention code requirements. In addition, modern fire departments must be prepared to respond to large-scale rural and urban disasters and terrorist threats. Local governments are tasked with allocating sufficient funds to departments to enable them to provide acceptable levels of these diverse services.

Fire protection has been considered a core municipal service since the nineteenth century, when a few of the larger cities in the state boasted fire fighting companies with hand and horse-drawn stream-powered fire pumpers. Fire protection was important in cities, where compact development with largely wooden buildings posed a constant danger of communitywide conflagration. Rural fire protection as a function of county government, in contrast, did not exist until after World War II, simply because water was not available for rural fire fighting before that time. Since unincorporated areas in the early and mid-1900s were generally rural in nature, characterized by widely separated farm

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buildings and residences, fire protection was regarded as a matter of concern for the individual property owner, but not necessarily county government. Yet, as urban development has spread to formerly rural areas and citizen expectation for fire protection in such areas has increased, fire protection services delivered at the city and county level have grown more similar. This article addresses the manner in which cities and counties provide and fund fire protection services, the multiple roles of the modern fire department, and the ratings systems used to evaluate fire departments for purposes of determining the rate of insurance applicable in a particular area.

## Fire Service Provided by Local Government

Though neither cities nor counties are required by law to provide fire protection, many cities do provide such services through a city fire department. When a city establishes a fire department, it assumes an implied obligation to provide a reasonable level of fire protection. Courts have ruled that failure to provide adequate facilities or to control a fire does not constitute a liability against a city; nevertheless, people expect the fire department to be reasonably competent in controlling fire, considering the adequacy of equipment, personnel, and water supply, along with the nature of the fire and its headway when discovered. A city that does not wish to establish its own fire department may provide fire protection by contracting with another city or with an incorporated fire department.<sup>1</sup>

Cities are authorized to appoint a fire chief, employ firefighters, organize and maintain a fire department, and prescribe the duties of the department (G.S. 160A-291). Fire chiefs are charged with directing fire fighting and training activities, maintaining equipment, correcting fire hazards, and making annual reports to the city council concerning departmental activities (G.S. 160A-292). City fire departments may be staffed by paid or volunteer firefighters or some combination of the two. The city's general fund is the primary source of funds for capital expenditures, equipment, and salaries. Thus, the city council's ability and willingness to appropriate funding to the fire department largely controls the level and breadth of service it is able to provide.

While fire protection outside city limits historically was the exception rather than the norm, most areas in the state today are afforded some level of fire protection. Counties, unlike cities, do not typically provide fire services through county fire departments, though they are authorized to establish such departments (G.S. 153A-233). Instead, most counties contract with volunteer fire departments and, on occasion, cities, for fire protection in a designated area. Some counties maintain fire and rescue divisions in which they employ personnel assigned to work in rural fire departments. In addition, fire and rescue divisions of county government coordinate the work of various rural departments.

Counties, like cities, may appoint a fire marshal or assign the duties of a fire marshal to another qualified county officer or employee. Fire marshals may be charged with advising the board of county commissioners on improvements in county fire fighting or fire prevention activities, coordinating county fire fighting training and prevention, assisting volunteer fire departments to improve their fire fighting or fire prevention capabilities, and making fire prevention inspections, including the periodic inspections and reports of school buildings required by Chapter 115 and the inspections of child care facilities required by Chapter 110 (G.S. 153A-234).

While counties may appropriate general fund revenues for fire protection, counties may utilize two other methods for additional rural fire protection funding. First, resident property owners may petition for and voters may agree to establish a rural fire protection district. In such a case, the board of county commissioners may levy taxes up to the voted-upon rate limit, 10 or 15 cents per \$100 in property value, to fund fire protection. Alternatively, boards of county commissioners may designate a certain area in the county a service district and levy additional taxes in that area to fund fire protection services. No voter approval is necessary to establish a service district. Fire protection services may also be funded privately: groups of county residents may form associations and contract for fire protection with various public and private agencies.

When a county enters into an agreement with a volunteer fire department to furnish protection in a designated area for a fixed fee, the volunteer department then functions as a county fire department for all intents and purposes. The area protected by an individual volunteer department is usually referred to as an insurance district.

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1. North Carolina Fire Service Reference Manual I-1 (North Carolina Association of Fire Chiefs, North Carolina Department of Insurance, Office of State Fire Marshal, 2003 ed.) PDF available at <http://www.ncafc.com/firemanual.htm>.

## Contracts with Municipalities

As previously noted, G.S. 153A-233 expressly authorizes counties to contract for fire protection with cities or other units of local government. Cities and towns may install and maintain water mains and hydrants, as well as buildings and equipment, outside the city as well as inside city limits (G.S. 160A-293). In addition, personnel and equipment may be dispatched to protect unincorporated areas pursuant to an agreement between a city and a county or between a city and the owner of property to be protected. Counties may use tax revenues to compensate cities for fire protection furnished to rural areas. Neither a city nor its employees may be held liable for failure to answer or delay in answering a fire call outside the corporate limits [G.S. 160A-293(b)]. Moreover, the city (but not individual firefighters) is immune from civil suit for acts committed in rendering fire protection outside the city. Employees of city fire departments, while performing services outside the city on the orders of the fire chief or the city council, have the same jurisdiction, authority, rights, privileges, and immunities as they enjoy within the city. One important privilege conferred by this provision is coverage under the North Carolina Workers' Compensation Act [G.S. 160A-293(c)].

Some cities contract to furnish fire protection to rural fire protection districts located in unincorporated areas, whereas others contract with an incorporated volunteer fire department to furnish fire protection to the city. The authority to contract for fire protection is contained in G.S. 160A-11 and G.S. 160A-461, which give cities the power to contract or be contracted with; and in the provisions of G.S. 160A-274 and G.S. 160A-277 that authorize cities to lease property, to use real and personal property jointly with another governmental unit, and to lease, sell, or convey land to a volunteer fire department that provides fire protection to the city.

## Tax-Supported Rural Fire Districts

Residents of rural areas without fire protection may seek to establish a tax-supported fire protection district pursuant to the procedures set forth in Chapter 69 of the General Statutes. The first step in establishing a tax district is to present to the county commissioners a petition signed by at least 35 percent of the owners of real property who reside in the area, which must be situated outside the corporate limits of a city or town. The petition must describe the area to be included in the district and give the new district a name (G.S. 69-25.1).

The question of levying a special tax for the purpose of providing fire protection is then submitted to the "qualified voters" of the proposed district. Those who own real property in the area but do not reside therein are not "qualified voters" and may not vote in the election. If approved, this special tax is collected on all taxable property in the district, real and personal, but may not exceed 15 cents per \$100 assessed valuation. A method is also provided whereby an existing district that has previously authorized a tax of 10 cents per \$100 valuation may vote on whether to increase the tax to 15 cents per \$100. The fact that a 15-cent tax is authorized does not require that the full amount be levied, and most districts that have authorized the 15-cent levy actually tax at a lower rate.

The board of county commissioners (after consulting with the board of elections) sets the date for the election, which is then conducted by the county board of elections (G.S. 69-25.2). The form of the ballot is prescribed by statute. If a majority of those casting ballots vote "in favor of tax for fire protection in \_\_\_\_\_ Fire Protection District," the county commissioners then select the means of providing such protection. The statutes provide several alternative methods of doing so, including the following:

1. contracting with an incorporated city or town
2. contracting with an incorporated nonprofit volunteer or community fire department
3. contracting with the state Department of Environment and Natural Resources
4. using the county's fire department if it has one
5. establishing a fire department within the district
6. using a combination of the above (G.S. 69-25.5)

The taxes collected for fire-protection purposes go into a special fund administered by the board of county commissioners or by a three-member "fire protection district commission" appointed by the county commissioners. Fire-protection district commissioners must be qualified voters who reside in the district; they serve for two-year terms and are subject to the county commissioners' supervision (G.S. 69-25.7).

The statutes also authorize an election to determine whether an existing fire district should be abolished. This election is called on the petition of 15 percent of the resident owners of real property within the district (G.S. 69-25.10). Fire-district boundaries may be increased or decreased; such a change may be accomplished by petition, so that another election is not necessary. Even territory within a city can be added, if the city so desires (G.S. 69-25.11). When all or any part of a district is annexed by a municipality that furnishes fire protection, the annexed territory ceases to

be a fire district (or part of a fire district), and fire-district taxes may no longer be collected in the annexed area. The procedure for prorating fire-district taxes in the event of annexation during a fiscal year is specified by statute (G.S. 69-25.15).

### **County Service Districts**

The County Service District Act of 1973, codified as Article 16 of G.S. Chapter 153A, empowers boards of county commissioners to create special districts to furnish several traditionally urban services, including fire protection.

The county commissioners must hold a public hearing, after giving statutory notice, before they adopt a resolution defining a new district. To justify a district, they must find that all of the following criteria have been met:

1. There is a demonstrable need for one or more of the authorized services.
2. The proposed services cannot practically be provided on a countywide basis.
3. The proposed services can be provided to the district without unreasonable or burdensome tax levies.
4. There is a demonstrable demand for the proposed services by those who live in the district. (G.S. 153A-302)

No territory that lies within a municipality or a sanitary district may be included within a service district without the approval of that unit's governing body. It should be noted that, contrary to the requirement for a rural fire-protection tax district, no election need be held to establish a county service district. The county commissioners' resolution that defines and creates a service district becomes effective at the beginning of the fiscal year following its adoption (G.S. 153A-302).

The county service district shares one important characteristic with the rural fire-protection district: those who own property within the district are required to pay additional taxes to support the services provided within the district. Counties are expressly authorized to levy property taxes within a service district in addition to those levied throughout the county, and to finance services within the district at a higher level than other county residents receive. A service district established for fire protection services may by resolution of the board of county commissioners be taxed for emergency, rescue, and ambulance services as well. In addition, the governing board may by resolution limit the maximum tax that may be levied in the district to 15 cents per \$100 (G.S. 153A-309.2). In any event, the combined county and service district tax may not exceed \$1.50 per \$100 of property value (G.S. 153A-307). A county may also allocate any other revenues to a district that are not restricted in use by law.

### **Insurance Districts**

A board of county commissioners may designate an area served by one or more rural fire departments as an insurance district (G.S. 153A-233). Such a district is not supported by a specific district tax and exists solely for the purposes of establishing an insurance grade for the included area.

### **Associations That Contract for Fire Protection**

Occasionally, individuals or associations of persons who live outside a municipality contract with a city or a volunteer fire department so that they receive the protection of a municipal or other accredited department for a fixed fee. This type of contract is expressly authorized by G.S. 160A-293.

### **Selection of an Approach**

Each of the alternatives outlined earlier for furnishing county fire protection has both advantages and disadvantages. A countywide career department with paid employees, for example, could provide municipal-quality fire protection to county residents, but would also be prohibitively expensive for most counties. The customary practice of contracting with volunteer departments to furnish protection in rural areas is relatively inexpensive since no salaries need be paid. A county government can retain some control over these contracted-for fire-protection services through contractual provisions requiring annual performance evaluations, compliance with standards issued by the National Fire Protection Administration (NFPA), participation in county training programs, and/or performance measurement evaluations of a department. A county may also choose to supplement the staff of a volunteer department with paid county employees during normal weekday working hours.

Contracting with a city for fire protection to be furnished by its department has the advantage of relieving the county of the responsibility for organizing, training, administering, and maintaining its own department. Also, many city departments are staffed by highly trained personnel and have excellent equipment. But not all cities will agree to furnish protection to outlying rural areas, and in any event, a city department's first duty and highest priority is to

protect life and property within the municipal corporate limits. To maintain its fire-insurance rating, a city may be required to keep certain equipment and personnel within its boundaries at all times; thus, the full resources of the department are never available to all county residents.

A tax-supported rural fire-protection district is attractive because it can be established without increasing the tax burden on county residents who do not own property within the district. If this alternative is chosen, the cost of the protection is placed entirely on those who will receive the service. This approach has the disadvantage of requiring a successful districtwide election before the district can be created. If an election is not feasible, the county commissioners may be asked to establish a county service district for the provision of fire protection. Either a rural fire-protection district or a service district will probably operate under contract with one or more rural volunteer or city fire departments, with the advantages and disadvantages mentioned earlier in this article.

The final alternative, encouraging groups of rural residents to contract with a city or volunteer department for fire protection, creates few if any problems for the county government. Unfortunately, most residents lack the initiative and expertise to organize and contract for such an arrangement.

### **Organizing Volunteer Fire Departments**

Whatever approach is used to furnish rural fire protection, probably one or more volunteer departments will be used. Three of every four fire departments in the United States are staffed entirely by volunteers.<sup>2</sup> For example, no county in this state has a fully paid fire department, and counties usually contract with volunteer departments to furnish protection to rural residents. Similarly, when a tax-supported fire district is established, fire-protection services are usually provided by a volunteer department. Such departments may be incorporated pursuant to the Nonprofit Corporation Act, as contained in G.S. Chapter 55A. The corporation is legally created when one or more incorporators sign the articles of incorporation, have them notarized, and then file them in the Office of the Secretary of State, in Raleigh.

## **The Impact of Annexation upon Fire Service**

### **Territory That Is Part of an Existing Fire District**

Increasingly North Carolina cities are annexing territory that includes part or all of a rural fire protection or service district. Before a city may annex territory, it must prepare a report setting forth its plans for extending to the new area all of the major municipal services it provides (G.S. 160A-47). The report must provide for extending fire protection in substantially the same basis and manner as that afforded to areas already within the city limits. One permissible way of extending such services is for the city to contract with a rural fire department to provide such protection.

Annexations often eliminate or seriously reduce the tax base supporting rural fire departments. The General Assembly afforded a measure of protection to such departments by requiring cities to make a good faith effort to negotiate a five-year contract with a rural fire department to provide fire protection in an annexed area previously within a rural fire district (G.S. 160A-49.1). A good faith offer to a rural fire protection or service district is an offer to pay annually the amount of revenue that would be generated in the district, based on two factors: (1) the district's tax rate at the time the resolution of intent to annex was adopted, and (2) property values in the area on January 1 of each year. For insurance districts, a good faith offer is an offer by the city to pay annually the amount resulting from multiplying the fraction of the city's general fund budget in the current year dedicated to fire protection by the city's current tax rate, and then multiplying the result by the value of the property in the area served by the rural fire department. An offer by a city to compensate the rural fire department for revenue loss directly caused by the annexation also is deemed a good faith offer. A city also may satisfy the good faith offer requirement by offering to contract only for first responder service. In the case of an offer solely for first responder services, a good faith offer is half of the amount calculated in one of the three methods set forth above. A rural fire department that does not receive a good faith offer from an annexing city may appeal to the Local Government Commission and apply for an order staying the annexation pending the commission's review.

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2. FEMA, U.S. Fire Administration (NFPA International, A Needs Assessment of the U.S. Fire Service: A cooperative Study Authorized by U.S. Public Law 106-398, FA-240, December 2002, at 5.



In addition to making good faith offers to contract, rural fire departments also are protected from the financial calamity that could result from its assumption of high levels of debt just before a city decides to annex its territory. A city must pay annually a proportionate share of any payments due on any debt relating to facilities or equipment of a rural fire department that serves an annexed area, if the debt existed at the time the resolution of intent to annex was adopted (G.S. 160A-49.2). If the city contracts for continued fire protection service by the rural fire district, its debt service payments must begin when the rural fire department ceases to serve the annexed area. If the city and rural fire department do not enter into a contract, the city's obligation to pay begins upon the effective date of annexation.

### **Requirement for Citywide Level of Fire Service**

When a city annexes new territory, it must as a condition of the annexation demonstrate its ability to provide the same level of fire protection to the new territory as that afforded to rest of city (G.S. 160A-47). A city may serve a newly annexed area in several ways. It may contract for continuing services with a rural fire protection department that serviced the area before annexation. It may build a new city fire department to service the annexed area or service the area from an existing department. In any event, the city is required by law to refund a prorated portion of fire district taxes paid by taxpayers in the annexed area for any months remaining in the fiscal year after the annexation occurs (G.S. 69-25.15; 153A-304.1).

## **Organizational Structure of a Fire Department**

Fire departments are organized in a variety of ways. Rural volunteer fire departments may be organized by battalions based upon shifts of work or geographic distribution of individual fire stations. Municipal fire departments and county fire departments or fire divisions of county public safety departments typically are organized into divisions that represent the varied responsibilities of the department or division. These divisions commonly are: administration, operations, prevention, investigation, training, communications, emergency management, and equipment maintenance. In some departments, the responsibilities associated with certain of these divisions are placed under a combined division.

### **Administration**

The fire chief, deputy chiefs, and assistant chiefs are administrative personnel, though these individuals commonly have other divisional responsibilities. For instance, the fire chief for the City of Charlotte also serves as the city's director of homeland security, and deputy chiefs frequently serve in operational roles by directing emergency responses on the scene. The administrative duties of such officials include preparing and monitoring the fire department's operating budget; overseeing and carrying out human resources, promotion, and payroll activities; purchasing necessary items and equipment; managing departmental contracts; providing information to the public; managing information systems; and engaging in strategic planning for the department.<sup>3</sup> The fire chief is the public official who is ultimately responsible for the administration and operation of the entire department, though the chief may, and often does, delegate responsibility for certain administrative duties to staff members in the administrative division.

### **Operations**

The Operations division of a fire department typically is charged with duties of fire suppression, emergency response, and rescue activities. The majority of fire department personnel typically are assigned to an operations role. The smallest unit within this division typically is referred to as a fire company, which consists of three to five people on duty at all times assigned to one fire truck. The person in charge of a fire company usually has the rank of a company captain or lieutenant. Fire companies may then be grouped into battalions based upon stations or shifts, as previously mentioned. Alternatively, fire departments with several stations may be divided into districts and a district chief placed in charge of each district.

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3. See, e.g., Charlotte Fire Department, Administrative Services, <http://www.ci.charlotte.nc.us/Departments/Fire/Administration/Administration+Division>, visited May 18, 2006.

When fire department personnel respond to a fire call, a district or battalion chief directs operations at the scene. The first priority of firefighters is saving lives.<sup>4</sup> The second is saving property.<sup>5</sup>

Fire departments today respond far more often to requests for emergency medical assistance than to calls for fire suppression. Indeed, the City of Raleigh fire department reported in 2005 that the number of fire calls answered had declined from a peak of more than 12,000 in 1999–2000 to 9,000 in 2004–5. Meanwhile, the number of city fire department responses to emergency medical calls nearly doubled over the same period, increasing from 9,500 answered calls in 1999–2000 to 18,500 in 2004–5. Under Raleigh’s First Responder program, which is similar to programs in other cities, a fire department unit is immediately dispatched to any life-threatening call in the city. The term *first responder* is an EMS designation, which indicates that the designated entity is to provide initial assessment of a victim’s condition, such as airway, breathing and circulatory systems, and basic first aid intervention, including CPR and automatic external defibrillator capability.<sup>6</sup> Thus, fire fighters may be the first to arrive on the scene of a vehicle accident or at a home or business after a 911 call is placed. Fire fighters dispatched to such incidents are called upon to carry out duties ranging from technical rescue, which might involve extricating a person trapped in a vehicle, to first responder services, such as using a defibrillator to resuscitate a person whose heart has stopped beating or injecting epinephrine to assist with allergic reactions, to traditional fire suppression activities, such as extinguishing a vehicle or structure fire.<sup>7</sup> Fire departments also are increasingly called upon to respond to emergencies involving hazardous materials such as chemical spills or the discovery of clandestine methamphetamine laboratories.

## Prevention

Fire prevention activities may include the inspection of buildings and enforcement of codes and standards, which are discussed in detail in the latter part of this article. Larger fire departments also plan and conduct community fire prevention education programs. In some departments, fire fighters dedicate time between fire calls to public education activities along with other departmental responsibilities.

## Training

The State Fire and Rescue Commission, part of the North Carolina Department of Insurance, is responsible for adopting a State Fire Education and Training Plan, a State Master Plan for Fire Prevention and Control, a Rescue Training Plan, and a State Master Plan for Rescue Services. One of the central purposes of the commission is to increase the professional skills of fire protection and fire fighting personnel and rescue personnel. The commission is empowered to accept gifts, matching funds, and other consideration from private or other governmental sources for use in promoting its work and to make grants necessary to pursue its objectives (GS 58-78-5).

The commission establishes voluntary minimum professional qualifications for all levels of fire service and rescue service personnel. The commission has established voluntary certification programs for firefighters, drivers and operators of fire apparatus, emergency vehicle operators, fire and rescue instructors, fire officers, fire and life safety educators, fire investigators, hazardous materials responders, and rescue technicians. The certification programs are based upon performance standards issued by the National Fire Protection Administration (NFPA). Fire departments may implement their own internal training procedures and programs and may require their personnel to be certified or to meet requirements beyond the minimum necessary for certification. Departments also may require applicants for employment to successfully complete a physical assessment that is designed to demonstrate whether an applicant can perform the duties required of a fire fighter. Such an assessment might include a ladder climb to assess whether

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4. City of Charlotte, Charlotte Fire Department, Operations Division, <http://www.ci.charlotte.nc.us/Departments/Fire/Operations/Home.htm>.

5. *Id.*

6. See FEMA, U.S. Fire Administration; NFPA® International, *A Needs Assessment of the U.S. Fire Service: A Cooperative Study Authorized by U.S. Public Law 106-398, FA-240/December 2002*, at 3 (citing NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2001).

7. City of Winston-Salem, Winston Salem Fire Department, Fire Suppression, <http://www.ci.winston-salem.nc.us/default.aspx?mod=Article&id+381>.

an applicant suffers from acrophobia, a body drag to determine whether applicant can work under stressful, enclosed conditions to rescue an unconscious victim, a hose drag and stair climb to evaluate upper body strength, and an agility course to evaluate fitness, balance, strength, and agility under emergency or stressful conditions, among other events.<sup>8</sup> Some cities, such as Greensboro, have their own state-of-the-art training facilities. Departments in larger cities may offer specialty training in activities such as confined space rescue, structural collapse, responses to emergencies involving hazardous materials, and emergency medical response.

A detailed discussion of the building code enforcement and inspections follows later in this article.

## Communications

An emergency communication system consists of two elements, reporting and dispatching. The most common means of reporting a fire to the fire department is by telephone.

A communication system's dispatching element consists of a dispatcher announcing to an individual fire company, over a two-way radio or intercom system, the location and nature of the alarm. In some large cities, only the fire companies that will respond to the call are alerted. In small cities all companies are alerted, regardless of which ones are to respond. Constant communication is maintained between the dispatcher and the fire apparatus by two-way radio. All automobiles used by fire department personnel, including the chief administrator's, are so equipped.

While fire department personnel typically are able to communicate with one another via such radio or intercom systems, they often are unable to communicate with other emergency responders. A nationwide survey conducted in 2002 revealed that the ability to communicate by radio with federal, state, or other local partners actually declined as the size of a fire department increased.<sup>9</sup> The North Carolina State Highway Patrol's Voice Interoperability Plan for Emergency Responders (VIPER) is designed to remedy the problems associated with the inability to communicate by radio between departments. Under VIPER fire departments as well as other local emergency responders will transition from use of two-way radios linked to communications centers to 800 mhz radios that will enable all public safety agencies in the state to communicate with one another through interoperable radios.<sup>10</sup> The bulk of funding for the VIPER system has come from State Homeland Security grants issued by the United States Department of Homeland Security. Local governments will be required to purchase compatible radios to participate in VIPER.

Another interagency communication issue arises from the fact that the map coordinate system relied upon by most departments is a purely local system that cannot be integrated with a global positioning system that might be used by nonlocal responders such as urban search and rescue teams, the National Guard, or other state or local responders.<sup>11</sup>

## Maintenance

The maintenance of apparatus and equipment is critical for the modern fire department. To comply with federal emission control regulations, the manufacturers of diesel engines have had to resort to very sophisticated electronic fuel-injection systems. Extremely sensitive to close setup tolerances, these systems require expensive diagnostic equipment for proper maintenance. This new generation of electronically controlled engines is challenging to even the best fire department maintenance personnel.

Another dramatic change has occurred in the design of automatic transmissions for fire-fighting apparatus. Proper shifting relies on a close-tolerance electronic mechanism that is driven by a miniature computer chip. Even a slight drop in battery voltage below the required level results in an engine that will not accelerate and a transmission that will not shift. Again expensive diagnostic treatment is required to keep the apparatus in top working order. Fire departments that provide first responder services also must maintain rescue equipment such as hydraulic tools along with ladders and ropes. All departments must maintain personal protective gear such as helmets, uniforms, and self-contained breathing apparatus.

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8. See, e.g., Greensboro Fire Department, Employment and Training, <http://www.greensboro-nc.gov/Departments/Fire/employment/hiringprocess.htm>; City of Rocky Mount Fire Department, Support Services <http://www.ci.rocky-mount.nc.us/fire/support.html>.

9. A Needs Assessment of the U.S. Fire Service, *supra* note \_\_\_, at 85.

10. <http://www.nccrimecontrol.org/Index2.cfm?a=000001,001148,001154>.

11. A Needs Assessment of the U.S. Fire Service, *supra* note \_\_\_, at 85.



## Types of Fire Protection and Fire-Fighting Apparatus

Two types of fire protection are available to a community. The first is private fire protection, such as automatic sprinklers, automatic fire detection systems, and automatic extinguishing systems like those found in commercial property and other particularly hazardous areas. The second is normally referred to as *public fire protection*, which consists of a publicly supported fire department, a public water system, a building inspection function, and, to some extent, police protection relating to discovery and reporting of fires.

The two principal types of fire-fighting apparatus are pumpers, or pumping engines, and ladder trucks. The number of pumping engines and ladder trucks in any fire department will depend on the nature of the local fire problem, the level of fire service desired, and the city's ability to finance the equipment. Pumping engines carry hose and are equipped with a pump, a water tank, and various fire-fighting appliances. Standard pump sizes are 750, 1,000, 1,250, 1,500, and 2,000 gallons per minute. The chassis on which the equipment is mounted may be of the commercial type used by industry and business, or it may be custom built by the manufacturer.

Ladder trucks, the second-most-common type of fire-fighting apparatus, are found in cities that have buildings of three or more stories. Their chief function is to transport the large assortment of tools and appliances needed at fires and the personnel to use them. Usually they carry a ladder that operates automatically to a height of 75 to 100 feet. The ladder is permanently attached to the truck and is raised by hydraulic power provided from the truck's motor. In recent years some cities have purchased *elevating platforms* in lieu of or in addition to the standard straight ladder.

A third type of truck—the rescue truck—is becoming more common in the fire service. This truck supports rescue efforts at the scene of fires and supports the hydraulic rescue tools (jaws of life) used to extricate persons from automobiles. In larger fire departments, a rescue truck company is the principle responder to high-level, below-grade, or other types of technical rescue emergencies. Two additional types of trucks also may be found in fire departments across the state: tankers, which carry water to areas without hydrants, and brush trucks, which are used to fight wildfires.

## Expanding Role of Fire Service

### *Fire Prevention through Inspections and Code Enforcement*

One of the more important duties of the fire department is to prevent the conditions that give rise to fires. For decades fire prevention codes have been enforced by local governments in North Carolina to ensure that buildings are constructed and used to minimize the threat of fire and explosion and to save lives.

Before 1991 there was no requirement that local governments enforce a fire prevention code; indeed there was no uniform state fire prevention code. In 1991 a fire prevention code (then volume V) was added to the State Building Code. Since state law has for some time required local governments to enforce or arrange for the enforcement of the State Building Code within their planning jurisdiction, this meant that local governments became responsible for administering a local fire prevention program based on a uniform statewide code. Since 1991, the State Building Code has been reorganized to rely more heavily on international codes, but a fire prevention code remains a part of it.

The fire prevention code differs from other parts of the State Building Code in several respects. First, the fire code applies to a full range of uses and types of construction, but one- and two-family residences are expressly excluded from its application. Second, the fire code applies not only to the features of newly constructed buildings; many portions of it apply to conditions in existing buildings and premises. Indeed, many of the most important inspections made by local fire inspectors are inspections of buildings that are already occupied to check them for fire safety. Fire inspectors not only issue construction permits for conformance of new buildings with the structural features of the code; they also issue operating permits for a variety of commercial and industrial uses. A third difference concerns the ability of a local government to modify state fire prevention code regulations to suit local purposes. As a general rule the State Building Code may not be amended or modified by local governments. However, local modifications to fire prevention regulations that are more stringent than state standards may be adopted. These local modifications must be approved by the North Carolina Building Code Council, but the council is compelled to approve proposed local modifications if they are related to fire prevention and fire safety and are more stringent than the state regulations. Finally, as a general rule, local inspection departments may not impose civil penalties on those who violate provisions of the State Building Code and must use other sanctions and remedies. However, a local government may impose civil penalties for violation of the state fire prevention code, at least in those circumstances where the State Fire Marshal does not exercise the state's authority to impose such penalties.

### ***Who Inspects?***

Like all other inspectors that review plans, inspect buildings, and enforce the State Building Code, fire inspectors are subject to the training, examination, and certification requirements of the North Carolina Code Officials Qualification Board. Whether employed in a municipal fire department or in a municipal inspections or development department, a fire inspector must pass exams qualifying the inspector to inspect buildings according to certain occupancy classifications and sizes. In some mid-sized and large cities, many of the firefighters have obtained the necessary state certification to qualify as fire inspectors and to inspect certain types of buildings. Today, for administrative purposes most municipal fire inspectors are located in a fire department. However, in certain cities some fire inspectors are assigned to inspection departments where their primary responsibility is to review construction plans for new buildings for compliance with the fire prevention regulations of the code.

### ***Requirements for New and Remodeled Buildings***

Many fire protection standards are incorporated into requirements affecting new construction and remodeling. In such instances fire inspectors must review plans for and check for the proper installation of equipment at the time the structure is built. Different requirements apply to different building occupancies. Automatic sprinkler systems are required for most commercial and industrial occupancies. Automatic fire-extinguishing systems that rely on chemicals are required for certain specialized uses. In addition, standpipe systems must be installed in buildings of a certain height, occupancy load, or size to provide ready access for fire hoses. Similarly, portable fire extinguishers and fire alarm systems must be available in buildings with various occupancies.

Fire regulations apply to still other features of the design and installation of building systems. Special regulations apply to fuel-fired appliances and the storage of fuel oil, heating and ventilation and refrigeration systems, incinerators and emergency and standby power systems, and even commercial kitchen exhaust hoods to reduce the danger of stove fires.

### ***Requirements for Existing Buildings and Occupancies***

#### ***Fire Protection Systems***

Various fire code standards concern fire protection systems. For example, if the code provides that a required fire protection system is out of service, the fire department and code official must be notified immediately. In such a case the fire official is authorized to require either that the building be evacuated or that an approved fire watch be provided for all occupants left unprotected by the shutdown.

#### ***Fire Escape and Overcrowding***

Overcrowding in buildings can lead to catastrophe in the case of fire. The code provides means for fire officials to calculate and enforce the occupancy load of certain types of uses and occupancies. In addition, the code includes extensive requirements for the number and location of room and building exits and the means the exit furnishes for discharging people. Two exits are required for most spaces, but one exit is allowed in certain circumstances.

Because of potential consequences of overcrowding, G.S. 58-79-20 gives the Commissioner of Insurance, the fire chief, or a certified inspector the right to enter and inspect any building in the jurisdiction to check for violation of the occupancy limits. If a violation of this sort is found, the inspector may order compliance "forthwith."

When hazardous conditions threaten life or property, Section 110.3 of the Fire Prevention Code also allows the fire inspector to abate those hazardous conditions that are in violation of the fire prevention code.

### ***Miscellaneous Fire Regulations***

Fire inspectors are also expected to enforce a dizzying array of regulations that apply to particular business activities or events. Special regulations apply, for example, to the storage and handling of compressed gases, to tire rebuilding and storage, to events held in tents and other membrane structures, to the peculiar fire dangers that occur during the construction and demolition of buildings, to the problems caused by the emission of ethylene gas from the ripening of fruit and crops, to the potential problems that may occur when aircraft are maintained and fueled, and to the special dangers posed by toxic and flammable materials. Many of these regulations address the use, dispensing, storage, and handling of materials. Thus fire inspectors must check for these conditions in existing businesses and ongoing activities on a periodic basis.

### ***Required Inspections***

One of the more visible functions that fire inspectors perform is to make those periodic fire prevention inspections required by state law. Section 106 of the fire prevention code requires local units to inspect buildings with hazardous, institutional, high-rise, assembly, and residential occupancies at least once a year. (The inspections of residential occupan-

cies exclude one- and two-family residences and include only interior common areas of multifamily residential buildings.) In addition, industrial and private school buildings must be inspected once every two years. Properties with business, mercantile, or storage occupancies, along with churches and synagogues, must be inspected once every three years.

In addition, the statutes require inspections of certain facilities. G.S. 110-91(4) requires child care facilities to be inspected for fire prevention and safe evacuation prior to the issuance of a license and whenever renovations are made. The State Building Code takes the additional step of classifying child care facilities as either institutional or educational in nature. Section 106 of the state fire prevention code requires that institutional facilities must be inspected annually. Educational facilities must be inspected biannually. G.S. 110-92 allows these child care safety inspections to be made not only by fire prevention inspectors, but also by building inspectors, firemen, or “other officials or personnel of local government.”

Possibly the most well-known fire inspections are conducted in public schools at least twice a year. G.S. 115C-525(a)(1) through -525(a)(5) list five specific fire hazards that inspectors must look for. Inspectors must ensure that (1) corridors and stairways are clear and exit doors are kept unlocked; (2) no unauthorized electrical wiring has been installed; (3) combustible materials are stored in a safe manner; (4) supplies are stored in a well-ventilated place; and (5) trash and rubbish are not permitted to accumulate on school grounds. Inspections must be conducted by either a certified fire inspector, a certified building inspector, or a certified electrical inspector. The board of county commissioners determines who will make these inspections. The board may use its own staff or arrange for these services to be supplied through another local government.

### ***Other Fire Prevention Activities***

Emergency planning and preparedness has always been a part of fire prevention and a goal of the fire service. Its importance has been highlighted in recent years by the scope of the emergency response required by events such as the terrorist attacks of September 11, 2001, and Hurricane Katrina in 2005. In North Carolina, the state building code requires that a fire safety and building evacuation plan be prepared for a number of types of building occupancies. Building occupants must participate in fire drills, and employees must be trained in fire emergency procedures. Other emergency planning activities in which fire departments participate include preparing for disaster responses with partners such as urban search and rescue teams from other jurisdictions, the National Guard, and other state and federal agencies.

In addition, many fire departments engage in a wide variety of programs that are designed to inform the public about the need to prevent fires and to be prepared in event fire does occur.

## **Homeland Security**

All state and local organizations were required to adopt the National Incident Management System (NIMS) protocol developed by the federal Department of Homeland Security as of July 1, 2005, in order to receive federal preparedness assistance grants. As first responders and providers of emergency services, fire departments are at the forefront of the effort to implement the federal guidelines. NIMS is designed to enable federal, state, and local organizations to work together effectively to prepare for, prevent, respond to, and recover from, domestic incidents, regardless of the cause, size, or complexity of the event.<sup>12</sup> NIMS integrates pre-existing best practices in emergency response into a consistent, nationwide approach designed to apply across disciplines and to all jurisdictional levels.<sup>13</sup> A central component of NIMS is the Incident Command System (ICS), initially developed by the U.S. Forest Service and state and local fire fighting agencies in California as a coordinated method of fighting wildfires, as the standardized incident management structure. Various forms of ICS were utilized by fire departments before NIMS was developed.<sup>14</sup> NIMS is intended to standardize ICS and render it applicable not just to fire departments but instead to the entire emergency response system.<sup>15</sup> NIMS instructs that effective incident management begins with preparatory

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12. Department of Homeland Security, National Incident Management System, at ix (March 1, 2004), [http://www.fema.gov/emergency/nims/nims\\_compliance.shtm#nimsdocument](http://www.fema.gov/emergency/nims/nims_compliance.shtm#nimsdocument) and white paper, NIMS and the Incident Command System, [http://www.fema.gov/txt/emergency/nims/nims\\_ics\\_position\\_paper/txt](http://www.fema.gov/txt/emergency/nims/nims_ics_position_paper/txt).

13. *Id.*

14. *Id.*

15. *Id.*

activities conducted on a “steady state” basis, long before any incident occurs.<sup>16</sup> NIMS has six primary components: (1) command and management; (2) preparedness; (3) resource management; (4) communications and information management; (5) supporting technologies; and (6) ongoing management and maintenance.<sup>17</sup> Preparedness, under NIMS, involves planning for the use of personnel, equipment, and other resources; training on multiagency incident command and management, organizational structure, and operational procedures; participation in realistic exercises, qualification, and certification activities; and the formalization of mutual aid agreements among jurisdictions specifying the assistance each expects to provide during an incident.<sup>18</sup>

Two North Carolina fire departments were among the organizations receiving State Homeland Security grants in 2005. The City of Charlotte fire department received a \$600,000 grant to develop an Urban Search and Rescue Team (USRT) with qualifications meeting federal standards. The city’s USAR Team will be available to assist regional partners and the state in emergencies. The Bay Leaf Volunteer Fire Department in Wake County received a \$200,000 grant for a mobile air compressor system to fill a self-contained breathing apparatus, a more traditional fire-fighting apparatus, but one still deemed essential to homeland security.

## Insurance Classifications

Before 2000, fire departments in North Carolina were rated for insurance purposes by a private corporation, the Insurance Services Office, Inc. (ISO). The General Assembly responded to concerns regarding ISO’s inability to conduct timely inspections, a lack of understanding of ISO standards, and institutionalized fear of ISO inspections by giving the Commissioner of Insurance and State Fire Marshal statutory responsibility for grading fire departments that served populations under 100,000.<sup>19</sup> Fire departments serving areas with populations over 100,000 continue to be inspected and rated by ISO.<sup>20</sup> ISO remains an important figure in the ratings system for all fire departments, however, as the State Fire Marshal evaluates fire departments against the current ISO Fire Suppression Rating Schedule, with North Carolina modifications.<sup>21</sup>

City and county fire departments and rural fire departments that have a contractual relationship with a city or county are evaluated by inspectors with the Office of the State Fire Marshal on a scale of 1 to 10 for insurance rate purposes. A department with a 10 rating is considered to have no fire protection for purposes of setting insurance rates. Of the rates set for property considered to have fire protection, rates for real property within the jurisdiction of a fire department with a class 9 rating will be the highest, while insurance premiums for real property within the jurisdiction of a Class 1 fire department will be the lowest. Ratings are based upon the fire department itself, communications, and water supply.<sup>22</sup> To obtain a 9S rating (the North Carolina equivalent of an ISO Class 9), a rural fire district must have at least twenty personnel with eighteen designated as firefighters and two as traffic personnel or show that an average of twelve firefighters has responded to each of the previous twenty structure fires. In addition, all areas in the insurance district must be no more than five road miles from a fire station.

The Office of State Fire Marshal issues split ratings, for example 6/9S, as well as straight ratings, which appear as one numeral only. Split ratings reflect the rating for property located within 1,000 feet of a fire hydrant (the first number) and other property in the district (the second number). Jurisdictions with complete water coverage receive a

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16. Department of Homeland Security, National Incident Management System, at 4 (March 1, 2004), [http://www.fema.gov/emergency/nims/nims\\_compliance.shtm#nimsdocument](http://www.fema.gov/emergency/nims/nims_compliance.shtm#nimsdocument).

17. *Id.* at 3.

18. *Id.*

19. S.L. 2000-176; *North Carolina Fire Service Reference Manual*, note, II-7.

20. The Fire Department for the City of Charlotte is not inspected by ISO, but instead is rated based upon loss data from ISO.

21. *North Carolina Fire Service Reference Manual* note \_\_, II-4.

22. Office of State Fire Marshal, Requirements to Meet the 9S Rating for Initial Certification/Re-Inspection of Fire Departments in North Carolina, available at [http://www.ncdoi.com/osfm/ri/ri\\_9s.asp](http://www.ncdoi.com/osfm/ri/ri_9s.asp) (last visited January 30, 2005).

straight rating. The savings from being within the boundaries of an insurance-rated district are substantial. A homeowner who is located in a Class 9 (or 9S) district will pay about 25 percent less for his or her insurance than if he or she were in a Class 10 area.

## Costs of Fire Protection

The cost of supporting a fire department can be substantial. During the 2005–6 fiscal year, total outlays for fire service in Charlotte exceeded \$77 million. Rural fire departments, which survived for decades upon membership dues, private contributions, and fund-raising events, now almost exclusively have come to rely upon county appropriations and dedicated tax revenues. Total fire district revenues projected for Wake County for the 2005–6 fiscal year were nearly \$18 million.<sup>23</sup> Appropriations to three rural fire departments in Wake County exceeded \$1 million each.

Protecting individuals and structures from fire is a labor-intensive effort. Fire chiefs strive to have as many firefighters as possible respond to a fire emergency. Fire fighting demands a coordinated attack. Fire suppression, structure ventilation, and search and rescue must occur in a specific order but as close to instantaneously as possible. In addition, a rapid intervention team must be on-site and prepared to rescue any firefighter who encounters trouble.

Moreover, the total fire cost for a city or county includes not only direct outlays for fire protection and the value of the property destroyed, but also the installation and maintenance cost of private fire protection systems, insurance premiums in excess of losses paid, costs of compliance with laws, and ordinances enacted in the interest of fire prevention, losses due to disruption of business by fire, and loss of life and personal injury.

## Additional Resources

*Fire Chiefs Reference Manual*. Published by the N.C. Fire Chiefs Association in Raleigh, North Carolina. PDF file available at <http://www.ncafc.com/firemanual.htm>.

Loeb, Ben F. Jr. *Fire Protection Law in North Carolina*, 5th ed. Chapel Hill, N.C.: Institute of Government, The University of North Carolina at Chapel Hill, 1993.

*Minimum Rating Requirements for Fire Districts in North Carolina*. Published by the Fire & Rescue Service Division of the State Department of Insurance in Raleigh, North Carolina.

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23. <http://www.wakegov.com/about/budget/fy06/2006adoptedbudget.htm>.



