

The President's Conference on

**FIRE
PREVENTION**



*Report of Committee on
Firefighting Services*

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“The serious losses in life and property resulting annually from fires cause me deep concern. I am sure that such unnecessary waste can be reduced. The substantial progress made in the science of fire prevention and fire protection in this country during the past forty years convinces me that the means are available for limiting this unnecessary destruction.”

Harry S. Truman

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REPORT OF COMMITTEE ON FIREFIGHTING SERVICES

ADMINISTRATION, PERSONNEL, AND EQUIPMENT

Annually there are over 800,000 fires in the United States. Fire departments answer more than a million alarms in all. In addition to the fires in buildings are those brush, grass, rubbish, boats, automobiles, and other vehicles. There are also numerous calls for rescue work and special services.

There are approximately 1,000 fire departments manned by fully paid professional firemen, and at least 15,000 others that are part-paid and volunteer.

Fire departments for the most part are operated by municipalities and are supported principally by taxes on real estate. Fire department expenditures in cities of over 10,000 population were \$3.69 per capita in 1946.

Support for the Fire Services. – Cities are currently seeking new sources of revenue to pay the costs of municipal government, including the costs of fire departments. The cost of living is forcing salaries higher; the cost of firefighting apparatus, hose, and equipment is increasing. Cities will be forced in the immediate future to consider every possible economy of operation in the fire department, consistent with an adequate fire defense.

Systems of charges may be employed when a city gives fire department services to unprotected suburbs. In almost all cases, municipalities provide a degree of firefighting service for surrounding territory from which the municipal fire department receives no tax support.

Integration of fire services has received some attention in connection with the problem of fire-defense organization in wartime. No program to bring about such integration has been effectively advanced, and there is likely to be strong opposition from municipalities, which do not want to lose control of a local service.

By such integration there is a possibility of securing fire services better adapted to the areas served; resulting economies are possible; and a better career service for professional firemen might also be provided.

Another approach is to shift more of the burden of fire protection from the public firefighting service to private property. The best protection is that which is built into the building through good design. To name a few items of protection, we have automatic sprinkler systems; automatic fire detection systems supervised by central stations; fire walls; fire doors; stair enclosures, and watertight floors. The provision of private protection is fairest to all concerned, because each property thus pays its way according to its fire protection demands.

Fire Insurance and Municipal Fire Protection. – Through State and regional rating bureaus, the National Board of Fire Underwriters, or other organizations, insurance companies maintain an engineering service that is available for advice on improving a municipality's fire defenses. These insurance engineering services have effectively encouraged cities to maintain strong, reliable water supplies and have promoted good fire departments and other features of municipal fire defenses. They grade municipal fire defenses, including fire departments, according to the Standard Grading Schedule of National Board of Fire Underwriters. This rating affects fire insurance rates in most parts of the country, and provides an incentive to the city to improve its major items of defense. Fire prevention work by fire departments may, under the grading schedule, affect grading relatively little.

The Fire Department as a Career Service. – The majority of fire departments are small, numbering 20 men or fewer. Frequently it is only in large cities that a real career service is offered in the fire department. At present, a man can ordinarily advance only within the department he joins. This is most serious, resulting in the quality of chief officers being fixed, because a city ordinarily does not go outside its own department for new men or officers. A superior fire officer must have very diversified knowledge, much of which is technical. Many officers have become proficient through their own exceptional efforts.

Part of the difficulty is due to a provincial attitude taken by the people of a local community. Of more practical importance is the fact that each city and town has its own salary scale, pension plan, and other benefits that are purely local. A man cannot be brought in without some unfairness to present members of the department; a man cannot leave without some sacrifice of seniority or pension rights.

One method that has been suggested for dealing with this situation is to set up a Statewide system of civil service and pension administration for fire departments. There is an observable trend in that direction. Another suggested method of providing a career service is to integrate fire departments into single services, operated under the auspices of counties or metropolitan fire districts. This can be accomplished without necessarily following county, metropolitan or State limitations in the formation of such integrated departments; but the objective should be to avoid their becoming top-heavy in an administrative sense. Britain had experience with a wartime National Fire Service. Four Australian States have fire departments that cover their entire State. The smallest, South Australia, has 125 full-paid and 77 part-paid men; the largest, New South Wales, 842 full-paid and 3,139 part-paid men.

Personnel Administration. - A substantial number of cities administer matters of recruitment and promotion through a personnel agency, usually a civil-service commission. These commissions enforce suitable standards for heights, weight, age, and moral character for new recruits and establish lines of promotion based on seniority, merit, and examination. While these civil-service commissions are not without their limitations, they offer the best method so far devised to secure fair treatment of men. The principal need is for improvement of the standards they administer.

A basis for personnel administration within a department is often established by a written set of standards for the conduct and action of men and officers. Fire departments should make wider

use of such written standards as guide books covering discipline, care of houses and equipment, general rules of action in administrative matters, and in response and operation at fires. The principal difficulties with such standards are that they are kept up-to-date and that amendments are allowed to become established by custom or usage.

Salaries and Pensions. – There is a wide difference in the scales of salaries paid to fire department members. Some variation is of course due to local living conditions, but on the average, salaries are too low for the type of men and services required.

Pension plans are desirable for all occupations. For the fire department they are particularly important, because they should operate to enable men to retire when they have reached an age beyond which firefighting duty becomes too difficult or dangerous for them. The lack of a satisfactory pension system results in a situation observable in too many fire departments, namely, that the average age of the men is unreasonably high.

Management Requirements of Fire Companies. - The number of men required depends on the number of fire companies to be operated, plus sufficient men for fire prevention work, training, maintenance, and other activities of the department. The number is also affected by the arrangement of shifts and the total hours worked by the men.

The first step in appraising fire department protection in a given city is to determine the number of fire companies needed. The number of men follows from the number of companies and the kind of work they do. The principal units are engine (or pumper) companies, ladder companies, and special companies for salvage and rescue work. Many departments are being called on more and more for special services, particularly companies to man rescue and other emergency equipment, and many fire departments give ambulance service.

In a given city, it can usually be determined whether there are too many or too few companies, but it is not possible to generalize. Similarly, the number of men needed for any given fire company can be determined by studying the work required of that company; but it is not possible to say that four-man, five-man, or larger companies should be the rule.

Economics in the operation of fire departments should be sought only after careful study of the number of companies required.

A city need not be baffled by the problem of securing manpower for the full number of companies it requires. The city should man as many of the required companies as possible with full-paid personnel. For the other companies, manpower may be supplemented by an auxiliary force of trained and disciplined part-time men. Such a program may be especially helpful in cities of less than 30,000 population.

Working Hours. - The fire department is a round-the-clock, 24-hour service. The total number of hours worked depends on the arrangement of shifts. The trend is toward shorter workweeks. This is affecting the cost of fire departments by increasing the total number of men required to man the fire companies.

A fire department that puts into effect a shorter workweek, the three-platoon or similar system, must add men if the same number of companies is to be manned. Unless men are added, the number of companies must be reduced or the manning per company must be reduced. Companies with too few men are not able to give efficient service.

It has long been against the rules of many full-paid departments for firemen to hold other part-time jobs while off duty; but often these rules have not been enforced. During the war, firemen made a worthwhile contribution by working, off duty, in war plants. The war needs no longer exist, and the practice should now be stopped.

Apparatus and Equipment. - Much apparatus, such as pumpers and ladder trucks, is old and needs replacement. Apparatus manufacturers are busy with replacements, the ordering of which was held up by the war. It is likely to be some time before manufacturers can meet these needs.

Practices of some fire departments are slowing up fire apparatus replacements. While there are some differences in apparatus made necessary by climate and topography, there is little reason why pumper and ladder trucks should not be of standard design in all cities. Apparatus specifications usually differ in minor details of body dimensions, arrangement, and equipment. These variations unnecessarily increase cost and delay deliveries.

We urge fire departments that want prompt delivery and a fair price to base their specifications on the specifications for automobile fire apparatus prepared by the Committee on Municipal Fire Apparatus of the National Fire Protection Association or recommended by the National Board of Fire Underwriters. These specifications have been circulated to cities by the U.S. Conference of Mayors. We also recommend that these specifications be brought up-to-date at the earliest possible moment. Work on a revised set of specifications has recently been done jointly by the International Association of Fire Chiefs and the National Board of Fire Underwriters. These will shortly be distributed to the fire service.

There is also a national standard for fire hose, prepared by the National Fire Protection Association, the American Society for Testing Materials, and other bodies, under procedures of the American Standards Association. The most useful form of this standard is one provided by Underwriters' Laboratories, Inc., which will act as the inspection and testing agency for a municipality on hose purchases. Standardization of hose threads on hose couplings and hydrants also merits continued attention.

An Apparatus Replacement Program. - Only a few departments have an apparatus replacement program that is adhered to, and many now find themselves with outmoded apparatus, a condition aggravated by the difficulty of getting apparatus built during the recent war years.

In spite of relatively little mileage traveled, automobile fire apparatus does wear out, because of conditions of service different from that of automobiles in ordinary trucking service. Wear on motors is accelerated by frequent cold starting and by long periods of pumping with motors operating near top capacity.

The life of fire apparatus is also affected by developments in other automotive equipment. It is outmoded when it reaches an age when it cannot compete (in acceleration and stopping, for example) with other motor vehicles on city streets or country roads. Much of the fire apparatus in use today was built in the period before the development of heavy-duty automobile trucks and is now obsolete. We urge city fire departments to get their city councils or governing boards to approve a continuous program for the retirement of old apparatus and for its replacement.

Because of delay in delivery of about 2 years on some items, particularly pumpers and ladder trucks, some fire departments may wish to see whether they can get fire apparatus which was bought for military needs, and which may be declared surplus by the War and Navy Departments.

Improved Firefighting Methods. - The fundamental techniques of fire fighting are the same today as they have been for some time. They principally involve putting water on a fire. Fog nozzles and small hose lines are coming into wider use, and wetting agents (advocated to make more effective use of water) have received publicity. There is an unfortunate tendency for some salesmen and fire departments to become enthusiasts for one technique or improvement. The hard facts are that each of the items is useful, but is not in any sense a cure-all.

Regarding hose lines, it is more a matter of choosing the size of hose and nozzle tip that is right for the particular firefighting job, than it is to say that all fire departments should use large lines, small lines, large nozzle tips, small nozzle tips, fog nozzles, or other equipment. The same comment applies to various chemical equipment: foam, carbon tetrachloride, and carbon dioxide.

None of these items of special equipment are revolutionary in the sense that they permit general abandonment of conventional firefighting techniques. All are important and each may furnish the firefighter with a real advantage in dealing with some particular fire situation. In general, fire departments cannot take full advantage of a large number of special items of equipment and useful appliances, because of cost involved.

Competent firemen agree that the way to fight a fire is to get inside the building, find the fire, and get water on it. When an alarm is delayed, or the building is of excessive height or area, or the material burning radiates heat that will not allow close approach, the fire department must mass hose streams. This situation points to the importance of measures for reducing the height and area of buildings, and for requiring automatic sprinkler protection when the total amount of combustible materials is so great that it is otherwise impossible for firefighters to get water on the fire.

Fire departments often have to fight inside buildings under great difficulties. This task requires training, because under normal working conditions a fireman obtains real firefighting experience only at difficult fires.

Salvage Operations. - The number of fire departments that do salvage operations is increasing. These operations require special equipment and special training. The operations involve the spreading of waterproof covers, removing water used in firefighting promptly, and otherwise protecting against unnecessary water damage. Training salvage operations is carried on in most

firemen's training programs, and there is wide acceptance of the idea. There are a number of large cities where salvage work is not performed by the fire department, and in the country as a whole, there is room for considerable improvement in salvage operations.

Prefire Planning. - Firemen cannot depend on experience alone in firefighting operations. An increasing number of fire departments are resorting to prefire planning of operations at all buildings in the city. Chief officers in most departments are expected to have worked out in their minds the methods to be followed in an attack on a fire in any building, and they supplement this preplanning with actual knowledge of buildings through inspections. Some departments carry it further by sending out entire assignments to a given building, where both officers and men go over the fire possibilities and figure out just where apparatus will be placed, just where entry can be made, where ventilation can be carried out, and what water supplies and private fire protection are available to assist their operations.

These procedures are entirely feasible and will help to prevent disastrous fires by uncovering conditions that make the fighting of the fire impossible. Once brought to light, something may be done to remedy these situations; but they are usually brought to light only by a fire disaster. The Winecoff Hotel fire in Atlanta is a good example of this sort of situation.

A Proving Ground Needed. - Fire departments are alert to the possibility of improving apparatus and equipment. Our Committee adopted a motion that the Conference consider proposing that the Federal government, as a civil defense measure, be authorized to establish a proving ground and a technical and research laboratory available to the various fire departments, with personnel for the operation of this proving ground and laboratory to be recruited from the fire protection profession.

Water Supply. - Most cities provide water for fire protection purposes from their domestic water distribution system. A few of the larger cities also have installed a high-pressure system for fire protection in congested, high-value areas only, with a separate system of mains and pumps.

Domestic water distribution systems should provide quantities of water for fire protection in addition to that supplied for domestic consumption. The amount of water necessary for fire flow depends upon the height, area, type of construction and occupancy, congestion and hazards of the buildings in a particular section, and its determination is largely a matter of judgment and experience. The grading schedule of the National Board sets up a basis for determining the fire flow necessary in high-value districts of cities of various populations.

When a municipality has no domestic water supply system, it must depend on pumpers taking suction from any available water, such as rivers, ponds, and wells. The municipality should make a study of such available sources of water, and provide roads and other facilities for pumpers to reach and pump from such sources without becoming mired. Sometimes even a small brook can be dammed to provide a pool, or to flow into an open concrete tank, from which pumpers may draft.

During the war, many water system improvements were deferred, and for some time water utilities will be busy catching up with extensions and also major improvements.

A plan frequently followed at industrial plants is to store quantities of water close to the buildings to be protected. The idea is that, in case of fire, the water will be right there ready for use. Such storages are for firefighting purposes only and thus are independent of the public water supply. The plan came into use because of the unreliability of the public supply.

War experience demonstrated the need of local storage of water for firefighting. In England and Germany, ground storage tanks or reservoirs were provided in each block in a city. Firefighting water was taken from these storage tanks by fire department pumpers.

Technical bodies should review the traditional principles of water supply design in the light of war experience.

Preparedness for Disasters. - Fire departments are one of the first services called for all sorts of emergencies. At times they have had to deal also with major disasters, such as floods, hurricanes, and earthquakes. During the war, civil defense planning caused some attention to be given to plans for dealing with major disasters. Few of these are currently in force. A few cities maintain active agencies that plan operations to cope with a disaster; but the great majority have no such plans at all, so far as the fire department is concerned.

Fire departments have given little study to the lessons of the war destruction, by fires, of cities in Germany and Japan. The war has been over for 2 years; but no advice has yet come to fire departments from the War Department to indicate what sort of situations may be expected from a sneak atom-bomb, incendiary, or biochemical attack on our cities. Fire departments would welcome guidance about this.

Fire Department Communications. - Delayed alarms are an important factor in fire loss and show up conspicuously among the factors responsible for the largest fires. Consequently, the facilities for fire alarms and for communication within a fire department are important.

The principal requirements of fire department communications are (1) means of promptly receiving calls for fires and other emergencies, and (2) intercommunication between units, particularly between fire alarm headquarters and fire companies.

Present Public Fire Alarms. - The conventional fire alarm system comprises street fire alarm boxes connected electrically to a central fire alarm headquarters. A few cities have boxes well distributed, so that in any part of the city a box can be found within reasonable distance; others have fair box distribution in central districts only.

Fire alarms are sent principally by telephone. The telephone companies do not assume responsibility for fire alarm service, and there are obvious limitations to full dependence on telephones.

Standards for municipal fire alarm systems have been developed by the signaling committee of the National Fire Protection Association and have promulgated by the National Board of Fire underwriters. These standards outline the features necessary in public fire alarm systems. They

call for facilities that provide the general public with a means of calling the fire department promptly and that are dependable, in the sense that they are free from many of the limitations of telephones. These standard systems, where incomplete, should be extended. Public fire alarm systems are appropriate for many small communities that to date have been dependent on telephone service.

Radio. - Radio has two fundamental uses in fire department communications: (1) between mobile equipment and headquarters, and (2) for point-to-point service where wire service is impractical. Radio is being increasingly used by the installation of 2-way sets on chiefs' cars and on all pieces of fire apparatus. Radio is particularly useful for volunteer fire services, where a central radio headquarters may be set up to control fire apparatus in a rural or forest territory.

Radio is not intended to replace wired fire alarm systems and fills only one of the two fire department requirements on communications: that of intercommunication between units; and it is not wholly a substitute in this respect for wired systems. No radio development is in sight that will provide for the reporting of fires by citizens; so the installation, extension, or replacement of wired systems should not be deferred in anticipation of a radio system of reporting.

The following radio frequencies are now available to municipal fire departments: 12 channels in the 152-162 megacycle band, 12 channels in the 72-76 megacycle band, and 15 channels in the 30-40 megacycle band. These have only recently become available; the number of radio-equipped fire departments is still small.

In the allocations, channels have been reserved for the exclusive use of short-range walkie-talkie units or pack set radios, so that if they are used on large or simultaneous fires they will not in any way interfere with the regular land-station-to-mobile-radio service.

The Federal Communications Commission has fixed July 1, 1950, as the date when all municipal fire departments shall be established in the 152 megacycle band and shall shift from existing channels, unless a municipality or fire department can make a factual showing of the need for some other frequency.

The 72-76 megacycle and the 30-40 megacycle channels will then be left open for county operation, or for the radio services required by volunteer departments that set up their mutual aid districts or areas covering a combination of volunteer departments.

Private Fire Alarm Systems. - Fire departments have long encouraged private fire alarm systems in buildings. With facilities provided in buildings, either for automatic detection of fires or for manual transmission of alarms, there would be fewer delayed alarms that contribute to life and property loss by fire.

The best private fire alarm service is provided by a private central station system under contract with a private company, which not only installs the system but maintains, inspects, and supervises fire alarm, burglar alarm, and similar services.

There are practical reasons why private fire alarm systems are not generally connected to public fire alarm systems. Public fire alarm systems can handle private alarm systems directly connected to them if there are only a few connections; a number of small cities permit them. To give such service, large cities find that they have to provide maintenance and supervision in private properties, and usually they prefer not to do it in competition with existing private companies.

Recommendations on Administration, Personnel, and Equipment

1. That fire departments be regarded as fire prevention as well as firefighting agencies and that substantial parts of their budgets be devoted to fire prevention activities.
2. That ways be explored for meeting the increasing cost a of fire departments.
3. That insurance rating agencies review their gradings of cities to see whether it is possible to provide additional incentives for fire prevention work by fire departments.
4. That ways be explored to remove obstacles that keep the fire department from being a desirable career service, particularly the provincial attitude of cities that prevents men from advancing except in their own small departments; and that the integration of small fire departments into units large enough to provide such a service be studied.
5. That economies in fire departments be sought only after careful study. The approach recommended is that the number of fire companies required be established; that manpower be determined by the needs of the companies plus additional personnel for fire prevention bureaus, training, maintenance, and administration; and that trained part-time firemen be used to supplement fully paid personnel, when total manpower needs exceed what the fire department has funds to provide on a fully paid basis.
6. That replacement of fire apparatus be accelerated; that all fire departments adopt orderly programs for its replacement; that purchase shall follow standard specifications; that the program include special equipment for technical applications, including modern breathing apparatus, fog, foam, carbon dioxide, and other chemical equipment; that efforts to achieve wider standardization of threads on hose couplings and hydrants be continued; that better apparatus and techniques be developed by research; and that a national proving ground and laboratory be set up for the purpose.
7. That fire departments study the operations they are likely to have to perform in fighting fires in all large properties, and thus bring to light, before a fire, the factors that might contribute to life or property loss.
8. That traditional design of public water systems for fire protection be reviewed in the light of war experience.

9. That disaster plans be developed in all areas to cover fire department operations, and that the War Department be asked to furnish guidance regarding fire department requirements in event of sneak atom-bomb, incendiary, or biochemical attack.
10. That public fire alarm systems, where incomplete, be extended, and that they be provided where they are lacking in all communities.
11. That radio be used where appropriate to supplement wired intercommunication systems in fire departments and for rural areas where wired service is impractical; and that advantage be taken of frequencies now available for such service.

FIRE PREVENTION BY THE FIRE DEPARTMENT

Traditionally, fire departments have been considered as firefighting organizations; but today fire departments are recognized as agencies seeking to prevent fires as well as extinguish them. A fire prevented is better than one extinguished. Fire prevention work by fire departments is prompted by the lively concern firemen have for avoiding unnecessary loss of life.

These fire prevention activities are not complex. First, there is a system of inspections. Second, educational campaigns are promoted to encourage sane and safe practices. Finally, for persons who will not voluntarily cooperate, public safety laws are enforced and fires are investigated.

Inspection Work. - It has long been customary for fire companies in many cities to make fire prevention inspections. The practice is by no means general, and it could, with profit, be more widely observed. Present inspection work is often haphazardly and indifferently performed.

In cities that do an effective inspection job, each firefighting company is required to do such inspections. A common objective is to inspect all buildings in a company district four times a year. In a city of 100,000 population, a representative fire company might have in its district 3,500 families in 1,600 dwelling units; 250 small stores and shops; and about 100 large properties, such as industrial plants, warehouses, and public buildings. These figures are helpful in visualizing the job of inspection done by a fire company.

The company inspections are limited usually to common fire hazards and details of maintenance of private fire equipment. The company inspectors report through channels to headquarters, where a fire prevention bureau or chief officer follows them up.

A common operating routine is to assign one man per day to inspection work. The total volume of fire prevention work done, including public relations, depends on the extent to which members of fire companies are expected to get out and make public contacts.

Educational Campaigns. - Fire prevention work is futile, unless all persons are informed about fire safety and are interested enough in it to be willing to take advice in fire matters and to obey fire laws.

Public education by fire departments is handled by the fire chief, by a fire prevention bureau, or in a few cases by a fire department bureau of public relations. Here are a few of the approaches used in educational campaigns.

Of principal importance, most fire departments hold, is work with school children. A number of departments have had success by assigning one or more officers to devote full time to fire prevention work with children. The children's programs include poster and essay contests, school and home inspections by children, demonstrations, plays, parties, visit fire stations, and a wide variety of activities to promote interest and understanding of fire safety by children.

Seasonal campaigns mark the year-round educational programs of fire departments. Fire Prevention Week in October is almost universally observed by cities under fire department sponsorship. A Spring Clean-Up Week is similarly observed in many communities. Special efforts are made at Christmas and on the Fourth of July. At Christmas, safe handling of decorations and Christmas trees in stores and homes is encouraged. On the Fourth of July, children are directed to safe celebrations, public fireworks displays often being featured to keep fireworks out of the hands of small children.

An annual inspection of dwellings is made by many departments, the firemen in some cases contributing a part of their off-time for the purpose. Cooperation by house occupants is voluntary, and the services of the fire department in this sort of campaign are universally welcomed.

More and more fire departments are using the press and radio for education. Both newspapers and radio stations have been ready to use competently prepared material.

Educational work is tied together in most cities through a fire prevention committee, usually sponsored by the local Chamber of Commerce. A few cities have created fire prevention committees by city ordinance. One such is Dallas, Tex. Fire chiefs usually serve as members of such committees. Often they are asked to serve as chairmen; but this course is not favored, as the chief can do nothing as chairman of such a committee that he cannot do in his official position. The fire prevention committee can be used to provide a force, outside of politics, to secure public cooperation.

Law Enforcement. – The legal authority of fire departments is derived from various State laws and city ordinances. Of these, the city charter is important, as it defines the general authority of the city to operate a fire department and establishes the general responsibility of the fire department for fire prevention week. This basic authority is most valuable. Many fire chiefs and fire prevention officers do not fully appreciate the relatively strong position they are in by reason of their responsibility for the public safety in fire matters. It is this broad general authority on which the fire department has to fall back, when it enforces orders, under the general police power, covering matters on which there are no detailed ordinances, or when it deals with situations that must be declared public nuisances.

The State Fire Marshal. - In most States, the authority for fire prevention work, as distinct from the ordinary operation of a fire department, comes from a State fire marshal law. A common provision of the State fire marshal law is that the local fire chief is ex officio a deputy or assistant State fire marshal. In cities protected by volunteer and part-paid fire departments or those that do not have adequate fire prevention personnel, the State fire marshal's office virtually provides them with many fire prevention bureau services. A number of State fire marshals also perform technical services, such as maintaining a laboratory and providing special experts who may be called on by the local fire department. The local fire department is usually pleased to have such support from a State agency that may be independent of local politics.

Fire Prevention Ordinances. - We urge cities that do not have such an ordinance to adopt the recommended ordinance creating a fire prevention bureau, a model form of which is recommended and circulated by the National Fire Protection Association and the National Board of Fire Underwriters. A great many cities have such an ordinance.

There are a wide variety of laws dealing with fire hazard and fire protection matters, which are discussed in the report to the conference on laws and law enforcement. It is desirable, in any city, to assemble in a single compilation all of the laws to be administered by the fire department. This is usually referred to as a fire prevention code. During the last 15 years, a good many cities have adopted comprehensive codes, the general features of which are similar to those in the recommended fire prevention code circulated by the National Board of Fire Underwriters.

The Fire Prevention Bureau. - Many fire departments established a fire prevention bureau at the time that one man at the headquarters was assigned to full-time work on fire prevention inspection. His first duties, of course, were to follow up the work of inspection done by various fire companies of the department.

This Committee considers the proper place for a fire prevention bureau to be in the fire department, directly under the chief of the department. This is the pattern followed in the majority of cities.

The scope of the work of a fire prevention bureau includes all sorts of inspection tasks. In addition to routine inspections and to following up the work of fire companies, inspection work that is difficult or time consuming is usually handled by the bureau. Inspections of a highly technical nature are necessarily made by the bureau.

In addition, the fire prevention bureau handles complaints, and it must be able to solve specific problems referred to it. It often maintains certain technical services, occasionally a laboratory or photographic department. At present, most bureaus are not equipped to give citizens comprehensive fire protection advice; but the day is approaching when they will be able to do this.

Relationship of the Bureau to Other Agencies. - The bureau handles points of contact with other inspection agencies. The work of the bureau may bring it in contact with public jurisdictions, such as those of State fire marshals, State labor departments, tenement-house commissions and the like. It may deal with certain Federal regulatory bodies like the Bureau of

Marine Inspection and the Interstate Commerce Commission. The bureau is a logical channel for such contacts.

It shares a place in the city government with departments for building, electrical, plumbing, health, boiler, elevator, and other inspections. There is some overlapping of jurisdictions, particularly between the building department and the fire prevention bureau. There is need for a clear line of demarcation between the area of inspection covered by each. In general, building departments should be expected to handle new building construction and related matters of structural soundness. Fire departments should handle matters where maintenance is involved, where private fire protection equipment is installed, and where there are features of storage, manufacturing processes, or hazards to life involved that are peculiar to the occupancy rather than to the building structure.

In any case, the important thing is for a clear division of operations, with close coordination between the fire prevention bureau and building department. Some cities place a fire department officer at the building department to review plans for the fire department. Another scheme requires all permits, licenses, and approvals to be applied for at one municipal office, which then sees that the fire, building, and other departments make the necessary reviews or inspections.

For large properties, the owner may be getting recommendations for improvement of fire safety from the fire prevention bureau, insurance engineers, and others. The fire prevention bureau should encourage these and other agencies to consult one another, so that an owner will get the best advice and not be confused by recommendations that differ in details.

Industrial Fire Protection. - The fire prevention bureau, as already mentioned, handles educational and public relations work for the department. One of its task is to keep in touch with the heads of the safety and fire protection departments in industrial plants within the city. The bureau lends support to the fire protection man, to see that details of plant protection are carried out. Perhaps more important, the fire department serves as a clearinghouse for helpful suggestions on fire protection procedures and practices in industrial plants.

Bureau Personnel. - The best features of existing fire prevention bureaus have been described by the foregoing. In the average city, the fire prevention bureau consists merely of a staff of inspectors. In too many fire departments, personnel for the fire prevention bureau is selected from among the physically handicapped members of the department. This is a practice very detrimental to effective work. Few fire departments that have fire prevention bureaus use them to the best advantage. Men are assigned to do inspection work with little natural ability for it and with a definite lack of training and experience.

There is need for a better selection of personnel for fire prevention bureau staffs. In general, the men should be chosen for the work from the younger firemen who have the best educational background. Some men with engineering education and experience are needed on the staffs of fire prevention bureaus. In some cases, fire protection engineers have been developed from among the fire department members, but this has occurred so infrequently as to suggest that one of the major problems in fire prevention bureau operation is to set up conditions that will attract

persons with adequate technical education to the fire department, for eventual employment in the bureau.

Fire departments may be able to develop fairly satisfactory inspectors through training courses. At present such training courses are very few, and it could be recommended that State fire marshals' departments, in cooperation with the firemen's training program of the State and cities, set up courses of instruction that would help to develop inspector talent.

Routine Investigation of Fires. – Quite apart from the business of running down the crime of arson, the routine investigation of fire is the most effective single item of fire prevention work that can be performed by a fire department. Most departments make routine reports on fires, consisting, in the poorest grade of department, of simple entries in a fire record journal.

Investigation of fires, as a fire prevention measure, includes bringing home to citizens their responsibility for allowing a fire to start. This responsibility is too often obscured by the fact that a person suffering a fire is indemnified for the physical losses by insurance. It has never been customary in the United States to try to bring home to individuals the fact that it is an offense against the public safety to have a fire, even a so-called "accidental" one. In spite of this, there appears to be no question that under our common law a person can be held liable for damages to his neighbor's property from a fire that spreads from his own premises, provided the fire was a result of his negligence or the negligence of his servants.

Effect of Over-Insurance and Over-adjustments. - The line between an "accidental" fire and a deliberate fire is sometimes very hard to draw. Close to a deliberate fire is one where the property owner is provided with an incentive to be neglectful.

Some departments feel that much closer cooperation is needed from various insurance people, if they are to keep fire losses at a low figure. The investigation of fires, even where no actual arson is involved, shows that to the extent that insurance companies allow over-insurance or are careless or "soft" in the making of adjustments of losses, frequent fires will be encouraged. Public adjusters, operating on a commission basis, are most often complained of by fire departments as a factor encouraging "over-adjustments."

Recommendations for Fire Prevention by the Fire Department

1. That the objective of the fire prevention work of the fire department be to produce a situation where citizens are informed about fire safety and interested to the extent that they are willing to take advice on fire matters and observe laws enacted for their safety from fire; that in every city there be created a local fire prevention committee; that the fire department, through a bureau of public relations, or through a fire prevention bureau in the larger cities, provide facilities for education of the general public.
2. That special attention be paid by fire departments to cooperating with school authorities in securing the interest of school children in fire safety; that, in large departments, a number of men especially chosen for the purpose be assigned to work with children and in the schools.

3. That the fire departments proceed to secure public cooperation by inspection and educational activities, of which the following offer examples that have been effectively used and are being used by many progressive fire departments:
 - a. A larger total number of contacts with the public, through firemen doing inspection work on detail from the firefighting companies.
 - b. More effective seasonal fire prevention campaigns, including better programs during Fire Prevention Week, Clean-Up Week, Christmas, and Fourth of July periods; supplemented by campaigns against any local situation, such as rubbish and grass fires, the number of which may be excessive due to lack of public cooperation or to failure to enforce laws.
 - c. An annual dwelling house inspection campaign, partly for inspection purposes, principally to seek public interest and support of fire prevention.
 - d. Promotion of self-inspection work and training in the use of first-aid appliances by employees of business concerns and the occupants of building; the organization of private fire brigades and fire safety organizations in industrial plants, mercantile properties, institutions, and elsewhere as may be appropriate.
4. That all fires be thoroughly investigated to establish the idea of personal responsibility for fire prevention and to bring to the attention of insurance agents and adjusters cases where over-insurance or “soft” adjustments of losses may tend to encourage an attitude of carelessness or indifference of fire in any individual property owner.
5. That all members of the fire department receive training in fire prevention work and be expected to promote fire prevention; that a portion of the permanent staff of every fire department be assigned full-time to fire prevention activities, in large departments through the creation of a fire prevention bureau; that the younger, better educated members of the department be chosen for such work and specially trained for it; that the qualifications of members of the bureau be constantly broadened until these may provide a place where a citizen may go for comprehensive fire prevention advice.
6. That the fire prevention work of the department be clearly defined by an ordinance creating a fire prevention bureau or by a similar legislation; that all municipal fire prevention ordinances be compiled in a single volume to be known as the Fire Prevention Code; that the Fire Prevention Code be kept as complete and up-to-date as possible.
7. That the fire prevention bureau be a division of the fire department under the chief of department so that the chief may properly coordinate all fire prevention activities of the department; that the functions of the bureau be clearly designated, to avoid as far as possible overlap or conflict with building departments and other city departments, fire prevention bureaus being assigned to all work involving storage, manufacturing processes, or hazards to life peculiar to the occupancy, and to installation or maintenance of private fire protection equipment.
8. That the few States not now having State fire marshals consider establishing such an officer or vesting fire marshal powers in some State official; that State fire marshal, through

properly qualified staffs, provide fire prevention bureau service where it is not provided by fire departments; that State fire marshals provide various technical services (photography and laboratories) available to local fire departments; that State fire marshals provide facilities for assisting in the training of fire department personnel assigned to fire inspection and fire investigation work.

FIREMEN'S TRAINING

Organized systematic training for firemen, starting with a few drill schools in fire departments in the United States more than 60 years ago, has made great advances in recent years. As early as 1914, the North Carolina Firemen's Association began a training program at its meetings. In 1916, the International Association of Fire Engineers (now the International Association of Fire Chiefs) endorsed the principle of firemen's training and in 1919 developed a suggested set of standard fire department drill evolutions.

By 1925 the first 3-day course for firemen was held at the Universities of Illinois and Iowa. During this same period, a number of progressive insurance inspection bureaus in middle western States added itinerant instructors to their staffs. About this time, the short courses were also given support by a Fire Service Extension Committee of the Fire Waste Council of the United States Chamber of Commerce.

The short courses, so-called State "fire school" and "fire colleges," were often an outgrowth of fire association and fire chiefs' meetings. They have since become a feature of training in at least 25 States. In the early fire schools or colleges, which were usually operated once each year for a period of 3 to 5 days, demonstrations with apparatus were conducted and lectures were given. Although some of the more progressive members of small town and village fire departments sought admission to drill schools located in the larger nearby cities, the fire colleges were about the only source of help then available to volunteer firemen and members of small departments.

The Fire Department Instructors' Conference, sponsored by the Fire Prevention Department, Western Actuarial Bureau, and the Memphis Fire Department, has been an important influence since 1927, and still is. At about the same time, in 1930, firemen's training had achieved enough importance to be given attention by the U.S. Office of Education in cooperation with State vocational educational offices, many of which took a prominent part in early State programs.

The entrance of vocational education as an ally of the fire services gave many programs a real lift, by providing funds and expert guidance in developing instructors among the fire department personnel practicing in training work, and in arranging the machinery of instruction. In 1937 in-service firemen's training was set up as an integral part of public vocational education, and cooperative training programs were started in 22 States. For the year ended June 30, 1946, some 30 States had one or more State vocational fire instructors; and 1,374 classes were conducted in 780 locations. State training programs gave systematic, measured instruction under competent educational auspices to some 30,000 firemen.

In 1939 the National Fire Protection Association made a survey that traced the growing field of State training programs. Only half of the cities of over 20,000 population had fire department training schools. In 1941 the Firemen's Training Committee of the National Fire Protection Association was organized. In 1946 a joint evolutions committee of representatives of the Fire Department Instructors Conference, the International Association of Fire Chiefs, and the N.F.P.A. Firemen's Training Committee was organized.

During the war, the armed services provided training centers with generous physical equipment for training personnel in the manipulative operations of firefighting. At Coast Guard and Navy centers, the facilities provided mock-ups of ships in which actual fires could be attacked. This did much to add to the "training consciousness" of firemen and should lead to continued demands for training programs in fire departments. The same is true of industrial fire brigades, many of which were organized and trained during World War II, and continue to function as a necessary protective measure in peacetime.

Nearly every State has an organized firemen's training program, and the immediate future for training is very good. In many States the programs are being expanded. Some provide pre-entry instruction for students who expect to enter the fire service. Certain institutions of higher learning have provided well-equipped, permanent training centers. Outstanding examples are at Oklahoma A. & M. College and the University of Maryland.

Changes in Working and Living Conditions. - When industrial and living conditions were simpler, firemen learned through experience on the job. Little attention was given to organized systematic training. However, in recent years demands upon the fire service have made it imperative that all members of fire departments be trained for their work sufficiently to enable them to utilize the results of technical progress. The more complicated living and working conditions become, the more there is to know about fire prevention and firefighting.

There are over 80,000 professional paid firemen and an estimated 725,000 volunteer firemen in America. This makes a total of around 800,000 municipal firemen - that is, persons engaged in protecting cities, towns, villages and small rural communities in which publicly operated fire departments are maintained. However, this figure does not include persons serving in private fire brigades.

According to a report compiled by the National Fire Protection Association for the year ended June 30, 1946, only 30,000 firemen were enrolled in systematic class instruction, not including large city departments that operate their own training programs without outside aid. Making ample allowance for numbers not counted in this survey, there still remains a much too wide differential between the total training program possible and the actual number of firemen now being reached with organized systematic instruction. This means that in great numbers of community centers, very little if any firemen's training is going on.

A New Concept of Firemen's Training. - Only a few years back, many people, including leaders of the fire service, thought of operational training - evolutions and drills with apparatus under a drillmaster - as *the* training program for firemen.

There are three main parts of firemen's training:

1. Basic and technical operational training for the rank-and-file men.
2. Officers' training for those responsible from the administrative, managerial, and supervisory standpoints. Fire officers should be well beyond basic operational skill in connection with fire apparatus, which must be acquired by all rank-and-file firemen. The training of officers largely center around the further development of leadership ability, the satisfactory directing and handling of men, the organization of work of the department, and advanced technical firefighting problems.
3. Instructor's and conference leader's training for those who teach or direct the learning activities of others. Teaching is a profession and a career. Just as there is a fund of information on the proper performance of fire evolutions, there is also a fund of information on sound instructional principles and procedures. These things are not peculiar to firefighting, but to teaching. A good fire instructor must be basically grounded in firemanship and must also be trained as a teacher.

The content of training courses designed for the upgrading and improvement of persons under the three parts of the program just mentioned is, of necessity, quite different. All training should be designed to assist those interested in promotion and advancement.

Informational teaching is never a satisfactory substitute for teaching that is organized and carried out in an on-the-job basis. There is no fully accurate way of measuring just how much a man knows about a given subject – how much he recognizes, understands, or appreciates. In measuring “doing ability”, however, a performance test will reveal whether or not the learner can do a job and how well he can do it.

The need for continuing organized systematic training is clearly apparent to those who have thought the problem through. Firemen do not stray trained. Refresher and “brush-up” instruction is essential, therefore, from time to time, even for experienced men. New men who require training must be added to departments as others leave, and, as the years go by, there is a natural growth in diversity and scope of the activities engaged in by all firemen.

Suggested Statewide Training Programs

While no two States follow exactly the same pattern of development, there are points of similarity in the programs now in operation in about 40 States. The units discussed in the paragraphs that follow appear in various State programs and may well be considered in any Statewide plan for firemen's training.

Local Fire Department Training Programs. – What local fire departments both paid and volunteer do for themselves is the heart of any Statewide program. Naturally, the size of the local department, the personnel, equipment, apparatus, firefighting tactics and procedures used, and the type of fire department organization are all factors to be considered in determining the training program appropriate for a given department. Every local department should go just as far as it can and then secure such supplementary training assistance as may be necessary.

Itinerant Instruction. - Itinerant instructors, such as are made available through State boards for vocational education and other agencies, travel over the State helping to plan local training programs, offering certain phases of firemen's training themselves, coordinating effort, and guiding further development. To the small outlying volunteer department, this service has already been of great value and has undoubtedly helped to advance training far more rapidly than would have otherwise been the case. City departments might well make more use of itinerant instructors.

State Fire Schools (or Colleges). - These schools serve as clearing houses on practices and procedures and help to keep firemen up-to-date on new materials, equipment, and changes in fire prevention or firefighting tactics. They also stimulate interest and encourage firemen to put forth their best efforts. It should not be expected that the total training responsibility for an entire State can be discharged with a State fire school alone, however good it may be. Only a limited number of men are thus reached for a week or less each year. However, State fire schools serve to interest men in further training and constitute an important unit in the total training.

Officer Training Courses. - Far less has been done up to the present in developing organized systematic training for officers of fire departments than for the firemen themselves. Officer training needs a great deal of emphasis in State programs. Otherwise, the hundreds of men in departments who receive operational training are being given advantages not available to persons with officer responsibilities. Once established, officer schools can be operated on either a Statewide basis or for subdivisions thereof. Some form of officer training is highly desirable, and the scope of such training, based on actual needs, is almost unlimited. Much of it should deal with the successful directing and handling of men.

The basis of all officer training, as in the training of the rank-and-file firemen, is the study of the actual duties, responsibilities, and problems confronted by each individual in his official capacity. More carefully made analysis are needed to reveal the jobs and subjects in which officer training needs are the greatest. Both prospective and present officers should be included in a training plan.

Instructors Training Courses. - Every State needs a reservoir of capable, trained fire instructors. If possible, these instructors should be located in various parts of the State and be available to some extent beyond the service areas of their own departments. The more firemen there are in a State who are trained to teach, the more rapidly units can be added in a Statewide training program and the more men can be reached with a good quality of instruction.

Whenever the available supply of qualified fire instructors in a State is low or becomes low, it is time to qualify other promising individuals who are interested in becoming instructors. Periodically, there is need also for "brush-up" and refresher courses for instructors already qualified, especially when the original training was secured some time ago.

Suggested City Department Training Programs

The units discussed in the paragraphs that follow appear in many city programs and may well be considered by paid departments.

Company Schools. - Organized systematic training, giving the quickest results, starts with the men who actually answer the calls and fight the fires as they occur. Such schools are ordinarily conducted daily and weekly, for periods of varying length, by the officer in charge of a company, or by designated instructors for a company. The purpose is to perfect the proper handling of tools and apparatus.

There is still great opportunity for more interesting and challenging instruction at the company level. Company schools can be carried on with either of two attitudes apparent on the part of the personnel: the men can go through their work in a perfunctory manner, complying with orders but showing no special interest; on the other hand, the men can look forward to the drills because of their value and the desire to improve, feeling a genuine pride in the organization of which they are a part. With this attitude, men are really improving themselves as firemen and as citizens.

City Training School. - Operating throughout the year and manned by the necessary qualified instructors working under the direction of a chief inspector, the well-organized and well-conducted city training school is effective. Whole companies are often taken out of service, at least annually, to receive training that cannot be done satisfactorily at the company level. Commonly included are drill tower and smoke chamber experience. Some of the new equipment to make this experience more realistic is being patterned after that recently used by our armed forces when training their firefighters. Performance tests, along with informational examinations, check both the effectiveness of the instructor and the learner's grasp of the situation.

Four distinct groups can and do profit from a city training school through organized classes:

1. The *probationary* fireman who gets his initial trial training there before he gets his definite work assignment.
2. The *experienced* fireman who is given an opportunity to improve on specific phases of fire prevention and fire extinguishment. Such training, well given, not only improves his present ability but should, in a measure, prepare him for possible promotion.
3. The *advanced* fireman who is ready, willing, and able to move forward perhaps more rapidly than certain of his associates. Classes to which he is assigned naturally will deal with the more technical phases of ventilation, hydraulics, gases, hazardous materials, and similar subjects. Such men are present in nearly any department.
4. The *specialized* fireman who is selected by supervisors who know his interest and capabilities to take specialized training. In this group are pump operators, first-aid men, inspectors, arson investigators, and the like. Classes are organized to turn out individuals specialized in at least one line of fire work.

Instructor Training School. - As in the Statewide instructor training schools, the emphasis needs to be placed in learning how to teach others, rather than on skill as a fireman, which should already be possessed. There must be schools and classes organized and conducted to improve

the efforts of those who may already be assigned to such responsibility, and to train promising recruits who show evidence of ability as teachers or instructors.

Officer Training School. - What has been said previously with respect to officer training applies here. When company officers, taken in small groups, analyze their responsibilities and duties and receive well-planned instruction from time to time, the whole training program is moved forward. Subjects commonly included are technical firefighting practices, use of protective equipment, the handling of men, and public relations. Trained men need trained officers; and trained officers want trained men working under their direction.

Chief Officers' Conference. - Considerable success has been attained in some cities through the holding of a regular chief officers' or senior officers' conference. Presided over by the chief of the department, these conferences often include his deputies, battalion or district chiefs, the chief instructor and other senior officers. Such a unit, operating as a part of the over-all plan, keeps the training needs to the foreground and keeps officers informed about progress made. As training problems are discussed and future plans made, the total program is kept geared properly to the administrative policies and procedures of the entire city department.

Suggested Small Town and Village Department Training Programs

The following training suggestions are offered for the training programs that small towns, villages, and communities must of necessity carry on for themselves:

1. Secure the services of State itinerant instructors and other instructors in both planning and execution of the program.
2. Make appropriate modifications of certain of the elements appearing in the Statewide and city programs.
3. Utilize the training resources of adjoining communities for the benefit of several communities in close proximity.

Small departments can be helped the same as larger ones by instructor-training and officer-training courses, made available through a live and going Statewide program, as illustrated. Better Statewide fire training programs naturally mean more service to the smaller fire departments.

Suggested Programs for Private Fire Brigades

There are numbers of fire departments that are similar to public fire departments, but which protect industrial, mercantile, institutional, and governmental establishments. These range all the way from small private fire brigades to fire departments of substantial size. The armed forces, forest services, and other agencies also maintain firefighting organizations.

In each of these, there are some features of the training requirements that are highly specialized. Examples are the techniques of forest firefighting, and the Navy and Coast Guard programs to train ship firefighters during the war. In some instances, this specialized training also has been

available to persons outside the particular service. This specialized training should not be confused with a complete program of firemen's training.

Private fire brigades and all specialized fire-defense organizations should develop a program commensurate with their specific needs, but embodying most of the features of a complete program, as appropriate for municipal fire departments.

Recommendations for Firemen's Training

1. That continuing, systematic, up-to-date programs of training for firemen are necessary in order that they may discharge their responsibilities in firefighting and fire prevention; that fire chiefs' and firemen's organizations continue to focus attention on and support firemen's training programs; that firemen's training be recognized as one measure of an effective fire department.
2. That every fire department not having a training program establish and maintain one commensurate with training needs, and departments now having training programs in operation continue to develop and improve them; that local fire departments take the initiative in providing training programs, using standard practices and calling upon appropriate outside assistance to improve further such programs from year to year; that city departments cooperate with and assist private fire brigades and the smaller outlying departments with their training programs; that a more adequate supply of carefully selected instructors and conference leaders be developed from within the fire service; that training programs be based on specific needs, as revealed by careful surveys of local situations.
3. That the armed services (including the National Guard), the merchant marine, the forest services, industrial, mercantile, institutional, and governmental establishments and maintain fire departments be encouraged primarily for their own personnel to develop and extend existing training programs, or to provide programs where they are now lacking; that such programs recognize the special needs of the particular department or service, but that in the interests of general efficiency these programs be carefully geared to and in harmony with the programs of firemen's training as carried on in the various States and cities; that where appropriate specialized training facilities are available, provision be made for extending this training to other firemen.
4. That instruction, when offered, be organized around the activities and actual jobs of firemen and that a complete firemen's training program be considered as having several essential parts: training for rank-and-file men, primarily operational; training for officers, of an administrative, supervisory, and leadership nature; training of instructors and conference leaders: and certain highly specialized training for fire prevention and firefighting.

5. That since training of firemen as a public service occupation through vocational education channels as administered by the U.S. Office of Education and State boards for vocational education, with support from both Federal and State funds, has been effective; has increased the number of firemen receiving training; has provided well-planned training for many fire departments; and has generally improved the efficiency of training, the established pattern be continued and strengthened.

6. That the possibilities be explored for the establishment, at training centers such as those now existing or contemplated by certain States, of suitable buildings and other equipment, so that some operational training may include use of equipment in actual fires; that similar centers may be possible in some of the largest cities; that while such training facilities are useful, as demonstrated during the war by the armed services, operational training is only one part of a comprehensive training program; that proposals for a nationally operated center for such training be left open, and for the present, State training programs be developed and strengthened.

FARM AND RURAL FIREFIGHTING SERVICES

The loss from fires on farms and in rural communities in the United States in 1946 was an important factor in our fire waste. A high percentage of the fire loss occurs annually in such areas. In addition to the ordinary fire hazards on the farm, the mechanization and electrification of agriculture has introduced new causes of accidents and fire that make close cooperation necessary between Federal, State, and private agencies in the development of effective organization plans for reducing these fire losses.

The continued prosperity of farmers and other rural property owners and the safety of their families is dependent to an important extent upon dependable, organized fire department service. This service was early recognized as one of the necessary and vital functions of our incorporated cities and villages, and as a result, the development of fire departments has been along the lines necessary to meet their specific needs, until recent years.

Fire protection minded organizations and individuals have now realized that improved roads, modern automobile fire apparatus, and rural telephone service can make available comparable facilities for fire control throughout our farm and rural communities. As a result since about 1920 the development of rural fire departments has increased slowly at first, but with considerable headway during the late 1930's and following World War II. Many States during the 1920's and 1930's enacted legislation to encourage and promote rural fire-control programs. Such legislation has made it possible to place such programs on a more substantial basis than could be done previously.

Rural fire department service is public fire protection furnished to property located outside the corporate limits of a city or village *by specific assignment*, using apparatus designated for such purpose. This includes farm property, scattered suburban dwelling or mercantile property, isolated manufacturing property, or small unincorporated communities. Assignment must be

specific, so that every property owner within a given district will know definitely the procedure to follow in turning in an alarm, and so that *prearranged* fire department service will be immediately available.

In this way, the farmer or other rural property owner, having made prior arrangement and contribution to obtain this service, may have the same feeling of assurance that organized firefighting assistance will respond at his call that the city dweller has always enjoyed.

Common methods used to provide rural fire department service include fire departments supported by subscriptions, service on a fee basis from existing fire departments, and by organization of fire protection districts.

Fire Protection Districts. - Protection is provided by governmental means through the formation of specific fire protection districts, or by authorizing townships or counties to provide fire control service by taxation and other means in their rural areas. By means of legislation, a number of States have provided that one or more townships, or a part of a township, or parts of several townships may form a special fire protection district within which a tax may be levied to provide fire protection. Management of the district's affairs is the duty of a duly elected or appointed board of trustees or existing governmental body. Fire protection for all property within the limits of a county, township, or fire protection district is generally provided by one of the following methods:

1. A contract between one or more established city, village, or private fire departments and the rural governmental body, whereby protection is provided for an annual fee, with the fire departments providing apparatus, equipment, manpower, maintenance, and housing facilities.
2. Provision and maintenance of apparatus and equipment by the rural governmental body, with manning and housing facilities provided by one or more city, village, or private fire departments. The service rendered is then paid for on the basis of a set fee per run, per hour, or per year.
3. Provision of full rural fire department facilities by the rural governmental body, including apparatus, equipment, housing, and personnel. The fire department is then located in one or more villages or communities within the boundaries of the township, county, or fire protection district.

It is generally found that small cities, villages, and communities profit by participating in these plans for the provision of rural fire departments service as much as do the farmers and other rural residents. Such communities may in this way become better equipped to combat the fires occurring within their limits and can also service the rural area without jeopardizing their own protection. Many small communities would be dependent on very inadequate first-line fire department equipment, if it were not for the additional support available for a combined program from the rural area served.

Rural Fire Protection Legislation. - Information contained in a report prepared by Mr. John D. Rush of the United States Department of Agriculture in November 1946, which apparently contains the most up-to-date available on the status of Rural Fire Protection Laws and Programs, indicates that by 1946 basic legislation authorizing rural fire protection under township, county,

or special district governing bodies had been enacted in 38 States. Most of these laws have either been enacted or revised since 1920. Although most of the programs now in operation are based on old laws, amendatory legislation has served to bring such programs in line with the material progress that has been made recently in the field of fire control. Such amendatory legislation gives sanction to those programs formed under the older laws, but requires them to conform as soon as possible to the provisions of the newer statutes. During the decade 1930-39, 12 States adopted or revised laws for the establishment of fire protection districts in rural areas. Because of the local nature of fire protection programs, little data are available to indicate the extent to which programs have been developed in these 38 States. Mr. Rush, in his report, compiled the following approximate data, giving some indication of the progress that has been made:

California – At least 250 fire protection districts, some operating on a county-unit basis.

Illinois – More than 110 fire protection districts, with a State association. Evidence indicates that by the end of 1947 there will be in excess of 150 such fire protection districts operating within the State of Illinois.

Iowa - Township fire protection furnished by at least 400 city and village fire departments.

Kansas – At least 20 townships with contracts for fire protection.

Massachusetts – More than 50 fire districts serving the thickly populated suburban communities with few farms, but many more township fire departments serving rural areas in which most of the farms are located.

Minnesota – At least 208 townships protected.

Nebraska – About 30 rural fire protection districts.

New York – A total of 1,324 fire districts and a State association.

North Dakota – At least 150 townships with some protection.

Ohio – At least 408 townships with some protection

Oregon – At least 72 fire protection districts.

Vermont – At least 25 fire districts serving approximately 1 percent of the farms; but other farms are stated to be served by municipal fire departments.

Washington – Approximately 100 fire protection districts.

Enabling legislation has been utilized to some extent to establish rural fire protection districts in Colorado, Idaho, Montana, and Nevada. Some progress in the utilization of State laws authorizing township fire departments, the extent of which is unknown, has been reported in Connecticut, Indiana, Michigan, Pennsylvania, and Wisconsin. The movement to organize county fire departments, consisting of a number of fire companies distributed in various parts of the area under county administration, is, except in a few isolated instances, just beginning. In a few States for which very rough estimates were obtained, including protection provided voluntarily or by law, the proportion of all farms in each State has some degree of fire department protection has been estimated as follows: Connecticut, 50 percent; Delaware, 90 percent; Idaho, 5 percent; Maine, 20 percent; Massachusetts, 50 percent; Maryland, 90 percent; Michigan, 75 percent; Missouri, 15 percent; New York, 80 percent; Rhode Island, 90 to 100 percent; and Vermont, 10 to 15 percent.

State enabling legislation should be provided Nationwide to permit incorporated rural governmental bodies, such as townships, counties, or special fire protection districts to provide

their own fire protection; to contact to give or receive such protection to or from other incorporated governmental units or incorporated private organizations; to provide protection jointly with other units; or to contribute toward the support of other fire departments in return for fire protection service. Such rural governmental bodies should be permitted through State legislation to enact and enforce, by means of qualified building and inspection authorities, regulatory ordinances covering building construction, the safeguarding of hazardous conditions, the installation of private fire appliances, and other fire prevention measures.

A State Rural Fire Protection Advisory Body. – Complete information covering ways and means to provide rural firefighting service and fire prevention activities should be available from an efficient rural fire protection advisory body in each State. Such a body should be capable of giving complete organizational, promotional, and planning advice, based on the specific needs of the community involved, of the communities adjacent thereto, and of the State as a whole. Such advice should be coordinated with the requirements of local fire insurance rating bureaus, where proper rural fire department service is recognized as justification for rate benefits.

The advisory body may be set up to operate as an official State body, under the general direction of a State fire marshal, for example, or it may be a voluntary association. If it is a voluntary organization, it may function through an executive committee selected annually. We recommend that a rural fire protection specialist be employed in the State Fire Marshal's office to extend and improve rural fire protection; we also recommend that a rural fire protection specialist be employed by the State Agricultural Extension Service to stimulate and conduct educational programs in rural fire prevention and first-aid control of fires. We further recommend that the Rural Fire Protection Committee act in an advisory capacity in planning and directing the activities of these two specialists.

(Examples of groups from which representation might be drawn, as appropriate, for the State Rural Fire Protection Committee are: the State Fire Marshal, the State Fire Prevention Association, the State Inspection Bureau, the State Fire Chiefs' Association, the State Firemen's Association, Volunteer Firemen's Associations, Association of Township Officials, the Grange, the Farm Bureau, the Farmers' Union, Stock and Mutual Fire Insurance Organizations, the Agricultural Extension Service, the State Department of Education, the Conservation Bureau, and the State Foresters.)

A Fire Prevention Program. - In view of generally wider distribution of fire companies in farm and rural areas, an effective program to keep fires from starting, backed by law, is possible. Authorities who have the responsibility of carrying out this program should be thoroughly versed in all details of farmstead planning and special farm fire prevention problems. The representatives of various rural interests, such as agricultural organizations, rural educators, parent-teacher associations, women's clubs, the rural press, local fire insurance agents, forest fire organizations, 4-H Clubs, Farm Bureaus, and similar organizations can be helpful and should be urged to cooperate and assist in the conduct of the over-all rural fire prevention program.

FOREST FIRE SERVICES

Municipal, industrial, and building-site areas, involving structures of all kinds, comprise less than 150,000,000 acres of the land area of the United States, or only about 7 percent. The other 93 percent of the 1.9 billion acres of the United States is in farm and pasture land, open range, or forest. It is outside the sphere of activity of municipal fire departments, and is mostly without the benefit of insurance and specialized protection service.

Forest lands make up one-third of the total, farm lands make up about one-fourth. The remainder is mostly in the form of other wild lands. Each year well over 175,000 fires start on such lands of Virginia. The reported damage is conservatively appraised at 36 million dollars in commercial values. To this must be added the less tangible damages, such as loss of soil in the mountains, increased danger of floods, damage of water supplies, to scenery, and to wildlife. Such damages are of even more public importance.

In referring to the "forest fire" problem in this report, the term is used in the broad sense and is meant to include forest, brush, and grass fires on all wild and uncultivated lands.

Forest Protection. - Responsibility for forest fire protection is now actively assumed by Federal, State, county, and private agencies. The Forest Service protects the largest area of Federal forest lands, consisting of 185 million acres. Several other Federal agencies also have a highly important job of protecting over 150 million acres of other public wild lands.

In 43 States, organized protection from fire on non-Federal forest lands is a primary job of the State forestry departments. During 1946 the State Foresters, together with their cooperating local and private agencies, carried on fire control on 320 million acres of State and privately owned forest land. Protection is also being extended as rapidly as funds permit to an additional 119 million acres that need protection but are not now receiving it.

Under the Clarke-McNary Act of 1924, a total of 23 million dollars is being spent on this cooperative protection program. Of this amount the States are contributing 55 percent; the Federal Government 35 percent; and private landowners 10 percent.

The housing shortage and other critical war needs, and postwar demands for wood products, have greatly increased the pace of woods operations, and have resulted in increasing the danger of fire in logging debris in all forest regions.

At the same time, the property value of forests everywhere is greatly increased and the appraised damage done by fires has doubled.

A further factor is the great increase in other forms of public use. The elimination of wartime restrictions has put increasing thousands of hunters and fishermen back into the woods and has returned former military and war industry workers to residence in forest areas. Vacation travel into forest regions is on the increase and airplanes now take parties into areas remote from ground transportation. All these trends increase the chances of forest fires and are reflected by a sharp uptrend in man-caused fires.

Fire Prevention. - In spite of impressive progress in the success of forest firefighting, the reckless waste and destruction, in the form of huge forest fire losses that still arise from careless American habits, must be reduced at the source. This is a tremendous task, requiring an aggressive and continuing campaign. Examples in this direction are the National Forest Fire Prevention campaign and the “Keep America Green” programs. They must be coupled with some restrictions of use in highly hazardous areas.

Protection. - The numerous Federal, State, county, and private protection agencies need to be strengthened and their efforts more fully coordinated. By such means all land resources would receive a degree of protection consistent with the values represented and the fire liabilities that exist. In this effort, the principle of public values and public responsibility for problems beyond the control of the landowner needs greater recognition, and public financial support should be extended accordingly.

Forest protection agencies are still largely financed on a prewar basis, but costs of labor and equipment have advanced by 50 percent or more.

Labor for firefighting activities is scarce and largely unskilled. Better efficiency is badly needed. Increasing mechanization to replace hand methods and increasing speed of action provide the best prospect for attaining this efficiency. The old problems of time and distance are overcome drastically by parachute firefighters and by parachute delivery of equipment and supplies to the scene of action. Less spectacular, but of equal importance, are many other modern trends in development, such as tractor-bulldozers, special tractor-drawn plows, new fog nozzles and wetting agents to make water more effective, improved radio equipment, and a long list of specialized equipment to fit the firefighting work in each locality.

VOLUNTEER FIRE DEPARTMENTS

Following recognition of rural fire department service as a vital part of the fire protection plan of our Nation, fire officials, the National Fire Protection Association, Government officials, fire apparatus manufacturers, and insurance interests became interested in compiling standards for this important service, since it is a well-known fact that development along carefully thought-out lines, using proved standards as a guide, always produces better results than unplanned growth. Numerous standards for rural fire department service have been compiled by the various interested groups; but those published by the National Fire Protection Association in the pamphlet, “Volunteer Fire Departments for Rural and Small Communities,” combine, through its Committee on Farm Fire Protection, the well-thought-out ideas of each of these groups. The recommendations contained in this publication should be consulted, carefully studied, and followed by all charged with the organization and operation of rural fire departments. In the work of approving rural fire department service for rural fire insurance rating purposes, the various State rating bureaus used published specifications that closely follow the recommendations of the National Fire Protection Association.

To give satisfactory protection, a rural fire department service must consist of the same fundamental facilities that go into the make-up of a city fire department service.

The tendency is to bring volunteer fire departments under public control, as described. Those not under public control should be incorporated, so that individual members will not be liable to damage suits. Private volunteer fire departments sooner or later are likely to call upon governmental bodies to appropriate funds for equipment, maintenance, and other expenses. This tendency should be encouraged, to place fire protection on a more permanent and more practical basis. Laws of some States prescribe the method of organizing volunteer fire departments and require them to be under the direction of some governmental body.

Alarms. - Audible general alarm facilities, such as horns or sirens, are generally a necessity where fire departments are volunteer. For a discussion of telephone service, fire alarm telegraph, and radio, see the section of this report on Fire Department Communications.

Motorized Apparatus. - There are two principal types of fire apparatus suitable for rural and farm fire department work. One is a triple combination pumper (pumper with hose body containing 2 ½-inch hose and water-tank equipment), and the other is the water tank type of apparatus, or booster type of apparatus that is primarily dependent on the supply carried on the truck.

Specific responsibility should be placed on mechanically inclined fire department members for a regular schedule of maintenance of mechanical apparatus and all equipment. "Preventive Maintenance" should be properly scheduled and accomplished by intensive inspection and proper adjustment.

Fire Prevention Activities. - In addition to their regular duties, the department personnel should become a self-constituted educational force to disseminate the fundamentals of fire prevention, as gained from their personal experience in fighting fires and from publications on the subject, which should always be at their disposal.

We recommend that the members of the fire department regularly inspect the premises in their community, in order to locate and secure the correction of all conditions that constitute potential fire hazards. We also recommend that the members of the department tactfully secure the cooperation and interest of property owners in the building of driveways leading to natural water supplies, or in providing ponds or other artificial reservoirs.

Full and complete news of all activities - civil, social, and firefighting should be given to the press. In particular, advice as to fire prevention and fire protection should be frequently published. National Fire Prevention Week should always be fittingly observed with addresses and demonstrations in the local schools, civic organizations, farmers' club, etc.

Fire departments charged with the responsibility of farm fire protection should have complete knowledge of safeguarding special features of hazards prevalent in farm buildings.

Extent of Running District. - The distribution and assignment of rural fire department companies necessary to properly cover a specific district is a matter that requires through study of the characteristics of the property therein. In general, it can be expected that the longer the run by the fire department, the greater the possibility of excessive loss to individual property and of conflagration in congested areas. However, the acceptable distance has gradations depending upon the degree of building congestion, concentration of values and hazards, topography, condition and arrangement of roads, traffic, probable delay due to bridge and railroad operation at roadways, and other obstructions to response. Rapidity of response under unfavorable conditions, in view of the alarm facilities available, is a consideration of special importance where water supplies are limited, as in rural districts. Also the probability of simultaneous fires increases directly with the size and congestion of a specific district.

In recognition of these factors, many rural districts have found it necessary to establish multiple-company operation and arrange mutual-aid agreements to provide effective coverage under all conditions. In all cases, we suggest that the insurance rating bureau having jurisdiction be consulted in planning company distribution and assignment, as recognition of this service for insurance rate consideration may be dependent on these factors.

Farm Water Supplies. - The development of permanent water supplies for fire department use at farm property should be promoted extensively by the authorities in charge of administering the affairs of the district covered and by the fire department members during regular inspections of property.

Wherever possible, provide for the building of cisterns on farms and near rural public buildings, so that fire department pumpers can use them for water supply. Sufficient water supply for at least 1 hour pumping, at not less than a 50 gallon-per-minute rate, should be available. This normally would require a minimum cistern capacity of 3,000 gallons. If a small stream is available, an ample supply of water may be provided by the building of a dam. When building a tank or reservoir, it is well to provide 4,000 gallons total capacity, so as to allow for the tank not being full at all times. Runways and roadways for fire department pumpers to available streams and ponds should be provided.

The publication of the National Fire Protection Association, entitled "Water Systems for Protection on Farms," contains many valuable suggestions for water supply development. The Portland Cement Association has cooperated in the development of plans, blueprints, forms, and methods for the installation for fire protection reservoirs.

The problem of making the best use of all available supplies at each farm should be given intensive study by the rural fire department at its regular training periods. Water supply records should be studied during training sessions devoted to planning the attack at each individual farm.

Recommendations for Fire Services in Farm and Forest Areas

1. That all States should enact legislation enabling rural governmental bodies such as townships, counties, or special fire prevention districts to provide public firefighting

service; that this legislation also authorize the formation of fire protection districts that may or may not be coextensive with other governmental subdivisions; that the legislation provide for building and fire prevention regulations and their enforcement, including those appropriate for natural terrain and forest areas.

2. That rural fire protection service should be tax-supported, as the fairest means of distributing the cost.
3. That a State Rural Fire Protection Committee be set up in each State to promote and guide a Statewide program for rural fire prevention and protection, including coordination of rural and forest protection services. This may be a voluntary association of the districts, State departments, and organizations and individuals interested, or it may be an official State body.
4. That local fire prevention activities, including public education, be sponsored by all rural governmental bodies that operate organized fire services; that adequate staff be provided on a local, regional, or State basis to carry on fire prevention and building inspections, supervision of natural terrain and forests, and development of fire protection water supplies at each farm property.
5. That special consideration be given to rural youth in fire prevention education, which would include demonstrations, identification of fire hazards, actual training, participation in fire prevention contests, preparation of exhibits at fairs, and firefighting surveys.

REFERENCE MATERIAL ON THE FIREFIGHTING SERVICES

The following sources are among those that will supply lists of published material relating to the subject of this report:

Case-Shepperd Mann Publishing Co., 24 West Fortieth Street, New York, N.Y.
International Association of Fire Chiefs, 24 West Fortieth Street, New York, N.Y.
International Association of Fire-Fighters, American Federation of Labor Building,
Washington 1, D.C.
International City Managers' Association, 1313 East Sixtieth Street, Chicago, Ill.
International Municipal Signal Association, Inc., 8 East Forty-first Street, New York,
N.Y.
National Board of Fire Underwriters, 85 John Street, New York 7, N.Y.
National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.
Public Administration Service, 1313 East Sixtieth Street, Chicago, Ill.
Superintendent of Documents, Washington 25, D.C.

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