I.S.O. CLASSIFICATION RATING AND ITS EFFECT ON INSURANCE PREMIUMS

Strategic Management of Change

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ABSTRACT

The Insurance Services Organization (I.S.O.) fire rating schedule determined, in 1995, that the Town of Chelmsford, Ma. would remain at a fire classification rating of four. The problem that prompted this research project was a suggestion, by a member of the Board of Selectmen, that if the Town of Chelmsford, Ma. improved its I.S.O. rating from a class four to a class three it would not only improve the level of fire protection received, but would also decrease the cost of homeowners' insurance to the residential property owner at little or no cost to the town.

The purpose of this research was to analyze the cost of bringing the Town up to an I.S.O. class rating of three, to evaluate the cost savings to the residential property owner in the way of homeowners insurance and to see if an improved level of fire protection would be realized.

In conducting this research, the historical method was utilized by thoroughly reviewing literature directly related to the subject matter. During this process answers to the following questions were researched:

1. What improvements are needed to bring the Town of Chelmsford's I.S.O. rating from a class four to a class three?
2. What will these improvements cost?
3. Is there a substantial savings to the property owner if the I.S.O. rating is improved?
4. Would the level of fire protection to the tax payer be improved?
5. Is the I.S.O. rating system a proven measure of residential fire

protection capabilities?

The research did show that there was no savings to the property owners in insurance premiums even if the fire classification was improved from a class four to a class three. In addition it was found, that the I.S.O. classification rating system should not be used as the only tool in evaluating a community's fire protection capabilities, because fire prevention activities and life safety concerns were not addressed in the overall classification process.

Although there was no apparent cost savings in improving Chelmsford's fire rating classification, the author will recommend that the town moves forward to improve its I.S.O. rating to a class three because the overall fire protection provided to the community will be improve.

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INTRODUCTION

The problem that prompted this research project was a suggestion, by a member of the Board of Selectmen, that if the Town of Chelmsford, Ma. could improved its Insurance Services Organization (I.S.O.) rating from a class four to a class three it would not only improve the level of fire protection received, but would also decrease the cost of homeowners' insurance to the residential property owners. Furthermore, it was felt that the cost of improving the class rating to a three would be minimal and would save the tax payers "millions of dollars." With this being said, the Town Manager was directed to gather all the necessary background information and to draft a plan for its implementation.

The purpose of this research was to analyze the cost of bringing the town up to an I.S.O. class rating of three, to evaluate the cost savings to the residential property owner in the way of homeowners insurance, and to see if an improved level of fire protection will be realized.

In conducting this research, the historical method was utilized by thoroughly reviewing literature directly related to the subject matter. The following five research questions were posed:

1. What improvements are needed to bring the Town of Chelmsford's I.S.O. rating from a class four to a class three?
2. What will these improvements cost?

3. Is there a substantial savings to the property owner if the I.S.O. rating is improved?

4. Would the level of fire protection to the tax payer be improved?

5. Is the I.S.O. rating system a proven measure of residential fire protection capabilities?

BACKGROUND AND SIGNIFICANCE

The Town of Chelmsford is located in Eastern Massachusetts and was incorporated in 1655. Chelmsford is 24 miles north of Boston and borders the City of Lowell, a densely populated urban city. The town consists of 23.18 sq. miles and has a residential population of 32,383. Residential homes number 11,815 with an assessed value of $1,760,449,200. Commercial and Industrial property are assessed at $356,336,200 (CMPC, 1996)

Housing in town is typical of your Northeastern suburb consisting mostly of single family wood framed homes with a median value of $177,000.00. The break down of single and multi family units are as follows:

Single Unit - 9,377 Units -- 79.4%

2-4 Units - 664 Units -- 5.6%

5 or More Units - 1,437 Units -- 12.2%

Other - 337 Units - 2.9% (CMPC,1996, table 3-2)

The years in which these structures were built are:

1989-March 1990 - 169 Units -- 1.4%

1980-1988 - 2,087 Units -- 17.7%

1970-1979 - 1,612 Units -- 13.6%

1960-1969 - 3,679 Units -- 31.1%

1950-1959 - 1,960 Units -- 16.6%

1940-1949 - 552 Units -- 4.7%

1939 or earlier - 1,753 Units -- 14.8% (CMPC,1996, table 3-3)

In addition to the residential property the Town of Chelmsford has built a substantial commercial/industrial base employing more than 15,000 people. The largest employers in Chelmsford in 1994 included the following establishments:

United Parcel Service 1,600 employees, Town of Chelmsford 878 employees, Hewlett Packard 550 employees, Sun Microsystems 350 employees, Harvard Community Health 320 employees, Comet Products, Inc. 275 employees, Cadence Design Systems 220 employees, Optronics, Inc. 215 employees, Mercury Computer 165 employees, Palm Manor Nursing 160 employees, (CMPC,1996, table 4-1)

FIRE DEPARTMENT

The fire department is a fully paid department consisting of 60 uniformed employees that operate out of five stations. Fire fighters work a 42 hour per week schedule and are divided into four groups. On a normal shift they operate five (5) engines, one (1) ladder and one (1) heavy rescue. The operating budget of the department is 3.2 million dollars.

WATER SUPPLY

The Town's water supply is derived from seventeen (17) underground wells. Pumping stations then fill elevated tanks, which in turn offer a static supply and provide for adequate water pressure. The town's water supply system is operated and maintained by three separated and distinct water districts (Center, East, and North). All three districts operate independent of the local government and receive their operating monies from the water consumers in their district.

FIRE ALARM AND DISPATCH

Dispatch of all fire apparatus is done by civilian Public Safety Operators. Two operators are on duty 24 hours a day and are responsible for receiving and transmitting all fire related alarms. In addition to dispatching 4,500 fire calls, they also handle more than 40,000 police calls. Fire Alarm maintenance and upkeep is provided by uniformed fire fighters.

INSURANCE SERVICE OFFICE (I.S.O.)

The I.S.O. was formed in the early 1970's to consolidate many regional and state insurance rating organizations. The Fire Suppression Rating schedule which they provide grades communities on the basis of their fire defenses. These rating ranges from one to ten with one being the best protection and ten representing no recognized protection. The Fire Suppression Rating schedule is based on three factors and weighted as follows:

Fire Department = 50%

Water Supply = 40%

Fire Alarm Facilities = 10% (Dykstra, 1989, p.14)

The I.S.O. has evaluated and rated the Town of Chelmsford three times since their inception, most recently in 1995. Each time the town was rated a class four. Over the past four years the fire department has experienced a 50 percent cut in the overtime monies used to maintain staffing levels. These cuts have lead to many station and/or company closings. During the I.S.O. reevaluation period, Union leaders and sympathetic politicians told the town's people that the current I.S.O. class rating of four would surely drop because of the closings and cut backs. This in turn would end up costing them more in insurance premiums than they would have spent by keeping up the manning levels. When the class rating stayed at a four the Union leaders and their supporters reported that if the old staffing levels had been maintained, our rating most likely would have improved to a class three and thus saving the taxpayers millions of dollars. Due to this controversy, the Board of Selectmen has requested that the Town Manager devise a plan to raise our I.S.O. rating to realize these savings. Furthermore, they have stated that the cost for this class improvement will most likely be minimal, compared to the savings the residential taxpayer will gain.

This research project is significant to the department because it answers the questions raised regarding the improved fire protection and cost savings from moving the Town's I.S.O. rating from a four to a three. This research paper is also relevant to the E.F.O. course in Strategic Management of Change, Unit 2, The Change Management Model, as it addresses the importance to assess and to analyze a situation to see whether change is needed or not.

LITERATURE REVIEW

The Literature Review began with basic research on the Insurance Service Office (I.S.0.) and its fire rating system. This provided the author with a valuable insight on how and why the rating system is used and what it is comprised of. The author examined various text books along with information provided by the I.S.O. on its web page. In addition, the Resource Learning Center (L.R.C.) provided me with various articles on the subject of fire rating classification. Finally, I was able to obtain the grading schedule done by the I.S.O. in 1995, for the Town of Chelmsford, along with their recommendation for fire rating classification improvements.

In the Fire Suppression Rating Schedule Handbook the author explains the grading system to be one that measures the adequacy of equipment, facilities, personnel, and performance. Classification is based on the current level of fire defenses. Credit is then given for existing fire protection capabilities as opposed to receiving deficiencies for fire protection a community does not have. The evaluation process gives credit in the following three areas:

1.	Fire Department	50 percent
2.	Water Supply	40 percent
3.	Receiving and Handling Fire Alarm (Hickey, 1993)	10 percent

The grading schedule is divided into two sections.

1- Section 1 - The Public Protection Classification number is applicable to the average size building in the city being graded with a maximum needed Fire Flow of 3,500 G.P.M. Fire suppression resource needs

> are determined according to a basic fire flow value that is less than the maximum fire flow needed. Automatic-Aid from surrounding communities can be used under specified conditions to meet a portion of the resources needed for the city being graded.
>
> 2 - Section II - This section is applied individually to each large building with a needed Fire Flow in excess of 3500 G.P.M. to develop an individual Public Protection Classification number that reflects the available water supply for that specific property. The fire risk presented by this class of property does not directly impact on fire insurance premiums for other property owners in the city. Fire apparatus providing outside aid, within 15 miles of the city being graded, may be counted in meeting fire apparatus needs for these properties.(Hickey, 1993, p.9)

Gary Dykstra, a field rating representative from I.S.O., wrote an article in The Minnesota Fire Chief magazine further explaining the I.S.O. rating system. I.S.O. uses a numerical rating system which ranges between 1 and 10. A rating of 1 provides the best fire protection possible and a rating of 10 provides for no fire protection at all. This rating number is then used by the insurance industry to set policy and premium rates. The I.S.O. survey is done at no cost to the community. An I.S.O. survey in a community with a population over 25,000 is conducted on a 10 year cycle and communities under 25,000 are surveyed on a 15 year cycle (Dykstra, 1989).

According to the Fire Suppression Rating Schedule Handbook, the public protection classification number is one guide used to develop insurance premiums for a given municipality and "As a basic principle, the better the community's classification, the lower the insurance premiums" (Hickey, 1993, p.1). The handbook goes on further to describe a village in New York State that improved its Public Protection Class from a 9 to a 7 and realized a savings of $200,000 in annual insurance premiums for the village (Hickey, 1993)

Managing in the Fire Services states that certain public protection classifications are sometimes grouped together. This is based on the fact that once a community reaches a certain level of fire protection the loss experience in residential dwellings does not vary significantly (Bigglestone, 1979). The Fire Chief's Handbook further confirms this and states that once a community reaches a class 4 fire protection rating the insurance premiums for residential dwellings will not change even if the classification improves (Coggan, 1995). In addition to the two referenced sources above, I contacted two local insurance companies in the Chelmsford, Ma. area, Brainerd Insurance Inc. of Billerica, Ma.(G.C. Brainerd, telephone conversation, Oct. 9, 1997) and Talbot Insurance Agency of Chelmsford, Ma. (E.J. Talbot, telephone conversation, Oct. 8, 1997) and priced insurance premiums for an average priced home in Chelmsford. I had them quote me policy prices for a class 4 and a class 3 fire protection rating and found that there was no difference in premium cost between the two. Thus, supporting the statement in Managing the Fire Service and the Fire Chief's Handbook.

According to Managing in the Fire Services, the logic behind grouping classifications is that private residential homes are similar in construction and have similar occupancy hazards. This tends to make a response to a residential fire fairly uniform from community to community once they reach a certain fire protection classification. In addition, water supply needs for a residential fire are limited and benefits in this area are not realized and not needed if the community is rated a class 4 or better (Bigglestone, 1979).

However, Management in the Fire Services and The Fire Chief's Handbook both

point out that a residential homeowner can realize a reduction in their insurance premiums by making fire safety improvements (i.e., a fire alarm and/or sprinkler system) no matter what fire protection classification they fall under.

The grading schedule (according to I.S.O.) is intended to be used for insurance underwriting purposes only and does not measure the efficiency of the Fire Department in a community (Hickey, 1993). Although the rating schedule may assist local government officials in evaluating the service that is provided, any upgrade in fire protection should be based on saving lives and property conservation along with an overall cost-effective analysis not just to lower the classification rating (Bigglestone, 1979). The Fire Schedule Rating System (F.S.R.S.) has many limitations with respect to a community's fire protection and prevention program. Fire prevention activities and life safety concerns are issues that are not addressed in the overall F.S.R.S. process (Hickey, 1993).

In order to review the Town of Chelmsford's new fire protection classification rating, the Town Manager requested "The Classification Details and Improvement Statement" (Appendix A) from I.S.O.. Chelmsford received the same classification rating it had received the previous time, a classification rating of 4. The total fire protection credit given to the Town was a 60.59%. This falls at the low end of the class 4 scale which run from 60.00% to 69.99%. Classifications are broken up as follows:

Class	Percentage
1	90.00 or more
2	80..00 to 89.99
3	70.00 to 79.99
4	**60.00 to 69.99**

5	50.00 to 59.99
6	40.00 to 49.99
7	30.00 to 39.99
8	20.00 to 29.99
9	10.00 to 19.99
10	0.00 to 9.99(Appendix A)

Under the "Improvement Section" of the document 17 statements of improvement were offered: 4 were in the area of receiving and handling alarms, 9 were in the area under the fire department, and 4 were under the water supply section. These statements can be found in Appendix A. The Town of Chelmsford, Ma. would need to improve its I.S.O. rating by 10% (on the rating schedule) to qualify for a class 3 protection rating.

Receiving and handling of alarms received a 6.25% out of a possible 10%. The Fire Department received a 28.98% out of a possible 50% and the water supply received a 27.54% out of a possible 40%.

Many of the items for improvement have already been implemented or could be improved at little or no cost to the Town. They are as follows:

Statement 1, fire calls should immediately be transferred from the Communication Center to the Fire Department. This has been done with a combined Fire/Police Dispatch Center.

Statement 2, both the number to report fires and the fire department business number should be listed under "Fire Department" in the white pages. This can be done a no cost to the Town.

Statement 5, credit for the Engine Companies can be improved by 20% by

incorporating pump test with proper record keeping into the Engines' normal maintenance. This can be done within budget.

Statement 6, credit for the reserve Engine can be improved by incorporating pump test with proper record keeping into the reserve Engine's normal maintenance. This can be done within budget.

Statement 12, pre fire inspections of commercial, industrial and other similar-type buildings should be done twice a year. These inspections are currently being conducted.

Statement 13, records of all training should be kept. A proper record keeping system has been instituted since the survey was done.

These improvements done for little or no cost will raise the Town's classification rating by approximately 4.7%.

The other improvement statements have a substantial cost.

Statement 3, three operators in dispatch are needed. The cost for this improvement is approximately $120,000.00

Statement 4, radio alarm dispatch circuits should be supervised in accordance with NFPA 1221. An exact cost is not available at this time but it is believed to be in excess of $50,000.

Statement 8, 1 fully equipped reserve ladder truck is needed. The department does not have a reserve ladder. A new ladder truck would cost in the range of $500,000.00. A used ladder truck would be somewhat less depending on age and condition. Housing of this truck would also be a problem because of lack of space.

Statement 9, all sections of town should be within 1 ½miles of an adequately-equipped engine company and 2 ½miles of an adequately equipped ladder company. This would mean building additional fire stations at 1 million dollars a piece, purchasing new apparatus (new engines @ $220,000.00 and new ladders @ $500,000.00 each), and hiring additional personnel to man the new apparatus @ $40,000.00 per new fire fighter.

Statement 10, increasing on-duty company personnel by one person will increase the department credit by .20%. To increase this item by 1% (hire 5 fire fighters) it would cost over $200,000.00 at starting fire fighter's rate.

Statement 11, complete facilities should be provided for training. Currently, the department does not have the land available to build a training center, i.e., classroom building, drill tower, fire buildings, flammable liquid pit, etc. The estimated cost for a small training center would exceed $200,000.00.

Water supply issues will not be reviewed or addressed because they are beyond the authors expertise, knowledge and/or control.

PROCEDURES

The research procedures used in preparing this paper consisted of a literature review of historical data. The Learning Resource Center (L.R.C.) at the National Fire Academy was contacted in September of 1997 and asked to search any subject related to the I.S.O. rating system. All subjects searched were post 1990. Many articles located during the search were sent to the author from the L.R.C.

Along with the articles sent from the L.R.C. a list of additional resources available on inter library loan were enclosed. Many of these resources were in my personal library including The Fire Chief's Handbook, Managing the Fire Services, and the Fire Suppression Rating Schedule Handbook. These texts proved to be very valuable in the research. In addition, the author downloaded information about I.S.O., as a company, from their web page @www.iso.com. I was provided with the I.S.O. "Classification Details and Improvement Statements" by the Chelmsford Town Manager. This document was used in assessing our current classification and improvements needed to improve our current rating. Additional data was also collected from the Chelmsford Fire Department training and maintenance records.

The research began with a thorough review of all the literature collected. This was done to help make the author more knowledgeable about a subject on which he was not very familiar. I.S.O.'s role and basis for classification was reviewed along with the procedures and guidelines used in the classification process. Further research was done to see how the classification rating affects the residential homeowners' insurance premiums in Chelmsford.

After this research was completed, the I.S.O. "Classification Details and Improvement Statement" document was analyzed and compared to the current operations of the Chelmsford Fire Department and Public Safety Dispatch Department.

The research and analyses was limited to the Fire Department and Public Safety Dispatch Department due to the lack of knowledge and control the author had over the three Water Districts. Any classification upgrades and/or related cost to the community were based solely on these two departments. Improvements and cost estimates were also based on the author's interpretation of the I.S.O. grading schedule and improvement statements.

RESULTS

1. What improvements are needed to bring the Town of Chelmsford's I.S.O. rating from a class four to a class three?

Chelmsford's current I.S.O. percentage rating is a 60.59 which is within the class 4 rating of 60.00 to 69.99 percent. In order to bring the I.S.O. rating up to a class 3 in would require an improvement of 9.41 percent on the rating scale or an improvement above 70.00 percent (Appendix A)

Improvement statements 1, 2, 5, 6, 12, and 13, found in Appendix A, all can be accomplished with little or no cost to the town.

Statement 1, fire calls should immediately be transferred from the Communication

Center to the Fire Department and Statement 2, both the number to report fires and the fire department business number should be listed under "Fire Department" in the white pages will provide a gain of .5 percent.

Statement 5, credit for the Engine Companies can be improved by 20 percent by incorporating pump test with proper record keeping into the Engines' normal maintenance. This will provide a gain of 2.0 percent.

Statement 6, credit for the reserve Engine can be improved by incorporating a pump test with proper record keeping into the reserve Engine's normal maintenance. This will provide a gain of .2 percent.

Statement 12, conducting pre fire inspections of commercial, industrial and other similar-type buildings twice a year and Statement 13, keeping proper training records will provide a gain of 2.0 percent.

These improvements would raise the classification scale by 4.7 percent. This is approximately half of the needed increase towards a class 3 rating.

All other improvements can only be accomplished at a considerable cost to the Town. Statements 8, 9, and 10 which relate to hiring more fire fighters, building new fire stations and purchasing an additional ladder truck have been viewed by the author to be cost prohibited. Statements 3, 4, and 11 are the least expensive of the cost items and will give the town the additional percentage points needed to improve the rating to a class 3.

Statement 3, increase to three operators in the dispatch center will cost approximately $120,000.00, annually, this is based on hiring 4 dispatchers at $30,000.00 a

person. This will provide a gain of 1.0 percent.

Statement 4, supervising the radio alarm dispatch circuits in accordance with NFPA 1221 will cost the town around $50,000.00 and provide for a 2.0 percent gain.

Statement 11, building a training facility will require the purchase of two acres of land and the construction of a classroom building, a drill tower, fire buildings, flammable liquid pit, etc. The estimated cost for a modest training facility will exceed $200,000.00. This will provide a gain of 3.3 percent.

The improvements in statements 3, 4, and 11 would raise the classification scale by 5.3 percent. Collectively, all the improvements stated above would raise the classification rating of the Town of Chelmsford by 10 percent, accomplishing the goal of attaining a class three classification.

2. What will these improvements cost?

The total cost for these improvements will be approximately $370,000.00. As noted above, statements 1, 2, 5, 6, 12, and 13 can be done at no cost. Statements 3, 4, and 11 will cost $120,000.00, $50,000.00 and $200,000.00 respectively.

3. Is there a substantial savings to the property owner if the I.S.O. rating is improved?

The research has shown that there is no savings to the property owners in the Town of Chelmsford if the fire classification is improved. According to Managing in the Fire Services certain public protection classifications are sometimes grouped together. This is based on the fact that once a community reaches a certain level of fire protection the loss

experience in residential dwellings does not vary significantly (Bigglestone, 1979). The Fire Chief's Handbook further states that once a community reaches a class 4 fire protection rating the insurance premiums for residential dwellings do not change even if the classification improves (Coggan, 1995). In addition, the two local insurance companies in the Chelmsford, Ma. area I contacted, Brainerd Insurance Inc. of Billerica, Ma. and Talbot Insurance Agency of Chelmsford, Ma., stated that a home owners insurance policy in Chelmsford for a class four and a class three was identical in cost.

4. Would the level of fire protection to the tax payer be improved?

Although I.S.O. is clear to state that the fire rating schedule is intended to be used only for insurance underwriting purposes and not to measure the efficiency of the Fire Department in a community, improvements conducive to the ones noted above should have a positive effect on the Town's fire protection (Dykstra, 1989). For example, conducting annual pump tests and keeping proper records will help to ensure that an engine will pump properly at a fire scene when needed; by improving fire fighter training and building a training facility in which to train will improve operations on the fire ground; and having a properly manned dispatch center along with proper equipment to receive and transmit alarms is a valuable asset to the town and should improve the level of fire protection to the taxpayers.

5. Is the I.S.O. rating system a proven measure of residential fire protection capabilities?

The rating schedule may assist local government officials in evaluating the service that

they receive, but fire protection capabilities need to be based on the departments ability of saving lives and overall property conservation, not just the I.S.O. rating system (Bigglestone, 1979). In addition, the Fire Schedule Rating System (F.S.R.S.) has many limitations with respect to a community's fire protection and prevention programs. Fire prevention activities and life safety concerns are issues that are not addressed in the overall F.S.R.P. process and are a major part of the community's fire protection system (Hickey, 1993).

DISCUSSION

The results of the study were somewhat of a surprise to the author. I was always under the impression that if a community lowered its I.S.O. rating that its insurance rates and premiums would be decreased accordingly. In the research done on the community in which I live and work, Chelmsford, Ma., this has proved not to be the case. I must say that I was not alone in this belief. Of course the member of the Board of Selectmen that requested the study thought rates would go down, but to my surprise both insurance agencies, I contacted, were of the same belief. They honestly had no idea that the rates did not differ until they plugged the request into their computer system.

Information on this fact was very consistent through out the research. Both Managing in the Fire service and The Fire Chiefs' Handbook both conferred that once a community reaches a certain level of fire protection the fire classification does not effect

insurance premiums and policy rates.

The study proved to be very worth while for my organization. As chief of the department I found that many of the no cost items in the improvement statements, once implemented, will greatly improve the overall fire protection in the community. As a matter of fact many of these issues have already been addresses and implemented, i.e. pump testing, training and record keeping improvements, receiving emergency calls and pre fire inspections. Many of the cost items will be reviewed and put into the department's long range plan. The town is currently in the planning phase of revamping the entire dispatch system, including staffing and equipment issues. The research will allow me to lobby for improvements to meet the staffing and equipment needs required by the I.S.O.

RECOMMENDATIONS

Although there is no apparent cost savings in improving Chelmsford's fire rating classification, I do feel that the improvements that have be suggested in this research paper will help to increase the overall fire protection provided to the community. To this end, I will recommend that the town moves forward to improve its I.S.O. rating up to a class three.

In order to improve the Town's I.S.O. rating from a class 4 to a class 3 it will cost the town approximately $370,000.00 in year one and a minimum of $120,000.00 every year thereafter. Because of the capital outlay requirement for the training facility and the dispatch center equipment improvement needs, I will submit a request to the Capital Planning

Committee for the approval of these needed funds and push for the inclusion of these issues in the communities long range plan. The $120,000.00 cost for the additional dispatch personnel will be requested of the Town Manager along with a plan for their utilization.

The cost savings to the homeowner by the way of reduced insurance premium and policy cost is nonexistent in a classification improvement from a class four to a class three. Insurance savings to rate payers can still be realized by the homeowner if the individual chooses to install fire alarm and suppression systems in their own homes. The Chelmsford Fire Department will develop a document explaining how a homeowner can have these systems installed in their homes, along with an approximate cost and estimated saving on their insurance premiums. This information will give the residential homeowner an avenue to decrease their insurance rates if they choose to do so.

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APPENDIX A

INSURANCE SERVICES OFFICE, INC.

639 GRANITE STREET SUITE 2C BRAINTREE, MA 02184-5366 (617) 843-8400 FAX: (617) 356-1441

November 26, 1997

Bernard F. Lynch, Town Manager
Town Offices
50 Billerica Rd
Chelmsford, Ma 01824-2777

Dear Mr. Lynch,

We are enclosing Classification Details and Improvement Statements in response to your recent request. These details and statements cover the items which are reviewed in our Fire Suppression Rating Schedule, and which are of importance in determining your fire insurance classification.

These Classification Details and Improvement Statements were developed using the information obtained during our 1994 survey and consider that conditions in your town remain the same. They refer only to the fire insurance classification of your town which may be used in the calculation of property insurance premiums and are not for property loss prevention or life safety purposes.

The town classification applies to properties with a needed fire flow of 3500 gpm or less. The private and public protection at properties with larger needed fire flows are individually evaluated, and may vary from the classification.

Please contact us if you have any questions concerning the enclosed material

Very truly yours,

Peter Elias
Public Protection Department

enclosures

CLASSIFICATION DETAILS

Municipal: Chelmsford	State: Ma	Population: 32000 +
Date Surveyed: 1/95	Total Credit: 60.59	Class: 4

RECEIVING AND HANDLING FIRE ALARMS

This section of the Fire Suppression Rating Schedule reviews the facilities provided for the general public to report fires, and for the operator on duty at the communication center to dispatch fire department companies to the fires.

	CREDIT ACTUAL	CREDIT MAXIMUM
(Item 414) Credit For Telephone Service		
This is item reviews the facilities provided for the public to report fires, including the listing of fire and business numbers in the telephone directory.	1.50	
2. (Item 422) Credit For Operators		
This item reviews the number of operators on-duty at the communication center to handle fire calls.	2.00	
3. (Item 432) Credit For Dispatch Circuits		
This item reviews the dispatch circuit facilities used to transmit alarms to fire department members.	2.75	
4. (Item 440) Total Credit for Receiving and Handling Fire Alarms	6.25	10.00

FIRE DEPARTMENT

This section of the Fire Suppression Rating Schedule reviews the engine and ladder-service companies, equipment carried, response to fires, training and available fire fighters.

	CREDIT	
	ACTUAL	MAXIMUM
(Item 513) Credit For Engine Companies		
This item reviews the number of engine companies and the hose and equipment carried.	6.83	10.00
2. (Item 523) Credit For Reserve Pumpers		
This item reviews the number of reserve Pumpers their pump capacity and the hose and equipment carried on each.	0.70	1.00
3. (Item 532) Credit For Pump Capacity		
This item reviews the total available pump capacity.	5.00	5.00

CLASSIFICATION DETAILS

FIRE DEPARTMENT
(CONTINUED)

	CREDIT ACTUAL	CREDIT MAXIMUM
4. (Item 549) Credit For Ladder Service		
This item reviews the number of ladder and service companies and the equipment carried.	4.87	5.00
5. (Item 553) Credit For Reserve Ladder Service		
This item reviews the number of reserve ladder and service trucks, and the equipment carried.	0.24	1.00
6. (Item 561) Credit For Distribution		
This item reviews the percent of the built-upon area of the city which has an adequately-equipped, responding first-due engine company within 1 1/2 miles and an adequately-equipped, responding ladder-service company within 2 1/2 miles.	2.64	4.00
7. (Item 571) Credit For Company Personnel		
This item reviews the average number of equivalent fire fighters and company officers on duty with existing companies.	5.74	15.00+
8. (Item 581) Credit For Training		
This item reviews the training facilities and their use.	2.96	9.00
9. (Item 590) Total Credit For Fire Department	28.98	50.00+

+This indicates that credit for manning is open-ended, with no maximum credit for this item.

WATER SUPPLY

	CREDIT ACTUAL	CREDIT MAXIMUM
1. (Item 616) Credit For the Water System		
This item reviews the supply works, the main capacity and hydrant distribution.	24.10	
2. (Item 621) Credit For Hydrants		
This item reviews the type of hydrants, and method of installation.	1.98	
3. (Item 631 Credit For Inspection and Condition of Hydrants		
This item reviews the frequency of inspections of hydrants and their condition.	1.46	3.00
4 (Item 640) Total Credit For Water Supply	27.54	

CLASSIFICATION DETAILS

Municipality: Chelmsford State: Mass Population: 32000 +

Date Surveyed: 1/95 Total Credit: 60.59 Class: 4

SUMMARY OF CREDIT

FEATURE	ASSIGNED	MAXIMUM CREDIT
Receiving and Handling Fire Alarms	6.25%	10.0%
Fire Department	28.98	50.00
Water Supply	27.54	40.00
*Divergence	-2.18%	
Total:	60.59	100.00

The Public Protection Class is based on the total percentage credit as follows:

Class	%
1	90.00 or more
2	80.00 to 89.99
3	70.00 to 79.99
4	60.00 to 69.99
5	50.00 to 59.99
6	40.00 to 49.99
	30.00 to 39.99
8	20.00 to 29.99
9	10.00 to 19.99

*Divergence is a reduction in credit to reflect a difference in the relative credits for Fire Department and Water Supply.

The above classification has been developed for use in property insurance premium calculations only.

FIRE INSURANCE CLASSIFICATION

IMPROVEMENT STATEMENTS
FOR

CHELMSFORD, MA

PREPARED BY
INSURANCE SERVICE OFFICE, INC
639 GRANITE ST
SUITE 2C
BRAINTREE, MA 02184

DATE PREPARED BY: 11/97

The following statements are based on upon the criteria contained in our Fire Suppression Rating Schedule and upon conditions in Chelmsford on 1/95.

They indicate the performance needed to receive full credit for the specific item in the Schedule, and the quantity, you have provided. Partial improvement will result in receiving a partial increase in the credit.

These statements relate only to the fire insurance classification of your town which may be used in the calculation of property insurance premiums. They are not for property loss prevention or life safety purposes and no life safety or property loss prevention recommendations are made..

RECEIVING AND HANDLING FIRE ALARMS

Credit For Telephone Service (Item 414).

Statement 1:
For maximum credit in the Schedule, fire calls should be immediately transferred from the Communication Center to the Fire Department.

Statement 2:
For maximum credit in the Schedule, both the number to report a fire and the fire department business number should be listed under "Fire Department" in the white pages directory. Your fire number is listed and your business number is not listed under "Fire Department".

Credit For Operators (Item 422)

Statement 3:
For maximum credit in the Schedule, 3 operators are needed on duty at all times. You have 2 operators on duty.

Credit For Dispatch Circuits (Item 432)

Statement 4:
For maximum credit in the Schedule, the radio alarm dispatch circuit should be supervised in accordance with National Fire Protection Association Standard, 1221.

FIRE DEPARTMENT

Credit For Engine Companies (Item 513)

Statement 5:
For maximum credit in the Schedule, 3 engine companies are needed in your town. These are calculated as follows:

3 for the Basic Fire Flow of 3500 gpm.

You have 4 engine companies in service. These are calculated as follows:

74 percent for Engine 2 because of insufficient equipment & pumper tests.
72 percent for Engine 3 because of insufficient equipment & pumper tests.
56 percent for Engine 4 because of insufficient equipment & pumper tests.
71 percent for Engine 5 because of insufficient equipment & pumper tests.

Credit For Reserve Pumpers (Item 523)

Statement 6:
For maximum credit in the Schedule, 1 fully-equipped reserve pumper is needed. You have 1 reserve pumper. This is calculated as 79 percent for Pumper 1 because of insufficient equipment & pumper tests.

Credit For Ladder Service (Item 549)

Statement 7:
You have 1 ladder company. These are calculated as follows:

88 percent for Ladder 1 because of insufficient equipment
24 percent for Rescue 1 because of insufficient equipment

Credit for Reserve Ladder Service (Item 553)

Statement 8:
For maximum credit in the Schedule, 1 full-equipped reserve ladder truck is needed. You have 1 reserve service truck. This is calculated as follows:

24 percent for Truck Rescue 1 because of insufficient equipment & insufficient aerial ladder

Credit For Distribution (Item 561)

Statement 9:
For maximum credit in the Schedule, all sections of the town with hydrant protection should be within 1 1/2 miles of an adequately-equipped engine company and 2 1/2 miles of an adequately-equipped ladder company. The distance to be measured along all-weather roads.

Credit For Company Personnel (Item 571)

Statement 10:
An increase in the on-duty company personnel by one person will increase the fire department credit by .20%.

Credit For Training (Item 581)

Statement 11:
For maximum credit in the Schedule, complete facilities should be provided for training and the training program should be improved. You received .33 percent credit for the current training program and the use of facilities.

Statement 12:
For maximum credit in the Schedule, pre-fire planning inspections of each commercial, industrial institutional and other similar-type building should be made twice a year by company members. Records of the inspections should include complete and up-to-date notes and sketches.

Statement 13:
For maximum credit in the Schedule, records should be kept of all training.

WATER SUPPLY

Credit For The Water System (Item 616)

Statement 14:
For maximum credit in the Schedule, the needed fire flows should be available at each location in the town. Needed fire flows of 2500 gpm and less should be available for 2 hours, 3000 and 3500 gpm for 3 hours and all others for 4 hours. See the attached table for an evaluation of fire flow tests made at representative locations in your town.

Statement 15:
All AWWA standard hydrants within 1000 feet of a building, measured as hose can be laid by apparatus, are credited; 1000 gpm for hydrants within 300 feet; 670 gpm for 301 to 600 feet; and 250 gpm for 601 to 1000 feet. Credit is reduced when hydrants lack a pumper outlet, and is further reduced when they only have a single 2 1/2-inch outlet.

Credit For Hydrants (Item 621)

Statement 16:
For maximum credit in the Schedule, all hydrants should have a pumper outlet, 6-inch or larger branch connection, uniform size operating nut and should operate in a uniform direction.

Credit For Inspection and Condition of Hydrants (Item 631

Statement 17:
For maximum credit in the Schedule, all hydrants should be inspected twice a year, the inspection should include operation and a test at domestic pressure. Records should be kept of the inspections. Hydrants should be conspicuous, well located for use by a pumper, and in good condition.

FIRE FLOW TESTS

CHELMSFORD, MA

TESTS MADE ON 1/95

TEST NO.	NEEDED FIRE FLOW *, GPM	LIMITED BY SUPPLY WORKS	LIMITED BY DISTRIBUTION MAINS	LIMITED BY HYDRANT SPACING
2	3000		500	
3	750			560
6	3500			1160
7	3000		750	
8	750			580
10	1750			1120
12	2250			1220
13	2250			1380
15	750			670
16	3000			920
17	750			650
18	750			340
19	2250			640
20	750			290
21	2250			1000
22	3500			1740
23	3000			960
24	2500			1320
25	2250		800	
26	3000		1000	
27	2250			760
28	3000			1000
29	2250			380
30	1750		250	

*Needed fire flows exceeding 3500 gpm are not considered in determining the classification of the municipality.

ISO COMMERCIAL RISK SERVICES, INC.

HYDRANT FLOW DATA SUMMARY

CITY: Chelmsford STATE: MA ZIP: WITNESSED BY: DK DATE: 11/8 & 9/94

Test No.	Type Dist. *	Test Location	Service	Flow-GPM Individual Hydrants	Flow-GPM Total	Pressure PSI Static	Pressure PSI Resid.	Flow At 20 PSI Needed	Flow At 20 PSI Avail	Remarks
		Central Chelmsford Water District								
1	comm	Boston & Mill	ls	1520	1520	90	90	2250	adequate	
2	comm/res	Boston & Cambridge	ls	760	760	40	0	3000/750	500	
3	res	Concord & Tuttle	ls	560	560	60	30	750	650	
4	comm	Mill & Turnpike	ls					4500/2520	adequate	A
5	comm	Alpha & Stuart	ls	1340	1340	78	62	6000/	2700	
6	comm	Central Square	ls	1160	1160	86	77	3500	3400	
7	comm	Littleton & Garrison	hs	750	750	69	40	3000	750	
8	res	Pike Hill & Westford	hs	580	580	87	72	750	1100	
9	res	Chestnut Hill & Galloway	hs	945	945	52	48	750	2900	
10	comm	Dalton & Glen	ls	1120	1120	85	25	1750	1200	
11	res	North & Erlin	ls	1160	1160	75	32	750	1300	
12	comm	North @ Jr. High School	hs	1220	1220	90	40	5000/2250	1500	B
13	comm	Davis @ High School	hs	1380	1380	94	87	4000/2250	4900	B
14	res	School & Old Westford	hs	910	910	78	78	750	adequate	
15	comm/res	Graniteville & Princess	hs	670	670	104	97	4000/750	2600	
16	comm	Main & School	hs	920	920	104	61	3000	1300	
17	res	Acton & Burning Tree	ls	650	650	92	75	750	1400	

18	res	Protector & Park	ls	340	340	68	50	750	600	
19	comm	Maple @ Byam School	ls	640	640	78	31	2250	700	
20	res	Sleigh & Surrey	ls	290	290	63	30	750	350	
		East Chelmsford Water District								
21	comm	Carlisle & Marshall	ms	1000	1000	42	35	2250	1900	
22	comm	Billerica & Mill	ms	1740	1740	82	60	3500	3000	
23	comm	Billerica & Scientia	ms	960	960	85	40	3000	1200	
24	comm	Billerica & Apollo	ms	1320	1320	88	65	2500	2400	
		North Chelmsford Water District								
25	comm	Btwn High & Jr. High School	ms	820	820	63	18	5000/ 2250	800	B
26	comm	Parkhurst & Court House	ms	1000	1000	55	20	5000/ 3000	1000	
27	comm/ res	Princeton & Amhurst	ms	760	760	64	42	2250/ 750	1100	
28	comm	Tyngsboro & Wotton	ms	1000	1000	62	59	3000	4200	
29	comm	Tyngsboro & Wood	ms	380	380	64	43	2250	550	
30	comm	Groton & Ward Way	ms	340	340	40	10	1750	250	

A Denotes area served by a 12" main in the vacinity of a 4.0 mg storage tank.

B Denotes hydrant protection provided from 2 sprinkler water districts.

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR PROPERTY INSURANCE PREMIUM CALCULATIONS ONLY AND ARE NOT INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION. THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

Comm = Commercial; Res = Residential.
Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are not considered in determining the classification of the city when using the Fire Suppression Rating Schedule.