

**Analytical Approaches to Public Fire Protection
FST381**

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Will legislation mandating reduced ignition propensity cigarettes have an impact on life and property loss from fires in communities like Barberton, Ohio and the State of Ohio?

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Introduction

The Smoking Material Fire Problem Illustrated

Canton, Ohio, July 14, 2007: A lit cigarette falls onto a chair by accident. The chair is on the front porch of a house where a thirteen year old is asleep in his upstairs bedroom. After some time, the chair catches fire. Adults discover the fire on the front porch and try to put it out with an extinguisher. Their efforts fail and the front porch is quickly engulfed in flames. The heat is overwhelming. The adults can't help. The sleeping teen wakes but dies trying to exit the structure. An accidental fire claims a young life (*Monsewicz, 2007*).

This kind of tragedy is not unique to Canton, Ohio; this is just a recent example. Tragically, it is a scenario which happens all too frequently throughout the United States, the entire State of Ohio, and in smaller cities like Barberton, Ohio.

As John Hall Jr. (2006) vividly illustrates through exhaustive research in *The Smoking Material Fire Problem*, consistently, fires whose ignition source is smoking materials, are the leading cause of fire deaths in the United States. This was true in 2003 when an estimated 24% of all structure fire civilian deaths were caused by smoking materials. The 25,600 fires caused 760 deaths, 1,520 civilian injuries, and \$481 million in property damage. From these numbers one can conclude that smoking material caused deaths and property losses are indeed problems with which the fire service, government, and citizens should be concerned on a national level. A look at the years 1999-2003 reveals:

UNITED STATES SMOKING RELATED STRUCTURE FIRES

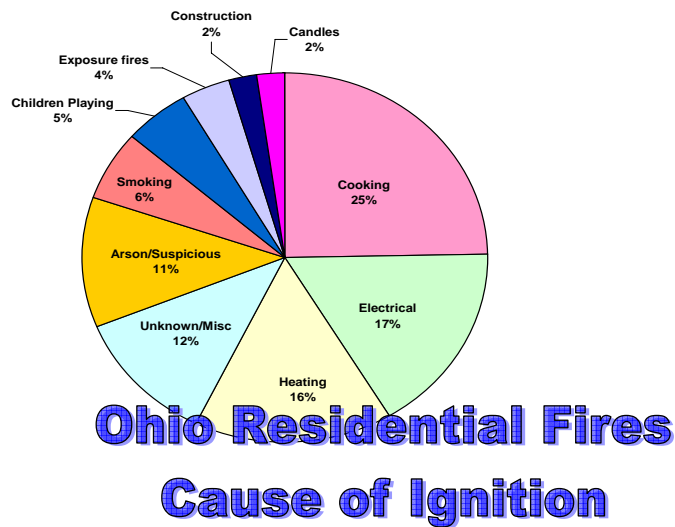
Year	Total Fires	Dollar Loss	Civilian Deaths
1999	44,000	\$630,000,000	920
2000	32,200	\$676,000,000	900
2001	29,700	\$440,000,000	850
2002	29,700	\$488,000,000	630
2003	25,600	\$481,000,000	760

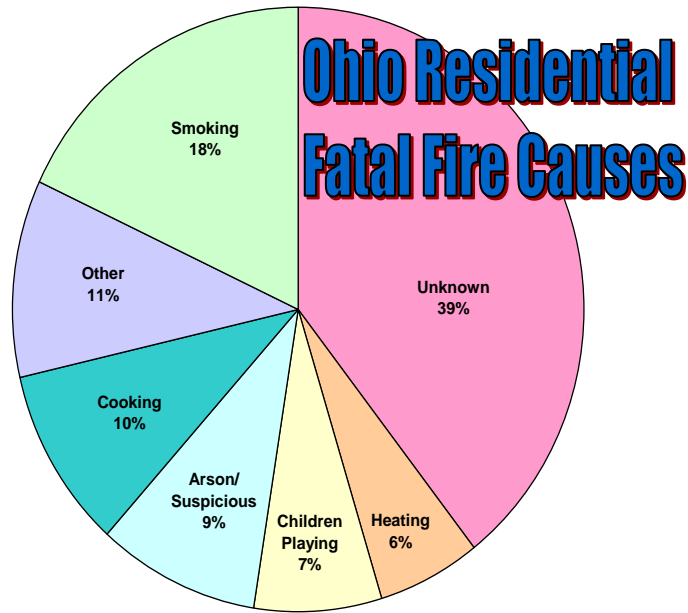
In the State of Ohio, there have been between 12 and 26 fire deaths caused by smoking in each of the years between 2000 and 2006. The following chart, which contains data from the Fire Marshal's Fire Prevention Bureau (C. Pitzer, personal communication, July 17, 2007), illustrates the impact smoking caused fires have recently had in the State of Ohio.

OHIO SMOKING RELATED FIRES

Year	Total Fires	Dollar Loss	Civilian Deaths
2000	1,792	\$12,246,432	12
2001	2,167	\$12,484,915	23
2002	2,076	\$10,412,797	12
2003	1,749	\$8,206,389	17
2004	1,909	\$9,729,264	13
2005	2,262	\$11,133,279	23
2006	1,950	\$15,915,789	26

Strikingly, the Ohio State Fire Marshal's Office reports (C. Pitzer, personal communication, July 17, 2007) that while cigarettes are only responsible for 6% of residential fires, they are responsible for at least 18% of residential fire deaths. This is displayed in the following two pie charts.





As the introduction scenario pointed out, all local Ohio fire departments experience fires caused from smoking materials to some extent. In the City of Barberton (population 28,000) there have been fires caused by smoking materials as well. The following data, taken from the department data base, represent the problem which exists in Barberton.

BARBERTON SMOKING RELATED STRUCTURE FIRES

Year	Structure Fires	Dollar Loss	Civilian Deaths
2002	2	\$400	0
2003	3	\$5,000	0
2004	2	\$2,700	0
2005	2	\$33,100	0
2006	5	\$78,600	1

These statistics show fires ignited by smoking materials result in significant loss of life and property in small cities like Barberton, the State of Ohio, and throughout the entire United States.

Background

The fire problem from smoking materials is not a new one. Lit cigarettes and other smoking materials give off heat; thus, they are sources of ignition. When a lit cigarette comes into contact with another combustible- bedding, paper in the trash can, clothing, etc.- a fire may occur if the air, fuel, and heat properties are in correct proportion. Suffice to say, as long as people have and continue to smoke, there will be a fire hazard related to smoking.

Individuals, government, and the fire service have long recognized the risks associated with all kinds of fire hazards and have sought ways to minimize the risk of fire hazards. The development of the “safety match”, voluminous building and fire codes, child-resistant cigarette lighters, and the regulation of the fire safety of mattresses are all examples of fire hazard minimization efforts. In regard to cigarettes, the question “Could cigarettes be made differently so that they would produce less of a hazard when left unattended?” has been posed and debated as well.

The idea of developing legislation to require the engineering of cigarettes to make them fire safer is over twenty five years old. The early efforts at national legislation were not successful in requiring companies to manufacture fire safer cigarettes. Instead legislation was aimed at laying the ground work for fire safer cigarettes. After the early debates, Congress eventually passed The Cigarette Safety Act of 1984 which created a study group to consider the idea of producing fire safe cigarettes. This group’s report was released in 1987. It was concluded that the creation of reduced ignition propensity cigarettes was technically feasible and that they may also be economically feasible. Once this report’s conclusions were digested, Congress passed the Fire Safe Cigarette Act of 1990. This piece of legislation put the responsibility of developing a standard which defines a fire safe cigarette into the hands of the

National Institute of Standards and Technology. In 1993, tests were conducted to develop a standard. This standard, American Society of Testing and Materials (“ASTM”) standard E2187-04, is the resulting standard upon which the idea of reduced ignition propensity cigarettes is based (Alpert, Carpenter, Connolly, Rees, & Wayne, 2005, pp. 2-4).

As the idea of fire safer cigarettes was being played out on a national level, many state governments were also contemplating the issue. California, New York, Virginia, Maryland, Pennsylvania, Wisconsin, Rhode Island, New Jersey, Connecticut, Oregon, Minnesota, and Massachusetts all proposed some sort of fire safe cigarette legislation in the 1980s. It was not until August 16, 2000, however, that the State of New York became the first in the United States to pass legislation requiring a reduced ignition propensity cigarette standard to be defined and have all cigarettes sold in the state comply with this standard. Eventually, on June 28, 2004 the requirement for all cigarettes sold in New York to comply with ASTM standard E2187-04 went into effect (Alpert et al.,2005, pp 2-4).

Cigarettes which meet the standard are less densely packed and have bands of thicker paper in the wrapper. The decreased tobacco density and banding of the wrapper produce cigarettes which self-extinguish when unattended. The standard effectively creates a cigarette which burns for a shorter period of time when dropped on another combustible when unattended. Because it is not being smoked, the cigarette will extinguish and the material it is in contact with will not ignite. This is because the heat required for ignition, which would be reached after continued burning, is not achieved.

Today, cigarettes which meet the fire safe cigarette standard are required in 4 states, pending requirement in 18 states, and being considered in 10 states. 18 states have not taken up the issue in any formal way (Coalition, 2007).

States which require reduced ignition propensity cigarettes:

New York (effective June 28, 2004)
California (effective Jan. 1, 2007)
Oregon (effective July 1, 2007)
Vermont (effective May 1, 2006)

States which have passed legislation and are awaiting implementation of reduced ignition propensity cigarettes:

Alaska	Maryland
Connecticut	Massachusetts
Delaware	Minnesota
Hawaii	Montana
Illinois	New Hampshire
Iowa	New Jersey
Kentucky	Rhode Island
Louisiana	Texas
Maine	Utah

States which are contemplating fire safe cigarette legislation:

Alabama	Ohio
Arizona	Pennsylvania
Michigan	Tennessee
Nebraska	Washington
North Carolina	Wisconsin

States which have no formal action underway:

Arkansas	Nevada
Colorado	New Mexico
Florida	North Dakota
Georgia	Oklahoma
Idaho	South Carolina
Indiana	South Dakota
Kansas	Virginia
Mississippi	West Virginia
Missouri	Wyoming

Discussion

Proposed effect of a fire safe cigarette law in Ohio

Applying the theory behind reduced ignition propensity cigarettes to the opening scenario from Canton, Ohio this summer:

- 1) A lit cigarette falls onto a chair by accident
- 2) The cigarette continues to burn and the chair material heats
- 3) The cigarette extinguishes shortly thereafter because it is a fire safe cigarette; the chair material stops heating
- 4) There is no fire
- 5) There is no loss of property
- 6) The teenager starts school next week

But, for an analytical perspective that is convincing, one needs to consider the effects of reduced ignition propensity cigarettes in the real world. Have states which require reduced ignition propensity cigarettes witnessed a reduction in cigarette caused fires, fire losses, and fire deaths?

The State of New York, the pioneer in legislation and implementation, has required all cigarettes to be fire safe for just over three years. Some analytical value can be drawn from New York's experience although data for an analysis is incomplete and hard to obtain. In 2004, where the law was in implementation for half of the year, there were 28 fire deaths blamed on cigarettes. This is lower than what was experienced in each of the four preceding years (Gormley, 2007).

Deaths from Cigarette Ignited Fires 2000-2004

Year	Number of Deaths
2000	43
2001	44
2002	38
2003	More than 30*
2004	28

* Incomplete data from this year; I assume 31 for averaging purposes. (AP article)

Using these numbers, the average number of cigarette related deaths in the four years prior to legislation implementation was 39 deaths. The change with implementation was a

decrease to 28 deaths. This reflects a **28%** decrease in the number of cigarette related fire deaths. This figure may even be conservative considering the law was only in effect for half of the year.

Limitations and Assumptions of Discussion

It is recognized that fire data collection, collation, and dissemination is not a perfect science. Some organizations are better at it than others. One limitation of the above data and following discussion of possible effects is that the data concerning the true effects of fire safe cigarette implementation has been hard to obtain. Repeated tries in the form of emails and voice mails to obtain 2005 and 2006 data about the loss of life and property from cigarette caused fires in the State of New York failed.

An assumption which must be made is that education efforts and initiatives concerning cigarettes will remain at the same levels. More public education about safe smoking practices could reduce the incidences of fires caused by cigarettes and a decrease in education could result in an increase in cigarette related fires as people are more careless. This assumption allows the direct correlation between safe cigarette legislation and a reduction in incidence of fire to be made.

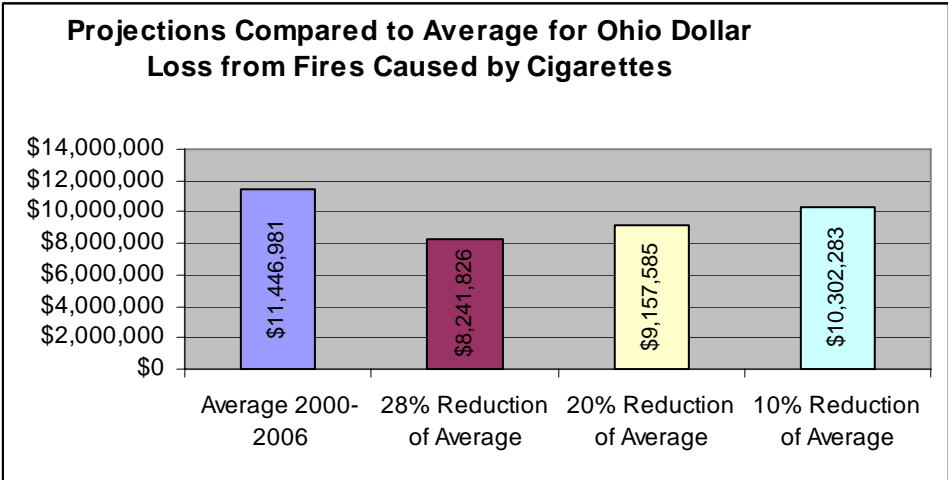
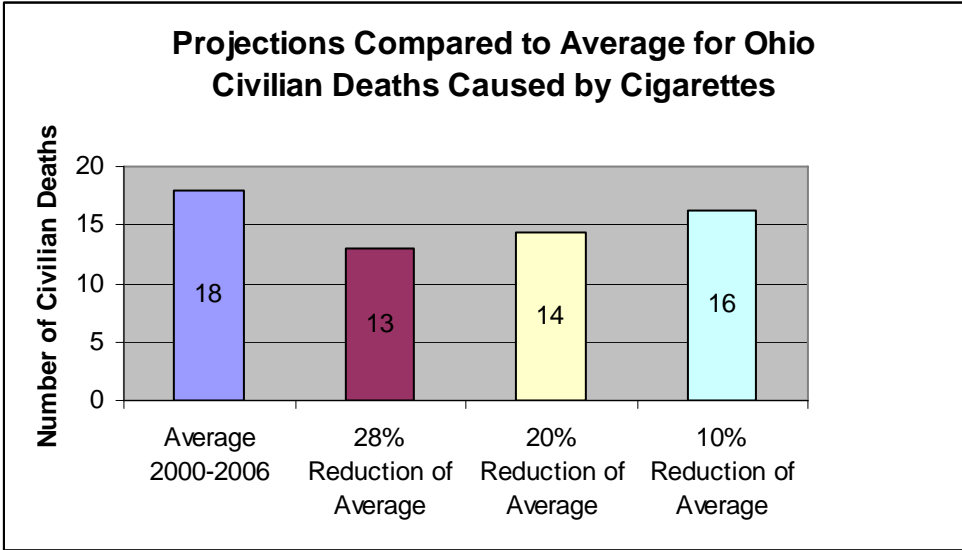
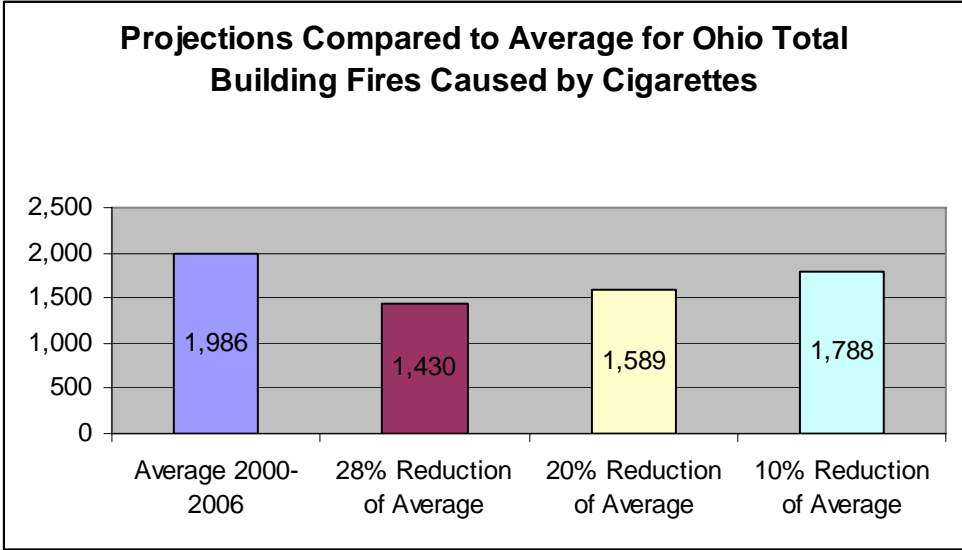
Another limitation of the data is the large amount of “unknowns” when it comes to fire cause. Conscientious fire investigators cannot list cigarettes as a cause of a fire if they cannot rule out other causes. Thus, many fire causes are listed as “unknown”. Cigarettes may be responsible for an undetermined amount of these unknown causes and this could skew the data concerning the cigarette fire problem; usually underestimating it. For example, in my jurisdiction there was one fatality in the sample space attributed to smoking in the data used.

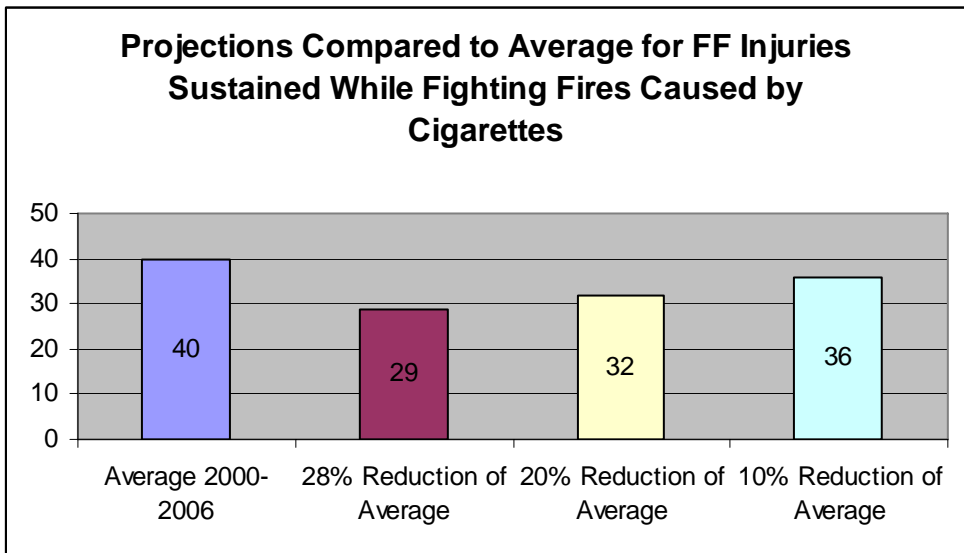
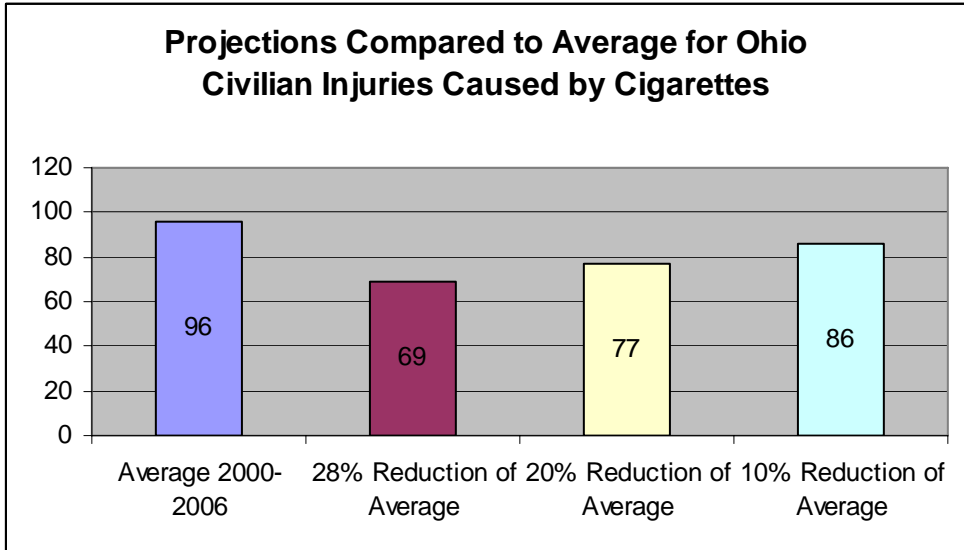
However, another fatality could have very well been cigarette related but the investigation could not prove it. The official cause is listed as “undetermined”.

As the years pass and data from states with implementation becomes known, a more statistically accurate picture of the effects of fire safer cigarette implementation will emerge.

Possible Impact of Reduced Ignition Propensity Cigarette Legislation in Ohio

In order to see visually and quantitatively what impact fire safe cigarette legislation might have, the following charts are offered for the State of Ohio data. Averages for the Ohio data given at the beginning of this paper, which describe Ohio’s smoking material fire problem, are given in the chart. These averages are then shown next to possible reductions which may occur if fire safe cigarette legislation is passed. The 28% figure is taken from the reduction in New York deaths and applied to all of the categories. (The limitations of this figure notwithstanding). 20% and 10 % reductions are also shown. These arbitrary figures show the very conservative (hopefully) estimated reductions in each respective category with the use of reduced ignition propensity cigarettes. This exercise has been done to show that even if the effects of such legislation are limited, the results would still be beneficial to protecting life and property in the State of Ohio.



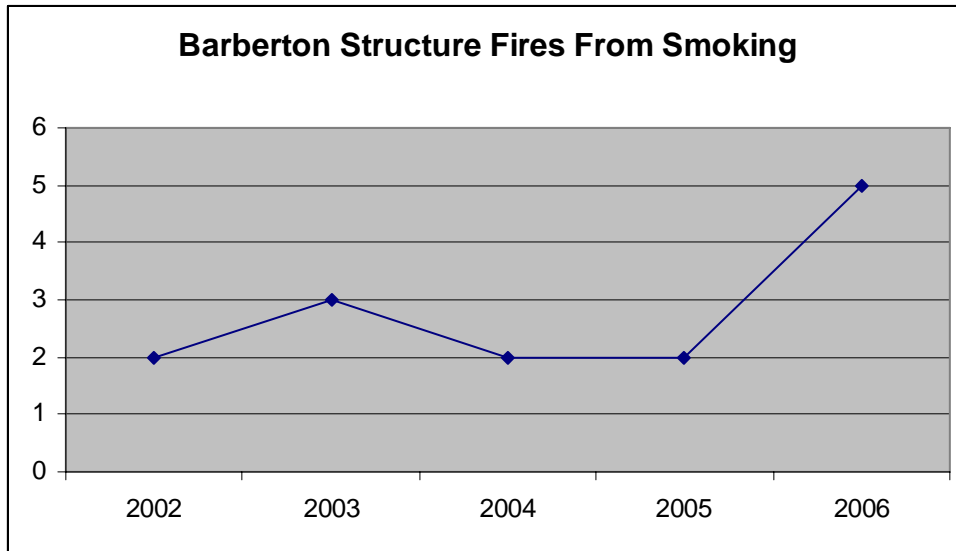


As these five charts show, reduced ignition propensity cigarettes would result in fewer fires from cigarettes. Consequently, there would be fewer civilian deaths, FF and civilian injuries, and less property loss.

Possible Impact of Reduced Ignition Propensity Cigarette Legislation in Barberton

The possible impact to the City of Barberton of the proposed legislation is not as easily visible because the number of cigarette caused building fires is low compared to the whole state;

yet the impact could be very significant. A chart for fire trends using the data for Barberton presented at the beginning of the paper follows:

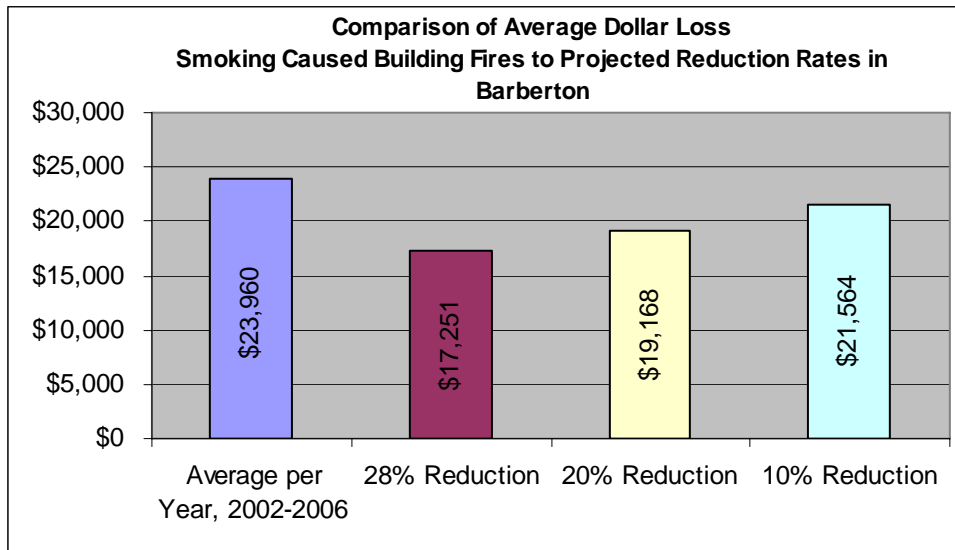


Because of the low number of fires in a relatively small jurisdiction, the effects of fire safe cigarette legislation are harder to show through a method using percentages. More realistically, the almost three building fires averaged per year over the last five years could easily be zero in the year which the legislation takes effect. Legislators contemplating a fire safe cigarette law must believe that a reduction in the number of cigarette caused fires will result in no cigarette caused fires in any given year in many small communities like Barberton. One or two less fires a year for a small community is only a fraction of a percentage reduction for the state as a whole, but a very significant reduction at the local level.

In the last five years in the City of Barberton, there have been two civilian fire fatalities. One fire was officially ruled as being caused by smoking. The second fatality was also suspected to be caused by smoking, but investigators from the City of Barberton and the Ohio Fire Marshal's office did not have enough evidence to make a ruling. The cause of this fire is

listed as unknown. In both instances, the victims were elderly, disabled people at home alone; one of the high risk groups which benefit from fire prevention initiatives.

If the number of cigarette caused fires decreases, the dollar loss associated with these fires will also decrease. This is seen visually in the following chart which compares the average loss over the last five years in Barberton with percentage reductions as done with state data.



Conclusions and Recommendations

The mission of the fire service is to reduce the loss of life and property from the effects of fire. Integral to this mission is the concept of fire prevention; the idea being that **prevented** fires pose no risk to life or property. The pillars of fire prevention are education, engineering, and enforcement (the three “Es” of fire prevention). The production and use of reduced ignition propensity cigarettes is an example of engineering as a fire prevention tool.

The cigarette industry has the ability to engineer and produce cigarettes which are “fire-safer”; they are (or will soon be) required in many states. The adoption of legislation requiring cigarettes sold in Ohio to meet the performance standards of reduced ignition propensity

cigarettes (given a constant rate of smoking and prevention education) will result in the reduction of the number of fires attributable to cigarettes. This reduction in the number of cigarette-caused fires will consequently reduce the loss of life and property from fires in the State of Ohio and its communities like the City of Barberton.

Reduced ignition propensity cigarettes will eventually be the industry standard throughout the US. Whether Ohio law makers act sooner or later, fire safer cigarettes will eventually be widespread throughout Ohio's communities. It is recommended that Ohio act sooner. Not all cigarette caused fires will be eliminated and the fire service must still educate people about fire safe behaviors. But, in theory and in real world experiences, the number of cigarette caused fires, deaths, and property losses will be reduced. Our communities and our State will be safer and some community-rocking tragedies will be prevented.

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