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Fire Service: Challenge To Modern Management

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The fire service mission is traditional and enduring: to prevent fires and to respond to those that do occur and put them out. Although good departments stress the preventive role, all are primarily organized to serve in crisis—to react promptly and to protect the community.

Fire departments range in size from one truck—two man operations to large bureaucracies with hundreds of vehicles and thousands of men, and across the spectrum from all-volunteer to fully paid. Problems are generally most serious in larger departments, and in older cities, but basic trends are evident nearly everywhere. Increasingly, moreover, the problems of the fire service are tied to other major problems in the urban milieu.

Perhaps more than any other municipal service, the fire service is linked by a sense of fraternity and tradition, the keystones of which are reliability, dedication, esprit, heroism, and self-sacrifice. So much indeed does the spirit of altruism, of selfless dedication, yet survive that in thousands of communities where other services are paid the fire service is still largely or entirely volunteer.

In the contemporary urban milieu, however, this tradition is gradually eroding and coming to seem anachronistic. Public adulation and even sympathy for the firefighter has been waning; serious technological problems are mounting; costs are rising; and in the larger cities demands on the fire service are increasingly becoming conspicuous symptoms of deeper social ills.

This erosion of tradition underlies several of the fire service's most serious problems. Firefighters are increasingly disturbed because their traditions, and the values they represent, appear to be disintegrating. Changing public attitudes, deteriorating relations with minority communities, and a trend toward bureaucratization have dimmed the luster of the job and shaken and transformed many firefighters' self-image. Morale and turnout among volunteers in some areas is dropping. And in larger cities, imbedded in the general national growth of municipal service unions, these trends have helped accelerate a rise in militancy, with growing demands on wages and working conditions and a growing willingness to strike.

This crisis in public and self-identity has also afflicted fire service management. Recruiting highly qualified men is more difficult, and labor and community relations are increasingly important, though unwanted, concerns. Costs have been rising, but voter resistance to increased budgets and taxes has stiffened. And management itself has become more difficult now that tradition no longer suffices to motivate and guide skilled manpower. Yet nearly everywhere other traditions still dominate: the only road to the top of most fire departments is from within, and few training programs are available to teach the desired skills. Moreover, even among officers, the acculturation toward putting out fires is so decided that

many of the best men prefer field command even to top administrative or staff jobs.

Management also faces tough external problems, which are best illustrated in the context of how the fire service operates. Since fire is inherently a physical and chemical phenomenon, much fire service activity is oriented technologically, from prevention through extinguishment. Many fire departments, for example, inspect or advise on building plans, particularly in larger cities. This activity helps ensure that materials, wiring, heating units, etc. meet the fire codes and will present firemen as few problems as possible should a fire occur.

Most also inspect industrial, commercial, and public buildings—and residences to which they are invited—for possible ignition sources, kindling and fuel, for lack of safe egress, and for other potential hazards.

And nearly all fire departments have special communications networks, both into the department from the public, to report hazards and fires, and within the department for contact with mobile units.

When an alarm is reported, the most conspicuous part of the service springs into action: fire engines and sirens, pumps, hoses, axes, hooks, and ladders. At a building fire, firemen rescue and evacuate people and put out the fire. Once the fire seems to be out the tedious work of overhauling begins—finding and quenching embers and hot spots from which the fire could reignite, and setting the property in order.

To carry out these activities effectively, the fire service depends heavily upon outside persons and agencies: those who formulate and administer the codes, architects and building contractors, fire insurance companies (whose rating practices influence private fire protection, such as detectors, sprinklers, or brush clearance that property owners provide), telephone companies, private or auxiliary alarm services, and equipment manufacturers and suppliers. These form important additional parts of the fire protection "system." And when they perform poorly, they impair the fire service's ability to carry out its mission.

Some of the problems generated by these other parts of the system have social rather than technological roots. For example, an office building or housing project that others consider desirable may be uneconomical if all the fire department's recommendations for protection are included in its design. Other officials or civic leaders may well feel the building is worthwhile even if it is more susceptible to fires and fire damage than the fire chief would prefer.

This conflict is potentially even more serious when the affected market is unstable. In relatively prosperous areas, for example, rigorous inspection and code enforcement often are effective tools. In decaying inner-city areas, however, accumulating evidence shows that, when applied traditionally, inspection and enforcement often add

to the woes of marginal properties and accelerate the process of abandonment. Abandoned buildings are poor assets, as the experience of dozens of cities shows; they reduce the inexpensive rental stock, further blight their neighborhoods, and can even generate an increase in structural fires.

Even more basically, the fire service lacks real control over the demands for its services. Most of its power centers on technology, while generally less than a third of all fires—or even of fatal fires—can be traced to technical origins. Smoking, children playing with matches, and careless handling of flames have headed the national lists of causes for years. Mounting effective educational and "awareness" programs to counter these causes has proved quite difficult, and clearly identifiable successes are rare.

Further, particularly in larger cities, the nature of the fire service's demands has changed dramatically. False alarms, rubbish fires, nonfire emergencies, fires in vacant or abandoned buildings, and deliberate fires now outnumber what used to be the fire service's main *raison d'être*. And most of these problems are now concentrated in slum areas, where they seem ineluctably tied to deteriorating housing and facilities, continued overcrowding and undermaintenance, and other social ills.

Compounding these problems of public management is a growing crisis in private fire protection, the major part of which centers on insurance. Disturbed by persistently declining rates of return, and even losses, many insurance companies are withdrawing from the urban property insurance market. Fire insurance and extended coverage are increasingly difficult to obtain in many urban areas, even at higher rates.

Because insurance plays a key role in securing credit, financing, and mortgage investment, 25 states have now introduced FAIR plans and insurance pools, based on Title XI of the Housing and Urban Development Act of 1968. These pools write insurance on properties that cannot obtain coverage in the voluntary market; the pool's income and losses are shared by insurance companies operating in the state in proportion to their share of the state insurance market.

Some of the pools have grown rapidly; in New York, for example, the pool is now the largest underwriter of noncommercial properties in the state. Yet, even in these states, problems remain. Many pools have administrative delays, cumbersome procedures, limits on coverage, and rapidly increasing rates—all of which can lead to a lack of insurance or underinsurance for urban properties. And the basic reluctance of insurers to expand their markets continues. Some brokers speculate that underwriters may soon abandon many major cities, leaving them entirely for the pools to insure.

At the same time, the insurance industry's class-rating procedures exert strong pressures on fire service manage-

ment. Everywhere except New York City, insurance rate scales are based in part on the way the local fire department is "graded"—according to a "Standard Schedule" of its nominal assets and policies. The schedule simply tallies items that could be used for fire protection; it does not measure actual performance. Nonetheless, the grading procedure visibly ties insurance rates in an area to fire department compliance with the schedule, and hence can generate political pressures on the department to conform.

The effect of the pressures often is to divert city management's attention away from the fire department's real performance toward the costly items in the schedule. If a fire department is well down on the scale, the grading may still help it, even though the schedule is concerned solely with "inputs" and not with the fire protection that citizens actually receive. For better departments, the grading is not so well regarded: it has been labelled overly rigid, too conservative, and unsoundly based on obsolete and narrow rules of thumb. In cities with better departments, it is now often viewed as an undue claim on the budget and as an obstacle to effective management and innovation.

There are other obstacles to innovation, too. As students of bureaucracy have noted, even without external pressures line agencies such as fire departments are ill-equipped in outlook, skills, and organization to undertake novel or significant change. They are especially ill-equipped to undertake efforts that involve more than minimal technological uncertainty and risk. The rewards for success within the organization are too small, and the price of failure disproportionately high.

This problem is compounded in that the fire service receives little effective support from industry, universities, or the federal government. It still depends for information and new ideas largely on a few dedicated interest groups and professional associations, which are backed by limited financial resources and next to no research. Most of the research that has been done has either supported existing practices and products or treated subjects that, while important, are peripheral to the main interests and needs of the urban fire service—such as nuclear blast fire problems, forest fires, and the chemistry of combustion. Congress passed a Fire Research and Safety Act (1968) which set federal responsibility for urban fire research, but only this year have there been even prospects of supporting appropriations.

As a result of all these influences, even with the advent of motorized equipment and mobile radio communications, basic fire department practices have changed little in the past century. Radio has just begun to replace voice and hand signals and messengers for tactical communications at the fire scene. Power tools have just begun to replace axes and crowbars in ventilating roofs and walls. Command and control still function with turn-of-the-century technology and procedures. New materials, new

protective clothing, new fire detectors, new extinguishing agents, or materials to enhance water, have been introduced slowly, if at all, in part because of the small and atomized fire service market and a fragmented and reluctant supply industry.

It may seem strange that the fire service market is not so attractive to industry, since the stakes involved nationally in fire protection are large. Annually in the U.S. some \$2.5 to \$3 billion is spent directly on the fire service, and fire destroys or damages roughly the same value in property. In a recent year, an estimated 50,000 persons were seriously burned or poisoned by fumes, and from similar causes 12,000 people died.

Locally, the direct costs range from roughly \$2-\$3 per capita, in areas where most or all the service is volunteered, to \$35 and more per capita in cities such as the District of Columbia, San Francisco, and New York. Costs in many fire departments have been rising rapidly, partly because of general inflation and partly because costs in the supply industry and salaries, pensions, and fringe benefits in the municipal labor market have outraced the general price index. The rise has been particularly conspicuous in the larger departments, where manpower costs amount to more than 90 per cent of the budget.

The basic fire cost problem that city management faces is also what weakens the lure of the fire service market: mandatory costs are rising much faster than the revenue base, so that discretionary funds are growing increasingly scarce. Many volunteer departments raise funds through donations and other forms of charity, and even those that receive some money from taxes still have so little that their purchasing and bargaining power is small.

Paid departments have larger budgets, but manpower costs claim all but a small part, and since all the funding is local, most departments now face a tightening budgetary squeeze.

Nearly all the problems described above could benefit from attention. Outlined briefly below are some approaches toward a few that now seem attractive. The topics treated are illustrative, but certainly not exhaustive. The key to meeting many of the pressures on the fire service is to employ fire service manpower more effectively. There are three basic approaches to doing so:

- Better management—to develop and make the best use of scarce resources and individual talents toward fire service goals.
- Improved operations—to ensure that men and equipment are available where and when they are needed, in appropriate numbers and condition.
- Improved technology—to extend men's abilities and free them to make the best use of their skills and judgment.

Let us briefly consider each in turn.

Management. Many cities have more than a hundred full-time firemen, and the largest dozen or so have more than a thousand. This size, and the growing concerns

with costs, labor relations, force deployment, and community relations make it increasingly important that, especially in larger departments, fire officers be trained as *managers*, not just as firefighters. The fire service can no longer rely for management solely on the spirit of tradition and naramilitary discipline.

Tradition and most firefighters' personal inclinations call for risk-taking and flexibility. Yet these qualities are increasingly discouraged by both formal department organization and increasing union pressures for work to be more highly structured and defined.

Similarly, increased attention is needed in general for fire service personnel: improved programs for personal development, including advanced education and training, and rotation through staff as well as line positions; attractive alternatives to traditional career patterns for men with special skills; and a greater focus on the medical and safety problems that lead to injuries and deaths. For the last, indeed, research of national scope is needed on fire-related medical problems, such as the cumulative effects of repeated exposure to hot or toxic gases inhaled under strain.

The fire service also could benefit greatly from broader structural changes: increased minority membership; opportunities for lateral entry (entry into the service at other than the lowest ranks, such as occurs at the officer level in the armed forces); and mobility (with compatible pension rights) among fire departments in different cities. Some departments are moving toward such steps; further progress would accelerate the flow of talented people and new ideas.

Operations. An important and difficult set of management issues concerns the allocation of fire-fighting units: how many units to have, and how to man and deploy them. How these issues are resolved affects both fire protection effectiveness and the cost of providing it. Most departments now follow tradition and the insurance grading schedule. They have, for example, the same number of men and units on duty around the clock, though in most cities demand in the afternoon-evening peak period is several times greater than demand during early morning hours. Although these traditional policies have been in practice for many years, both experience and analysis show that different policies can help departments do much better.

One key principle, for example, is to match resources more closely to demand. Ways of doing so include:

- Instituting proportional, overlapping, or variable shifts to bolster manpower when it is needed most.
- Varying manning to meet conditions, workload, and special hazards.
- Constituting fire units that operate mainly during hours of peak demand (such as New York City's "tactical control units").
- Varying numbers and identities of units sent in response to alarms, depending on the likelihood of given

types of alarms and hazards at various locations and times of day (as with the "adaptive response" in several cities).

- Training other city employees as reserve firemen to respond when needed (as Scottsdale's "fire wranglers").

Where there are problems, the gains these approaches yield can be large. In New York City, for example, it has been estimated that the increased effectiveness a few such innovations provide would have cost an additional five to 10 million dollars per year if supplied traditionally.

In providing coverage, especially during major incidents or other active periods, major gains also arise from taking advantage of economies of scale. These are most easily realized in large departments, but also can be achieved among smaller ones through effective mutual-aid plans or area-wide consolidation.

Technology. Improved oxygen masks for firefighters; lighter, stronger, more abrasion-resistant and fire-proof clothing; better crash-proof and flame-proof helmets; and improved light and reliable two-way radios for firemen in action, all would enhance the firefighter's capabilities. Higher, stronger aerial ladders, lighter, stronger hose, better power tools, better heat detectors, and more scientifically designed water nozzles would reduce the limitations of current equipment. Automatic regulation of pumper flows and pressures would free men from a mechanical chore to aid their colleagues more directly at the scene of a fire.

Scientific foundations for many of these items already exist. All that needs to be done is to get such technology developed and to put it into practice—both of which are difficult for the reasons described above. Since the problems are common to nearly all departments and the solutions will be applicable nationally, efforts toward solution should properly be national in scope. One approach would be through a national development center—perhaps one of the national laboratories now seeking work. Another would be through national R&D support for work carried out in industry, universities, and nonprofit organizations. Yet another would be through "technological brokers," who would bring together people with the problems and those with possible answers, and help them develop what is needed—both for the local problem and for a national market. This last approach indeed has recently led in New York City to "slippery water"—a technological breakthrough that permits a fire department to increase the flow through a hose at a given pressure by 70 per cent or more, and to more than double the reach of the stream.

All these approaches, however, require money—either risk capital from entrepreneurs or funds from the national government. And such money is likely to be forthcoming only if the fire service market becomes more venturesome, or if a strong constituency develops that elevates fire in national priorities. □