The Residential Fire Problem In the United States and its Effect on the Economy

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INTRODUCTION

In the United States of America, one of the most technologically advanced countries on the planet, it seems strange that we should have the worst fire loss record of all the major industrial countries. While our fire losses have declined over the past 15 years our numbers are still high for a major industrial power. Our property losses are nearly 10 billion dollars a year. Our loss of life due to fire still hovers between four and five thousand per year and the civilian injury rate is approximately 30,000 per year. Add on to this the injury rate of fire suppression personnel, and the number is in excess of 100,000 injuries per year due to fire.

Our greatest loss of life and property is in fires that occur in residential settings. Again it seems strange that the area where we have the greatest loss is the areas where we have the least amount of control in preventing the loss. From a statistical standpoint the numbers have remained somewhat constant over the past 10 years. Why is this happening? What is it that allows a technologically advanced country to have such a poor fire loss record?

In this paper I will look at the fire loss problem as it pertains to residential fire loss. I will compare our record with other countries and provide some reasons why our record is so poor. I will also show two different approaches to controlling this problem. The first will be from the private sector or the market and the other from government or non-market. I will also show what has worked and what has failed in both areas.

THE FIRE PROBLEM

In order to understand the impact of fire loss in the United States of America, it is necessary to compare our record with that of other similar, industrial countries. After comparing our record with the other industrial nations I will show the overall fire problem in the United States and then the problem as it pertains to residential structures.

The International View

In data collected up to 1981 fire incidents per million population were the highest when compared to other industrial nations in Europe and Asia. Except for Canada, the United States was almost double the amount of fire deaths and structural fire incidents **(Schaenmann, 1982:11)**. **(see figures 1 & 2)**

In technology the United States has an edge over the other countries to which it was compared. In the United States over 60 percent of residences use smoke detectors. This is in comparison to Europe where smoke detectors are found in only one to five percent of the residences. The study also found that automatic sprinklers and residential sprinkler systems are more common in the United States than in Europe **(Schaenmann, 1982:13)**.

It seems that in Europe and Asia there is more government intervention than in the United States. Because of this, concepts and ideas that work over there may not be as welcomed over here where strong government intervention is frowned upon. Some of the areas where other countries have had success are:

- Public Attitudes and Public Education

  Fire safety education in Europe is an important part of family learning as well as being stressed in the public schools.
- Construction and Code Enforcement

  There is more public support for stronger building codes in European countries, also fire and building departments have more authority in interpreting codes. Extensive plan review for new and existing structures are required in many European countries.
- Insurance

  If building plans are not approved, insurance can be denied.
- Consumer Products Safety

  In certain European countries products cannot be sold unless they have been tested and approved by the government.**(Schaenmann, 1982:1-3)**

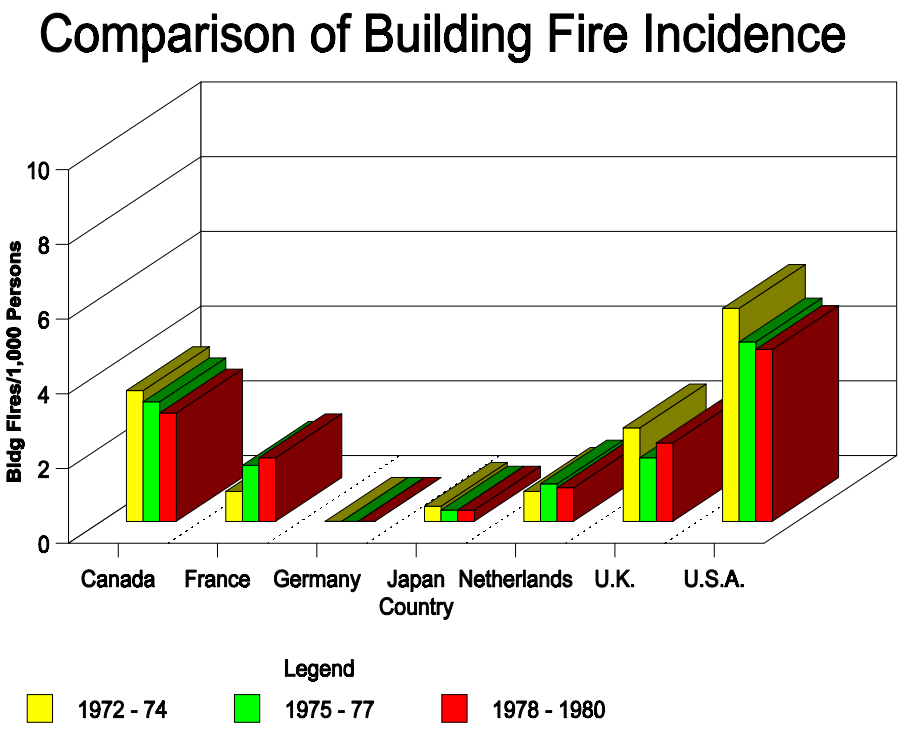

Figure 1 Comparison of U.S. and other countries in amount of building fires
Ref: Schaenmann, 1982

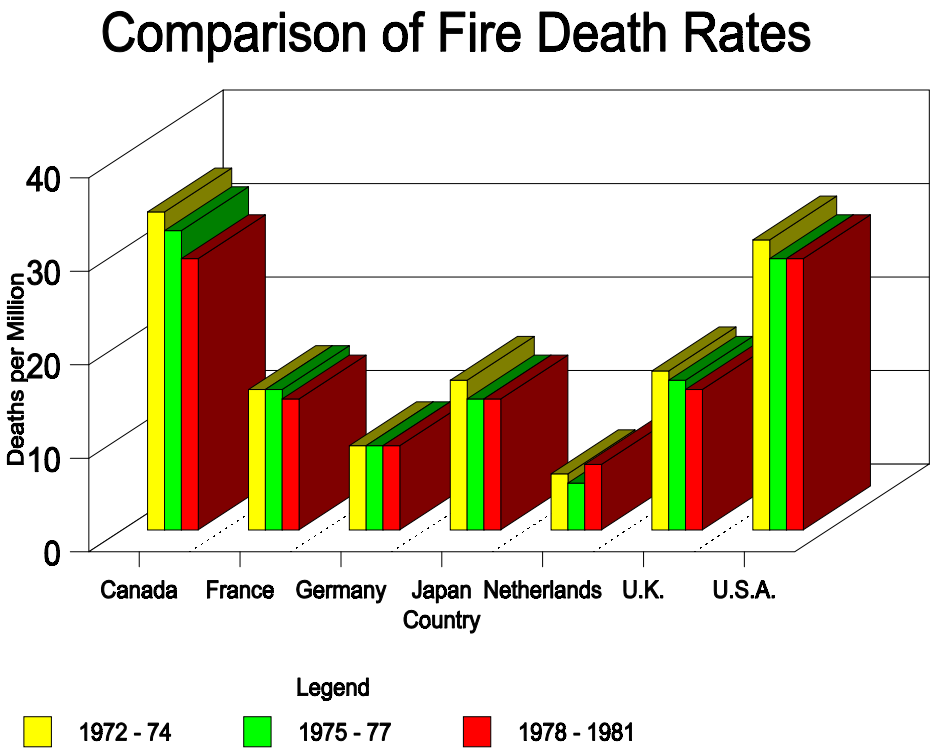

Figure 2 Comparison of U.S. and other countries in fire death incidents **Ref: Schaenmann, 1982**

The National Fire Loss Problem

Over the past ten years the fire loss in the United States has continued to decline somewhat, but it is still very high as compared to other countries.

The number of fires responded to has remained relatively constant during the past 5 years. In 1990 total fires responded to by fire departments in the United States was approximately 2.01 million**(Karter, 1991:37)**. In 1994 total fires responded to by fire departments in the United States was approximately 2.05 million**(Karter, 1995:93)**.

The dollar loss from fires has continued to increase from 7.8 billion in 1990 to 8.1 billion in 1994. The loss from fires in structures has been relatively constant at about 85 percent. In 1990 the losses were 6.713 billion dollars or 86 percent of the total dollar loss and in 1994 the losses were 6.867 billion dollars or 84 percent of the total dollar loss. **(See Figure 3)**

[Note: These figures denote direct fire loss which is defined as value in dollars of the property destroyed by fire, heat, smoke.](Ulrich, 1979:7)

Loss of life and injuries has declined overall since 1990 but from a statistical standpoint it still remains somewhat constant. In 1990 the fire deaths were 5,195 and in 1994 they had dropped to 4,275.

A major concern has been the loss due to arson or incendiary fires. Over the past five years the percentage of fires attributed to arson has remained constant at approximately 20 to 30 percent. The number of structure fires attributed to arson has decreased from 97,000 or 14.7 percent in 1990 to 86,000 or 14 percent in 1994. The percentage seem to remain constant at about 15 percent over the five year period. Fire deaths due to arson have remained around 13 percent of all fire deaths. In 1990 there were 715 deaths or 13 percent due to arson and in 1994 there were 550 fire deaths or 13 percent due to arson. Dollar losses involving structural fires have ranged from 1.394 billion or 20.8 percent in 1990 to 2.351 billion or 21.1 percent in 1994 **(Karter, 1991:37, 1995:93). (See Figure 4)**

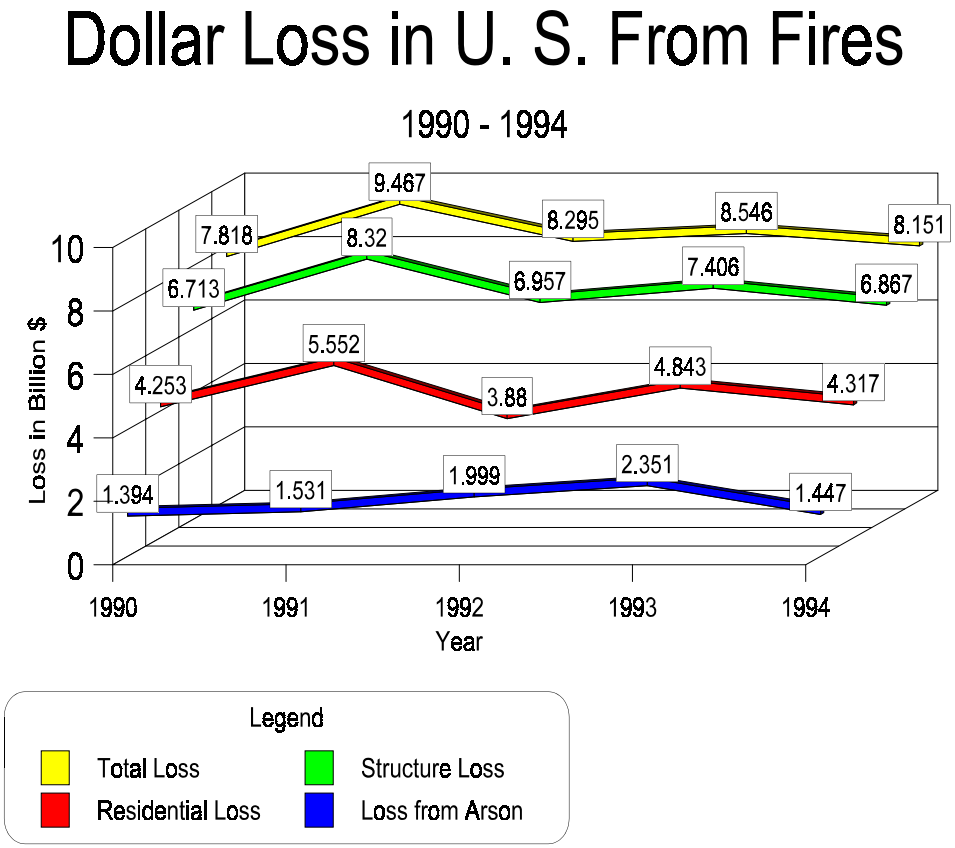

Figure 3 Dollar Loss in United States from Fire - 1990 to 1994 **Ref: Karter, 1991-1995**

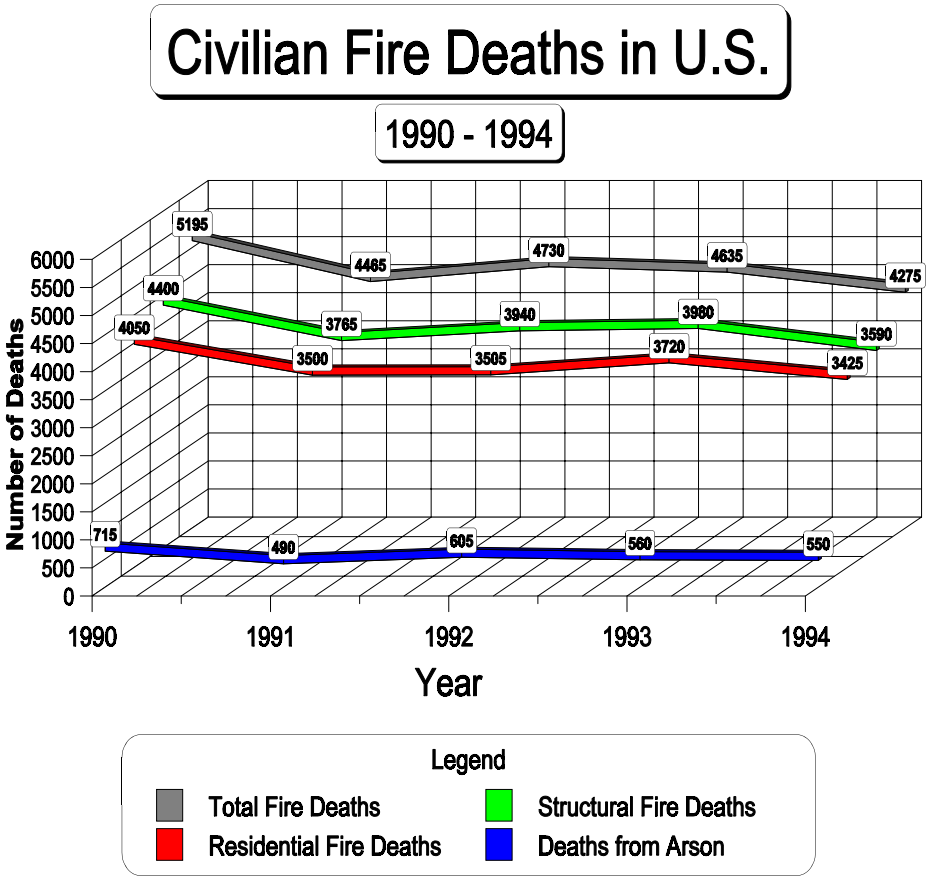

Figure 4 Fire Deaths in United States - 1990 to 1994 **Ref: Karter, 1991-1995**

The Residential Fire Problem In the United States of America

Over the past ten years the majority of dollar loss and life loss due to fires occurred in residential occupancies. This includes single- and two-family dwellings, apartments, and condos/townhouses. From 1990 to 1994 the percentage of residential fires has stayed at approximately 60 percent for dollar loss and 80 percent for life loss. In 1990 of the 6.713 billion dollars that were lost as a result of structure fires, 4.25 billion dollars a result of fires in residential structures. In 1994 the amount lost to structure fires increased to 6.867 billion. Of this 4.31 billion was a result of residential structure fires **(Karter, 1995:93).**

While the loss of life has decreased from 1990 to 1994 the percentage of people killed in residential fires has remained the same, at approximately 80 percent. In 1990 the total number of people killed in residential fires was 4,050 or 78 percent of the total. In 1994 the total killed in residential fires was 3,424 or 80 percent of the total **(Karter, 1995:93)**.

The Effects of Poverty on the Fire Problem

A growing problem that has been studied is the relationship of poverty and fire loss. During the late 1970s and early 1980s studies relating to fire problems in urban and rural areas showed there was a direct relationship between fire loss and the rate of poverty in that area or jurisdiction**(Fahy & Norton, 1989:30-31)**.

The urban study examined fire rates in the following cities: Syracuse, NY; Newark, New Jersey; Phoenix, AZ; Toledo, OH; and Kansas City, MO. Areas where a correlation was found were poverty and family stability and housing characteristics. In this study and other ones, it could be determined that there was a distinct variation between poverty and fire rates. In the studies the three factors that related to fire rates were: poverty level; undereducation; and parental presence.

Studies of rural communities found similar problems. The rural study covered Alabama, Arizona, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, West Virginia, and Virginia. These states were chosen because the poverty rate was in excess of 15.5 percent of the population of the state. The studies showed a distinct relation between fire loss and poverty.

The problems found in rural residential fires were heating (41.8%); smoking (19.6%); cooking (12.8%); and electrical distribution (8.6%). The reason for the high fire loss due to heating was the number of fires in solid-fueled heating equipment (wood burning stoves). The causes were usually poor condition of the equipment and failure to follow manufacturers instructions on installation and operation **(Fahy & Norton, 1989:32-33)**.

The studies of urban and rural areas showed differences in the causes of fires in poverty stricken areas. In urban areas the major cause is arson or incendiary fires or fires set by unsupervised children. In rural areas the major cause was heating related.

Another facet of the study showed the increasing number of children among the poor. In the past the elderly were the majority, but recently there has been a dramatic increase in the number of children. From a fire safety point of view this is a major concern. Statistics show that the two age groups that have the highest fatality rate are children under age 5 and adults over age 65 **(Fahy & Norton, 1989:33-34)**.

One of the reasons for the high rate of fire loss among the poverty class can be traced to diminished financial resources. When funds are limited and choices need to be made between basic health care and fire safety, the health care usually wins. This can be attributed to peoples belief that they will have a greater chance of getting sick than having an fire. Also fires happen to the other person and not them. Because of limited financial resources the poverty class are unable to afford smoke detectors, fire safe clothing, bedding and furniture. Other problems among the poverty class are the need for additional security. In high-crime areas the need for the added security of extra locks and nailing shut windows severely compromises safe routes of egress from the home. This constant stress of living in poverty also increases the risk of juvenile fire setting. This is a problem that has increased dramatically over the past ten years. The lack of education is another factor in the high fire rates among the poverty class. Because of limited education these people fail to understand the fire safety messages that are provided concerning smoke detectors, escape plans, emergency notification and safer heating systems **(Fahy & Norton, 1989:34-36)**.

Fire Problem Summary

The United States has the poorest fire loss record of most industrial nations. Part of this is our approach to fire protection and part is apathy on the part of the public in general towards the fire problem. The United States fire loss has diminished over the past ten years but is still very high. The highest fire loss both in property and life is in residential fires, which account for 60 percent of property loss and 80 percent of life loss. One major area of concern is the relation between high fire loss and poverty.

THE MARKET APPROACH TO THE FIRE PROBLEM

Historically the most common approach to controlling the fire problem in the United States has been either increasing the fire suppression forces or attempting to control the situation by way of regulations. While both have had some success, overall they have been very costly to the consumer in ways such as higher taxes and increased business costs that are passed on to the customer. It has been suggested that a market driven approach be used. The Council of Economic Advisors believes that market driven methods can create incentives for the insured to provide a safe environment. This is contrary to the approach by government which is to enact regulations to bring about compliance **(Hemenway, 1987:415)**. This approach is somewhat new. In the past, studies have shown that insurance companies were not helpful in providing incentives to those they insure with regards to improving safety. In the area of fire insurance the concept of providing incentives is being used more now than in the past, but still not as much as hoped **(Hemenway, 1987:416)**

Previous Approaches to the Fire Problem by Insurance Companies

The insurance industry has been a driving force in the field of fire protection for the past three hundred years. This can be seen as far back as the Great Fire of London in 1666 where four-fifths of the city was destroyed. Early fire departments or fire brigades were formed by, or supported by insurance companies to protect their properties from any fires that would occur. The first building and fire codes were developed by the National Board of Fire Underwriters (NBFU), an organization created by the insurance industry, in the mid-19th century. This was done to better protect the property they were insuring. The development and enforcement of fire and building codes was not taken over by local government until the early part of the 20th

century as a result of several disastrous fires, such as the Triangle Shirtwaist Factory Fire in 1911 **(Hemenway, 1887:419-420)**.

The Fire Insurance Grading Schedule

One such tool used by the insurance companies was a rating schedule developed by the NBFU in 1916 to rate municipal fire protection capabilities so the insurance companies could determine their fire insurance rates. This schedule, which has undergone several changes in the past 80 years, has had a major impact on how municipal government runs its fire departments and how they fund it. Since 1971 the rating schedule has be handled by the Insurance Service Organization (ISO) which replaced the NBFU.

The grading schedule rates three major functions of municipal fire protection. Building construction is first and represents 40 percent of the total weight of the schedule. The fire department is second with 50 percent of the total weight, and fire alarm is third and represents 10 percent of the total weight. Based on this rating schedule a municipality receives a rating classification between one and ten. A classification of one represents the highest classification possible and a classification of ten represents no fire protection at all. The fire insurance that individuals and groups pay is based on this classification schedule**(Coe, 1983:72-74)**.

The effects of this rating schedule on a municipal tax base can be substantial. By using this as a guide many municipalities determine the number of firefighters needed, as well as, fire apparatus. It is also used as tool to establish locations of fire houses and optimum response times. Each of these items affects how tax money is distributed for adequate fire suppression purposes. An important point to be made at this point is that this rating schedule is solely for the purposes of fire suppression and does not take into account any fire prevention activities done by the municipal fire department**(Coe, 1983:72-74)**.

Fire Safety Programs

One other area where insurance companies have had an impact is on providing funding for fire and arson prevention related programs. This funding is provided to state and local governments to combat arson and to provide public fire education programs to the population at large. The insurance companies also promote fire testing of material through agencies such as

Underwriters Labs, Inc. And Factory Mutual Research Labs, Inc **(Hemenway, 1987:420)**.

While these programs have been well received it must be understood that in each case the market-based insurance companies are providing financial support to governmental agencies to improve the fire problem. And in many cases this is being done to limit commercial property loss and not residential property loss, even though there is a trickle down effect to the residential area.

The Insurance Company Approaches to the Residential Fire Problem

There are two major areas where the market-driven Insurance companies can have an impact. These are on accidental fires and arson fires. The approaches to these problems may differ but the market can have a direct impact on the problems.

Accidental Fires

Accidental fires are defined as "non-willing or non-malicious burning of a person's property" **(DeHaan, 1991:323)**. In order to reduce the number of fires and fire related deaths the insurance companies could do one of several things. The first could be to provide an incentive program to their insured to provide a safer environment. These incentives could be in the area of reduced insurance rates, similar to the reduced rates that commercial establishments receive for the installation of automatic sprinkler systems. Areas where incentives could be provided are as follows.

- First would be the installation of smoke, heat and or gas detectors in the living areas of the dwellings
- Second would be installation of residential sprinkler systems in the dwelling.
- Third is the developing of a "home fire safety plan" and proof that it is practiced. This could be accomplished by working with the local fire company to have someone oversee the plan while in operation to determine its effectiveness.
- Fourth would be annual inspections of the heating and electrical systems, and the fire place and chimney by outside agencies that would provide certifications.
- Fifth would be certification that the dwelling was inspected by the municipal fire prevention bureau for any possible fire hazards and proof of abatement.

The incentives could be a reduction in the annual premium by a certain percentage, based on what changes were done to improve the fire safety of the dwelling. The same plan could apply to owners of apartment complexes that provide the above mentioned safety improvements to their building complexes. Renters could also receive reductions in their renters insurance if these improvement were made. Another aspect is that the insurers could raise the rates of the insured if a fire occurred and it was a result of not providing certain safety precautions similar to those indicated above. Insurance could also be denied to those with a poor fire safety record or they could be made to pay extremely high premiums for failing to have a good fire safety record.

Arson Fires

Arson fires are defined as " the willing or malicious burning of a person's property" **(DeHaan, 1991:323)**. Arson can be placed into two categories. The first being arson-for-profit and the second being other related factors such as pyromania, vandalism, revenge, or terrorism. Arson-for-profit can be insurance fraud, removal of tenants, undermining potential competitors, or an attempt to obtain government benefits. The reason for these are profit driven. The other types of arson can be rooted in psychological or political motives. From a market standpoint the first, arson-for-profit, would be the area where insurance companies could have a greater impact. **(Hemenway, 1987:425).**

In attempting to quell arson the insurance companies could approach the problem from two aspects. The first being prevention of the act by the methods they use in underwriting policies. The second could be in how easy or difficult it is to file a claim.

One way that people receive profit from arson fires is to overinsure the property that is going to be burned. This could be in either overinsuring the building, or by over insuring the contents. This allow for a greater return on their investment, since most of the insured building and contents has been destroyed by property. The insurance company can limit this from happening by a more in-depth inspection of the properties prior to the issuance of a premium, or a reinspection any time the insured asks of a larger than normal increase in the policy. It is possible for the insurance industry to track individuals who have profited from insurance claims as a result of fires in their residencies. By tracking these individuals other insurance companies

can be alerted if they attempt to purchase a policy with another company **(Hemenway, 1987:427-429)**.

The other way to prevent arson is to investigate more closely the claims made by the insured. By investigating the causes of the fires it can be determined if the fire was of a suspicious nature. If the insurance company determines through investigation that the fire was not accidental they can refuse payment on the claim. The insurance company can also go after the insured in the courts. If a person files a claim for an accidental fire, and it is later determined to be arson, the insurance can file suit against the individual for attempting to defraud the insurance company. **(Hemenway, 1987:430-431)**.

Why the Market-Driven System Fails

I have previously showed areas where the modified-market approach can be successful in lowering the residential fire loss record. Many of the suggestions made can work if the determination is put forth by the insurance companies. The problem is that the insurance industry as a whole may neither have the incentive or the resources to reduce the problem. It is possible that by decreasing the number of claims due to residential fires, the profit to be made by the insurance industry may also decrease

In Hemenway's article **(1987:418)** he discusses the "*expected utility theory*". According to him people who demand insurance are *risk adverse*, in that they are willing to trade a small loss (the premium) for the possibility of not having a severe loss (fire). If the probability of the loss increases, so increases the amount of the premium the insured is willing to pay. But if the chance of a fire is decreased to zero the economic incentive to purchase insurance is lowered. In other words, if there was no chance of a fire occurring then the need to have insurance to replace lost contents would not be necessary.**(See Figure 5)**

If the insurance industry were to provide incentives, such as those previously discussed, and they were effective in lowering the number of fires and life loss due to fires most people would not purchase the insurance. This is because the risk is not there, so there is no reason to pay for protection from it.

While the majority of fires in the United States are residential in nature, the chance of a

person having a fire are small from a statistical standpoint. In fact the possibility is only one percent. Based upon this and the fact that most losses due to residential fires are under 10,000 dollars per loss it is not in the insurance industry's interest to expend a great amount of effort in limiting the fire losses in residencies **(Hemenway, 1987:419).**

Two additional points to make on fire insurance coverage and fire loss are the following. Since fire losses are tax-deductible under the United States Tax Code it would benefit the insured not to have a lot of insurance, since they could deduct the loss on their taxes. The second point is if the fire insurance cost are too expensive the insured may decide not to install fire protection devices (sprinklers, detectors, alarms, etc.), or upgrade the property to limit the fire loss **(Hemenway, 1987:421)**.

It is believed that from an industry standpoint a reduction in the number of fires would have a direct effect on the insurance industry's over-all profit. If there were fewer fires, people would be less likely to purchase insurance so the amount of money coming in to the insurance industry would be reduced, thus creating a loss in profit **(Hemenway, 1987:419)**.

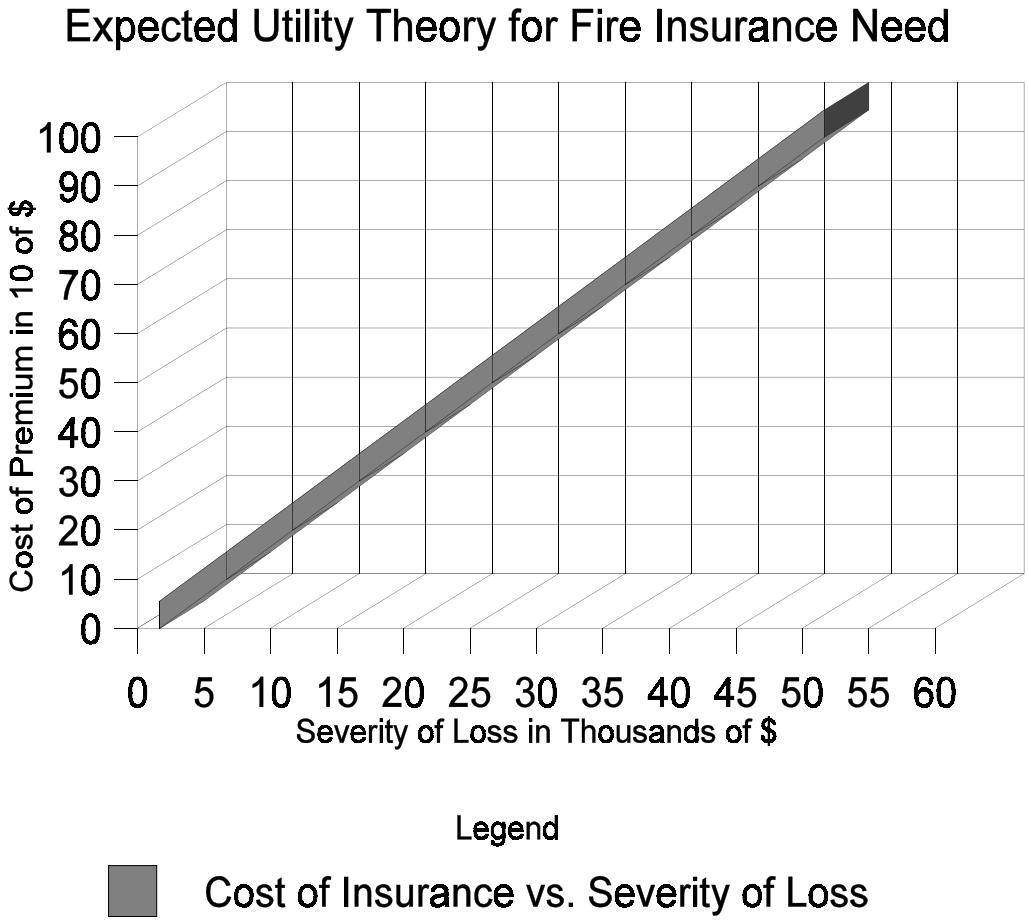

Figure 5 Expected Utility Theory as it Relates to Fire Insurance Need vs. Severity of Loss

The Market Approach Summary

The market approach would be the work done by the insurance industry. In the past the insurance has provided funding to local and state governments to help control the fire problem. They also have been a driving force in the development of the municipal fire services.

The insurance industry could help lower the fire loss by providing incentives to the insured for. These incentive could be for installing fire safety devices, fire safety plans, and fire safety inspections. They can also provide incentives in limiting the number of arson fires by being more discrete in their underwriting practices and in their payment of claims.

While things can be done to limit the number of residential fires it may not be in the best interest of the insurance companies to provide incentives. The number of people actually affected by a fire is very small. If the insurance companies expended large amounts of money to this end, it could have an impact on their profit. Because of this it would not be in their best interest to pursue this course of action.

THE GOVERNMENT APPROACH TO THE RESIDENTIAL FIRE PROBLEM

Historically, municipal government has had the responsibility for fire protection. Very little has been done on state or federal level, except in matters of providing large scale funding. Most municipal charters state that it is their responsibility to provide for the "public safety", which usually includes fire protection. Until the very late 19th century or very early 20th century the primary type of fire protection provided by municipalities was that of fire suppression, some fire prevention laws had been passed but the main concern was still suppression. Fire prevention activities for the most part were handled by the insurance industry. It was after several catastrophic fires the occurred between 1871 and 1911 that municipal fire prevention bureaus came into existence.

On a municipal level fire prevention activities are usually broken down in to two major categories. The first is regulatory enforcement, and the second is public fire education. In regards to the residential fire problem both of these have had some success and failure. The following sections will address these areas **(Robertson, 1995:8-10)**.

Regulatory Enforcement

Regulatory enforcement refers to the activities that a fire prevention bureau does regarding inspections, plan reviews, and levying of fines for non-compliance. The job of fire prevention entails coordination of activities with the building construction department and the fire prevention bureau. Prior to a building being built and during construction the inspections, plan review, and any fines that may be issued are done by the building construction office. After a "certificate of occupancy" is issued the fire prevention becomes responsible for inspections. The inspections are basically a maintenance inspection to make sure that potential fire hazards are abated. If violations are discovered a fine can be levied against the occupant or the owner in order to have them comply **(Robertson, 1995:43)**.

Fire inspections usually cover those areas where fires commonly begin and the common causes for accidental fire. Some of the common causes are electrical, smoking-related, cooking, improper storage of materials (flammable and combustible liquids). Some of the common areas for fires to occur are the bedroom, kitchen, living room/dining room, garage/basement.

While fire inspections are an important part of fire prevention they have a limited effect on residential fires. The United States Constitution protects us from illegal searches of our personal property. The concept is commonly called "*a mans home is his castle*". Because of this most fire inspections of residencies are not allowed unless the owner allows it. If he or she does not then a warrant must be obtained to allow entry. It is not common for warrants to be issued for the fire inspection of a dwelling **(Robertson, 1995:113)**.

It is this conflict between one of our sacred laws and the knowledge that the majority of structure fires and fire deaths occur in residencies that creates the dilemma. The only way, to date, that enforcement of fire prevention laws can be accomplished in residencies is with the permission of the owner or the occupant to allow the inspection. Most fire inspections of dwellings are done on voluntary basis, and are not enforceable if a violation is discovered.

Public Fire Education

It has been known for some time that the best way to improve the fire problem is to

educate the public to the dangers of fire. Attempting to bring about fire safety strictly by enforcement is very difficult. It has had success in Europe and Asia where government intervention is more readily acceptable. But in the United States this approach is usually met with stiff resistance. It has been discovered that educating the general public has had a more lasting effect on the problem. **(Schaenmann, 1982:11)**.

Some of the success stories in public fire education are as follows.

- Smoke detectors have had a dramatic impact on the number of fire deaths in United States. Over 60 percent of the homes in the United States have smoke detectors installed. Since they were introduced in the mid-seventies the number of fire deaths in residencies has decline steadily from about 6,000 in 1977 to just over 3,000 in 1994 **(Karter, 1991:41, 1995:94)**
- Residential sprinklers have been around since the mid-eighties. In those municipalities that have adopted the use of them into their fire codes, there has been a steady drop in deaths. The drop in property damage has been substantial also. While not as common as smoke detectors are they still have shown that they are effective in not only detecting the fire but also suppressing it. Some of the economic benefits have been reduced insurance rates, reduced property damages, and reduced indirect fire losses.
- Fire safety programs aimed a certain target age groups have been successful. Primarily the age groups have been young children and senior citizens. Some of these programs are *Learn Not To Burn* from the National Fire Protection Association (NFPA); Baby-sitter fire safety programs; fire safety for senior citizens; *Fire Prevention Week*; Smokey the Bear; Spark the Fire Dog; and the *Junior Fire Marshal Program* **(Robertson, 1995:123-132)**.
- Voluntary Home Fire Inspection Program has been a great success in many municipalities. This allow fire inspectors to inspect dwellings with the owners permission. If violations are found the inspector makes recommendations of what to correct and in the process educates the family about fire safety. This is strictly

a voluntary program and is done only if the owner wishes it.

- Operation E.D.I.T.H (Exit Drill In The Home) is a program that has allowed families to develop emergency escape procedures for the entire family in case of a fire. The program stresses multiple ways out of the home, calling the fire department, and finding a common meeting place.**(Robertson, 1995:123-132)**.

An other area of public education that has met with success is the control of arson fires. The major number of arson fires has been attributed to fires set by children. The *Juvenile Fire Setters Program* has allowed fire prevention personnel in conjunction with social workers attempt to find the reasons why the problem occurs, and through counseling, attempt to correct the problem.**(Robertson, 1995:123-132)**.

Why the System Fails

It has been seen that the fire loss problem has decreased in numbers over the past ten years, but from a statistical and percentage standpoint it has remained constant. Some of the reasons have been mentioned already. Code enforcement in private residencies is very difficult because without owner permission it would violate United States constitutional law, in that it violates the fourth amendment.

Most fire prevention efforts that are provided by municipal fire departments are funded through municipal tax dollars. In this time of limited budgetary resources for government it is difficult to fund these efforts. In most fire departments the majority of funding goes towards fire suppression because it is a very labor intensive, and therefore expensive, effort. Fire prevention activities are on a limited scale depending on the budget.

Another facet of why the government intervention fails is the attitudes of people in general. Fire prevention education has been around for well over 50 years, but is still not practiced. Many people have the idea that when it comes to a fire occurring in their home or on their property that "*it always happens to the other person and not to me*", and "*I am covered by insurance and it will cover the loss*".

Earlier in this paper I mentioned that there is a direct correlation between poverty and fire loss. Because of limited salaries and education many people forego fire safety for other

important areas of existence, such as food and medical care. This is why many poor people may receive smoke detectors or other fire safety devices from donations, but they are neither installed or used properly. Still others receive fire safety pamphlets or brochures and because of a lack of education are unable to comprehend them.

Government Intervention Summary

Fire prevention has been an essential part of municipal fire protection since the late 19th century, but it has usually been a step-child to the fire suppression effort. Fire prevention activities in the government sector are usually broken down into two major areas, regulatory control and public education. Regulatory control is the enforcement of the fire code by means of inspections, plan review, and the levying of fines for failure to comply. Public education is the process of providing learning materials, seminars, and meetings to various segments of the community in an attempt to lower the fire loss rate. These groups usually include children and the elderly.

The problem that occurs with residential fire loss is that inspections are not done because of conflicts with constitutional law and right of entry. The public education area has had a greater impact on the residential fire problem, but lack in certain areas. Because of economic short-comings and lack of education among the poorer sections of out population the effects of education are not as noticeable. Another problem that exists in the lowering of the fire loss rate is the attitude of people themselves. Many people have the attitude that fires never happens to them, but to others. The other attitude is that if a fire does occur, they have insurance.

SUMMARY

The fire loss record of the United States is one of the poorest among the industrialized nations of the world. Our fire loss rate is almost double that of many European and Asian nations. Some of the reasons for this is our approach to fire protection. Many European nations allow for more government intervention in the lives of its citizens, which we do not. Some of

their ideas are plausible for the United States with some adjustment.

Of all the fire loss areas, the losses in residencies are the greatest. Life loss due to fires in residencies is about 80 percent of the total number of lives lost, or about 3,500 live lost each year. Property loss is about 70 percent which comes to about five billion dollars a year. It is of great concern that the number of losses in residencies is so high. Some of the problems occur in people's attitudes towards the fire hazard itself, others are the belief that they are protected by insurance. The effect of poverty has a direct effect on the fire loss. Because of low economic conditions and low educational levels certain parts of the country have had a higher fire loss rate than others.

There are two approaches to the problem. The first is finding a solution through the market, in this case the insurance industry. The insurance industry has been involved in fire protection for the past three hundred years. The involvement has been assisting the public fire service with funding of public education and arson reduction programs and providing a rating schedule for the municipal fire departments. The insurance industry can supply other assistance in the way of incentives to its insured. If the insured show they are being safety conscience they can receive reductions on their insurance premiums. This system seems sound and plausible, but it could have a down side for the insurance industry. People are willing to pay high premiums for insurance in order to be protected against a severe loss. These same people would be less willing to pay high premiums if the chance of a severe loss is reduced. This is explained under the *expected utility theory.*

The government involvement, or non-market intervention in fire prevention has been common since the turn of the century. This is commonly done on a local government level and involves two areas of fire protection. The first regulatory enforcement, and the second being public education. With regards to the residential fire problem, the public education has had the greatest impact. Enforcement of fire codes is limited since constitutional law prevents unlawful inspections of ones's personal residence.

While the market and the non-market approach seperately have not had a major impact on the fire loss record, a combination of the two could provide for a reduction in the fire loss

rates, both in residential and commercial properties.

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