

MASTER PLAN

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CITY OF DOVER FIRE & RESCUE SERVICE

Master Plan Considerations

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Mission Statement of the Dover Fire & Rescue Service

To provide the community with information, education, services and representation to enhance their ability to survive from the devastation of fire, environmental, natural and man-made emergencies.

To achieve this mission, the department is responsible to insure that there is proper and sufficient equipment and personnel available to respond to emergencies and to perform life-saving activities in an urgent manner.

Department Goals

1. Prevent injury and loss of life and property by preventing fires.
2. Minimize injury and loss of life and property when a fire occurs.
3. Provide the highest quality emergency medical services.
4. Provide non-emergency community services as a secondary activity.
5. Mitigate the consequences of natural and man-made disasters.
6. Utilize a system of management that will assure a cost-effective operation of the department.
7. Ensure that the lives and property of the public and fire service personnel are adequately protected from fire and related hazards.
8. Provide training and education to the public and fire service personnel to reduce the risk of property loss, personal injury, or death.
9. Safeguard the environment from unintentional damaging forces.
10. Safeguard the economic base of our community.

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Staffing

In 1979 the fire department was staffed with 13 personnel per shift and responded to approximately 700 calls per year. At that time, the department did not provide ambulance service, did not respond to accidents unless there was a fire and was not responsible for emergency management services, which was a separate department entitled Civil Defense. The department now provides a host of emergency and non-emergency services to the community.

In addition to fire related emergency services, the department now provides additional emergency services to the community to include paramedic emergency medical service, vehicle extrication, water rescue, high-angle rescue, hazardous material response and mitigation, air quality identification and other services to mitigate a host of natural and manmade emergencies. The saying that, "when all else fails, call the fire department" has now become a reality with one additional caveat; they now call us first before all else fails. The department also provides a multitude of non-emergency services as well. These services include fire prevention and code enforcement, public fire and safety education, fire investigation, motor vehicle and residential lock-out services, water extrication, and air quality monitoring, to name a few.

Today the department is staffed with nine personnel per shift and responded to almost 4,600 calls for service during calendar year 1998. For 1999, the department is projected to respond to over 5,000 calls for service. Although the department responds to a 700 percent increase in calls for service since 1979, it is doing so with a 45 percent lower staffing level. The increase in demand for service coupled with the unchanged level of staffing has resulting in staffing shortages during peak response periods.

Fire Suppression

The following excerpt from the International City/County Managers Association, *Managing Fire Services* publication illustrates the multifunctional tasks performed simultaneously at the scene of a structural fire by fire suppression personnel. "Fire suppression operations have three basic functions: (1) rescue; (2) work involving the ladder, forcible entry and ventilation; and (3) the application of water through hose lines. Rescue and ladder companies handle the first two and engine companies the third. To raise ladders, ventilate, search, and rescue simultaneously takes quick action by at least four and often eight or more firefighters, each team under the supervision of an officer. The number of firefighters required to search and rescue should never be fewer than two and typically is at least four. The number of firefighters needed to advance and operate one hose line varies from two on smaller lines to four on large hand lines.

The standard formula for determining the volume of water needed and the number of hose lines to be advanced at a working structural fire is based on a minimum of two engine companies with at least eight firefighters. This formula calls for the discharge of three gallons of water per minute for every 100 cubic feet of involved fire area with typical fire loading. An area of 40 feet by 40 feet with 8-foot ceilings requires 384 gallons per minute. Two hose lines are needed to produce that flow and a third line to cover the floor above. Exposure coverage and search and rescue are not yet taken into consideration, but already eight or nine hosemen are needed, plus the pump operators, plus the supervisor.

Various controlled and statistically based experiments by some cities and universities reveal that if about sixteen trained firefighters are not operating at the scene

of a working fire within the critical time period, then dollar loss and injuries are significantly increased, as are the square feet of fire spread. As firefighting tactics were conducted for comparative purposes, "five-person fire suppression companies were judged 100 percent effective in their task performance, four-person companies 65 percent effective; and three-person companies 38 percent effective." Note that the above recommendations do not take into consideration the recently recommended standard that requires a manned backup hose line for protection of interior attack personnel.

Given these facts, the City of Dover Fire & Rescue Service does not comply with the preceding recommendations. Presently the city provides two engine companies staffed with three persons, one ambulance with two persons and one ladder truck with one person. Although the city does not meet these recommendations as presented, it has closely analyzed the current level of service in order to better use current staffing by cross-training the personnel in an attempt to meet these recognized recommendations. Although not perfect, it has been successful in that it has helped to minimize the risk of inadequate staffing on most of our fire calls. However, as noted, the growth of the city has increased the department's responses to the point that additional staffing is now necessary in order to respond in a manner that will continue to minimize the risk to our community.

Also impeding the department's ability to provide a high level of fire suppression services to the community is the fact that simultaneous and multiple alarms totally deplete available forces. These "double-header calls" split the city's two engine

companies on simultaneous alarms or reducing staff for fire calls by rerouting the ambulance to emergency medical calls.

Emergency Medical Services

Emergency Medical Services (EMS) is a major function of the Dover Fire & Rescue Service. EMS currently represents about 37% of the department's overall calls for service. The primary ambulance operates from Central Fire Station, located on Broadway. A back-up ambulance, located at South End Fire Station on Durham Road, is cross-staffed with firefighters from that station.

The City of Dover Fire & Rescue Service is on the cutting edge of patient care, providing paramedic level services to the community 24 hours a day, 365 days a year. Paramedic level care is currently recognized as the highest pre-hospital emergency medical care, offering the greatest chance of survival to the patients who are critically ill or injured. The department currently employs 16 paramedics who are cross-trained in other fire, rescue, and hazardous material functions.

In addition to the three ambulances, the two front line pumpers are equipped with "Advanced Life Support" equipment, which includes a cardiac monitor. This ensures quick definitive care can be administered when an ambulance is delayed because of back-to-back calls. Additionally, the department supplements its ambulance personnel on EMS calls by dispatching an engine company on all life threatening emergencies. The available staffing for emergency medical calls within the city is adequate. A recent study was conducted to evaluate the effect of staffing on the quality of EMS service. It was determined that for a large percentage of life threatening calls, a minimum of four trained personnel were required to effectively administer treatment. The cardiac arrest

scenario provides a good example because typically this type of emergency demands the most resources, both in personnel and equipment, of any single commonly encountered medical emergency. Resuscitation efforts require many interventions and procedures that must be performed in a sequenced and systematic manner. By responding an ambulance and an engine to all life-threatening emergencies, as is currently the practice, five personnel are available to render various levels of care.

Although staffing of the primary ambulance is adequate, the cross-staffing of the back-up ambulance at the South End Fire Station reduces the level of care to the residents of the south end of the city because of the added response time resulting from responses from Central Fire Station. According to the American Heart Association, in cases of cardiac arrest, cardio-pulmonary resuscitation (CPR) must be initiated within four minutes, and "Advanced Life Support" within 6 to 8 minutes of the cardiac arrest. This translates to a required response time of 4 to 6 minutes. When treatments are withheld, delayed, or performed inadequately, the chance of irreversible brain damage increases exponentially.

Fire & Rescue Training

As we head into the New Millennium, a reaffirmation of training needs for the Fire & Rescue organization must be in the forefront of management. Today's "firefighter," more than any time in the past, is a part of a broad-spectrum emergency-response team system. The challenges faced everyday by these men and women are of unprecedented technical complexity. Large sums of money are spent each year to operate this organization, but a very small percentage is earmarked for training of its' personnel. As the range of emergencies covered by the department grows, the

sophistication of equipment and methods to do the job increases, and understanding evolves as to what works and what doesn't work, it is even more important to refine the department's set of standards, best practices, and core knowledge, to keep pace.

Training in all its forms is the single most important ingredient in the readiness of firefighters and emergency responders to fulfill their assigned missions. Training most often spells the difference between success and failure in an emergency, when action must be quick and decisive. Internally, the department is charged with training its members in routine as well as advanced operational procedures. This is desirable to field a capable and qualified emergency service, but also because many federal and state laws and regulations now specify minimum hours of training in such areas as basic firefighter certification, emergency medical certification, hazardous materials and other related areas. As the demands for knowledge have accelerated among members of this fire & rescue, and as legislated training mandates have increased, it is imperative that all employees are properly trained.

Many cities and regionalized counties have their own training facilities and full-time training staffs. Training takes on several forms and can be implemented according to whatever the organization chooses to set for standards. Daily drills supplemented by scheduled activities on various subjects at a training center especially designed for all the firefighting and emergency skill building needed to keep personnel up to date. Officer training must also be conducted monthly using the various local, state, regional and national training programs.

As a result of budget reductions and the need to provide additional personnel for emergency response, the department's Training Officer position was reduced to a part-

time position in 1992 and completely unfunded in 1997. This has left a serious gap in the department's ability to provide systematic training to its personnel. An additional barrier to providing effective training to personnel is that the number of calls for service, some 12 per day average, causes significant disruptions while training on-duty personnel. It is recommended that the Training Officer position be restored to full funding immediately and additional funding be earmarked to provide training to employees off-duty.

Fire Prevention and Public Safety Education

The Dover Fire & Rescue Service has a long history of progressive fire prevention efforts. For more than twenty years, the department has provided a variety of fire prevention services for the community. As a result, the City of Dover traditionally experiences a low annual fire loss. A comprehensive fire and life safety ordinance, passed in December 1998, includes a stringent fire sprinkler section will further assist in keeping the fire loss within the city low. The current staffing of the Bureau of Fire Prevention is adequate.

Staffing Summary

Today the Dover Fire & Rescue Service responds to more calls for service than ever before. The department is also responding to these calls with fewer personnel than ever before. To adequately address the staffing needs of the department, the subject of response times for fire emergencies must be addressed. Therefore, the issue of current and projected staffing needs will be incorporate in the subject of response time, addressed below.

Response Time

According to the International City/County Managers Association, *Managing Fire Services*, “A prudent response pattern needs quick response times as well as a sufficient number of firefighters for the immediate attack.” Officials need to establish a maximum response time following receipt of the dispatch instructions at the station. In some urban areas, one and a half minutes are considered a desirable maximum, whereas in other urban areas the number is set at two and a half or three. Obviously, the response time policy varies according to the fire danger, the ability of the municipality to locate stations and staff apparatus and traffic speed. Average urban response speed is usually about 35 miles per hour. Once fire apparatus and personnel arrive at the scene, their initial activities require several more minutes.

The goal of fire suppression forces is to engage in fire suppression function before a fire reaches the flashover stage. Francis L. Brannigan, a noted expert on building construction and fire effects on buildings, defined flashover “as the stage of a fire at which all surfaces and objects in a room or area are heated to their ignition temperature and flames develop on all contents and combustible surfaces at once.”

The MMA Consulting Group, Inc., in its fire station location report for the City of South Portland, Maine, provided a more expanded explanation of flashover as follows: Flashover is a rapid transition in fire behavior from localized burning of fuel, to involvement of all the combustibles in the enclosure. At flashover, fire typically expands in six different directions: vertically through the ceiling, horizontally through the four walls, and even through openings in the floor. At that time, all barriers to fire growth

beyond the original compartment are under attack by extremely hot flame, smoke and gasses which expand at approximately 50 times their volume per minute.”

Considering that the time required for flashover in structural fires with standard fuels is typically about seven minutes, the apparatus, and firefighters must arrive and get operating very quickly. If it takes a resident two or three minutes to discover and report a fire and three minutes for the apparatus to be dispatched and arrive, the sizing up and initial attack need to be done in a minute or two, or the typical fire will have grown significantly in size. An unconscious person with depleted oxygen will typically suffer permanent brain damage after approximately four minutes. All of this needs to be considered within the context of multiple alarm fires and simultaneous alarms. Delayed response and understaffed response appear inevitable under those circumstances, unless planning is complete.

One task then, in evaluating suppression ability, is to determine how fast adequate firefighting forces can arrive at the scene of an incident and launch rescue operations, if needed, plus initial fire attack. Once the evaluation team has determined satisfactory parameters for the size of the initial attack team and response time and has measured the local situation, it can judge how satisfactory the response is. Often the response time is longer than officials expected, especially if the time span is measured from the moment the alarm was received to the actual initial attack. Team size may not be satisfactory until several vehicles arrive and this time delay must be considered as well. The efficiency of the attack team will be greatly diminished if an optimum number are not working at the scene.”

Once again, although the city has attempted to maintain a happy medium, growth in the community has outgrown the present resources. Both the north end of the city as well as the south end have extended response times that can exceed seven minutes.

However new housing and commercial growth have taken its toll on fire and rescue resources to the point that there are now delays in response for service. Not only does extended response times jeopardize the citizens' well being but the firefighter's as well.

In addition, when apparatus is at either end of the city, there are delayed responses getting back into the city for simultaneous or multiple calls. Therefore, it is imperative that the community give serious consideration to a north and south end station with the north end being given first priority. Unfortunately, due to its geographical boundaries, rivers and minimal road access it will always be difficult for Dover to provide a complete three-minute response time to the entire city. In addition, because of the layout of surrounding communities, their infrastructure, finances, political makeup and levels of service to be provided, it is difficult for Dover to rely on its neighbors for a defined regional response area or definitive response time.

New subdivisions are located throughout the north end with more being planned. There is new commercial growth in the area, a large nursing home, a county jail, the county administrative offices and industrial parks with large recreational plans being developed that will draw a substantial number of people to the area. In addition, there has been rezoning in the area with plans for additional changes.

Building and staffing a third station in the north end will not only improve response times, it will provide for additional resources to not only meet minimum recognized

standards but provide for fire protection while the other two stations are responding to major or simultaneous calls.

Insurance Services Office, Inc. (ISO) recently evaluated the city. The purpose for evaluating the city is to gather information needed to determine a fire insurance classification, which may be used to develop fire insurance rates. The survey was not conducted for property loss prevention or life safety purposes and no life safety or property loss prevention recommendations were made. We are proud to say that the protection class rating has improved from a Class 4/9 to Class 3/9 and will become effective July 1, 1999. This new classification may result in a decrease in the property insurance premium calculations for many insured commercial properties within the town.

In order for the city to get a Class 2/9 rating, it will have to improve its rating by 7.32 points and 17.32 points for a Class 1/9 rating. If the city were to add another Engine Company as recommended by ISO and staff it as recommended earlier in this plan, it would not be unrealistic for the city to receive at least a Class 2 and possibly a Class 1 rating.

The most effective and efficient way in which to address the need to reduce response times is to build a north end fire station. To effectively staff the north end fire station, five additional personnel per shift, 18 total additional personnel must be added to staff a pumper/ladder combination (quint) and an ambulance. This is not a new idea but has been recommended since the early 70's. This would provide the city with a quint and an ambulance in the south end of the city, an engine company in the downtown area and a quint and an ambulance in the north end of the city. The pumper

in the downtown area can effectively provide both fire suppression and basic life support, with assistance provided from either the north end or south end crews.

Time is a key factor in almost all EMS scenarios. Time from incident to the application of definitive care during a critical call can certainly make the difference in life and death; however, time of treatment affects many more calls than most people imagine. It can affect more than just saving someone's life. Most calls are not life threatening, however many studies have shown the quicker care is given the shorter the hospital stays and the quicker a patient can return to their normal life. By decreasing the hospital stay and returning a citizen to their job earlier saves thousands of healthcare dollars. It has a great benefit to the businesses when an employee returns to work earlier reducing overtime and sick time pay. Quick efficient paramedic level care has a positive effect on the local economy. When the time-of-call to time-of-treatment times are evaluated, it is clear there are only a few areas where there is a chance for improvement.

With efficiency of the current 911 systems, it would be very difficult to show any improvement. The department has a goal of 45 seconds from time of tone to time of response. The department meets and exceeds this threshold in most cases. The travel speed cannot be changed to decrease the response times due to safety regulations and practices. The only way to positively effect response times is to decrease the travel distance from the station to the incident location.

While the plan to build and staff a north end fire station would serve to both increase staffing to necessary levels and reduce response times to acceptable levels for the north end, additional staffing must be considered as an immediate need. Therefore,

prior to the building of the north end fire station, a total of six additional personnel must be hired immediately. This additional staffing will bring the total shift staffing to 11 personnel, allowing minimum staffing, due to vacation, sick leave, etc., to be maintained at 10 personnel. This will effectively allow for the back-up ambulance in the south end of the city to be staffed to respond for all emergency medical calls in that end of the city.

Apparatus

According to the National Fire Protection Association (NFPA), the normal life expectancy for first-line fire apparatus will vary from city to city, depending upon the adequacy of the maintenance program. In general, a 15-year life expectancy has been considered normal for first-line pumping engines. In fire departments where ladder trucks make substantially less responses to alarms than engines, a planned first-line service of 20 years for ladder trucks may be warranted. Some fire departments operate pumping engines with reasonable efficiency up to 20 years, although obsolescence will make the older apparatus less desirable even if it is mechanically functional. In some types of service, including areas of high frequency, a limit of 12 years for first-line service may be all that is reasonable. The older apparatus may be maintained as part of the required reserve as long as it is in good condition, but in almost no case should much reliance be placed if it exceeds 25 years of age.

The City of Dover presently maintains a fleet of four engines and two aerial ladder trucks. The engines consist of two, 1980 custom Macks, one 1991 custom E-One and one 1995 commercial GMC. The ladder trucks are a 1989, 102-foot Grumman platform and a 1975, 100-foot Maxim straight ladder. In the next 10 years, the city will have to

purchase two new engines and one ladder truck. If an additional station (North End) is built, a third engine or quint will also need to be purchased.

With regard to the ambulance service, a seven-year life expectancy is expected from the department's ambulances. Presently the department maintains a fleet of three ambulances that includes a 1999 Marque that serves as the first-line vehicle, a 1994 Marque that serves as a back-up vehicle, and a 1989 Wheeled Coach that is a reserve ambulance. Therefore, in the next 10 years, the city will have to purchase two ambulances to replace first the reserve vehicle and then the present back-up vehicle.

Programs

Fire Suppression

One of the primary goals of the department is to be accredited through the Commission on Fire Accreditation International. This Commission provides a comprehensive system of fire and emergency service evaluation that can help the city to determine risks and fire safety needs, evaluate the performance of the department, and provide a method for continuous improvement. The Commission on Fire Accreditation International will elevate the professionalism and level of service delivery within the fire and emergency services department.

City Administrators, Councilors, and the Fire Chief continually face critical decisions concerning fire protection and emergency medical services for Dover. Now more than ever, these individuals are faced with the constant pressure of doing more with less. Many local governmental executives are hard-pressed to justify any increase in expenditures unless they can be attributed directly to improved or expanded service delivery in the community. This effort is often hampered by the lack of a nationally

accepted set of criteria by which a community can judge the level and quality of fire, EMS and other services it provides.

The time has come for the Dover Fire & Rescue Service to elevate its level of professionalism with a process by which citizens, elected and appointed officials, and fire and emergency service personnel can assess when they have achieved an appropriate level of professional performance and efficiency as an organization. Many professional groups have developed accreditation systems to establish industry-wide benchmarks for management and overall organizational performance. At a time when the fire service and government in general are being more closely scrutinized than ever before, it is critical that fire and emergency service agencies have a well defined, recognized measurement tool that can be used to evaluate effectiveness.

As we move into the 21st century, the ability of the department to measure performance will be critical for elected officials, city administrators and the citizens served. The Commission on Fire Accreditation International provides an excellent self assessment process for fire and emergency service agencies to evaluate themselves. The self assessment process seeks to answer three very basic questions: Is the organization effective? Are the goals, objectives and mission of the organization being achieved? What are the reasons for the success of the organization?

There are a number of benefits for conducting an accreditation program within the fire and emergency services. These benefits range from abstract concepts to practical, day-to-day improvements. These benefits may include: the promotion of excellence within the fire and emergency services, encouraging quality improvement through a continuous self assessment process and providing assurance to peers and the public

that the organization has defined missions and objectives that are appropriate for the city. Additional benefits include (1) Providing a detailed evaluation of a department and the services it provides to the community. (2) Identifying areas of strength and weakness within a department and a method or system for addressing deficiencies and building on organizational success. (3) Professional growth for a department as well as its personnel involved in the self-assessment process. (4) A mechanism for developing concurrent documents, including strategic and program action plans. This process will increase the efficiency and effectiveness of department,

Lastly, the accreditation process assists fire service professionals in continually improving the quality and performance of their organizations by asking those critical questions to determine if the programs and services within the organizations are effective in meeting the needs of their communities.

Emergency Medical Services

It is the goal of the department to seek accreditation of its emergency medical services through the Commission on Accreditation of Ambulance Services (CAAS) for many of the same reasons as pursuing fire service accreditation. However, the purpose of seeking accreditation through this Commission is to ensure quality patient care for the citizens and visitor of Dover. CAAS has established a comprehensive series of standards for the ambulance service industry and the department would like to ensure that it meets these standards. The process includes a comprehensive self-assessment and an independent outside review of the department's EMS organization. This independent process will provide verification to the City Council, medical community and others that quality care is provided to the community.

Fire Prevention and Public Education

One of the primary functions of the Bureau of Fire Prevention is to enforce the codes and standards adopted by the city or state. Probably the most significant function of a fire prevention unit is the inspection of new and existing properties, which allows for the identification, documentation, and mitigation of fire and life safety hazards to limit or prevent the spread of fire.

Building inspections of new structures is done to ensure that the building is being built to the specifications of approved plans. Bureau personnel conduct plan reviews and inspections of sprinkler systems, fire alarm systems, cooking ventilation and suppression systems, HVAC systems and building life safety layout to ensure code compliance. A properly designed and built building also serves to protect lives of the occupants and to reduce damage in the event that a fire or other emergency occurs in the building.

Another function of the Bureau is fire investigation to determine origin and cause of fires. Because fires and injuries relating to fire are often the result in a breakdown of either fire prevention or life safety features, all fires must be investigated. This information is useful for developing legislation, engineering improvements or developing public education programs to address the fire cause in an attempt to prevent a reoccurrence.

In January of 1991, the City of Dover Fire & Rescue started shifting its primary emphasis from fire code administration to public fire and safety education. The Fire Prevention Lieutenant's position was redefined to shift duties toward fire safety education. This redefined position created an administrative person who, while being

cross-trained in fire inspections and fire cause and origin investigation, also serves as the Public Education Officer.

Fire safety education is designed to increase knowledge and to develop or change the attitudes and behaviors of men, women, and children toward fire. It encompasses a wide spectrum of programs and activities presented to audiences as diverse as school children, older adults, homeowners, preschoolers, apartment dwellers, disabled people, employees, hospital and nursing home staff, and church, service, and civic organizations. Fire safety topics may include home fire escape planning, babysitting safety, cooking fires, clothing fires, juvenile fire setters, first aid for burns, home fire hazard inspections, scald prevention, smoke detectors, fire extinguishers, and home sprinkler systems to name a few.

Whether a fire safety education program is large or small, it takes planning to be effective. From a short 30-second public service announcement to an extensive yearlong school based curriculum, fire safety education efforts must be well planned, targeted, continual, and measurable. As such, the department, in cooperation with the Dover School System, adopted the NFPA's Learn Not To Burn® curriculum for school-aged children. As the scope of the department's response to incidents broadens, so must the information that we disseminate to the residents of our community.

A starting point to diversify from typical fire safety to injury prevention is with young children. Schools provide a unique opportunity to reach children with injury prevention messages. As such, any curriculum used to reach children should be a school-based program. Additionally, teachers, who are the education professionals, should deliver the curriculum. The instructional methods and activities in the curriculum must be

based on the developmental stage of the child. It must engage the child in an active, experiential learning process. The curriculum must create a "link" between the classroom and the child's home.

To fill this need, the National Fire Protection Association developed a school based curriculum titled *Risk Watch*®. In January 1999, a group of 15 "pilot" teachers representing grades K through 8 introduced the *Risk Watch*® curriculum in their classrooms. As we make our way into the 21st century, the department would like to further its public safety education by taking advantage of the Internet for the dispersal of fire and life safety information.

Technology

The department currently uses 13 personal computers, networked to a computer server. The department uses four remote computers that communicate with the network server using modems and telephone lines. Two remote computers are located at the South End Fire Station another is located in the Office Manager's home for ambulance billing and a fourth is located in the department's medium duty rescue vehicle. The fire department's network server is attached to the city's network server using a high speed 128K ISDN line.

The department uses a wide variety of software programs to store and retrieve information. The department uses a commercial software suite for word processing, database development, and training program presentations. All official correspondence is developed using the MS Word and retained on the network server for easy retrieval. This office suite currently exceeds the needs of the department.

The department uses a commercial records management system (RMS) developed by a company called Sunpro. Sunpro is equipped with seven modules and includes fire incident reporting, pre-fire planning, inspection and occupancy management, daybook management (similar to a log book), medical incident reporting, training management and apparatus and equipment management. Information is inputted into their respective modules and the information analysis is used to manage respective programs. A summary of these modules is listed below.

Fire Incident Reporting – This module allows for the documentation of all incidents in the format outlined by the National Fire Incident Reporting System (NFIRS) and NFPA 901. It is used to document all incidents responded to by the department. This information, when analyzed, becomes a useful tool for determining incident types, locations, response times, fire loss, fire injuries, and fire deaths, to name just a few. This information also becomes useful in formulating our target audiences and subjects for our public fire education programs.

Pre-fire planning – New to the department this year, we are in the process of reviewing and updating our manual pre-fire plans and converting them to automated pre-plans. The process is tedious and the project completion date is not expected until late in 2000. When completed, pre-fire planning information will be accessible through mobile data terminals to be installed in all fire and rescue apparatus. Sunpro products are fully compatible with the cerulean technology used to transmit to the mobile data terminals. The department is currently working with the Dover Police Department to install mobile data terminals in all fire and rescue apparatus.

Inspection and occupancy management – The heart of managing our fire inspection program, this module contains fire inspection data on more than 500 business occupancies. The program is used to schedule inspections, re-inspections, and spot inspections. The program will also calculate the number of inspections completed, the number of violations and type of violations. This information proves useful in training our company inspectors and helps to target public education campaigns for businesses.

Daybook management – This module is used to document all items typically entered into a fire department log book. Although it is filled out (it does so automatically when another module is used) the department still uses a manual log book for legal purposes.

Medical incident reporting – This module is used to document all emergency medical calls. The information is currently used to export to the department's ambulance billing program. Some analysis information is used by the EMS Coordinator to forecast supply usage and to identify repeat calls for EMS service. Future plans are to use the analysis information in planning subject matter for the NFPA's Risk Watch Program. Risk Watch is the all-injury prevention curriculum currently being endorsed by the Fire Prevention Bureau.

Training management – All training received by our personnel is documented in the training management module. This information proves useful in collecting facts for annual appraisals, documenting continuing education units for EMT and EMT-P re-certification, and scheduling training needs. This module, it is expected, would become most important in the event the department were to face some legal liability suit resulting in a question of training or certification of our personnel. This information also proved useful in documenting training for our recent ISO inspection.

Apparatus and equipment management – This module is not currently used because of lack of resources to enter the data. It is the goal of the department to restore the department's part-time Clerk/Typist position. This position was eliminated in 1995 and partially restored to a part-time position in 1998.

The department's finance and payroll records are completely automated and are accessed through the city hall network server. Using these programs, the department's administration will be able to determine cost expenditures and revenues in various accounts immediately. While only six months old, this new software package will allow for all account payables and account receivables to be transacted using the automated system. While the city is still working out the bugs, this new program is capable of providing financial information in a matter of seconds.

Through the city's Public Safety Dispatch Center, information provided through the State of New Hampshire's E-911 system is provided to fire and EMS apparatus.

Additional information regarding the locations of street closings, water and sewer projects, burning permits, fire alarm and fire sprinkler system status are also available. The department is currently working to integrate the RMS with the Dispatch Center's Computer-aided Dispatch (CAD) Systems. This information will then be transmitted to the mobile data terminals written about earlier. The communication between Dispatch and fire and EMS units is in a state of constant review.

Hazardous material data is accessed through the computer located on the department's medium duty rescue squad. Using the program Cameo, information on thousands of chemicals can be easily accessed. Using its companion program, ALOHA, chemical plumes can be tracked to determine spread of chemical gases. This

program has not been used in an actual emergency but it is anticipated that the information retrieved from this program will prove valuable in a hazardous material incident. It is the goal of the department to further maximize the capabilities of automation by capturing all information contained in Tier II reports of hazardous chemicals within the city.

The city has invested heavily into its Geographic Information System (GIS). The GIS is a computer system capable of assembling, storing, manipulating, and displaying geographically referenced information. The city currently stores information of water supply lines, hydrants, sewer lines, catch basins, property lot lines, building footprints, streets, underground utilities, etc. This information is currently available to the fire department by visiting the engineering department. Future plans are to access this information through the ISDN line connecting the fire department's server and city hall's server and by modem from the field. This information could prove valuable during a natural or man-made disaster.

Additional plans include fire department access to the city's automated tax records and building inspection files. Though the capability to access these files is currently available through the ISDN line, access need is limited and it is easier to simply call or e-mail either of these two offices and get needed information from them.

In summary, the MIS for the Dover Fire & Rescue Service is in good shape. The department has been appropriated \$118,000 this fiscal year to install mobile data terminals into all fire and EMS apparatus. This will allow for the information stored in the department's server or city hall's server to be accessed from the field. As the saying

goes: "Information Is Power!" It is our goal to provide the best quality information to all of our employees to help them make the best decisions they can.

Emergency Management

Sheltering

One of the biggest and realistic hazards the citizens of Dover could face is that of a severe winter storm. The Blizzard of '78 and Ice Storm '98 are ample reminders of the potential for severe winter storm weather. Sometimes winter storms are accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chill. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines.

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to the cold can cause frostbite or hypothermia and become life threatening. Infants and elderly people are most susceptible. Pipes may freeze and burst in homes that are poorly insulated or without heat. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Heavy snow can immobilize a region and paralyze the city, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse buildings and knock down trees and power lines. In some areas of the city, homes may be without electrical power for days, leaving homes and businesses without life sustaining heat.

When such situations occur, people are forced to turn to alternative forms of heating. Many times these alternative forms of heating are unsafe. After the effects of Ice Storm

'98, two residents of Dover died in separate carbon monoxide poisonings from attempts to provide heat to their home and a third was left severely brain damaged. The first death resulted from an unvented emergency generator left running in a residential garage, the second death came from an unvented gas heater left running in a small apartment.

In years past, it was not uncommon for people to have an alternative or back-up heating system, such as a wood stove, for emergency heating. However, this is becoming more and more uncommon as people rely more heavily on their primary heating source because of the expense of installing a safe yet seldom used alternative heating system. When electrical power is out for an extended period of time during severe cold weather, appropriate shelters must be opened for residents who do not have an alternative method for keeping their homes warm.

While the city currently has sheltering capabilities, only one shelter has emergency generator back-up that can power the heating system. As such, although the shelters can be opened, the shelters will have no heat and are therefore not much better than having resident remain in their own homes.

During a winter storm where electrical power is lost, two key areas of concern must be met. First, communications must be in-place to notify both emergency workers and needy citizens that shelters are going to be opened. A plan must be in place ensure that key workers can be notified to return to work. A plan must also be in place to notify the citizens that the shelter is open. The second area of concern is the shelters themselves.

In addition to making sure that sufficient shelters are available, these shelter must be properly stocked to handle the number of people that may use the facility. Additionally, the sites chosen as shelters must be capable of providing heat and other utility services.



Communications

An established communications network serves the City of Dover. The Public Safety Communications Center dispatches all public safety agencies in Dover. The communications that occur among the Dover public safety agencies are divided among several radio channels. Essentially, each department within the City will coordinate their activities on their normal operating frequencies. In the event that a major winter storm hits the area, the Emergency Operations Center (EOC) will be opened as the command post for all storm related activities. Communications will be monitored and directed from the EOC by the department heads. The primary fire and police dispatch operations will remain at their respective dispatch areas.

Initial notification of a winter storm, with major power outages, will be made to the Emergency Management Director. The Emergency Management Director will notify the Dover Emergency Response Organization by contacting the Public Safety Dispatcher via commercial telephone or radio. The Public Safety Dispatcher will then contact the key members of the Dover Emergency Response Organization by telephone, cellular phone, radio, or pager.

The Public Safety Dispatcher will receive all subsequent updates and information from the New Hampshire Office of Emergency Management (NHOEM) until the EOC becomes operational. Once the EOC is operational, it will become the focus of emergency notifications and communication for the City. The EOC is located in the City Hall and will be the center for direction and control of emergency response in Dover. This facility has ample space to accommodate key city officials and is equipped with emergency generator power, along with telephones, base station radio transmitters, ham radio and cellular

phones. However, the current location of the present EOC may need to be relocated. If the city were to move city hall offices into the old Middle School, it is strongly recommended that the EOC also be moved. The location should include a conference room, a radio room and a small activities room; all located within close proximity to toilet and shower facilities. This building should also have emergency generator capabilities for all essential functions.

The following EOC positions will be staffed upon full activation:

City Manager

Emergency Management Director/Fire Chief

School Superintendent

Police Chief

EOC Operations Officer

EOC Communications Officer

Public Safety Dispatcher (stationed in the Public Safety Dispatch Center)

Community Services Director

Transportation/Logistics Officer

Public Information Officer

The following individuals will be recalled to staff the EOC at the direction of the

Emergency Management Director:

Mayor/Councilmen

Rescue Section Chief

Health Officer

Welfare Director

Purchasing Agent

Finance Director

Red Cross Chapter Chairperson

Salvation Army Representative

Should the City require personnel or equipment beyond that which is locally available, it will rely on state resources. The Emergency Management Director will forward requests to the NHOEM Local Liaison in Newington, NH, to request additional state resources.

Several state agencies are prepared to provide back-up equipment and personnel.

Primary communications to alert residents that a shelter facility is opened will be accomplished by using the two local radio stations, WOKQ (FM 97.5) and WTSN (AM 1270). Broadcasts announcing the location of available shelters, along with specific instructions for going to a shelter will be made at regular intervals throughout the day and night. A phone line within the EOC will be dedicated to answering questions about shelter activities. Additional instructions will also be posted on the City of Dover's Internet site.

Residents will be encouraged, via radio and newspaper, to visit the site before a winter storm to download instructions for going to a shelter. Because of the potential for downed phone lines, neighborhood sweeps in areas without electrical power will be made using fire and police vehicles and personnel to do door-to-door notification of shelter availability. Transportation for individuals who need such services will be arranged through the Dover School System Transportation Department and coordinated through the EOC.

With the exception of the shelter information page on the city's Internet site, all communications systems are in place and no major changes or upgrades are anticipated. The shelter information will be available for the Internet site by November 1999.

Shelters

The recommendation to evacuate people at risk during a winter storm situation requires that shelter spaces be made available and feeding operations for evacuees begin.

Generally, schools and churches provide the best shelter facilities since they combine the shelter spaces with the capability for mass feeding. Other potential shelters include community centers, the National Guard Armory, City Hall and other city owned buildings.

There are eight schools and many churches in the city, which, if unaffected by the winter storm, could provide shelter space for its evacuees or evacuees from other communities. It may be the best course of action to provide shelter and care for Dover's citizens by sheltering needy ones in another unaffected community nearby. However, as is most likely going to be the case, winter storms generally affect a wide region and therefore all neighboring communities will be in the same situation as Dover. As such, it becomes necessary for the city to explore potential sites within the city to serve as emergency shelters.

The following locations have been identified as potential sites for sheltering. The anticipated capacity of each shelter is also listed.

City Hall – 195

Dover High School – 3209

Dover Middle School - 1805

Woodman Park School – 1224

St. Thomas Aquinas High School – 784

Garrison School – 712

Horne Street School – 602

Portsmouth Christian Academy – 685

Dover Recreation Center – 125

Dover Housing Authority Recreation Center – 140

Total Current Capacity: 9,481

While the capacity of sheltering over one-third of citizens of Dover in either city owned buildings or one of the two private schools identified appears adequate, of these shelter locations, only one location currently has emergency generator power, that is City Hall. A second location will come on-line in January 1999 when the new Middle School is completed. Taking a pro-active approach to providing necessary sheltering, a request was made to the Dover School Department during the preliminary phases of construction of the new Middle School to include generator back up capabilities and a secure location on-site for sheltering supplies. As a result of that request, the school department included a generator capable of supplying electrical power to the heating system, gymnasium, locker rooms and food services area of the school. Additionally, a 168 square foot room off of the gymnasium has been dedicated to sheltering supplies. The city will soon have the capability to house, feed, and shower more than 3,000 people. The Middle School stocks a 30-day supply of food for its students. This food will be available for sheltered citizens.

The need to provide additional shelters with emergency generators is the key to providing a safe shelter location in the event of a severe winter storm. While the addition of the Middle School provides a measure of comfort, additional existing shelter sites must be equipped with emergency generators. As such, the following ten-year plan has been developed and included in the proposed revisions of the City of Dover Comprehensive Master Plan:

FY2001 – Install 135KW emergency generator at Dover High School. The estimated cost of this proposal is \$40,000*.

FY2003 – Install 85KW emergency generator at Woodman Park School. The estimated cost of this proposal is \$30,000*.

FY2005 – Install 85KW emergency generator at Garrison School. The estimated cost of this proposal is \$31,000*.

FY2007 – Install 85KW emergency generator at Horne Street School. The estimated cost of this proposal is \$31,000*.

**Price estimates were based on the installation of the generator at the new Middle School and a replacement 35KW generator installed at Central Fire Station in 1999.*

It should also be noted that the cost of purchasing and installing emergency generators for the purpose of sheltering is an eligible expense for the State of New Hampshire Emergency Management Assistance Program. Pre-approved projects are eligible for 50% matching funds. Therefore, the total cost to install each generator would be reduced to half the projected cost.

If the plan to install emergency generators is followed, the city will have sheltering capacity to handle 10,676 evacuees, of which some 8,942 will be in shelters with emergency generation of the heating system.

3 Flood Control

Currently the present flood control plans in effect appear to be working. Zoning and setback requirements presently required by the city have minimized the potential for major damage or loss of life. In addition, requirements required by the Federal Flood Control Insurance program have also controlled growth and encroachment on the rivers in the community.

However, the addition of flashboards to the Watson Road Dam and the Cocheco Dam have created flooding in some areas of the city that could be eliminated by the removal of the flashboards. Although the present flashboards are supposedly designed to fail during high water, the last three floods have had no impact on the flashboards. In addition, for the past 15 years, there has been little or no action taken by the current operator, or the Federal Energy Regulatory Commission, that would lead us to believe that we will see improvement in the two dam operations. Therefore, it is our recommendation that every effort is made to have the flashboards removed as soon as possible to minimize damage and possible loss of life.

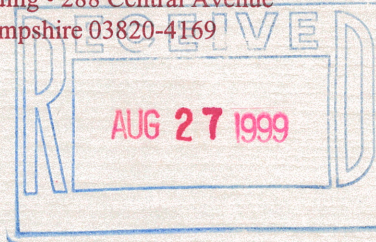


David F. Bibber, Chief

CITY OF DOVER FIRE & RESCUE

Municipal Building • 288 Central Avenue
Dover, New Hampshire 03820-4169

Telephone: 603-742-4646
Fax: 603-743-6146
fire&rescue@ci.dover.nh.us



Memorandum

To: Jack Mettee, Senior Project Planner
Appledore Engineering, Inc

CC: Chief David F. Bibber, Dover Fire & Rescue
Steve Bird, City Planner *cc*

From: Assistant Chief Ronald Clymer, Dover Fire & Rescue

Date: 08/25/99

Re: Requested Information

Please find enclosed the fire, rescue and other calls for service recap information for the previous three years. You will find the number and types of service calls as well as the average response times by each type of call. Again, I remind you that the department does not track response times by minutes and seconds and therefore an average response time can vary by nearly two minutes either way. Additional information you requested is as follows:

Central Fire Station

Central Fire Station, located at 9-11 Broadway, is a three-story brick structure built in 1899. The total square feet of space within the building is 7,000 sq. ft. The breakdown of space is as follows: Apparatus Bay: 3,000 sq. ft.; Office Space: 1,240 sq. ft.; Kitchen: 340 sq. ft.; Training/Day Room: 609 sq. ft.; Physical Training/Locker Room: 120 sq. ft.; Firefighter Bunk Room: 460 sq. ft.; Officer Bunk Room: 209 sq. ft.

South End Fire Station

South End Fire Station, located at 27 Durham Road, is a single story block structure built in 1967, with a single bay addition completed in 1999. The total square feet of space is about 5,984 sq. ft. The breakdown of space is as follows: Apparatus Bay: 4,664 sq. ft.; Kitchen: 204 sq. ft.; Physical Training: 180 sq. ft.; Firefighter Bunk Room: 204 sq. ft.; Officer Bunk Room/Office: 221 sq. ft.

August 25, 1999

Staffing

The department is currently staffed with 44 full-time uniformed employees, four call-personnel, one full-time and one part-time (20 hrs.) clerical staff. An organizational chart is enclosed for your information.

Call Concentration

The breakdown of calls by geographic area is based on City Wards. The breakdown for the past three years is as follows:

Ward 1: 19%
Ward 2: 18%
Ward 3: 14%
Ward 4: 10%
Ward 5: 27%
Ward 6: 11%
Mutual Aid: 1%

Mutual Aid

The department has a current mutual aid agreement with the following communities: Pease, Rochester, Somersworth, Rollinsford, North Berwick, ME, South Berwick, ME, Berwick, ME, Eliot, ME, and Lebanon, ME.

Please be advised that additional information will be sent to you regarding those issues we discussed in your office on August 13, 1999. It is hoped that the information will be sent to you around the first week of September. If you need any additional information, please feel free to contact me.

Enclosures

INCIDENT RECAP

Dates: 07/01/1996 to 12/31/1996, Incidents: All

| Description | Number | Average Response | Loss | Value |
|-------------------------------------|--------|---------------------|--------|---------|
| All | 1,843 | 4.32 | | |
| Fires | 45 | 4.13 | 95,708 | 174,006 |
| Structure Fires | 20 | 3.40 | 83,902 | 169,700 |
| Wildland Fires | 12 | 5.83 | 5 | 5 |
| Medical Emergencies (with patients) | 679 | 3.98 | | |
| Hazardous Materials | 24 | 4.58 | | |
| Other (includes mutual aid) | 1,098 | 4.53 | | |

INCIDENT RECAP

Dates: 01/01/1997 to 12/31/1997, Incidents: All

| Description | Number | Average Response | Loss | Value |
|-------------------------------------|--------|---------------------|---------|---------|
| All | 3,418 | 4.71 | | |
| Fires | 105 | 3.77 | 211,420 | 732,200 |
| Structure Fires | 36 | 3.50 | 162,430 | 721,600 |
| Wildland Fires | 20 | 4.00 | 40 | |
| Medical Emergencies (with patients) | 1,352 | 4.19 | | |
| Hazardous Materials | 21 | 3.43 | | |
| Other (includes mutual aid) | 1,940 | 5.13 | | |

INCIDENT RECAP

Dates: 01/01/1998 to 12/31/1998, Incidents: All

| Description | Number | Average Response | Loss | Value |
|-------------------------------------|--------|---------------------|---------|-------|
| All | 4,552 | 4.64 | | |
| Fires | 119 | 4.06 | 416,425 | |
| Structure Fires | 56 | 4.02 | 366,265 | |
| Wildland Fires | 29 | 4.31 | | |
| Medical Emergencies (with patients) | 1,710 | 4.30 | | |
| Hazardous Materials | 2 | 2.00 | | |
| Other (includes mutual aid) | 2,726 | 4.88 | | |

Dover Fire & Rescue Organization Chart

