

TOWN OF ACTON
FIRE DEPARTMENT RESOURCES STUDY
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Purpose and Scope of Study

This study was authorized by Article 20 of the 1979 Annual Town Meeting. Its primary purpose is to review the Fire Department's present resources (manpower, equipment, and stations location) to determine:

1. The effectiveness of the emergency services now being provided, operating from the present three stations.
2. The adequacy of the present service to the North Acton area.
3. Determination of the feasibility of providing better service to North Acton by relocation of one or more of the existing stations.
4. Determination of the long-range resources requirements of the Department and their optimum deployment to meet the anticipated Town growth with emphasis on the North Acton area.

The study's scope does not include organization, training, fire suppression techniques, medical emergency procedures, water supply, or similar matters. It starts with the inventory of resources and their locations and ends at the site of an emergency service call. The study deals with the questions of adequacy of the present resources and how effectively they are deployed and delivered to the call site. It does not extend to the question of how well are the work tasks being performed.

In the terminology used in this study, the term "emergency service" will be used frequently. It refers to any response by the "Fire Department" for assistance which has some degree of time urgency because of danger to life, personal safety, and/or property. The reason for the use of "emergency service" rather than the conventional terms of "call" or "fire call" is to focus attention on the important change that has taken place and that is expected to continue in the so-called "fire service". It no longer is limited to the original function of providing men and equipment to fight fires. It now is a widening group of emergency-oriented services ranging from fire prevention education to para-professional medical treatment.

As this study shows in detail later, the number of "fire only" type calls are gradually becoming a smaller relative portion of the total service being provided. This is a most significant change with the effect on the Department's operations ranging from the job specifications for new personnel to the choice of equipment.

The Consultant believes that this evolving change is so important that the traditional name "Fire Department" should gradually give way to one which better describes the public service being provided. Two suggestions are "Emergency Services Department" or "Fire and Medical Services Department".

Acton Fire Department Resources and Their Use

The present organization strength is the Fire Chief, Fire Prevention Officer, Captains (4), Firefighters (24 Privates), plus Emergency Medical Technicians (4). The Department operates with four platoons, each consisting of seven Firefighters and a Captain, plus a call force of approximately thirty (30). The Fire Prevention Officer (Lt. Robert Craig) works a 5-day week, days only.

Equipment Inventory:

- 3 Engine/Pumpers - first line (2 with 1,000 gals. and 1 with 1,250 gals. capacity)
- 3 Engine/Pumpers - reserve (2 with 750 gals., age 19 and 25 and 1 with 1,000 gals. capacity)
- 1 Ladder Truck - 75 foot aerial - being rebuilt
- 1 Ambulance - 5 years old
- 1 Rescue Truck
- 1 Brush Fire Truck - 4-wheel drive
- 1 Water Tanker - 1,500 gals. capacity - 1973 Reo chassis built by the firemen)
- 1 Pick-up Truck for Captain's transportation
- 1 Chief's Car

Station Deployment:

At Central Station (No. 1):

- 1 Pumper with snorkel (1,000 gals. capacity)
- 1 Pumper - reserve (750 gals. capacity, 25 years old but reliable)
- 1 Ambulance
- 1 Water Tanker (does not usually respond on first call)
- 2 Firefighters, 1 E.M.T. assigned to the Ambulance

At South Station (No. 2):

- 1 Pumper (1,250 gals. capacity)
- 1 Pumper (1,000 gals. capacity, 19 years old, reserve)
- 1 Brush Fire Truck
- 1 Ladder Truck with 75 foot aerial
- 2 Firefighters, both of whom respond on 1 piece (normally)

At West Station (No. 3):

- 1 Pumper (1,000 gals. capacity)
- 1 Pumper (750 gals. capacity, 20 years old, reserve)
- 1 Rescue Truck
- 1 Pick-up Truck assigned to Captain on-duty
- 2 Firefighters, 1 assigned to dispatcher duties at the station, 1 available for driving a Pumper.

Standard Response Procedures for Emergency Medical Assistance

Within the Central District, the following procedure is used: the responding group consists of an ambulance driver, a reserve pumper with two men, and the Police Department sends a one-man cruiser. This leaves the Central Station without manpower, any further needs must be handled by South and/or West Stations.

In the event of a hospital run, the police officer takes over as the ambulance driver, two firefighters accompany the patient as E.M.T.s, one firefighter drives the pumper back to the Central Station, the police cruiser remains at the scene and is picked-up as soon as possible. This procedure appears to have the benefit of reducing the time

period of no manpower at the Central Station but at the expense of tying-up a policeman as a member of the ambulance crew making the hospital run.

Within the South District, the call is answered by an ambulance with a driver from Central Station, a pumper with two men from South Station (reserve unit used), and the Police Department dispatches a one-man cruiser. South Station's manpower is fully committed until the return of the engine with one or two men. The Central Station has two men and West Station has one man available.

Within the West District, the call response is an ambulance with two men from Central Station, a piece (usually the rescue truck) with a driver from West Station, and the Police Department dispatches a one-man cruiser. West Station is now fully committed; Central Station has one man and South Station has two men available.

A typical medical assistance call, requiring transporting a patient to the hospital, commits one-half of the on-duty force plus one police officer. The remaining on-duty force available to respond to a second call consists of three men distributed (usually) between two stations. In the event the second call is also a medical emergency requiring an ambulance, mutual aid-type assistance would be called.

Acton's manpower coverage problem is increased by the absence of a local hospital. Most hospital runs are to Emerson in Concord, with some runs to Boston. The longer runs increase the time period during which two Fire and one Police Department personnel are not available for answering other calls.

Standard Response Procedures for Structure Fires

The standard response is two engines and the ladder truck from South Station, usually the combination of two engines from the Central Station (leaving one man for the ambulance) and the ladder truck with two men from South Station. This leaves South Station empty of manpower; West Station with one man (three pieces of equipment); Central Station with one man to cover either an ambulance call or to drive an engine.

The response to a structure fire call in the West District would be an engine from West Station with driver only plus the ladder truck from South Station with two men. The Department's minimum response practice (operating procedure) for a structure fire is two engines and a ladder (minimum of four men). In the event of the combination of calls assumed, the second engine would be driven by the first arriving call man. Call men reporting to the West Station (if dispatched) would bring the rescue unit.

Other fire calls (autos, brush or grass, rubbish, etc.) represent a less severe problem since the ladder truck is not required. Therefore, the most demanding situation used for evaluation purposes is a structure fire or a hospital run with the ambulance as single calls.

For multiple calls, it is a combination of the two during the same time period. It should be kept in mind that, from a statistical probability standpoint, the likelihood of a medical emergency occurring during the period of a serious fire is substantially greater (even though still quite low) than during a similar time period of no activity.

This is not a matter of mathematical probability; it is the result of fires being one of the largest causes of accidents and/or medical emergencies.

Multiple Calls

One way of evaluating the adequacy of the Department's manpower is to determine its ability to respond to a combination of a medical emergency and a structure fire call. The ambulance call requires three Fire Department employees plus the assistance of an Acton policeman. A cruiser responds to every ambulance call as a two-department coordinated standard procedure. This leaves three firefighters in two or three stations available for a fire call.

The standard response for a structure fire is three pieces minimum (four if the site does not have a hydrant service requiring a water tanker in the first response) manned by four firefighters. Therefore, the Department lacks one to two men to meet the minimum need for the combination of one ambulance and one fire call. The result could be a serious time delay.

Multiple calls are relatively infrequent in a Department having a volume of 100 to 150 calls per month. The minimum response capability however should be sufficient to handle the combination of one ambulance and one fire call simultaneously.

Use of the Call Force

The Call Force serves the combination of two major needs, namely providing the additional (trained) manpower above the permanent force during major fires, severe storms or similar emergencies, and/or to man the reserve equipment at the three fire stations during a period when all or most of the permanent force is committed for an extended period. The decision to call-up these reserves usually is made by the Captain on-duty and responsible for operations at the time.

Certain problems are inherent in the use of a call force in any town and Acton's are typical. These problems are not a reflection on the ability or the service rendered by this group. They are built-in limitations associated with this "paid when called" type of volunteer service. The major problems are:

1. Limited availability of call force firemen in a suburban community during daytime working hours, since many are employed elsewhere, plus the problem of a reduced number being in town on summer weekends and holidays.

2. An unavoidable longer response time than that of on-duty personnel responding from the station. This is more critical on late night calls. Although in certain cases, a call firefighter may live near the location of the call, his assignment may call for travel involving several times as much delay. For example, his task may be to drive the water tanker to the fire as part of the back-up response, thus requiring travel to the Central Station. The matter of how many men reach the scene how fast is one of the most critical requirements for an emergency service. Many changing conditions are causing this first response to become more critical in terms of saving lives. This will be reviewed at some

length and discussed in detail as it is a key factor in the question of how large a fulltime permanent force is "enough".

3. Adequate training of call firefighters is important for them to be effective and to work safely, minimizing the risk (which can be considerable even under the best conditions) not only to themselves but also to the other members of the firefighting teams. High turnover and limited time availability make it very difficult to maintain an adequate level of training in a call organization.

4. At a major structure fire, the number of firefighters used is increased by a substantial number of call firefighters. For this large group to be effective, additional supervision must be provided which can only be done by drawing from the permanent force.

Comparison of Acton Fire Department's Resources with 7 Area Towns

Tables 1, 2, and 3 show the results of comparing Acton Fire Department's resources with those of seven other towns. The choice of towns for comparison was made largely on the basis of reasonable similarity to Acton and location.

Table 1 lists those demographic characteristics of each town most suitable for this comparison; the services being provided; three key resources, namely number of personnel, amount of major equipment, and number of stations.

Table 2 shows how each town ranks when measured on the basis of the amount of resource available in relation to the number of households served. The comparison and ranking are made for each of the three elements of resource. Acton ranks third highest among eight in terms of equipment. Acton has one major piece of equipment for every 550 households served. Wilmington ranks first with 500

households per piece while Billerica ranks last (7th) with 1,310 households per piece.

A similar comparison made on the number of stations (where the measure is still the number of households), shows Acton to be third among eight again.

The third resource compared is the number of permanent fulltime firefighters. The comparison (using number of households) shows Acton to be sixth, i.e., next to the lowest, Dracut. Acton provides one firefighter for every 300 households.

Table 3 compares the same three resources as before, but uses town area instead of households as the measure. The ranking of Acton correlates quite closely. Acton ranks second for equipment, fourth for the number of stations, and fifth out of eight for the number of firefighters.

Overall, the comparison results say that Acton is in the middle of the eight towns group for the amount of equipment and stations provided, but is near the bottom in the number of permanent personnel provided.

It should be understood that in this type of comparison, there is no standard or no right amount of resources to be compared. The ranking shows Acton's relative position versus seven other towns in terms of relative amount of resources its Fire Department has to operate with.

COMPARISON OF AREA TOWNS FIRE DEPARTMENTS RESOURCES

	<u>TOWN DEMOGRAPHIC DATA</u>			<u>SERVICES PROVIDED</u>	<u>DEPARTMENT RESOURCES</u>			
	<u>POPULATION</u>	<u>NO. OF HOUSEHOLDS</u>	<u>AREA SQ. MI.</u>		<u>F. T.* CALL</u>	<u>STA.</u>	<u>EQUIP.**</u>	
ACTON	20,400	5,500	20	Fire/Amb	33	30	3	10
BEDFORD	12,325	3,000	13	Fire/Amb	19	0	1	4
BILLERICA	36,000	9,175	26	Fire Only	78	0	5	7
CHELMSFORD	32,000	9,000	23	Fire Only	63	0	5	7
CONCORD	17,300	4,200	26	Fire/Amb	34	0	2	8
DRACUT	24,000	6,000	22	Fire Only	28***	12	4	8
MAYNARD	10,000	2,650	5.5	Fire/Amb	20	15	1	5
WILMINGTON	18,000	4,000	18	Fire/Amb	34	10	1	8

* Fulltime Permanent Firefighters. Some towns have both Call and Volunteer Firefighters. Neither are used in making comparisons.

** Equipment Inventory shown includes major pieces, including reserve units available for use, but excludes Chief's car, pick-ups and special purpose units such as brush trucks, Civil Defense (old) rescue units and similar.

*** Includes an increase of 8 authorized by 1980 Annual Town Meeting.

HOW ACTON RANKS AMONG 8 AREA TOWNS ON FIRE DEPARTMENT RESOURCES
BASED ON NUMBER OF HOUSEHOLDS SERVED PER UNIT OF RESOURCE

	UNITS OF EQUIPMENT	TOWN RANK	NO. OF STATIONS	TOWN RANK	NO. OF F. T. FIREFIGHTERS	TOWN RANK
ACTON	550*	3	1,835	3	167*	6
BEDFORD	750	5	3,000	6	158	5
BILLERICA	1,310	7	1,835	3	118	1
CHELMSFORD	1,285	6	1,800	2	143	4
CONCORD	525	2	2,100	4	124	2
DRACUT	750	5	1,500	1	300	7
MAYNARD	660	4	2,650	5	133	3
WILMINGTON	500	1	4,000	7	118	1

* Explanation of Numbers: Acton has a major unit of equipment for every 550 households; one station for every 1,835 households; and one fulltime firefighter for every 167 households.

HOW ACTON RANKS AMONG 8 AREA TOWNS ON FIRE DEPARTMENT RESOURCESBASED ON TOWN AREA IN SQUARE MILES

	UNITS OF EQUIPMENT SQ MI/UNIT	TOWN RANK	NO. OF STATIONS SQ MI/STA	TOWN RANK	NO. OF F. T. FIREFIGHTERS # MEN/SQ MI	TOWN RANK
ACTON	2.0	2	6.6	4	1.6	5
BEDFORD	3.2	5	13.0	5	1.5	6
BILLERICA	3.7	7	4.4	1	3.0	2
CHELMSFORD	3.3	6	4.6	2	2.7	3
CONCORD	3.3	6	13.0	5	1.3	7
DRACUT	2.8	4	5.5	3	1.3*	7
MAYNARD	1.1	1	5.5	3	3.6	1
WILMINGTON	2.3	3	18.0	6	1.9	4

* Includes an increase of 8 authorized by 1980 Annual Town Meeting.

The resource comparison shows that under each of the 2 methods used, ACTON'S rank is virtually the same. Acton stands high (2nd or 3rd) in amount of equipment; mid-group in number of stations; and low (5th or 6th) in the number of fulltime firefighters.

Methodology of the Study

With the able assistance of Private William Klauer and the excellent records available in the Fire Department, an analysis was made using most of the calls over a two-year period. (Table 4 presents this analysis by sector and the types of emergency services.) The primary purpose of this work was to establish how many calls, of what type and when during a 24-hour day, from what location, and most important how long did it take to respond (called "run time").

To make this analysis, the Town was divided into fifteen areas of one to two square miles each and identical data was compiled for each. (Refer to map, Exhibit A.) The data developed for each area or sector consists of:

1. The breakdown and location of calls answered and classified in the four categories of "Fire", "Medical", "Auto Accident", and "Miscellaneous and False".
2. The time when the call was received shown in six-hour quarters of each 24-hour period.
3. The actual run time to those locations producing the majority of the calls. Run time experience is shown in terms of minimum, maximum, and typical (or mean) time for calls to that sector.

The two-year group of calls reflecting actual operating experience is shown in the column headed "Option A". The data in the "Option B" and "Option C" columns represent alternative schemes for the number and location of fire stations. The typical run times which could be expected for each option have been compiled. It is then possible

to compare for each sector the effect on the Typical Run Time (TRT) that would be caused by any change in number and/or location of stations. This provides the Town Management a practical means for measuring the cost/benefit effect of redeployment of the available resources and the addition of future resources.

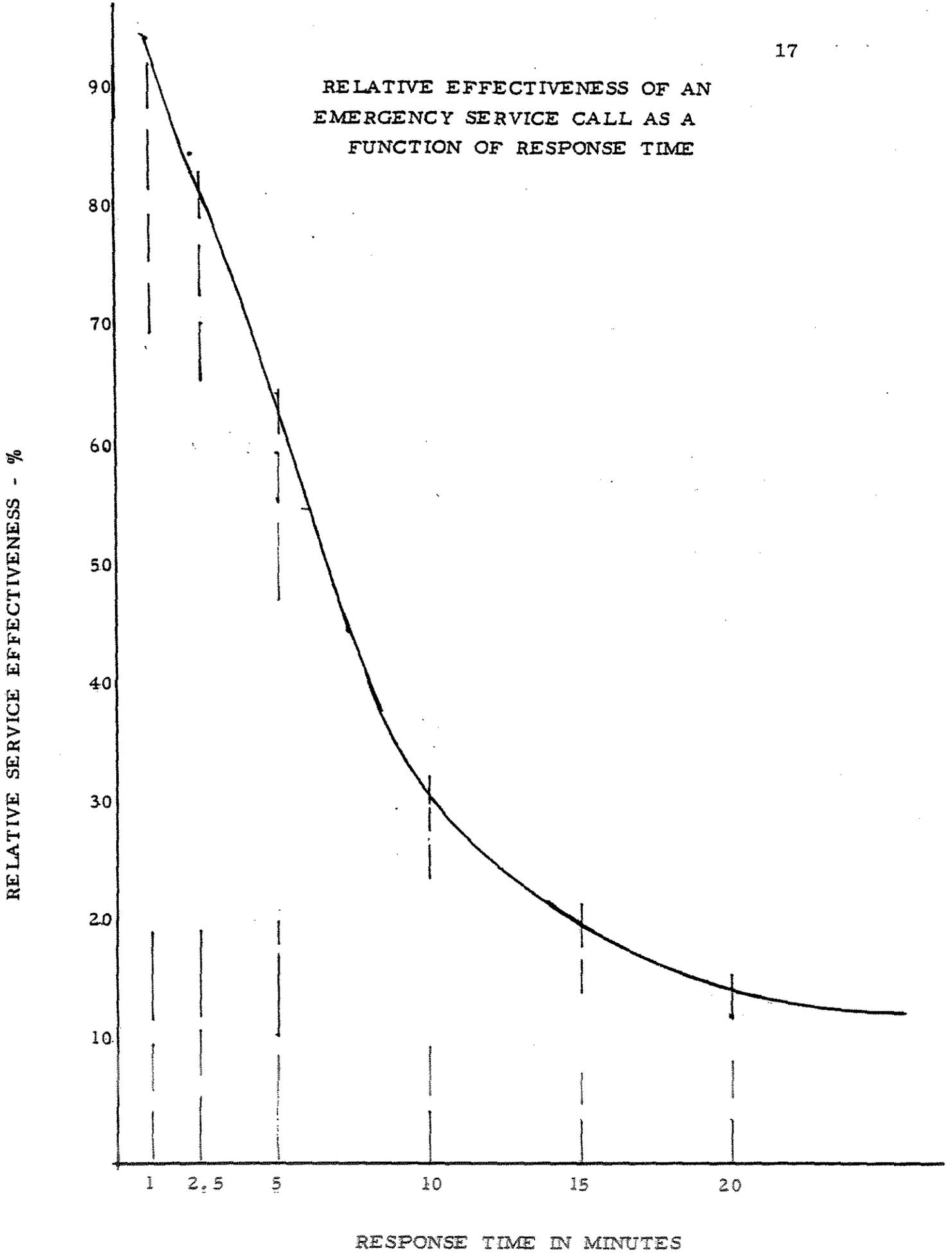
It is important to understand the reason why run time is the key measurement used in the evaluation phase of this study. The dominating measure of the adequacy of any fire and emergency medical service is the ELAPSED TIME BETWEEN RECEIPT OF THE CALL AND THE ARRIVAL AT THE SCENE OF SUFFICIENT MANPOWER AND EQUIPMENT TO RENDER EFFECTIVE SERVICE.

The graph which follows, showing the relative effectiveness of an emergency service call as a function of response time, explains why the time element is so important. The curve displays the very rapid rate at which the effectiveness of a response decreases as the time increases. This applies for both fire and medical calls. In fire situations, the ability to rescue alive the occupant of a burning building declines dramatically as the time increases. Similarly in medical emergencies, particularly for coronary failures, the beneficial effect of the assistance which can be provided is high if received within a few minutes, but drops rapidly with increased time.

This graph also illustrates an interesting (but secondary in this study) point relative to the matter of the cost difference between a Call Force and a fulltime organization or a combination. The typical run times of most of Acton's locations (as shown in Table 4) is in the 2.5 to 3.0 minute range with only a few reaching the 5.0 to 6.0 minute range. This, by any standards, is good to excellent service made possible only by a permanent fulltime organization. The best that could reasonably be expected from a Call Force would be 5.0 to 10.0 minutes under the best conditions with many reaching the 10.0 to 15.0 range. The result is that the relative effectiveness is reduced to about one-half of that of the fulltime group. This major improvement in effectiveness by shorter run times is the primary benefit received for the large increase in personnel costs required for permanent fulltime personnel.

Table 5 presents a summarization of the run data of Table 4 on a sector total basis and provides two items of operating data for evaluation purposes. The column headed

RELATIVE EFFECTIVENESS OF AN
EMERGENCY SERVICE CALL AS A
FUNCTION OF RESPONSE TIME



"Sector Calls per Year per Square Mile" shows the quantity of service provided each sector on a basis which allows direct comparison of one sector to another. The column headed "Run Times" shows the typical (or mean) run time representative of all calls in that sector during the two-year period. For example, Sector 3 experienced 82 calls per year, equivalent to 63 calls per year per square mile. The TRT for Sector 3 calls is 2.0 minutes. The combination of the two numbers provides a single overall index representative of the relative service need. One way of understanding this number is to think of it as the cumulative amount of waiting time in minutes per year which was experienced by persons in that sector.

This arbitrary number has provided the Consultant and will provide Fire Department management with a tool to measure change in the level of emergency service. That change can be the year-to-year trend of the effect of any change in the amount of resources and/or their location.

CONCLUSIONS

What the Run Data Tells Us About the Present Emergency Services

The total number of calls per year is reasonably stable with a low of 1,438 in 1976 and a high of 1,645 in 1979. Two-thirds of these calls have to be treated as emergencies.

To determine the relative adequacy (quality) of emergency services being delivered, the Town was divided into two sectors.

The Southwest Sector (13 square miles, about 2/3) receives excellent service for a large majority of calls. TRT is in the range of 2.5 to 3.0 minutes with a minimum of 1.0 and a maximum of 6.0 minutes. (Exception: One-man engine company is total first response capability from West Station. This is a serious and dangerously risky deficiency. Additional response capacity depends on five firefighters who live nearby; their typical back-up response is usually extremely fast.)

The standard ambulance call response is four men at the scene and three to make the hospital run. This requires the use of a police officer as the driver. The cost of this arrangement is a temporary reduction in police coverage - a risky practice. Multiple call frequency is low, but capacity to meet it is quite inadequate.

Overall excellent service to the Southwest sector should remain stable as long as the three station pattern is retained. The improvement need which is critical is added manpower at the West Station to make the first response an effective response.

The Northeast Sector (1/3 of Town area) receives adequate service. The difference in service is evident by comparing the Typical Run Time (TRT) of the ten Southwest sectors to the TRT of the five Northeast sectors. However, Sector 8 is an exception having the highest rate of calls and only a fair TRT.

OPTION B: Relocate one of the present three stations?

Analysis shows the loss of service to the Southwest sector will exceed any improvement in service to the Northeast sector. This would be a very expensive trade-off with questionable benefit that would be unacceptable.

OPTION C: Reduce the present three stations to two stations?

A reduction in operating costs would be realized, but a serious increase in TRTs for some of the Southwest sectors would result. There would be some improvement in the Northeast sectors but not enough to offset. Overall, this is a very expensive trade-off with questionable benefits and is completely unacceptable.

Overall conclusion on the short-range situation is to increase the manpower by a minimum of one position at the West Station and to retain the present three station locations.

Long-range (10 to 15 Years) Requirements

The Town of Acton should establish the optimum method to meet the future need of the Northeast area by planning for a fourth fire station in the area of Great Road and Main Street. This should also include providing additional manpower (two positions minimum) and equipment requirements. The latter could be met by a combination of redeployment and the addition of new equipment.

The Fire Department needs a long-range plan to build, man, and equip a fourth station adequate to serve the Northeast area so that the entire Town would receive a level of service equivalent to that now provided to the Southwest. To aid in this planning, the evaluation data developed for this study can readily be updated annually to serve as a continuing measurement of the rate of increasing needs of the Northeast. It would indicate whether the implementation schedule of the long-range plan was adequate.

Selection of the Site for a Fire Station in North Acton

The long-range plan being recommended for serving Acton's total need at full growth includes retaining the three existing fire stations and the addition of a fourth station at an appropriate location in North Acton.

The major criteria used for determining the optimum and the acceptable site location(s) are:

1. A location on or with quick and unimpeded access to Main Street (Route 27) and/or Great Road (Route 2A). A location at the intersection is logistically ideal.

2. The location should provide typical run times to the Northeast sectors comparable with those now provided to the Southwest sectors by the existing three stations pattern.

3. The selection of a parcel of land now publicly owned or controlled so that the acquisition would not reduce the tax base. If privately owned at this time, it may be acquired by donation, land swap, or a mutual accomodation arrangement negotiated with a private developer. If none of these are feasible, the privately owned land should be purchased at an acceptable price.

The recommended area of North Acton which meets the criteria 1 and 2 is shown on a partial map of Acton, Exhibit B. The optimum area is that abutting Great Road and/or Main Street for a distance of approximately half-a-mile north or south of their intersection. The less desirable but acceptable (from a logistics standpoint) locations extend north to Harris Street and south to Brook Street.

There is a good prospect of using publicly owned land, although some "negotiations" may be necessary. A partial list of such parcels with notations have been submitted with this study to the Town Manager and the Fire Chief. Most of the parcels listed will not be acceptable for one or more important reasons. The list is intended to provide a starting point for reduction down to those worth serious consideration. The inclusion of publicly owned parcels which are an obviously unsuitable location is to call attention to the possibility of acquisition by a land swap as an alternate to an appropriation.

Because of the critical importance of location and the increase in development activity in that area together with the rapid escalation of the price of land, it is recommended

action be taken to acquire an acceptable site without further delay. Although this is to meet a long-range need, there is no reason related to site selection which would require delay.

SPECIFIC RECOMMENDATIONS

1. Increase the authorized manpower level by two (2) positions (8 firefighters) in two steps of four each. One of these could be the transfer of four Dispatchers to firefighter duty under the plan for centralizing Fire and Police communications. This action deserves number one priority for any added funds to improve the fire/medical service.
2. If Item 1 is accomplished, it may then become feasible to operate at a minimum manning level of nine (9) men instead of ten (10), thereby reducing overtime costs substantially. It is recommended that this opportunity be evaluated further.
3. Proceed with the work of selecting and acquiring a future station site in the Northeast area as fast as is feasible. The action should include exploring the possibility of acquiring a site at locations presently publicly owned or through generous cooperation of a private developer active in the site area.
4. Using the results of this study as a starting point, complete the development of a Fire Department Long-range Resource Plan to cover the period from now to the period of Acton reaching its full growth. This plan would define in detail the total resources (manpower, equipment, stations) with an acquisition and funding schedule.

There could be a future relationship between the results of this study and the current plan to have one communications center serving both Fire and Police Departments. If in the implementation of the central communication plan no suitable long-range solution for the additional space needed is found, then it is recommended that the unsolved problem of

a permanent location for the communication facility be added to the Fire Department's Long-range Resource Plan. It appears that the major impact would be the amount of land and building area needed.

This Consultant's perspective on the magnitude of the recommended Fire Department Long-range Resource Plan, on a very preliminary basis, is as follows:

All figures are at the 1980 cost level.

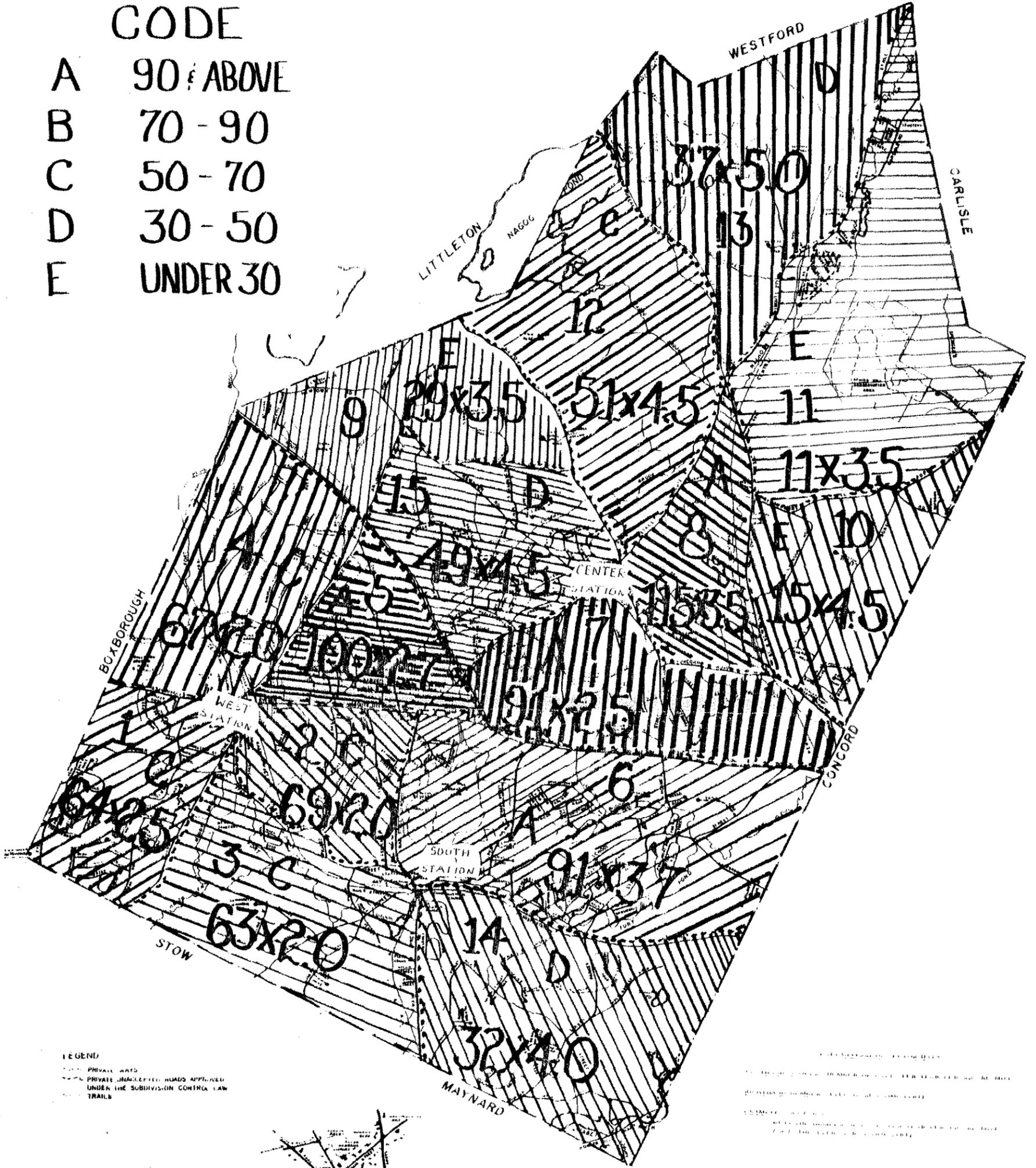
Estimated Department size to meet the needs of a "fully grown" Acton, expected to be reached in 10 to 15 years, is about 50 employees total, i.e., an increase in the platoon strength from the present eight (8) to about eleven (11). The annual increase in personal services budget would approximate \$300,000. An additional station in the Great Road-Main Street area is expected to cost \$300,000 to \$500,000 (today's prices) exclusive of site costs.

The probable net addition of two (2) major units of equipment (from 10 to 12). The most likely choice would appear to be a second ladder and a second ambulance or ambulance/rescue unit. This represents a capital cost of approximately \$200,000.

A P P E N D I X

CODE

- A 90 & ABOVE
- B 70 - 90
- C 50 - 70
- D 30 - 50
- E UNDER 30



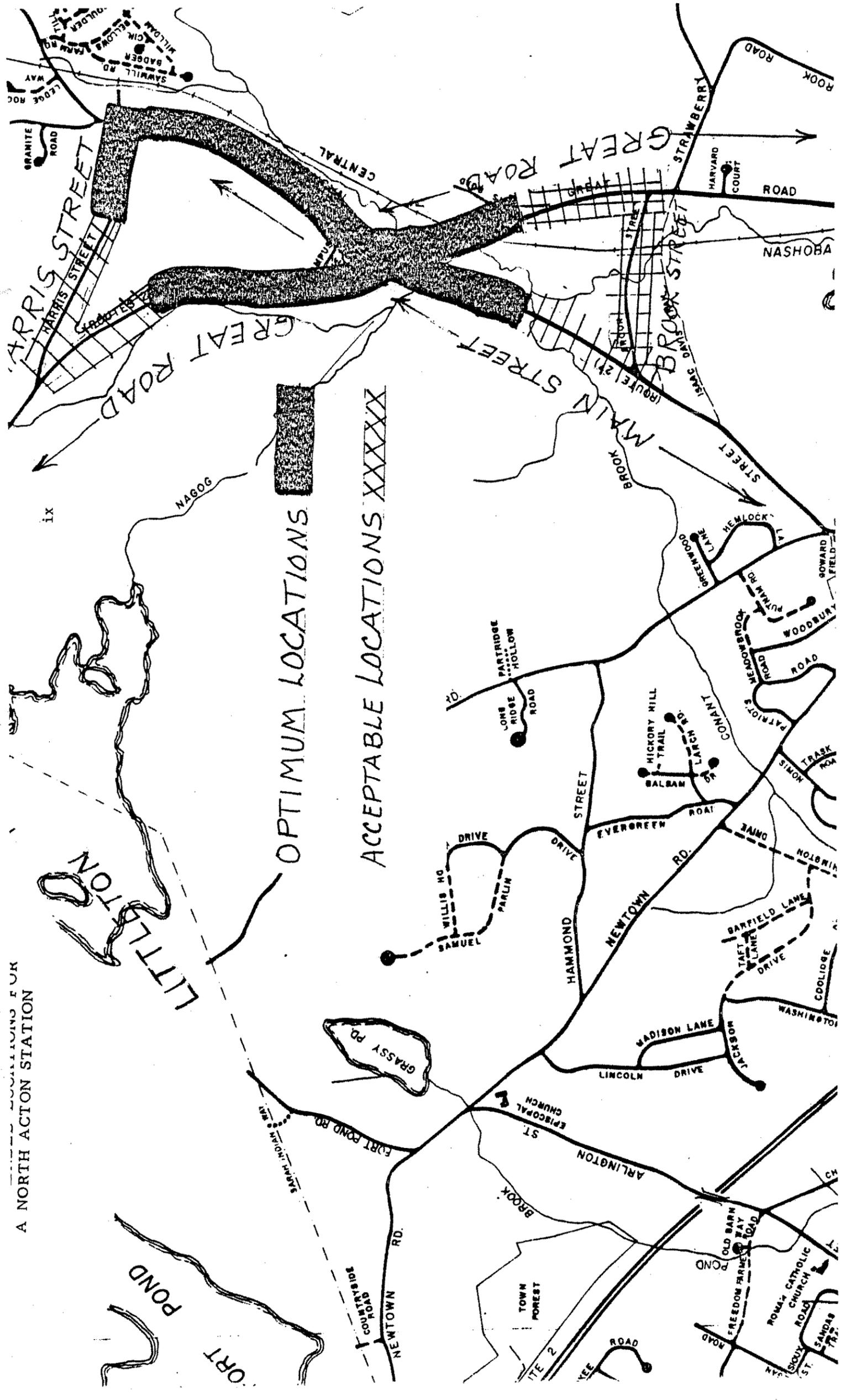
LEGEND
 --- PRIVATE WAYS
 --- PRIVATE UNREGISTERED ROADS APPEARED UNDER THE SUBDIVISION CONTROL LAW
 --- TRAILS



ALFRED HUNTER ENGINEERING

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LOCATIONS FOR
A NORTH ACTON STATION



TOWN OF ACTON
 Analysis of Emergency Service Calls
 Made by Acton Fire Department for a 2-Year Period

OPTION A OPTION B OPTION C
 PRESENT STATIONS STATION DEPLOYMENT STATION DEPLOYMENT

Area Location	Type Calls Breakdown				TOTAL	Time Received Profile (6 Hour/Quarter)*				Run Time			Est. Run Times.			Est. Run Times		
	Fire	Med	Auto Acc.	Misc & False		I	II	III	IV	Min	Max	Mean Typ.	MIN.	MAX.	MEAN.	MIN.	MAX.	MEAN.
Sector 1																		
Arlington	2	7	5	9	23	3	6	12	2	1	6	2.5						
Duggan	0	3	0	3	6	1	5	0	0	1	3	2.0						
Juniper Ridge	3	3	0	3	9	3	4	1	1									
Mass. Avenue	6	4	16	14	40	14	16	9	1	1	3	2.0	1	3	2.0	3	6	
Summer	3	2	5	6	16	3	6	6	1	1	4	2.5	1	4	2.5	3	7	
Ticonderoga	0	3	0	4	7	1	5	1	0									
Willow	2	6	7	5	20	8	9	2	1	1	6	2.5	1	6	2.5	4	9	
	16	28	33	44	121	33	51	31	6									
Sector 2																		
Flint	1	4	0	2	7	1	5	1	0	1	4	2.0						
Kinsley	3	0	0	5	8	2	4	2	0									
Liberty	2	4	4	0	10	1	5	2	2									
Main (141-260)	20	14	13	14	61	11	30	18	2	1	4	2.5	3.75	4.50		1	3	
Mass. Avenue	9	17	26	16	68	12	28	25	3	1	3	1.5	1	3		1	3	
Prospect	3	3	1	2	9	2	3	4	0									
Tuttle	3	2	0	0	5	1	2	1	1									
Windsor	0	3	1	3	7	2	4	0	1									
	41	47	45	42	175	32	81	53	9									
Sector 3																		
Main (1-140)	11	10	32	7	60	14	24	20	2	1	4	2.0	3	7		1	3	
Maple	1	5	0	3	9	1	4	2	2									
Martin	1	7	3	0	11	5	3	2	1									
Nash	3	0	0	3	6	3	1	1	1									
Railroad	2	1	0	4	7	0	3	3	1									
Robbins	2	2	0	2	6	2	3	1	0									
Stowe	2	5	3	4	14	3	3	5	3									
Central	10	18	12	11	51	13	20	15	4		4	2.0	1	4		1	4	
	32	48	50	34	164	41	61	48	14									

* Quarter I is from 6:00 a.m. to 12:00 noon, etc.

TOWN OF ACTON
Summary by Sectors
Analysis of Emergency Service Calls
Made by Acton Fire Department for a 2-Year Period

Sector No. & Area	Sector Area Sq. Mi.	Sector Calls Per Yr.	Sector Calls Per Yr. Per Sq. Mi.	Type Calls Breakdown				TOTAL	Time Recd. Profile				Run Times			Sector Rank		Service Level Index			
				Fire	Med	Auto Acc.	Misc & False		I	II	III	IV	Min	Max	Mean/ Typ.	Code Letter*	Map Color				
1 Summer-Arlington- Willow	1.1	70	64	16	28	33	44	121	33	52	31	6	1	6	2.5	C	Orange	160 64 x 2.5			
2 Center-Mass-Main	1.3	90	69	41	47	45	42	175	32	81	81	9	1	5	2.0	C	Orange	138 69 x 2.0			
3 Willow-Central- Main-Stow Line	1.3	82	63	32	48	50	34	164	41	61	48	14	1	4	2.0	C	Orange	126 63 x 2.0			
4 Arlington-Rt. 2- Boxboro Line-Mass.	1.5	100	67	37	59	26	60	182	57	65	39	21	1	5	2.0	C	Orange	134 67 x 2.0			
5 Arlington-Rt. 2-Mass	0.7	74	100	31	51	16	50	148	38	69	30	11	1	6	2.7	A	Red	270 100 x 2.7			
6 Main-Mass- Concord Line-Central	2.0	182	91	77	100	78	100	355	88	136	108	24	1	6	3.7	A	Red	337 91 x 3.7			
7 Main-Nagog Hill- Concord Road-Mass.	1.1	100	91	30	56	49	61	196	56	56	75	9	1	6	2.5	A	Red	228 91 x 2.5			
*A-90 & above		B-70-90		C-50-70		D-30-50		E-under 30													

