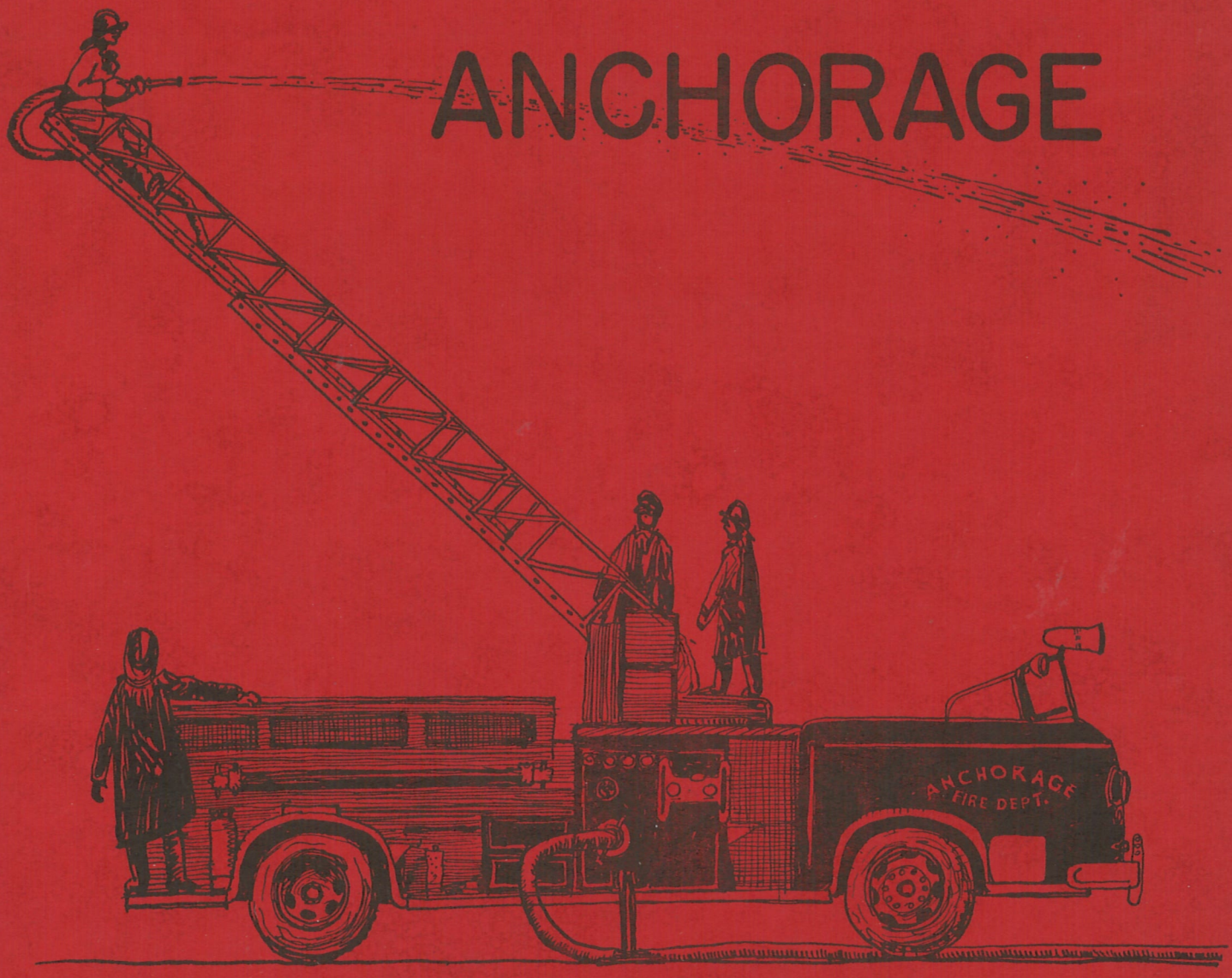
preliminary plan

FIRE PROTECTION FOR ANCHORAGE



city planning commission

ANCHORAGE ALASKA · AUGUST 1955

preliminary plan

FIRE PROTECTION

The Fire Protection Plan is one of a series of master plan reports being prepared under the general direction of the City Planning Commission. Other studies will eventually cover all phases of municipal life, making recommendations for the meeting of current needs and guiding future development.

Most phases of the planning program are being developed through citizens' committees composed of representatives of the entire community. Some technical phases, such as covered by this report are handled directly by the Commission with consultation by the concerned City officials. Upon the preparation of individual planning reports, they will be consolidated by the Planning Commission into a master plan, which will be based on the expressed desires, as well as the best judgement, of the people of Anchorage.

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Drawings by Donald J. Coolidge

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INTRODUCTION

The first purpose of an adequate fire department is the protection of life and property. Even a well organized volunteer fire department can go far towards achieving these goals. However, scientific progress has provided more and more new equipment and techniques to aid in both fire prevention and fire fighting. Municipal fire protection has been made a scientifically exacting business.

Modern fire fighting facilities are expensive. Planning for them must seek to avoid needless duplication of this expense while providing adequate protection for all areas. Because the Greater Anchorage area is in a state of unpredictable political growth, facilities should not be planned on the basis of present city limits alone. This report, therefore, analyzes the needs of the Greater Anchorage area as a whole, and attempts to weigh the immediate needs of the City of Anchorage in the light of an integrated area-wide plan. Thus, present improvements can readily become part of a unified fire defense program.

The City of Anchorage already has a good fire department which has shown up well both in action and in the statistics of an engineer's report. The department has received national recognition for its fire prevention work - ranking third in the nation for cities of this size. Well as it has done, though, the Anchorage Fire Department does not have all of the equipment and facilities which fire protection engineers feel it should have to meet all emergencies.

Adequate fire protection depends upon a number of factors: water supply, fire department facilities and training, alarm system, police cooperation, building codes, fire prevention activities, structural conditions in a city, and climatic conditions in the area. Recommendations for the development of an adequate water supply for domestic use and fire fighting have been made in a recent planning report. The report now in hand is concerned with the physical aspects of the fire department and fire alarm system - what equipment is needed and where it should be located for maximum yet economical protection.

Savings through reduced fire losses and insurance costs can result from implementation of the recommendations contained herein, but it is recognized that many other facets of the fire prevention and defense program must be studied before maximum economies can be realized. However, the capital expenditures envisioned in this report must be planned for over a period of

several years while provision of needed laws, personnel and training can be expedited much more readily as the need for them forces action.

The studies reflected in this report were compiled with the assistance of various authorities on fire defense. Special acknowledgement is made to Loren S. Bush, Chief Engineer of the Board of Fire Underwriters of the Pacific; R. C. Stevenson, Manager of the Pacific Fire Rating Bureau; and Louis Odsather of the Coffey-Simpson Insurance Agency, Inc.

FIRE INSURANCE RATINGS

In the past 100 years, insurance companies of the nation have taken the lead in fostering better and better fire protection in American cities - largely, of course, to protect their own insured risks.

Insurance companies exert their influence by levying insurance rates according to the adequacy of the fire protection of the community involved. The fire prevention and fire fighting resources of the community are assayed and rated and insurance rates largely based accordingly. The differences in insurance rates can mean so much to the residents of a city that every effort must be made by the city administration to give the best possible protection.

Estimates based on assessed property valuations and average insurance rates in the city indicate that Anchorage property owners pay approximately $780,000 a year in insurance premiums. Improvement of fire fighting facilities could mean a substantial saving to the residents of the city.

The determination of fire insurance rates is a complex procedure but two factors are primarily considered in setting the basic rate structure for a city like Anchorage. They are: (1) the adequacy of the city's fire prevention and defense activities in all their many phases, and (2) the fire loss experience of the entire Territory outside of Southeastern Alaska.

The effectiveness of Anchorage's fire defense activities is determined by the Board of Fire Underwriters of the Pacific, using a standard grading schedule compiled by the National Board of Fire Underwriters. The grading system weighs every factor in fire prevention and fire fighting - including the adequacy of the fire fighting and fire alarm facilities for a community of this size with its particular hazards. The last rating was made in the summer of 1954 when the City retained a rating of Class 5 for its overall fire program despite the effects of annexations in which 6.7 square miles were brought into the city limits. The best rating is Class 1, and the goal of every city is to come as near as possible to this rating.

The rating assigned to a city means a great deal to its property owners. Mercantile property owners have their rates pared down by almost ten percent each time the city gains a full class in its insurance rating. Dwelling owners gain a rate reduction of approximately 7.5 percent with each gain in class rating.

In dollars and cents, it is estimated that a gain in one class would mean an annual saving of approximately $48,000 for

mercantile owners in Anchorage and $20,000 for dwelling owners - a net saving of $68,000 a year. Thus, the city can very definitely help its residents by providing fire protection meeting insurance requirements as closely as possible.

This report is concerned with the provision of fire fighting equipment, fire stations and an improved fire alarm system - all of which could result in a substantial upgrading of the city's fire rating. However, it is well to bear in mind the fact that equipment alone will not provide the best possible insurance rating. The equipment must be manned - an expensive item. Improvements can also be made in building requirements, fire department staffing and training, water supply and the many other phases of a complete fire defense approach. However, adequate and well located fire fighting equipment and a good alarm system are indispensable for maximum protection.

No matter how successful Anchorage might be in reducing losses here, the city still suffers from whatever penalty that might accrue from heavy fire losses outside the city and elsewhere in Western Alaska. However, more than one-third of the population of Western Alaska lives in the Greater Anchorage area. It thus becomes beneficial to the city to help reduce fire losses in the whole Anchorage area - an effort that could cut down everyone's insurance rates, as well as make the entire area a better and safer place in which to live.

The long-range needs of the Anchorage area as a whole are considered in this report, with the purpose of adapting the city's fire protection facilities not only to the immediate city needs but also to the future requirements of the whole Greater Anchorage area.

AREA FIRE DEFENSE FACILITIES

A number of agencies in the Greater Anchorage area have fire fighting facilities. These include the City of Anchorage, the Spenard Public Utility District, the Fairview Public Utility District, the Alaska Railroad, and the two military posts -- Elmendorf Air Force Base and Fort Richardson.

Written mutual aid agreements bind three of these agencies to assist each other in emergencies. The Anchorage Fire Department, military fire departments and the Alaska Railroad are pledged to furnish men and equipment to each other upon request in case of a serious fire in any of their jurisdictions. While these are the only written agreements, there is also a measure of cooperation between all the fire departments in the area.

The facilities of each of the civilian agencies will be examined briefly below. The military facilities are not included since they cannot actually be included in surveying and planning civilian requirements.

1. Anchorage Fire Department.

The Anchorage Fire Department is primarily designed to serve all of the area within the city limits. The department is equipped with two 1,000 gpm (gallons per minute) pumpers, one 500 gpm pumper, and an aerial ladder truck which is also equipped with a 500 gpm pump. This equipment is backed by a Civil Defense pumper which is not, however, creditable to the city for insurance rating purposes.

The department also has a 1,000 gallon tanker, a hose truck and a rescue ambulance. The tanker is needed for use in the Post Road industrial area, Mountain View and Eastchester Flats, none of which now have a public water supply.

Three stations are now maintained by the city fire department. Central headquarters are located in the west wing of the City Hall. Sub-stations are located on Government Hill and in Airport Heights.

The central station, which houses two pumpers and the ladder truck, is located in the midst of the high value district of the city. All areas now considered high value by the insurance inspectors are within 3/4 of a mile of the central station, meeting the requirement that all such districts be within that range of a fire station. A high value district is one in which high-cost mercantile and industrial establishments are clustered close together, increasing the danger of a big loss in the event of a major fire.

The Government Hill station is a new building housing one pumper. An extra stall is available for one more truck. The Government Hill station furnishes the apartment and commercial districts on the Hill with protection which would be slow in arriving across the railroad yards from the central city station.

The Airport Heights station at 1605 Susitna Street is a converted residence equipped as a temporary station to serve the recently annexed portions of the city. The one pumper stationed there protects the large group of residences in the immediate vicinity and is also a little closer to Mountain View than the equipment stationed at the City Hall.

2. The Alaska Railroad.

The Alaska Railroad maintains two fire engines - a 750 gpm pumper and a tanker equipped with a 500 gpm pump. The equipment is stationed in a fire house in the heart of the railroad yards. It appears likely that the Alaska Railroad will soon abandon this station and turn its equipment over to the City of Anchorage.

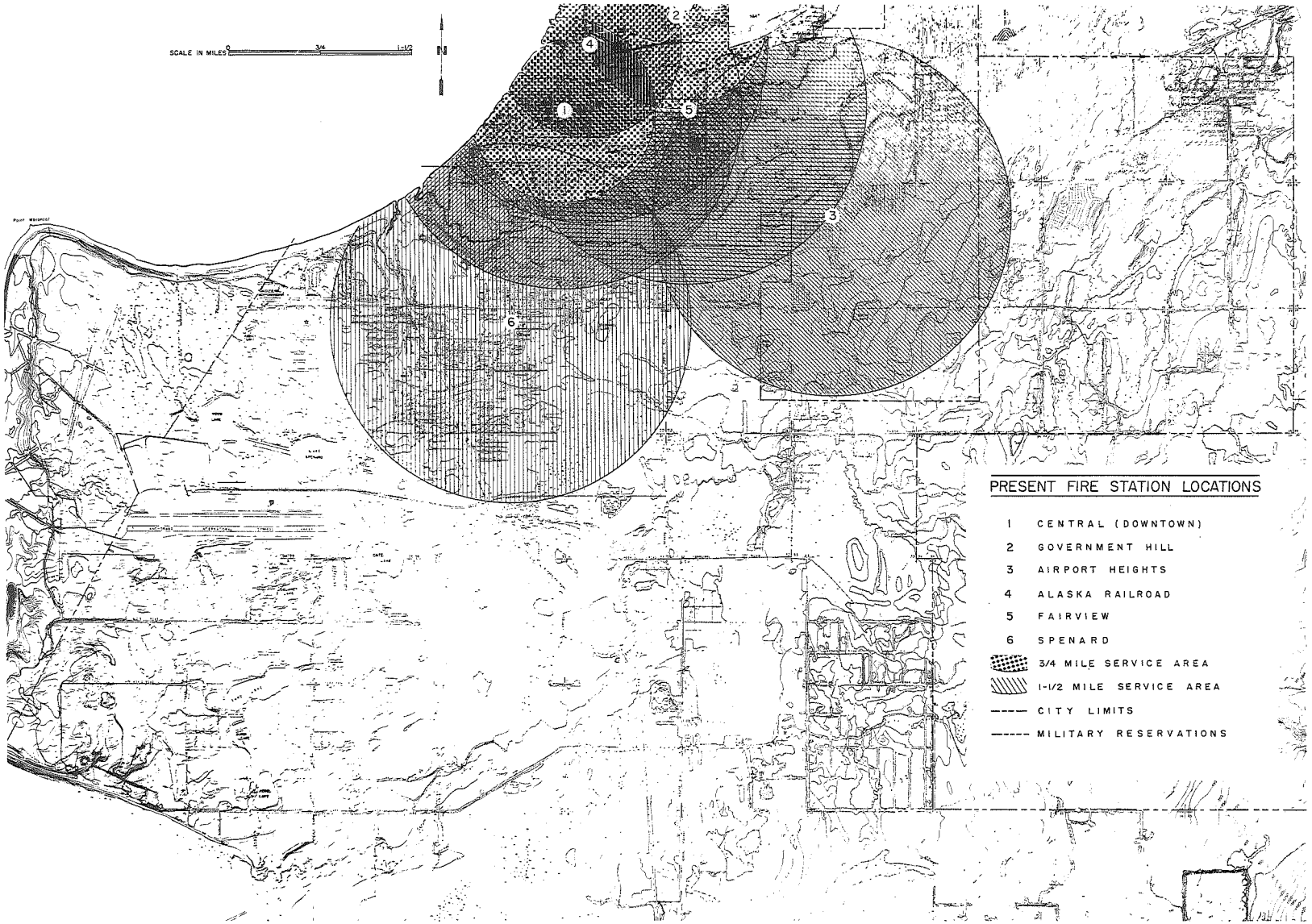
3. Facilities Outside City.

Both the Spenard and Fairview Public Utility Districts maintain their own fire fighting equipment.

At present, the Spenard Volunteer Fire Department has three of its own pumpers plus two Civil Defense pumpers at its disposal. Of the three pumpers owned by the Department, one has a 750 gpm rating and two are of 500 gpm capacity. An additional smaller pumper is held in reserve. One of the Civil Defense units has a capacity of 500 gpm and the second unit is a jeep pumper with a capacity of 350 gpm. All units are equipped as tankers, since a public water supply is not available in the utility district.

All of the Spenard Department's own equipment is stationed at the central station at Spenard Road and Wyler Avenue. Minimum protection for the furthermost areas is furnished by the two Civil Defense pumpers, one of which is stationed at Turnagain Tavern on the Seward Highway, and the other near the intersection of Sand Lake Road and the Seward Highway.

The Fairview Volunteer Fire Department is now equipped with a 500 gpm pumper owned by the Department and a 350 gpm jeep pumper furnished by Civil Defense authorities. The equipment is stationed at the Matanuska Valley Lines bus garage at Fourth Avenue and Ingra Street in Fairview.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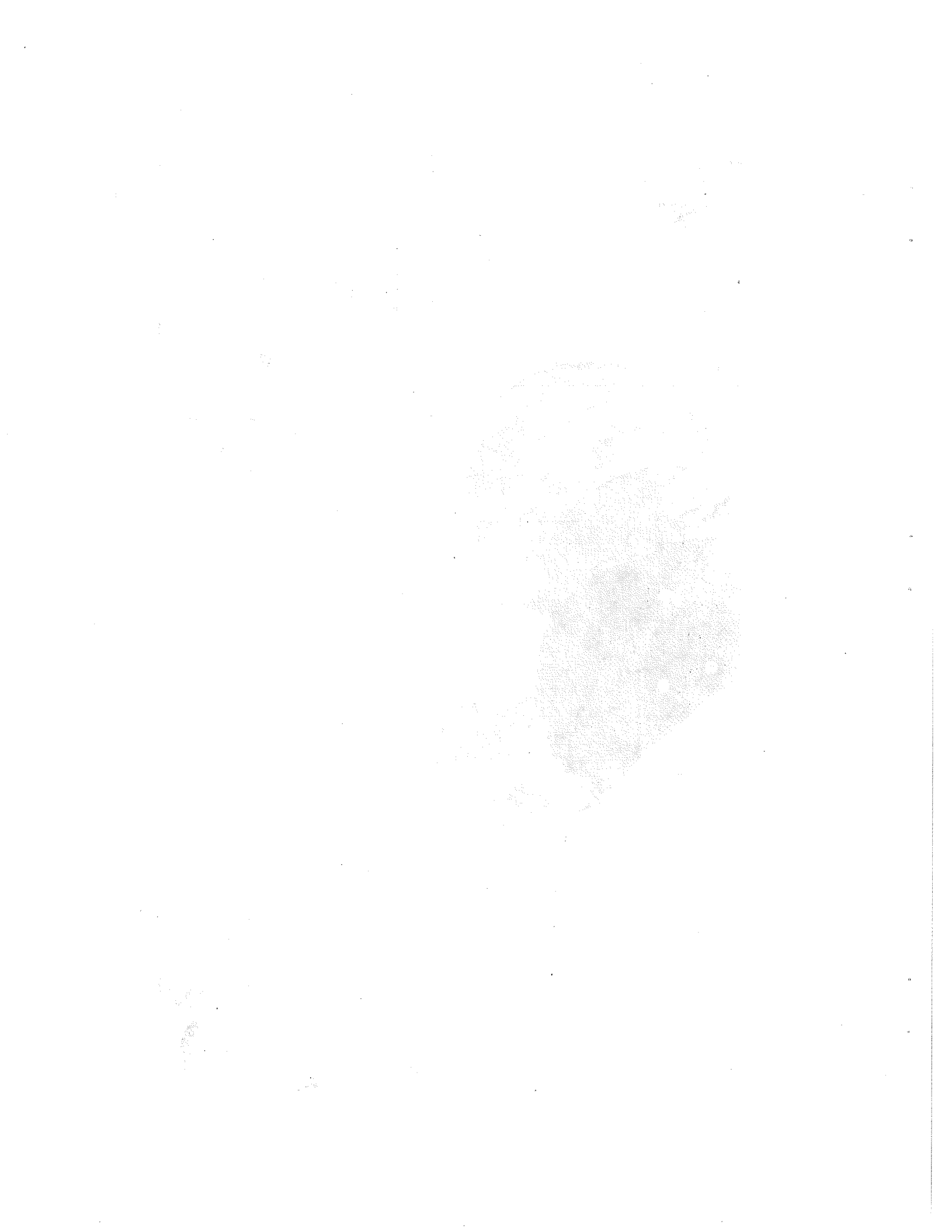
PRESENT FIRE STATION LOCATIONS
1 CENTRAL (DOWNTOWN)
2 GOVERNMENT HILL
3 AIRPORT HEIGHTS
4 ALASKA RAILROAD
5 FAIRVIEW
6 SPENARD
3/4 MILE SERVICE AREA
1-1/2 MILE SERVICE AREA
CITY LIMITS
MILITARY RESERVATIONS



ANALYSIS OF AREA NEEDS

1. Present Area Coverage.

Fire fighting facilities in the Greater Anchorage area are now placed to meet the needs of individual political subdivisions without regard to the services provided in adjoining areas. The map shown on the preceding page shows the distribution of all available fire fighting equipment at the present time.

The amount of area which should be served by one fire fighting unit is established by the National Board of Fire Underwriters. Barring such impediments as railroad grade crossings and poor traffic flow, the National Board prescribes that no structure in a high value area should be more than 3/4 mile from the nearest fire station. General residential areas should be no more than 1-1/2 to 2 miles from a station - with stations only about 3 miles apart. In areas where there are no high value buildings and where dwellings are so scattered that there is no more than one for every three lots, one station may serve an area up to 3 miles distant from it.

The service area assigned to each station shown on the accompanying map is based on the area it could serve under insurance underwriters' standards if there were no political subdivisions. It illustrates the degree to which the potential service areas of each overlap.

The map shows that fire stations are located quite close to each other in the more highly developed part of the Anchorage area. Because of the presence of the Alaska Railroad and Fairview Volunteer Fire Department equipment, there is a considerable duplication of potential service areas. However, the various agencies actually serve only their own jurisdictions and few people gain any insurance savings despite the number of fire stations in the area.

Within the city limits, only Mountain View is outside of the desirable maximum running distance from the nearest fire fighting unit at Airport Heights. On the other hand, the Alaska Railroad terminal yards are very well protected. They are fully covered by the city's central and Government Hill stations. In addition to this protection, the Railroad maintains its own fire department.

Outside the city, the central commercial and residential district of Spenard is also well protected by the concentration of equipment available in the central fire station on Spenard Road. Some protection is also furnished to Seward Highway communities by

sub-stations located at the intersections of Sand Lake Road and O'Malley Road. However, these sub-stations have no alarm system and no signals for alerting volunteers, so their usefulness at the present time is very limited.

The present distribution of equipment leaves one developing district east of the city - the Homesite Park area - without fire fighting crews within the recommended running distance. The Nunaka Valley housing development is protected only by a Civil Defense jeep pumper manned by residents of that community. Another area without protection is the general vicinity of Sand Lake, which is now developing as a residential area.

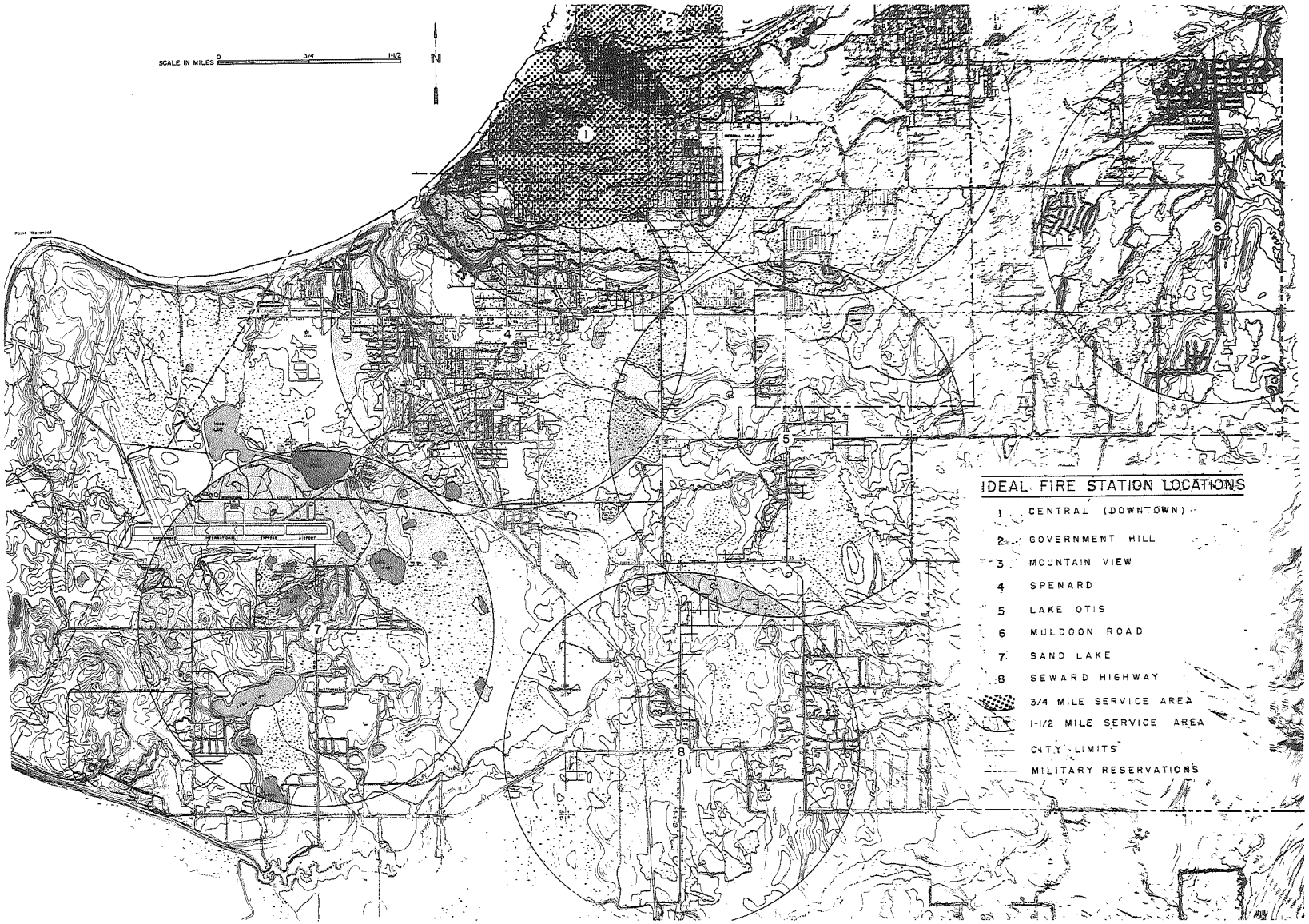
The fire fighting situation is further clouded by the fact that some areas, such as Homestead Acres on Lake Otis Road south of the present Anchorage city limits, are within the jurisdiction of a station that is not actually the closest to them. Likewise, the communities east of Anchorage are not now within the official jurisdiction of any fire fighting unit.

2. Present Area Needs.

This analysis shows that potential fire protection in the most highly developed part of the Anchorage area is more than adequate compared to the needs of other parts of the area.

As demonstrated above, there is a need at the present time for more adequate fire protection coverage in the Mountain View area within the city, for the communities which have sprung up east of the city, and for the growing residential developments in the lake area southwest of the city.

Based on the insurance underwriters' recommendations for an area like the Greater Anchorage area, it is estimated that three new fire stations, three pumpers, two tankers of approximately 1,000 gallon capacity and one ladder truck are needed to serve areas not now having adequate protection.


SCALE IN MILES 0 3/4 1-1/2
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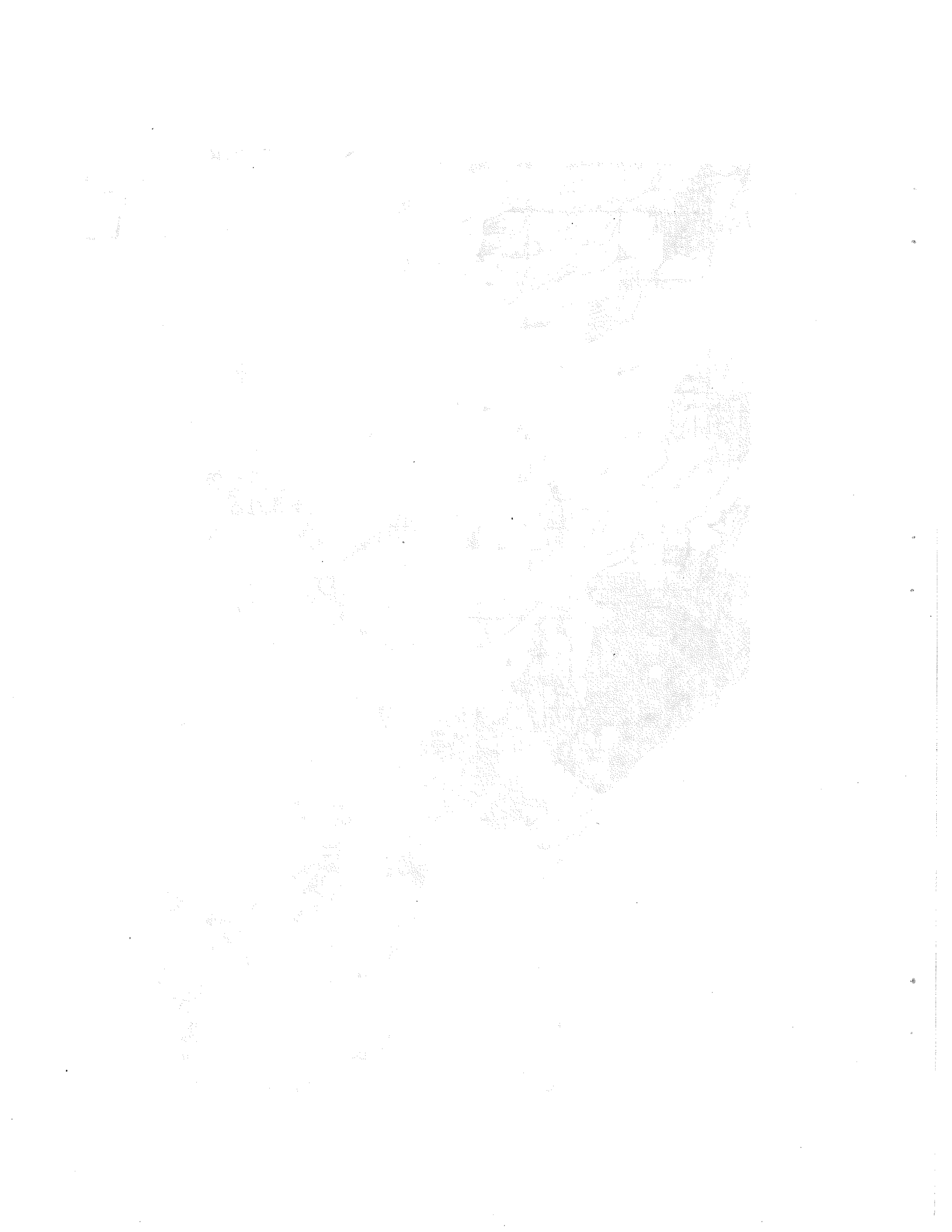
IDEAL FIRE STATION LOCATIONS
1 CENTRAL (DOWNTOWN)
2 GOVERNMENT HILL
3 MOUNTAIN VIEW
4 SPENARD
5 LAKE OTIS
6 MULDOON ROAD
7 SAND LAKE
8 SEWARD HIGHWAY
3/4 MILE SERVICE AREA
1-1/2 MILE SERVICE AREA
CITY LIMITS
MILITARY RESERVATIONS



FUTURE DEVELOPMENT

1. Ideal Area Distribution - Stations.

Planning for presently needed fire defense facilities in the City of Anchorage should take into consideration the needs of the whole Greater Anchorage area so that (1) needless duplication of service will be avoided, and (2) all areas will have adequate fire protection. Such planning will repay itself in the future in the event the area comes under the jurisdiction of one city or, at least, under one unified fire defense program.

The map on the preceding page illustrates the distribution of fire fighting units in the Greater Anchorage area which would be ideal to meet all currently anticipated needs. All the stations illustrated are within approximately three miles of each other, as prescribed by Board of Fire Underwriters standards. All are located in such a place that the equipment can readily reach almost any area within its designated service district.

This distribution abandons the City's present Airport Heights fire station in favor of a location on the Glenn Highway just west of the intersection with Airport Heights Road. This furnishes the protection now needed in Mountain View as well as providing good service to the residential development in the Airport Heights-City View area. Apparatus stationed here would also serve the Merrill Field area better and be in an excellent position to lend support to the downtown fire companies.

Another station located near the intersection of Tudor Road and Lake Otis Road would fill in the gap between the Glenn Highway station and the present stations of the Spenard Fire Department in central Spenard and on the Seward Highway. This station, while it would be best located at this intersection to furnish balanced area coverage, will probably actually have to be located further north on Lake Otis Road or east on Tudor Road so as to be as near as possible to the proposed new Methodist College at Goose Lake.

As indicated above, both the present Spenard central fire station and the new Spenard sub-station at Sand Lake Road and the Seward Highway, are well located for balanced area coverage.

Two other new stations would blanket the entire Greater Anchorage area with adequate protection. One of these should be on Muldoon Road just south of DeBarr Road. This would adequately serve an area so bounded by military reservations that it can only develop within the service area of this station.

The other new station would ideally be located near the intersection of Raspberry Road and Jewel Lake Road in the western portion of the Greater Anchorage area. This intersection gives access in all four directions so that any development in the area will be protected.

It should be noted here that the Anchorage International Airport - if it ever becomes the responsibility of a local fire fighting agency - will have to have a fire company of its own with such specialized equipment that it could not be used for normal residential or commercial area protection. This company would have to be in addition to the ideal distribution shown on the map, according to insurance rating standards.

2. Ideal Area Distribution - Apparatus.

All of the stations outside of the city would need to have equipment to meet one particular problem - the lack of a public water supply. Engineers suggest that the four stations in the least built-up areas be equipped with 750 gpm pumpers having a 500-gallon booster tank. Each such pumper would be backed up with a tank truck of about 1,000-gallon capacity. The purpose of this pumper-tanker combination is to (1) give speedier response to an alarm, since a pumper can travel faster than a tanker, (2) give adequate pumping capacity for drafting from wells, streams and lakes, and (3) provide additional pumpers in the area to back up equipment in the more congested sections in the event of a major fire.

Such pairs of apparatus, if properly situated with adequate manpower and alarm facilities, would furnish good protection to the outlying areas until such time as they had a public water supply.

To provide such apparatus for each outlying station and to bring other stations up to required strength, the Greater Anchorage area would need a total of 10 pumpers, 5 tankers, and 2 ladder trucks, excluding Civil Defense equipment which received no insurance credit.

Redistribution of presently available equipment throughout the whole area would reduce the number of new vehicles needed to 3 pumpers, 2 tankers and 1 ladder truck. Of these, 2 pumpers and the ladder truck are needed by the City.

Except for additional equipment which might be needed inside the city if population concentrated there instead of spreading out into the suburban areas, the numbers and types of equipment specified above would serve the area for perhaps as much as ten years. By population standards, this is more equipment than is necessary. By area standards, it would be just enough to give

good protection throughout the area. This, of course, makes it possible for the population to increase considerably before it becomes necessary to add additional equipment in the suburban areas.

This is the ideal distribution under ideal circumstances where there are no political subdivisions. Actually, of course, there are political problems involved. But such a pattern of services -- which would serve everyone in the Greater Anchorage area by saving lives, reducing insurance costs, reducing fire fighting costs -- should nevertheless be striven for by everyone in the Greater Anchorage area, so that such a coordinated program could some day be put into effect. Whether the area becomes all one city or not, everyone would save.

CITY NEEDS

1. Additional Apparatus.

With its present population and area, the Anchorage Fire Department is now without the necessary fire fighting equipment to meet insurance needs. The rating engineers specifically recommended late in 1954 that another pumper of at least 1,000 gpm capacity and a ladder truck, preferably aerial type, be purchased as soon as possible. Another pumper for use as a reserve unit is also required to achieve the best possible rating.

The desired reserve pumper would serve the city indefinitely since the fire underwriters do not require a city to have a second reserve unit until it is required to maintain nine first line engines. Similarly, a new ladder truck should meet the city's requirements for a number of years, since a third such unit would not be needed until the city's population reaches 50,000.

Additional first line pumpers will be needed, however. Latest estimates place the present population of the City of Anchorage at 30,000. By insurance underwriters' standards, the Anchorage Fire Department will need yet another first line pumper when the population advances to the 31,000 mark. In view of the rapid growth of the past, the city will probably need this pumper within a year.

A sixth first line pumper will not be required until the city's official population reaches 39,000.

Insurance underwriters require the City to obtain this equipment despite the presence of non-city fire fighting agencies in close proximity because the non-city agencies are not recognized as part of the City's own fire defenses. The fire fighting equipment is present but no one agency has enough equipment to meet the underwriters' requirements and bring about insurance rate reductions.

2. Manpower and Equipment.

In obtaining the new equipment it requires, the City must look to the future. Manpower is becoming more and more expensive and more and more reliance is being placed on mechanical equipment.

In the fire fighting field, increased horsepower in the equipment appears to be the answer. Greater engine power has made possible the aerial ladder truck which eliminates the need for a crew of ladder men. Increasing pumper capacities are making it possible

to reduce the manpower needed to man hose lines because innovations are being made to put the pressure to work with the hoseman instead of against him. It would be well, therefore, not to economize on horsepower at this time because fire equipment lasts fifteen to twenty years and even longer. It also has little resale value if it becomes obsolete, so future needs must be kept carefully in mind.

In this case, therefore, it would be best to obtain an aerial ladder truck and a pumper of not less than 1,000 gpm capacity even though their cost may seem high at the present time. Aerial ladder trucks, for instance, have been found to pay for their difference in cost over the almost obsolete "city service" ladder truck in as little as one year - just by the saving in manpower costs.

3. Duplication of Coverage.

Provision of this additional equipment, which is necessary if insurance savings are to be realized, entails expense. The expense is compounded by the fact that there is a duplication of potential fire protection here which cannot result in any savings in insurance costs to property owners in this area.

The ideal plan does not envision any fire fighting agencies in the immediate city area except the City fire department since that department already covers the entire area. In furnishing protection to City taxpayers, the City department is also in a position to furnish protection to non-taxpayers within the city limits.

The current duplication of service in the immediate city area could be eliminated by contractual arrangement between the City and the non-taxpaying agencies, such as the Alaska Railroad. This would provide much cheaper fire protection for the non-taxpayer. At the same time, the City would be reimbursed for a costly service it could not otherwise render, its equipment could be improved, and insurance savings could eventually be realized.

4. Alaska Railroad Department.

Both the preceding maps demonstrate how well the City fire department blankets the Alaska Railroad terminal yards. Yet, the Railroad maintains its own fire fighting equipment. This duplication could be eliminated with a consequent saving to the Railroad. But while in any overall plan it is desirable that the City furnish this protection, it cannot do so without payment. As a Federal agency, the Railroad pays no taxes, and is entitled to no municipal services which are paid for by taxpayers. Most properly, the Railroad should be making payments in lieu of

taxes since any privately run railroad would be assessed for taxes to the city. Such payments would entitle the Railroad to fire protection and other municipal services, just as other tax-paying industries in the city.

Barring this arrangement, the Railroad could contract with the City to pay for the fire protection being extended to it. An equitable arrangement between the City and the Railroad could doubtless result in considerable savings to both.

The 750 gpm pumper now used by the Railroad could be used to fill one of the City's current fire engine needs. For a residential area, such a pumper is adequate.

Elimination of this present duplication of equipment could fill one of the City's needs in fire fighting apparatus. It would still need a large capacity pumper and a ladder truck.

5. Central Fire Station.

The Anchorage Fire Department also needs far more adequate central fire station facilities. The present station in the City Hall is crowded due to encroachment by other expanding municipal services, as well as expansion of the Department's own staff and facilities. Traffic congestion sometimes slows down equipment trying to make a quick exit from the station. Badly needed are training facilities, especially a training tower with suitable yard space. Crowded quarters and lack of training facilities have been cited by the insurance engineers as important requirements for improved service and a better rating.

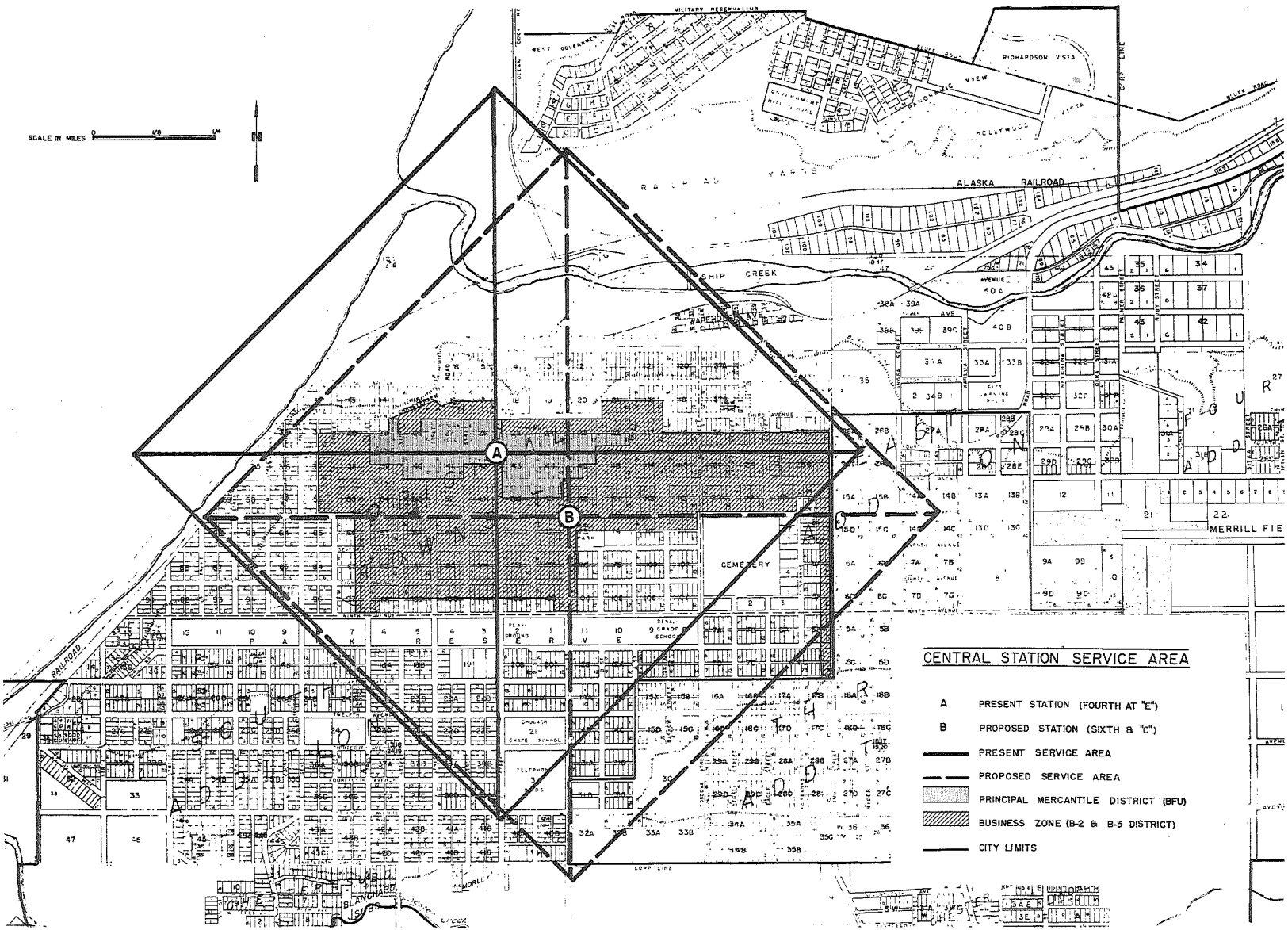
There is no space for expansion of the present fire department facilities at the City Hall. Little can be done about the traffic congestion that has not already been accomplished. Nowhere is there the space required for a drill tower of four or five stories height, with an adequate drill yard around it.

If the fire station must be relocated, it cannot be moved far from its present general location. In no case should any of the high value commercial district fall outside of the 3/4 mile maximum running distance allowed by the fire underwriters.

a. Location.

Availability of space and accessibility to traffic arteries considered, the present city ball park at Six Avenue and "C" Street appears to be the most desirable location for a new central fire station.

The location has the advantage of ample space where both an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ALASKA RAILROAD
SHIP CREEK
CEMETERY
MERRILL FIE
CENTRAL STATION SERVICE AREA
A PRESENT STATION (FOURTH AT "E")
B PROPOSED STATION (SIXTH & "C")
PRESENT SERVICE AREA
PROPOSED SERVICE AREA
PRINCIPAL MERCANTILE DISTRICT (BFU)
BUSINESS ZONE (B-2 & B-3 DISTRICT)
CITY LIMITS

adequate building and a training tower could be provided. Its location on "C" Street is further advantageous in that there is ready access to the high value areas along Fourth and Fifth Avenues, as well as most direct access to other areas either to the north or to the south. The Sixth Avenue location is further advantageous in that the high value area is gradually moving to the south and will probably eventually include most of Sixth Avenue.

The proposed location also embraces more of the potentially high value district than the present one. The map on the preceding page shows the area served by the present station and the proposed new station. The new station covers the potential Gambell Street business developments, and generally puts it much more effectively in the center of the area it is intended to serve.

b. Joint Fire-Police Headquarters.

Construction of a new building with all the necessary facilities is a major capital expense but there is a way of reducing the net cost. The City Police are currently operating out of rented quarters which have no garage facilities and lack numerous other requirements. Construction of a city Police Headquarters is urgently needed.

Police and fire departments are both emergency services utilizing some of the same type facilities. To minimize the cost of a new building for each, the construction of a Public Safety Building to house central operations of both departments seems feasible.

Points in favor of a combined facility in a new location include: (1) neither the Fire nor the Police Department is of such a nature that it should necessarily be located in the City Hall; (2) both sorely need permanent facilities; (3) both must be centrally located and accessible to main thoroughfares; (4) considerable cash savings could be realized in both construction and general operational costs; and (5) operations common to both departments could be consolidated. Development of a combined facility, therefore, seems a logical step.

While the police and fire services are different enough that they will need separate facilities, there are many that can be combined. Office personnel could be shared by both departments. Garage facilities could accommodate both police and fire vehicles. Joint use could be made of personnel facilities such as washrooms, lockers and day rooms. Stand-by power generation equipment could serve both departments without duplication.

To most adequately meet the city's needs, the Public Safety

Building would have to be flexible so that changing needs of the two departments could be met without undue cost or delay. With careful planning, then, such a Public Safety Building could meet the needs of both departments at a probable considerable saving in both construction and operating costs.

c. Capacity.

To provide adequately for the future, the central station should include stalls for at least three pumpers, one ladder truck, one hose wagon, one service wagon, one ambulance and two chiefs' cars. This should provide for the maximum amount of equipment which should be quartered in any one place. As the central area increases in size and value in future decades, it may become necessary to build another station - perhaps at Merrill Field, midway between the central and Mountain View stations - to furnish the needed protection within the required 3/4 mile radius. Such a new station would probably be needed before it would become desirable to place any more than the previously suggested amount of equipment in the central station.

In addition to engine stalls, the new central station should make adequate provision to house the increasing number of fire fighting personnel which will be needed. The Public Safety Building should also provide a small workshop, day room, hose tower, sleeping quarters, lockers, kitchen, administrative offices and utility rooms. Some of these facilities can feasibly be designed for combined use by Police and Fire Department personnel. The building should provide adequate office space for central administration and for fire prevention activities. The public alarm system should also be housed in the building, but within a separate vault.

6. Mountain View Station.

As indicated in the preceding section, the present temporary fire station in Airport Heights is not suitably located by fire insurance rating standards. A new station needs to be constructed along the Glenn Highway just east of Airport Heights Road. Because of the likely development along this highway, in Mountain View and in the Airport Heights-City View area, this station is a relatively permanent need. In addition, the location fits into a desirable pattern of fire protection for the whole Greater Anchorage area. This station should, therefore, be a permanent structure.

Satellite stations such as the proposed Mountain View unit should not, however, be built for use more than twenty-five years. The evolution of new fire fighting techniques is such that methods may change drastically. Zoning policies may change

and communities may develop differently than now anticipated. Some sudden new development could readily make today's modern, well-located stations obsolete and poorly situated in a relatively short time.

Initially, the Mountain View station should provide at least two stalls for heavy equipment and one for a chief's car or ambulance. The building should either be so designed that additional stalls could be added without injuring the sightliness of the building, or the station should be built big enough to house at least a ladder truck in addition to the pumpers and assistant chief's car. As the city grows, it will be necessary to place more equipment here until the need becomes urgent for yet another station in the area.

In addition to adequate equipment space, the Mountain View station should provide a hose tower, day room, sleeping quarters, kitchen, office and utility rooms.

The Mountain View station is needed immediately. The insurance engineers have specifically cited the need for a new station to serve the Mountain View area. Fire calls and losses in Mountain View are also equal to that for the entire area of the original city and far above that being sustained in the Airport Heights area.

7. Lake Otis Station.

Construction of the Mountain View station would leave the southernmost portion of the recently annexed area without the fullest protection. The most desirable location for balanced area coverage - the intersection of Tudor and Lake Otis Roads - is outside of the city so a station cannot be built there at this time.

Before a permanent facility is built, it would be desirable to know where the major buildings of the new Methodist College will be placed and what routes will give best access to the campus. While the area distribution pattern may be upset a little, the permanent station should be as accessible as possible to the concentrated living community represented by the college.

At present there is only scattered residential development in the southernmost portion of the city, the small community of Green Acres being the only cluster of homes there. The Anchor Homes housing development is just barely within two miles running distance from the proposed Mountain View station - the maximum distance allowable under insurance rating standards for such a community. Fire engineers point out, however, that a station should be provided in this area as soon as is feasible because protection would not be up to the most desirable standard.

As the area develops, a temporary station in the vicinity of Lake Otis Road and Fireweed Lane could probably meet immediate needs until the pattern of development is settled enough to permit construction of a permanent facility.

THE FIRE ALARM SYSTEM

Well-trained firemen and the best of fire fighting equipment are of little avail to a city if there is no dependable means of summoning them to a fire. A good fire alarm system is as necessary as a good water supply and a good fire department.

The Anchorage Fire Department has received approximately 300 fire calls a year during the past four years. Almost all of these alarms were transmitted by telephone.

1. Present System.

Only a small number of these hundreds of calls came over the city's existing fire alarm system. This system consists of telephones located in red steel boxes distributed in twenty-six places throughout the city. The telephones are directly connected to the fire department switchboard in the central station.

The public telephone alarm system has received no insurance credit to date. While the boxes have such dependable features as individual circuits and an independent power supply for an emergency, they apparently fail to meet other requirements.

The alarm boxes are scattered irregularly about the city. Only five boxes are available in the downtown high value area and two in the railroad terminal warehouse area. Several major apartment projects have some of the boxes nearby. The remaining boxes are largely scattered through residential areas.

All of the boxes are inconspicuous, probably a major reason why they have been used so little. They are painted a drab red and hung on a convenient pole. There is no distinctive marking indicating that the boxes are for fire use and there are no markings on the pole to alert passers-by that a fire alarm box is located there.

While Anchorage's alarm system is not satisfactory to the insurance engineers, there have been no accepted standards for the city to build towards. The fire insurance underwriters have been slow to accept the telephonic system at all and are only now revising their standards to fully recognize telephonic systems.

2. Standard Requirements.

By insurance underwriters' standards, an alarm system must have a very high degree of dependability. It must be readily available to anyone discovering a fire and it must be so well maintained that no part of it is out of order when it is needed.

Telephones located in homes and business establishments do not meet these standards because wires may come down, isolating a whole district from telephone communications. Business areas are also generally closed up at night and a person discovering a fire might have considerable difficulty in locating a telephone over which to transmit an alarm. A further disadvantage in relying on telephones alone is that any general failure of the telephone system means that there is no alternate alarm system available to the general public.

3. Insurance Savings.

The insurance engineers have penalized the City of Anchorage heavily because of its lack of a fire alarm system which meets their standards. Correction of this deficiency could mean an advance of more than one-half an insurance class in the city's overall rating. Such an advance would save mercantile owners alone an estimated $24,000 a year in insurance costs.

Dwelling owners would not immediately gain because mercantile risks get better insurance rates with each half class improvement in the city's rating while dwelling owners only get a rate reduction with each full class. But the improvement of the fire alarm system would improve the overall city rating so much that the chances of advancing a full class are highly increased - making savings available to all insurance purchasers in the city.

4. Two Modern Systems.

There are two general types of public fire alarm system available today. One is the conventional telegraphic system which consists of the alarm box which is so familiar on many city street corners in the United States. In the telegraphic system, a person turning in an alarm need only pull a handle to sound the alarm.

The newer telephonic system retains the distribution of boxes all over a city, but provides a telephone in the box instead of just a handle to be pulled. Such a box has been found advantageous because it gives the caller the opportunity to describe the nature of the fire. It also can be used to summon help in other emergencies, such as an automobile accident, where ambulances or police cars would be needed rather than a fire engine.

The telegraphic systems are purchased outright from commercial alarm manufacturers, whereas the telephonic systems are installed by the local telephone company on a rental basis. Unfortunately, the relative costs of these two systems - and the relative adequacy of each - have not as yet been fully explored. Intensive engineering studies are required to determine the best system for a particular city.

Following is an analysis of each of the two types of system and the merits and deficiencies of each.

a. Telegraphic Alarm.

The long-accepted telegraphic alarm system has been developed to a high degree of dependability.

The system is constantly monitored, with checks always being made to make sure that each box is in good working order. The alarm boxes are located on a closed electrical circuit so that the circuit is broken and a signal flashed if anything goes wrong. Each box is grounded separately so that the failure of one box will not put others in the circuit out of commission.

Basically, the operation of the box is this: when the alarm handle is pulled, a notched metal disc in the box begins to turn. The notches spell out a series of digits representing the box number and indicating its location. The signal is heard at alarm headquarters and punched out automatically on a permanent tape. The dispatcher then sends fire apparatus to the scene.

The advantages of a telegraphic system may be summed up as follows: (1) it can be purchased outright by the city; (2) several boxes can be located on a single circuit, reducing installation and maintenance costs; (3) the system is maintained by city forces, assuring quick repair of any failures; (4) the alarm is simple to operate.

Disadvantages of the telegraphic system include: (1) the alarm gives no description of the nature of the emergency; (2) it invites false alarms; (3) maintenance is a continuing expense to the city.

b. Telephonic Alarm.

The cost of the traditional telegraphic system, the relative infrequency of its use and its inability to describe the nature of the emergency, have forced many cities to seek a new approach to the problem of fire alarms.

Constant improvements in the telephone brought it to the fore as a fire alarm device. More and more alarms were being transmitted over the telephone. By contracting with their local telephone companies, some cities report they were able to install public telephone alarms at a considerable saving over the older system.

The telephonic system, like the telegraphic, is now equipped with built-in monitoring devices to assure its constant dependability. Each box is on a separate circuit so failures are immediately recorded. When an alarm is transmitted over a public alarm phone, a pair of lights flash on the alarm headquarters PBX board and remain on to indicate the location of the alarm box. A recording device records the alarm and its time. The dispatcher, advised of the nature of the emergency, sends the kinds and amounts of equipment necessary to meet that particular problem.

The telephonic system is advantageous in several ways: (1) the type of emergency can be spelled out and the proper equipment dispatched; (2) the system can be used for all types of emergency, not just fire; (3) experience has shown that false alarms are greatly reduced; (4) the emergency call conversation is recorded and can be played back immediately; (5) there is no maintenance cost.

Disadvantages of the telephonic system are: (1) the system can only be rented, creating a continuing expense with no resultant equity - it is not economically feasible for a telephonic system to be maintained by any agency except a telephone company; (2) maintenance could be interrupted by a strike if the telephone company is privately operated; (3) although the telephonic system is monitored to make sure the circuits are in operation, the telephone instruments themselves cannot be monitored and could become useless in an emergency; (4) telephones will not work with more than one on a circuit, so a separate circuit is required for each box, increasing costs considerably; (5) the telephonic system is slightly more complex to operate than the telegraphic.

c. Common Requirements.

Whichever type of system is used, good box distribution and good central alarm headquarters facilities are necessary.

Again, dependability and accessibility are the key factors. Standard requirements demand that in congested mercantile and manufacturing districts, boxes should literally be visible from the main entrance of any building. In any event, a person should not have to go more than three hundred feet, an Anchorage city block, to find an alarm box. In residential districts, this distance should not exceed five hundred feet.

An alarm system is expensive and insurance underwriters do not expect that a city will completely cover all areas with boxes in a single operation. Prime emphasis is given to an adequate system in the high value area, in business and manufacturing

districts, and near schools, auditoriums and other places of public assembly.

Residential areas are not so urgently in need of a public system, since private telephones are generally available for emergency use. The danger of a high life and property loss is also considerably lessened because there is much less chance of a conflagration in residential areas.

The alarm system headquarters must also be highly dependable. For this reason, insurance underwriters require that the headquarters be located in a separate vault if they are located in a building used for any other purpose, such as a fire station or telephone office. The engineers' preference is actually for a completely separate building in an area where it would not be subject to such hazards as fire and explosion.

The headquarters must also be directly tied in with all fire stations so that alarms may be quickly transmitted. Provision should also be made to make sure that the headquarters is completely adaptable to the changes which will be necessary as the city's population and property values go up.

FIRE ALARM SURVEY

Improvements in the telegraphic alarm system make it comparable to the telephonic system, which likewise has been improved to eliminate earlier deficiencies. In deciding on a system for Anchorage, the relative cost of each will probably become a deciding factor.

Proponents of the telegraphic system (without a telephone instrument) maintain that system is much cheaper and still more dependable than the telephonic. Those in favor of the telephonic system have cited sometimes significant savings.

The telephonic system of the City of Miami, Florida has received considerable publicity. Fire engineers report that the system is acceptable, but it is not perfect, largely because of poor box locations. Miami reports that it pays an annual rental of $187 per instrument.

Other cities for which general cost estimates are available are Syracuse, New York, which pays $134 per instrument annually, and Solvay, New York, which pays only $76.

No information on the adequacy of these various systems is immediately available so that a comparison of costs is not possible. However, it is common telephone experience that costs of a phone system go up as the system increases in size and this trend is indicated by the above figures. The smallest annual cost was listed by the smallest town in the group. Anchorage should, therefore, enjoy a relatively low cost per instrument because of its present size.

For some measure of comparison, it is estimated that a small telegraphic system meeting only the most minimum requirements would cost approximately $650 to $700 per box. However, central office equipment is a major expense and can represent up to half the cost of a small system. The larger the system, therefore, the lower the net cost of each box.

Telegraphic systems may also represent an economy over the telephonic when the system is extended to residential areas. In the long distances of such areas, the single circuits needed for each phone alarm box probably would entail considerable expense compared to the few circuits needed for a telegraphic system.

Due consideration must, however, be given to the fact that the City now has the beginnings of a public alarm system in its present twenty-six boxes. If this system can be upgraded enough to meet the insurance underwriters' standards, a telephonic

system may well prove the most feasible for Anchorage.

The City of Anchorage is justified in spending a considerable annual sum for fire alarm service. Improved service, as noted earlier, would probably improve the city's insurance rating by at least one-half a class. For mercantile property owners alone, this would mean an annual saving of an estimated $24,000. To achieve such a saving for major taxpayers, it would seem feasible that the city spend at least half that sum each year.

Fire alarm systems are complex and highly technical. It is not possible for a survey such as this to make any specific recommendations. However, it has been shown that a good system is needed and that a good system would mean considerable savings for all concerned.

With the urgency thus demonstrated, the City should quickly initiate the necessary engineering studies. Every facet of the system requires precise study by experienced personnel before the best system for Anchorage can be determined.

Once the engineering study is completed, the results of the study should be put into operation without delay. Construction priority should be given to the downtown mercantile area, the industrial areas and the concentrated apartment areas. Eventually, the system should be extended to all parts of the city to afford the maximum protection and the best insurance underwriters' classification.

A PROGRAM FOR THE CITY - RECOMMENDATIONS

Preceding pages have demonstrated the relationship between the present fire defense needs of the City of Anchorage and the future requirements of the whole Greater Anchorage area. Good equipment, properly located, will be of great value to the community and result in goodly savings over the years. An adequate fire alarm system is also required to make best use of fire fighting facilities available.

The following program attempts to satisfy all of these fire defense requirements for the City of Anchorage:

1. Fire Stations.

It is recommended that a permanent fire station be built in the vicinity of the Glenn Highway just east of the Airport Heights Road to replace the present temporary station in Airport Heights. The station should include stalls for a ladder truck, two pumpers and a chief's car or ambulance. Alternatively, it could include stalls for only two pieces of apparatus and an assistant chief's car but be flexible enough to be expanded for additional equipment without spoiling the appearance of the structure. Personnel day room, kitchen and sleeping facilities, a hose tower, and an office should be included.

It is recommended that a central Public Safety Building especially adapted to the fire and police services be constructed on the present city ball park at Sixth Avenue and "C" Street. As far as possible, the building should be flexible to meet future needs and should provide combined facilities for joint use by police and fire personnel. Fire department facilities in the building should include stalls for at least three pumpers, one ladder truck, one hose wagon, one service wagon, one ambulance and two chiefs' cars; small workshop, hose tower; personnel day room, kitchen and sleeping quarters; administrative offices; and separate fire alarm system vault.

It is recommended that a training tower at least four stories high and a drill yard of required standards be built adjacent to the new Public Safety Building. These facilities should meet standard requirements including stand pipe facilities and smoke room for training in use of gas masks, etc.

2. Apparatus.

It is recommended that two 1,000 gpm pumpers and an aerial ladder truck be acquired at an early date to meet immediate requirements.

One of the pumpers should be assigned to the Mountain View fire station when it is completed. The present 500 gpm pumper at Airport Heights should also be assigned to the Mountain View station as the Department's reserve pumper.

The second pumper would complete the Department's present requirements for first line pumpers. If the Alaska Railroad Fire Department's 750 gpm pumper becomes available, that unit should be acquired instead since it would economically meet present needs. This unit should be assigned to the Lake Otis Road fire station when it is established. Meanwhile, space can be found for it in the central fire station.

The aerial ladder truck should have a ladder at least seventy-five feet long and should be assigned to the Government Hill fire station.

With the continued population growth of the City of Anchorage, an additional 1,000 gpm pumper will be needed in the near future and provision should be made now to acquire that unit when it is needed. Space must be provided for this additional vehicle either by expediting construction of the new central fire headquarters or establishing a temporary station on Lake Otis Road.

3. Fire Alarm System.

It is recommended that engineering studies for a suitable fire alarm system for the City of Anchorage be begun now. Construction of a system to serve the high value mercantile district, the warehouse and industrial areas and concentrated apartment developments should be begun as soon as possible after completion of the engineering survey. The system should be planned to eventually cover all areas of the city.