

ITEM	8
MANAGER'S REPORT NO.	17
COUNCIL MEETING	1980 03 03

RE: FIRE PREVENTION CONTROL STUDY AND MASTER PLAN
 (ITEM 8, REPORT NO. 80, 1978 NOVEMBER 14)
 (ITEM 3, REPORT NO. 64, 1979 SEPTEMBER 24)

Following is a report from the Chairman of the Fire Study Technical Working Committee regarding the Fire Prevention Control Study and Master Plan.

RECOMMENDATION:

1. THAT the recommendation as contained in the following report be adopted.

* * * * *

1980 February 25

TO: MUNICIPAL MANAGER
 FROM: FIRE STUDY TECHNICAL WORKING COMMITTEE
 RE: FIRE PREVENTION CONTROL STUDY AND MASTER PLAN

RECOMMENDATION

1. THAT Council approve the appointment at this time of an Advisory Committee as described in this report, and that the material in this report dealing with the definition of the fire situation and with goals and objectives be sent to that Committee for their review and recommendations.

REPORT

STATUS OF STUDY

Referring to the attached flow chart we have now, within this report:

1. Defined the Fire Situation (Stage 3)
2. Established goals and objectives for review by the Advisory Committee (Stages 4 and 5).

PURPOSE OF THIS REPORT

The purpose of this report is to:

1. Obtain the Authorization of Council to appoint members to the Advisory Committee.
2. Indicate to Council for information purposes the Technical Committee's view of the fire situation.
3. Suggest goals and objectives for review by the Advisory Committee. (Following advice by the Advisory Committee goals and objectives will be presented to Council for specific approval.)

ITEM	8
MANAGER'S REPORT NO.	17
COUNCIL MEETING	1980 03 03

ADVISORY COMMITTEE

With Council's concurrence we will now appoint members of the organizations listed below to form an Advisory Committee.

The Advisory Committee will assist the Technical Committee by advising it on broad policy matters including:

1. Goals and objectives
2. Criteria for analysis of alternative approaches
3. Alternative approaches
4. Selection of "best" approach

The Advisory Committee will not report to Council; it will report to the Technical Committee. The Technical Committee will report to Council.

Following is the proposed Advisory Committee:

- | | |
|--|-----------------------------------|
| 1. Burnaby Chamber of Commerce | Mr. K. R. Beedie (1) |
| 2. HUDAC of Greater Vancouver | Mr. W. I. Parnetta (1) |
| 3. Provincial Fire Commissioner's Office | Mr. R. Dumala (1) |
| 4. Insurance Bureau of Canada | Mr. B. Piper (1) |
| 5. Burnaby Real Estate Board | Mr. C. Traunweiser (1) |
| 6. Firefighters' Union Local 323 | Mr. W. Copeland (1) |
| 7. B.C. Petroleum Association | Representative not yet suggested. |
| 8. Sprinkler Industry | Mr. P. van Gaalen (1) |
| 9. Fire Alarm Industry | Mr. R. Haskins (1) |

NOTE:

- (1) Have indicated willingness to accept appointment.

The material in the remaining pages of this report which indicates the research undertaken, defines the fire situation, and suggests goals and objectives, will now, with Council's agreement, be sent to the Advisory Committee. After receiving the advice from the Advisory Committee, the Technical Committee will report back to Council. (Subsequently, other reports dealing with alternative approaches, etc., will also be sent to the Advisory Committee by the Technical Committee.)

BACKGROUND

To define the fire situation a series of reports were prepared. These reports which are available for inspection in the Planning Department, are listed in Appendix "A".

The following in general terms are the steps which were taken to define the fire situation:

A broad data base was established keyed to 55 Fire Management Areas (FMA). This data will also be needed to develop alternative approaches toward a plan suitable to our fire situation.

In one working paper each FMA was analysed under the headings "Persons", "Property", "Demand for Fire Protection" and "Workload on Fire Halls". Population densities, property values, type and amount of development now and before 1986, structural materials, numbers of properties in substandard condition, numbers of fires, types of fires, numbers of calls, response times, number of calls to different areas handled by individual fire halls, etc. were included in the analysis. At the end of each FMA analysis conclusions were drawn as to existing or emergent problems.

Data was also accumulated on a community wide basis with respect to fire damage rates, number of calls, and response times, etc.

Certain properties which made excessive demands on the system, causes of fires, the amount of loss caused by fires, and mutual aid practices, were also reviewed in this paper.

A second working paper dealt with distribution of different types of development by gross floor area and by construction type; response times by Fire Hall by FMA (in the first report response times were by FMA only); relationship between response times and casualties and damage; percentage of calls by fire halls to FMA; gross floor area of high and low rise apartments by FMA; percentage of calls made by fire halls by daylight and darkness; estimate of dwelling units and commercial and industrial construction beyond 1986, by FMA. A list of buildings provided with sprinklers was also drawn up.

Both the above reports were reviewed and discussed with the Fire Department Board of Administration.

In response to the Technical Committee's request for further evidence on acceptable response time standards a report was prepared which provided further data and comparison with other communities in the Lower Mainland, elsewhere in Canada, and in the U.S. Standards which appeared to be a good guide based on the additional research undertaken, were suggested.

Fire loss per fire in which damage occurred in Burnaby was compared with the experience of other Lower Mainland communities and Victoria from data obtained from the Provincial Fire Marshall's Reports of 1976 and 1977. (Fire loss per fire was also included in a cross Canada survey. See below.)

Following receipt of replies to a questionnaire sent to Lower Mainland communities and other Canadian communities with population in the 100,000 to 500,000 category, a report was prepared comparing the Burnaby Fire Service with other communities in terms of Effectiveness, Level of Effort, and Total Organizational Performance.

A study of the extent to which different areas are inadequately served in terms of travelling distance and response times was made. This included an estimate of the amount of risk involved by showing the degree of intensity of fire suppression demand in the various areas where the standards are not met.

A study of the water system to determine whether it is adequate for the demands which could be made upon it was undertaken by FMA. The study is based on the assumption that if the fire flow (water) is adequate for the structures with the greatest fire flow (water) requirements in a given area, then it will be adequate for all other structures in that same area. Following is the methodology used:

1. Identification of those risk structures in each FMA requiring maximum fire flow (water).
2. Gathering data to estimate maximum fire flow (water) requirements of each of the selected risk structures in each FMA.
3. Estimation of fire flow (water) requirements based on insurance services formula.
4. Identification of all hydrants 300 feet from highest risk structures and 500 feet from lower risk structures.
5. Estimation of combined fire flow (water) capacity of hydrants 300 ft. or 500 ft. from the risk structures to determine whether it is sufficient to meet the maximum fire flow (water) requirements for those structures.

ITEM 8
 MANAGER'S REPORT NO. 17
 COUNCIL MEETING 1980 03 03

DEFINITION OF THE FIRE SITUATION

(1) Effectiveness, Level of Effort, and Total Organizational Performance - 130

We have made a comparison of Burnaby with a number of other communities with respect to "Effectiveness", "Level of Effort" and "Total Organizational Performance".

We sent a questionnaire in 1979 November to the Lower Mainland communities and to other Canadian communities with population in the 100,000 to 500,000 category. We received replies from Surrey, New Westminster, North Vancouver District, North Vancouver City, Edmonton, Alta., Thunder Bay, Ont., Hamilton, Ont., Halifax, N.S., London, Ont., Regina, Sask., and Laval, Que. These were used for the comparisons in the following chart. (Full report showing how criteria were developed, etc., available in Planning Department.)

BURNABY'S POSITION WHEN COMPARED WITH THE OTHER COMMUNITIES

EFFECTIVENESS		LEVELS OF EFFORT		PERFORMANCE	
Measure	(1)Quar-tile	Measure	(1)Quar-tile	Measure	(1)Quar-tile
Number of fires per 1,000 population	2	Fire Dept. expenditures per capita	1	Total cost per capita	1
\$ Property loss per capita	1	Fire Dept. expenditures per \$1,000 market value	1	Total cost per \$1,000 market value	1
\$ Property loss per \$1,000 market value	1			Total cost per fire	1
\$ Property loss per fire	2				
No. of civilian casualties per 100,000 population	4				
No. of civilian casualties per 100 fires	4				
No. of firefighter casualties per 100 fires	4				

NOTE (1) A quartile is the value that marks the boundary between two consecutive intervals in a frequency distribution of four intervals with each containing one quarter of the total.

The first quartile (1) indicates effectiveness (or level of effort or performance) that is above 75% of the participating agencies. The second quartile falls just above the average and the third quartile just below the average. The fourth quartile shows a result which is less satisfactory than 75% of the participating agencies.

The results of the comparison show that Burnaby:

- (a) Measures up well with respect to all criteria for levels of effort and for performance;
- (b) In terms of effectiveness compares very well with respect to property loss per capita and property loss per \$1,000 market value;
- (c) Also in terms of effectiveness is better than average with respect to the number of fires per 1,000 population;
- (d) In terms of effectiveness does not compare well with respect to the number of civilian casualties per 100 fires. However, it should be noted that the statistic is based upon the recording of every injury, no matter how slight. For example a person with a cut finger or receiving a whiff of oxygen is included as a casualty even if the person was not hospitalized. Thus, for example, in 1978, 42 casualties were reported but only 22 required hospital treatment (there were also six deaths). More investigation of this problem will be undertaken;

(e) In terms of effectiveness does not compare well with respect to the number of firefighter casualties per 100 fires. However, the problem may be more apparent than real because this high ratio is evidently largely due to the practice, now required by the Workmens' Compensation Board, of reporting every injury no matter how slight. Thus 191 firefighter injuries were reported in 1978, which resulted in a high ratio for Burnaby compared with other communities (20.10 against an average of 7.61). However, only 17 of those injuries resulted in time off. More investigation of this problem will be undertaken.

(2) Travel Distances and Response Times

In a report dated 1980 February 07 (see Appendix), the following distance and response time standards were advanced as being reasonable, consistent with modern practice.

INTENSITY OF DEMAND	PUMPER CO.		LADDER CO.	
	Travel Distance (Miles)	Response Time (Minutes)	Travel Distance (Miles)	Response Time (Minutes)
Strongest Level	1	3	1½	4
Second Level	1	3	1½	4
Third Level	1	3	1½	4
Fourth Level	1½	4	2	6
Minimum Level	2	6	2	6

If these standards are accepted the 1980 February 07 report shows that there are substantial areas of the municipality which are:

- (a) Too great a travelling distance from the pumper and ladder companies which serve them.
- (b) Not reached by the pumper and ladder companies within an acceptable time.

To appreciate the relative seriousness of the departure from the standards in different areas the attached maps should be examined. The degree of seriousness depends upon the "intensity of demand" for fire suppression services in different areas; it also depends upon the amount of development expected in the near and more long range future. All these points are brought into the 1980 February 07 report which deals in detail with this subject.

Data is also available within earlier working papers (1979 July 13 and 1979 August 14) on the population and employment densities, numbers of calls, floor areas by type of construction materials, number of properties in sub-standard condition, floor area of high and low rise apartments, etc. This data provides further criteria for guaging the relative seriousness of the travel distance and response time problem by providing a picture of what there is to burn in the areas which fall below the recommended standard.

By referring to Maps 1, 2, 3 and 4 it may be seen that the following areas are not served within the recommended standards:

- (a) West Central Area (includes Burnaby General Hospital)
- (b) The North Central Area
- (c) The North-East Area (includes Simon Fraser University)
- (d) The South and South-West Area (includes Big Bend)
- (e) The South-East Area (includes Cariboo Area)

(3) Water Supply

For the greater part of the municipality the water system appears to be adequate for fighting fires in those structures which require the greatest fire flow (water). The only exceptions are:

FMA 35 (Oakalla)	- 82% of required capacity
FMA 50 (North of Marine, West of Gilley)	- 65% of required capacity
FMA 51 (Stride)	- 34% of required capacity
FMA 53 (Big Bend)	- 40% of required capacity
FMA 55 (Big Bend)	- 50% of required capacity

It is the intention of the Insurers' Advisory Organization to undertake a survey of Burnaby's fire flow (water) requirements this spring and the result of our study will be compared with theirs.

(4) Careless Smoking

We have a high percentage of fires caused by careless smoking. From 1975 to 1978 10.75% of all fires were from this cause. Of 74 injuries occurring in a 3 year period, 28% were caused by careless smoking. Over a quarter of the major fires occurring in 1978 were caused by careless smoking. This is obviously a serious problem and is a major cause of fires at Provincial and National levels.

(5) Fires in Private Residential Dwellings

In Burnaby, as is common throughout the nation, close to half of the fires which occur are in private homes. Any attempt to reduce the overall incidence of fires occurring must be directed strongly towards private residences.

(6) Rescue and Safety Calls

Nearly half of the calls received are "rescue and safety" calls (i.e. not fires). Any attempt to reduce the workload on the fire service should be directed toward this responsibility.

(7) Fires Caused by Arson

In 1978, 14 fires, or 4.83% of all fires where damage occurred, were known to have been caused by arson, and these resulted in 6.94% of all the damage caused. Arson was the cause of 8.7% of the major fires in 1978 and accounted for 20% of the damage. If fires in the "suspicious" category are included 8.2% of all fires where damage occurred were caused by arson, resulting in 12.8% of all damage caused. Again, if the "suspicious" category were included with the known arson category, 22% of the 1978 major fires were caused by arson, accounting for 28% of the damage.

Having a municipal arson investigator on staff undoubtedly results in more identification of cases of arson and so a higher statistical arson ratio. However, fires caused by arson continue to present a serious problem. (It also seems to be a serious problem in other communities for in eight other communities from which arson data was obtained an average of 9.84% of fires were caused by arson.)

(8) Properties Making Excessive Demands on the Fire System

Certain properties generate an inordinate number of calls and make considerable and disproportionate demands on the fire service.

One example of this is a senior citizens' home from which 22 calls were made one year and 30 calls the next. Most of these were "rescue and safety" and perhaps this rate is not uncommon in a senior citizens' home, but this should be verified. Nearly all calls were in the "accidental" category and half of the calls resulted in responses from three fire halls for each fire.

(9) Fires Occurring in Open Space

There is considerable open space in Burnaby and no less than 10% of all fires occur in open space. Attending to these fires occupies a disproportionate amount of time for the fire department when one considers the relatively low value of the property served by the fire suppression units.

ESTABLISHMENT OF COMMUNITY FIRE PROTECTION GOALS AND OBJECTIVES

Having defined the fire situation the next step is the establishment of community fire protection goals and objectives. Because of the ease with which goals and objectives can be confused each will be described. The goals form the basis for the objectives.

(1) Goals

Our fire protection goals should be statements defining the kind and level of fire protection to which we aspire. They are drawn from our knowledge of the fire situation and are deliberately stated without regard to implementation; that is implementation cost, schedules and means are not considered. In this sense, goals are idealistic. They should be defined prior to considering how to accomplish them so that the goals are not dependent on the means of achievement.

Goals are:

- fundamental, in that they represent basic desires of the community
- inclusive, in that they encompass all aspects, public and private, of community fire protection
- non-specific, in that they refer to the quality (not the quantity) of fire protection
- future-oriented, in that they are achievable in the future
- time-independent, in that they are not scheduled events.

(2) Objectives

Fire protection objectives are statements which define the level of service to which the community is willing to commit itself. Another way of stating this is that the objectives define the level of risk which Council is willing to accept. Accepted risk is the unprotected portion of the fire related situation; the difference between what there is to burn and what the fire protection resources provided by the community can protect.

Guidelines for setting objectives are:

- objectives should represent a level of service (level of risk)
- objectives should be quantitative
- objectives should be attainable within a specified planning time period
- objectives should be independent of the means of satisfying them; that is, they should not be dependent upon a particular fire study approach.

GOALS

134

The following goals are proposed for discussion by the Advisory Committee:

1. To improve the level of fire protection service consistent with the municipality's ability to pay and to ensure that such improved level of service can be provided for anticipated new development.
2. Maintenance of ongoing review of municipal Fire Department costs to attain an optimum balance between the responsibilities of the Municipality and the Province with regard to the provision of Emergency Health Services.
3. To persuade the Province to enact legislation which will enable the municipality to offset some of the fire protection costs made necessary by the construction and occupancy of high risk structures.
4. To improve the ratio of the cost of the fire service to the value of property protected without reducing the quality of service.
5. Reduce citizen injuries and fatalities.
6. Reduce firefighter injuries and fatalities.
7. Reduce property loss per fire.
8. Reduce incidence of fires per capita.
9. Reduce number of calls per capita.
10. Reduce incidence of arson.

OBJECTIVES

In order to achieve the above goals the following objectives are proposed for discussion by the Advisory Committee:

1. Provide sites for pumper facilities within one mile travelling distance and 3 minute response time of strongest level, second level, and third level demand areas by 1982.
2. Provide sites for aerial ladder facilities within 1½ miles travelling distance and 4 minute response time of strongest level, second level, and third level demand areas by 1982.
3. Construct and/or relocate fire stations on selected sites to meet standards by 1986 or when warranted by development.
4. Supply fire flow (water) required for buildings with highest fire flow (water) demand in each fire management area by 1984.
5. Provide required fire flow (water) for all new construction.
6. Assumption by Province of the costs of "Emergency Medical" calls by 1982. (These are ambulance calls for heart attack victims, etc., not rescue calls for extrication of vehicle accident victims, etc. which will continue to require the municipal rescue service equipment.)
7. Assumption by Simon Fraser University of responsibility of providing its own fire protection service for first alarm calls by 1982, with municipal support for major fires by mutual aid agreement.
8. To make representation to the Associate Committees of the National Building Code and the National Fire Code in order to make mandatory sprinkler systems and smoke alarms preconnected to central alarm stations in all buildings over 3 stories and exceeding 6,000 sq.ft.

ITEM	8
MANAGER'S REPORT NO.	17
COUNCIL MEETING	1980 03 03

9. Smoke detectors to be installed and connected to a central alarm station in all residences by 1986. (Smoke detectors are already mandatory for new construction.)
10. Reduce citizen casualty rate to equal or below National rates.
11. Reduce firefighter casualty rate to equal or below National rates.
12. A high standard of arson investigation to reduce the incidence of arson related fires.
13. Reduce the incidence of fires caused by careless smoking.
14. Reduction of rates of "Needless", "Accidental" and "False Alarm" calls by 50% by 1986.
15. Setting up of special inspection and education system for properties making 5 or more calls per year, by 1982.
16. Development of more economical means of dealing with open space fires by 1984.
17. Establishment of intersection light control by Fire Department by 1984.

DISCUSSION ON POSSIBLE ALTERNATIVE APPROACHES

With agreement on the definition of the fire situation and approval of the goals and objectives the next step will be to select and obtain approval of selection criteria.

In order to examine alternative approaches selection criteria must be decided upon. The way in which this process is handled has similarity to the priority selection process which the C.I.P. Committee undertakes. Criteria are selected which will lead toward the attainment of the objectives which will have been decided upon.

The criteria may be placed into the categories - cost, benefit, legislative, political, and "other". Each objective decided upon should have at least one criterion applicable to it. Criteria may, as was done by the C.I.P. Committee, be weighted in order of importance.

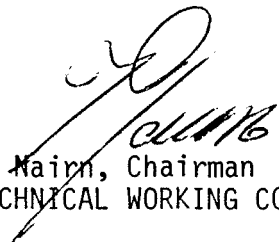
- A cost criterion could be, for example, "not to exceed \$10,000"
- A benefit criterion could be "maximum reduction of fire losses"
- A legislative criterion could be (for code amendments) "maximum number of major risks affected"
- A political criterion could be (public reaction resulting in) "minimum complaints".

Thus, by following the system in the attached flow chart the approaches to be used will not be selected until after the criteria have been selected and weighted.

However, it is clear that the "Definition of the Fire Situation" described above will mean that a continuation of the study will in all likelihood include:

1. Selection of sites for relocated and new fire halls to meet travel distance and response time standards.
2. Assessment of the degree to which application of all existing sprinkler regulations and possible code amendments for more encompassing and retroactive application of sprinkler regulations, will reduce demand for fire suppression and result in possible modification of travel time and response standards.

3. Assessment of the degree to which code amendments for retroactive application of smoke detectors for all residential dwellings will reduce demand for fire suppression and reduce time between detection and suppression, resulting in possible modification of travel time and response standards.
4. Study of traffic light control system and estimate of the extent to which this could reduce response times.
5. Negotiations with S.F.U. to lead toward S.F.U. responsibility for firefighting.
6. Continued concentration on arson control.
7. The development of an education program to bring about an overall reduction of fires and especially to reduce careless smoking, and the now numerous "Needless", "Accidental" and "False Alarm" calls. Also a reduction in excessive calls from individual properties.
8. A plan to add water lines and hydrants as necessary to reach fire flow (water) requirements for existing development and development expected in the short term (before 1986).
9. Negotiations with Province to determine Provincial role in regard to Emergency Health Service responsibilities.


T. Nairn, Chairman
TECHNICAL WORKING COMMITTEE

CRL/hf

Attach.

c.c. - Director - Fire Services
Municipal Manager
Municipal Treasurer
Municipal Engineer
Director of Planning
Chief Building Inspector
Planner II (CRL)

FIRE PREVENTION CONTROL STUDY AND MASTER PLAN

APPENDIX "A"

ITEM	8
MANAGER'S REPORT NO.	17
COUNCIL MEETING	1980 03 03

1980 February 25

Following is a list of reports which have been prepared.

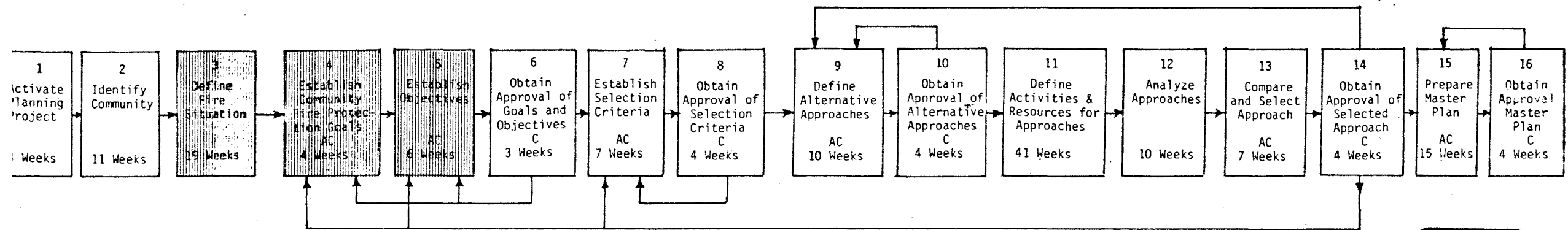
1. 1979 July 13 "Definition of the Fire Situation" (117 p. 13 maps)
Part I - Preliminary Analysis of Fire Management Areas Stage I (to 1986)
A working paper providing individual analysis of Fire Management Areas. Each FMA analysed under the headings "Persons", "Property", "Demand for Fire Protection" and "Workload on Fire Halls". Includes population densities, property values, type and amount of development now and before 1986, structural materials, numbers of properties in substandard condition, numbers of fires, types of fires, numbers of calls, response times, number of calls to different areas handled by individual fire halls, etc.
Part II - Preliminary Analysis of Data on Community Wide Basis Stage I (to 1986)
Includes deaths and injuries, fire damage, fires by occupancy type, numbers of calls, response times, demand on the system from further construction, causes of fires, amount of loss caused by fire, existing mutual aid practices, etc.
2. 1979 August 14 "Fire Study - Defining the Fire Situation - Appendix 8, 9, 23 to 28 inclusive" (25 p. 19 maps)
Distribution of different types of development by gross floor area and by construction type; response times by Fire Hall by FMA (in the 1979 July 13 report response times were by FMA only); relationship between response times and casualties and damage; percentage of calls by fire halls to FMA; gross floor area of high and low rise apartments by FMA; percentage of calls made by Fire Halls by daylight and darkness; estimate of dwelling units and commercial and industrial construction beyond 1986, by FMA.
3. 1979 October 30 "Fire Study - Defining the Fire Situation (7 p.)
Comparison in terms of "Effectiveness" "Level of Effort" and "Total Organizational Performance" with data obtained from U.S. Communities in the 1974 "Municipal Fire Service Workbook".
4. 1979 November 20 "Fire Study - Defining Fire Situation" (3 p.)
A summary of the fire situation as evident from reports of 1979 July 13 and 1979 August 14.
5. 1979 November 22 "Fire Study - Defining the Fire Situation - Questions Arising from Technical Working Committee Meeting of 1979 August 30" (6 p.)
Further data on response times and comparison with other communities in the Lower Mainland, in other parts of Canada and in the U.S. Acceptable response time standards suggested. Discussion on use of assessment term "substandard" to classify certain buildings, etc.
6. 1979 November 27 "Fire Study - Defining the Fire Situation" (2 p.)
Fire loss per fire in which damage occurred in Burnaby compared with the experience of other Lower Mainland communities and Victoria from data obtained from the Provincial Fire Marshall's reports of 1976 and 1977.

ITEM	8
MANAGER'S REPORT NO.	17
COUNCIL MEETING	1980 03 03

7. 1979 December 05 "Fire Study - Defining the Fire Situation (7 p.) - 138
A revision of the 1979 October 30 report based on different data.
8. 1980 January 31 "Fire Study - Defining the Fire Situation" (5 p.)
Following receipt of replies to a questionnaire sent to Lower Mainland communities and other Canadian communities with population in the 100,000 to 500,000 category, this report compares the Burnaby Fire Service with other communities in terms of Effectiveness, Level of Effort, and Total Organizational Performance.
9. 1980 February 07 "Fire Study - Defining the Fire Situation (10 p. 5 maps)
A study of the extent to which different areas are inadequately served in terms of travelling distance and response times. Includes an estimate of the amount of risk involved by showing the degree of intensity of fire suppression demand in the various areas where the standards are not met.
10. 1980 February 14 "Water System Study" (9 p.)
(Report includes only one fire flow (water) estimate form, but a completed fire flow (water) estimate form for risk structures in each FMA is available on file.)
This report is a study of the water system by FMA, to determine whether it is adequate for the demands which could be made upon it. Includes identification of risk structures requiring maximum fire flow (water), estimate of fire flow (water) requirements based on Insurance Services formula, identification of hydrants within standard maximum distances from risk structures, estimation of fire flow (water) capacity of hydrants and assessment of adequacy to meet demands of high risk structures.

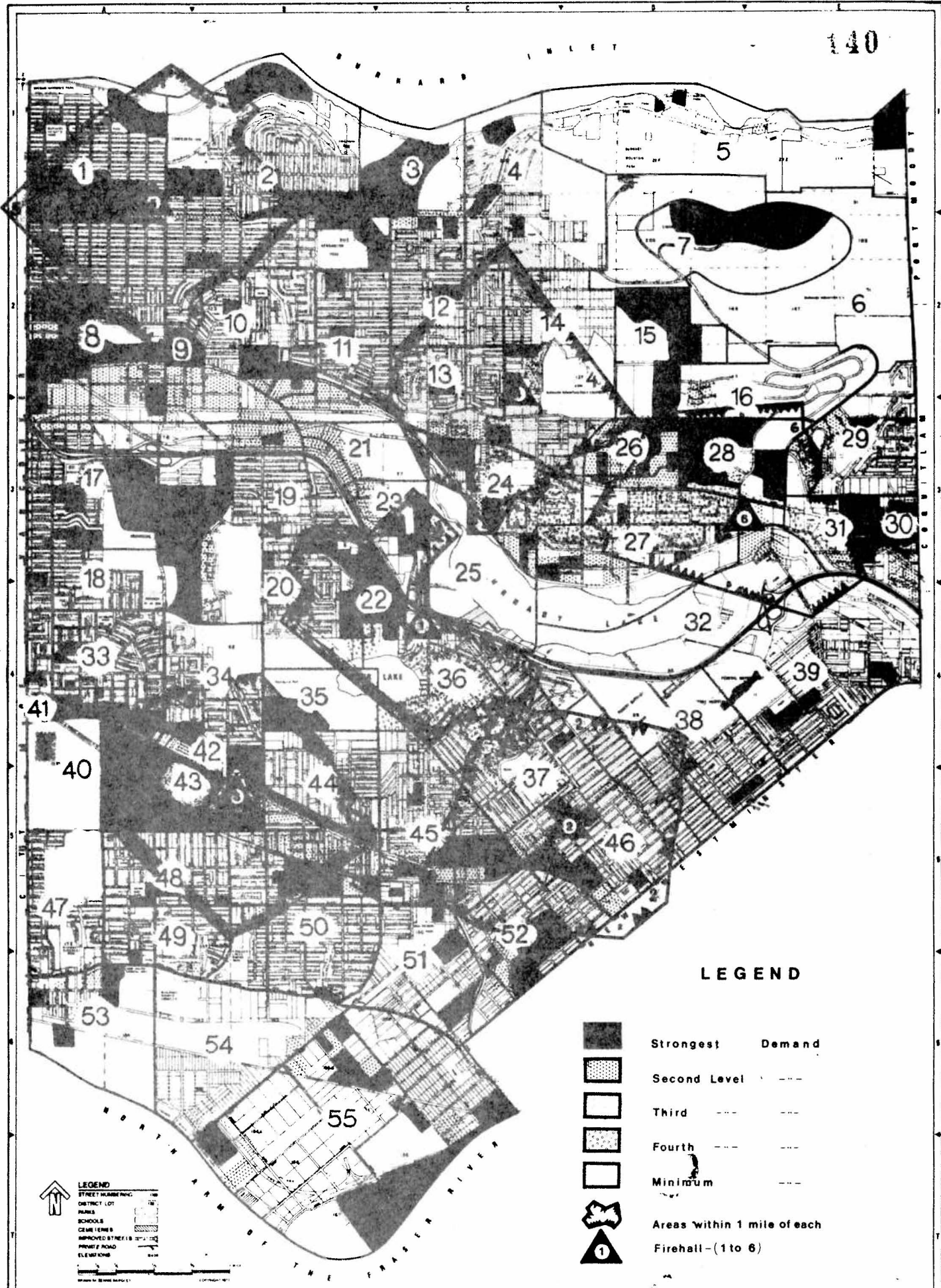
FIRE PREVENTION CONTROL STUDY AND MASTER PLAN - FLOWCHART

- (1) Where "AC" appears in one of the boxes below this means that the advice of the Advisory Committee will be sought at that stage.
 (2) Where "C" appears this means that Council approval will be sought at that stage.



ITEM 8
 MANAGER'S REPORT NO. 17
 COUNCIL MEETING 1980 03 03

ITEM	8
MANAGER'S REPORT NO.	17
COUNCIL MEETING	1980 03 03



LEGEND

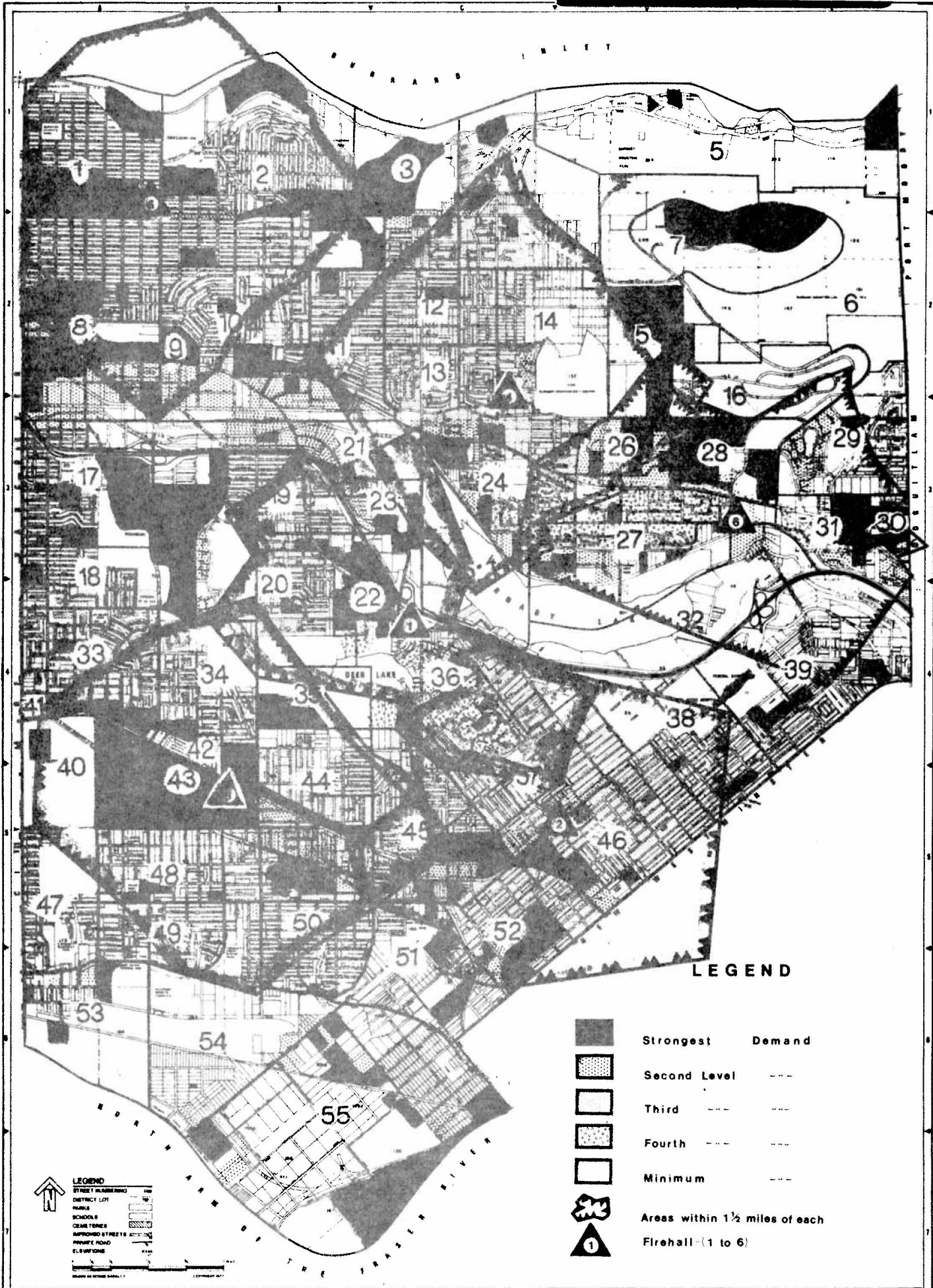
- Strongest Demand
- Second Level Demand
- Third Demand
- Fourth Demand
- Minimum Demand
- Areas within 1 mile of each Firehall - (1 to 6)

LEGEND
 STREET NUMBERING
 DISTRICT LOT
 PARKS
 SCHOOLS
 GAME FIELDS
 IMPROVED STREET LIGHTS
 PRIVATE ROAD
 TELEPHONE

Intensity of Demand for Fire Protection

ITEM 8
 MANAGER'S REPORT NO. 17
 COUNCIL MEETING 1980 03 03

MAP No.2

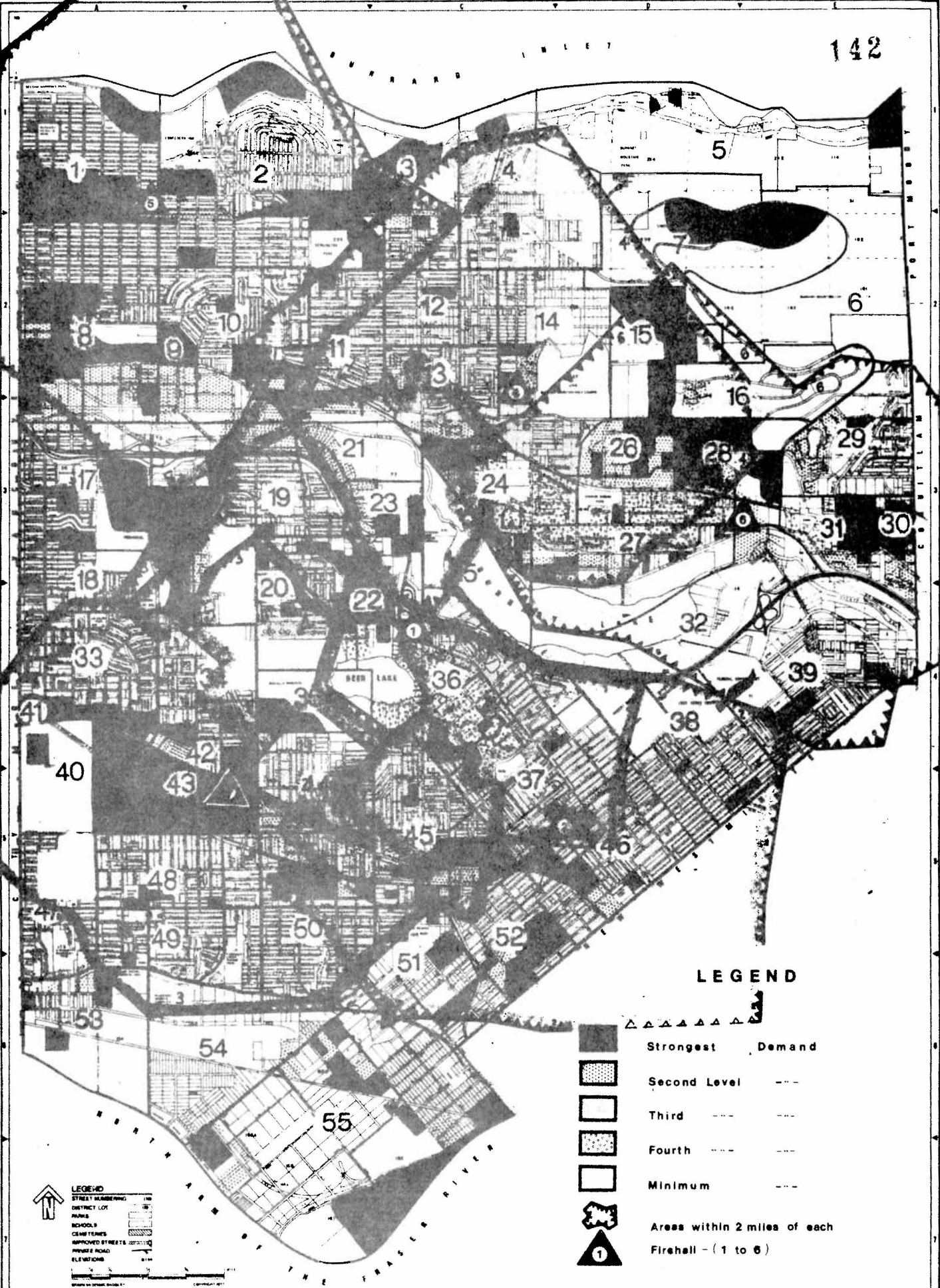


Intensity of Demand for Fire Protection

ITEM	8
MANAGER'S REPORT NO.	17
COUNCIL MEETING	1980 03 03

MAP No. 3

142



Intensity of Demand for Fire Protection

MAP No.4

ITEM	8
MANAGER'S REPORT NO.	17
COUNCIL MEETING	1980 03 03

