Agenda – Executive Policy Committee – January 17, 2006

REPORTS

Item No. 2 Requirement of Sprinklers in New and Existing Buildings
File EB-1.1.1

STANDING COMMITTEE RECOMMENDATION:

On November 20, 2006, the Standing Policy Committee on Protection and Community Services recommended that the report dated September 8, 2006, from the Fire and Paramedic Chief be forwarded to the Executive Policy Committee for information.

Agenda – Executive Policy Committee – January 17, 2006

DECISION MAKING HISTORY:

STANDING COMMITTEE RECOMMENDATION:

On January 9, 2007, the Standing Policy Committee on Property and Development referred the matter to the Administration.

On November 20, 2006, the Standing Policy Committee on Protection and Community Services recommended:

1. That the Standing Policy Committee on Property and Development refer the matter to the Administration with instructions to look at strategies for maximizing implementation of sprinkler systems in new and existing buildings.

2. That the report dated September 8, 2006, from the Fire and Paramedic Chief be forwarded to the Executive Policy Committee for information.

On June 12, 2006, the Standing Policy Committee on Protection and Community Services requested the Administration to report to the appropriate Committee of Council within ninety (90) days on the state of regulation and code regarding built in fire suppression infrastructure as a requirement to new and existing building stock in the City of Winnipeg and requested that said report also be submitted to the Standing Policy Committee on Protection and Community Services for information.

RE: **REQUIREMENT OF SPRINKLERS IN NEW AND EXISTING BUILDINGS**

FOR SUBMISSION TO: Standing Policy Committee on Property and Development and Standing Policy Committee on Protection and Community Services

ORIGINAL REPORT SIGNED BY: Wes Shoemaker
Fire & Paramedic Chief

REPORT DATE: September 8, 2006

RECOMMENDATION:

That this report be received as information.

Report Summary

Key Issues:

- Automatic sprinkler systems have been an effective and reliable tool in reducing fire deaths, injuries and property losses for over 100 years.
- The majority of fire deaths (94%) in the City of Winnipeg, over the course of the last 20 years, have occurred in residential occupancies, primarily one and two family homes.
- Current requirements for sprinklering buildings under the Building Code are somewhat limited and not specifically required in either one or two family homes.
- There is a movement throughout Canada and the U.S. to promote residential sprinkler systems. Various jurisdictions have additional sprinkler legislation in place or are either proposing or considering sprinkler system legislation.
- The benefits of residential sprinklers have been clearly demonstrated in communities who have had residential sprinkler requirements for some time.
- The concept of sprinklers for residential buildings fits the *PLAN WINNIPEG 2020 VISION* of making communities safer.

Implications of the Recommendation(s):

General Implications

(**X**) None

( ) For the organization overall and/or for other departments

( ) For the community and/or organizations external to the City

( ) Involves a multi-year contract

Comment(s):

Policy Implications

(**X**) No

( ) Yes

Comment(s):

Regulatory Implications

(**X**) None

( ) Eliminates or reduces regulatory impact

( ) Proposes regulatory impact

Comment(s):

Environmental Implications

(**X)** No

( ) Yes

Comment(s):

Human Resources Implications

(**X**) No

( ) Yes

Comment(s):

Financial Implications

(**X**) Within approved current and/or capital budget

( ) Current and/or capital budget adjustment required

Comment(s):

Report

REASON FOR THE REPORT:

On June 12, 2006, the Standing Policy Committee on Protection and Community Services requested the Administration to report to the appropriate Committee of Council within (90) days on the state of regulation and code regarding built-in fire suppression infrastructure as a requirement to new and existing building stock in the City of Winnipeg and that the said report also be submitted to the Standing Policy Committee on Protection and Community Services for information.

HISTORY:

Automatic sprinkler systems have been a means of providing fire protection to buildings for over 100 years. They have proven to be a very effective and reliable tool when properly installed and maintained. In 1995 the National Fire Protection Association (NFPA) had produced a report on the U.S. experience and benefits of sprinklers. One of the most compelling topics discussed in the report is the life safety benefit derived from sprinkler systems. The following statement is taken directly from the report.

> "*NFPA has no record of a fire killing more than two people in a completely sprinklered building where the system was properly operating, except in an explosion or flash fire or where industrial fire brigade members or employees were killed during fire suppression operations."*

A further breakdown of this statement is directed at specific occupancies.

> *"NFPA has no record of a fire killing more than two people in a completely sprinklered public assembly, educational, institutional, or residential building where the system was properly operating."*

A number of devastating fires have been investigated by NFPA over the years. In most of these fires, the lack of automatic sprinklers has been a key factor in explaining the accelerated growth and spread of many of these fires. Sprinkler systems have the capability to intercede at the incipient stage of a fire and therefore significantly reduce fire deaths and injuries, the impact of business and economic losses, as well as averting the social implications for employees and a community.

Over the years, the City of Winnipeg has experienced many disastrous multiple-death fires in residential buildings. Examples include:

- 1922, St. Boniface College Dormitory, ten deaths
- 1929, Medway Court, nine deaths
- 1974, Hazelmere Apartments, nine deaths
- 1976, Fort Garry Court, five deaths
- 1977, Preston Avenue Row House, eight deaths
- 1998, Flora Avenue residence, three deaths

As a result of these tragedies, the desire to provide improved levels of fire safety in existing multi-family residential buildings led to the adoption of numerous by-laws over the years - culminating in the adoption of the Residential Fire Safety Upgrading By-law No. 4304/86 on April 30, 1986. The by-law applies to all multi-family existing residential buildings other than one or two family homes and imposes upgrading requirements with respect to such things as smoke alarms, early warning/fire alarm systems, means of egress, compartmentation, electrical circuits in suites, and additional requirements for high rise buildings. Among the additional requirements for high rise buildings, the by-law requires that every mercantile occupancy, restaurant or licensed beverage establishment and every storey (and part thereof) intended for the storage or handling of hazardous substances be sprinklered.

DISCUSSION:

It should be noted that *"fire suppression infrastructure"* could typically include sprinkler systems, standpipe & hose systems, fire pumps and special extinguishing systems. The focus of this report will be on sprinkler system requirements for new and existing buildings.

Fire Deaths and Injuries

The introduction of various City by-laws over the years have had positive impacts in reducing the overall average number of fire deaths in the City of Winnipeg over the course of the last few decades (1985-1994: avg. 8.6 deaths, 1995-2004: avg. 6.3 deaths). Despite all of the positive changes and initiatives that have taken place in recent years, fire deaths continue to occur and the majority of fire deaths continue to occur in private homes and residential occupancies.

FIRE DEATHS IN THE CITY OF WINNIPEG
(Source: Office of the Fire Commissioner)

YEAR	RESIDENTIAL*	OTHER	TOTAL	% OF DEATHS IN RESIDENTIAL BLDGS*
1985	7	-	7	100%
1986	10	2	12	83%
1987	7	1	8	88%
1988	9	-	9	100%
1989	3	1	4	75%
1990	9	-	9	100%
1991	13	1	14	93%
1992	7	1	8	88%
1993	3	-	3	100%
1994	12	-	12	100%
1995	3	-	3	100%
1996	5	-	5	100%

1997	9	1	10	90%
1998	9	1	10	90%
1999	8	1	9	89%
2000	7	1	8	88%
2001	3	-	3	100%
2002	7	-	7	100%
2003	5	-	5	100%
2004	3	-	3	100%
2005	9	1	10	90%

***Note:** For the purpose of this report "Residential" means all one and two family homes, apartments, rooming houses and dormitories. Residential fires accounted for 94 percent of the fire deaths that have occurred during the last 20 years.*

Existing Code Requirements

Both the National Fire Code of Canada and the National Building Code of Canada are prepared by the Canadian Commission on Building and Fire Codes and published by the National Research Council of Canada. They are prepared in a format to permit adoption by local authorities. Amendments are made to the National Codes by the Province of Manitoba. The Provincial versions (Manitoba Fire Code and Manitoba Building Code) are then adopted under by-law by the City of Winnipeg. The Manitoba Fire Code is adopted by the City of Winnipeg Fire Prevention By-law No. 150/2004 while the Manitoba Building Code is adopted by the Winnipeg Building By-law No. 4555/87.

The Manitoba Fire Code contains a set of technical requirements designed to provide an acceptable level of fire protection and fire prevention within a community. The Manitoba Building Code contains a set of minimum regulations for public health, fire safety and structural sufficiency with respect to public interest and establishes a standard of safety for the construction of buildings including additions, alterations, renovations, upgrading or a change of occupancy. The Fire and Building Codes are complementary documents, providing safety measures for both the occupants of a building and for firefighters.

The Manitoba Building Code prescribes the installation requirements for a sprinkler system while the Manitoba Fire Code governs the inspection, testing and maintenance requirements of a sprinkler system after its installation.

Previous editions of the City's Building By-law and Manitoba Building Code did not have specific requirements for sprinklering but provided some concessions to designers if they chose to sprinkler a building.

Significant changes came about with the introduction of the 1995 National Building Code (1998 Manitoba Building Code) that provided requirements for automatic sprinkler

systems. An automatic sprinkler system became a Building Code requirement for the following types of new major occupancy classifications:

- Assembly occupancies. (Used for the gathering of persons for civic, political, travel, religious, social, educational, recreational, or like purposes, or for the consumption of food or drink. Examples would include a movie theatre or restaurant.)
- Care or detention occupancies. (Used by persons who require special care or treatment because of cognitive or physical limitations or by persons who are restrained from, or incapable of, self preservation because of security measures not under their control. Examples would include a residential care facility or a prison.)
- High hazard industrial occupancies. (Buildings containing sufficient quantities of highly combustible and flammable or explosive materials. Examples would include dry cleaning plants or flour mills.)
- Residential occupancies exceeding 600 square meters in building area or exceeding three stories in building height. (An example would include an apartment block.)
- Business and personal services occupancies exceeding 600 square meters in building area or exceeding three stories in building height. (Used for the transaction of business or the rendering or receiving of professional or personal services. Examples would include a law firm or general office building.)
- Mercantile occupancies exceeding 600 square meters in building area or exceeding three stories in building height. (Used for the displaying or selling of goods or merchandise. Examples would include a clothing retailer or grocery store.)
- Medium and low hazard industrial occupancies exceeding 600 square meters in building area or exceeding three stories in building height. (Buildings containing a higher combustible content. Examples would include factories and laboratories.)

The requirement for sprinklering is however subject to numerous conditions such as:

- Whether or not a building is of combustible or non-combustible construction,
- Fire resistance ratings of floor and roof assemblies, mezzanines, load bearing walls, columns and arches,
- Building height and building area,
- Occupant loads,
- The number of streets a building faces,
- Limiting distances, i.e. the distances between buildings and to other properties.

A designer and the design criteria for a building will therefore influence the final design of a building and hence whether or not the building is sprinklered.

For example, if a designer intended to build a typical 18 suite, three storey apartment block with an area of 1,600 square meters per storey, the Building Code offers

numerous possible design scenarios for a residential building. If this building was designed as non-combustible construction, then based on its height and area, it would be permitted to be built without a sprinkler system. If on the other hand, the same building was of combustible construction, a sprinkler system would be required.

Benefits and Myths about Residential Sprinkler Systems

There are many trade offs and benefits associated with automatic sprinkler systems; there also many myths and misconceptions. Extensive research and documentation exists, and is available, in support of residential sprinklering which identifies the associated benefits available to cities, developers, home builders and homeowners. In an effort to obtain support of these stakeholders, other jurisdictions that currently have residential sprinkler requirements, have compiled extensive documentation that explores the trade offs and benefits and dispels the myths and misconceptions that exist.

There are many potential benefits and incentives, identified by other jurisdictions, for sprinklering new developments. The purpose of these incentives is to reduce the net cost of installing sprinklers. That is, any cost reduced or avoided as a result of installing sprinklers. For example, cost savings could be realized by such things as the installation of smaller water mains and fewer hydrants.

Residential fire sprinklers also enhance both public and fire fighter safety and help meet service level objectives with respect to response times in new developments or in existing neighbourhoods where it takes fire crews longer to access.

Organizations in Support of Sprinklers

Automatic sprinkler systems have proven to be a significant contributor to the reduction in injuries, deaths and property losses. There are numerous organizations throughout Canada and the United States who recognize this and therefore actively promote the use of sprinkler systems and/or their benefits.

National Fire Protection Association (NFPA)

Established in 1896, NFPA serves as the world's leading advocate of fire prevention and is an authoritative source on public safety. Their codes and standards influence every building process, service, design and installation in the U.S., Canada and many other countries worldwide.

The Canadian arm of NFPA makes a strong case for residential fire sprinklers in Canada. They claim that the residential fire sprinkler offers the greatest potential for future reductions in fire losses. A 2001 report by the Canadian Council of Fire Marshals and Fire Commissioners states that residential fires account for 73% of all fire fatalities. In Winnipeg, nine of the ten fire deaths in 2005 occurred in

residential buildings. NFPA suggests that if society is serious about reducing the number of fire deaths then the strategy must focus on residential homes.

A recent NFPA report that examined the U.S. experience and benefit of sprinklers, determined that sprinklers reduce fire deaths and property damage by one- to two-thirds for all types of buildings. There is also sufficient statistical evidence (as experienced from Scottsdale, Arizona and Vancouver, B.C.) to demonstrate that fire sprinklers in residential homes offer a significant reduction in fire deaths and property losses.

NFPA's 2006 editions of the Building, Fire and Life Safety Codes now require mandatory residential sprinklers in all new residential occupancies. NFPA suggests that the Canadian Fire Service should consider promoting similar requirements.

Canadian Association of Fire Chiefs (CAFC)

CAFC is a non-partisan national association comprised of some 1,000 Chief Fire Officers located in every Canadian Province and Territory. It is the only association that speaks for all elements of the Fire Service in Canada.

CAFC believes that steps should be taken toward the protection of citizens by embracing recommendations designed to make the widespread use of automatic sprinkler systems a reality in that:

- Finance Canada should amend the federal tax regime to encourage owners of existing non-residential buildings and existing high-rise residential buildings to install automatic sprinkler systems.
- The National Research Council should amend the National Building Code to require that all new and existing low-rise residential structures be equipped with automatic sprinkler systems.
- Finance Canada should amend the Income Tax Act to permit the owners of low-rise residential structures to partially deduct from their payable taxes the cost of equipping their residences with required automatic sprinkler systems.

The Canadian Automatic Sprinkler Association (CASA)

CASA is a national trade contractors association that promotes, defends, enhances and improves the business of installing and manufacturing fire sprinkler devices and systems to enhance the level of life safety and property conservation from the effects of fire through the use of fire sprinklers.

Fire Sprinkler Alliance for Everyone (Fire SAFE)

Fire SAFE is a non-profit organization that promotes public education programs to help Ontarians understand the importance of residential fire sprinkler systems. Between 1995 and 2004, 119 children died in home fires. Fire SAFE Ontario is committed to passing legislation requiring fire sprinkler installation in all new

residential apartment and condominium construction in Ontario. They firmly believe that residential fire sprinklers are a proven, cost-effective solution that will save the lives of children, the elderly, the disabled and everyone else caught in a burning house.

Home Fire Sprinkler Coalition (HFSC)

The HFSC was formed in 1996 in response to the tremendous need to inform the public about the life saving value of home fire sprinkler protection. They have developed educational materials detailing automatic home fire sprinkler systems, how they work, why they provide affordable protection, and answers to common myths and misconceptions about their operation. They have a kit designed to educate jurisdictions and the public on the life saving role sprinklers play and why they are a win-win proposition for housing in any community.

U.S. Federal Emergency Management Agency (FEMA)

FEMA, a component of the U.S. Department of Homeland Security, leads the effort to prepare the U.S. for all hazards and manages all federal response and recovery efforts following any national incident.

In 2004, FEMA prepared a report with regards to residential fire sprinklers. The report states that fires in residences have taken a high toll of life and property and that the installation of residential fire sprinkler systems could save thousands of lives, prevent a large portion of fire injuries, and eliminate hundreds of millions of dollars in property losses.

Dedicated to reducing the nation's staggering loss of life and property caused by fire, FEMA has partnered with private industry and the fire service to advance the development of residential sprinklers.

Current Status of Sprinklered Buildings

Accurate data is currently not available or easily determined to provide reliable information as to the percentage of existing buildings (in the City of Winnipeg) that contain sprinkler systems.

Sprinkler Requirements in Other Jurisdictions

The Fire Prevention Branch conducted a survey of 14 major Canadian cities to determine the current requirements in place for sprinklering and to determine if other jurisdictions are proposing legislation to require sprinklers in the near future. Appendix "A" summarizes the survey findings. It should be noted that in Ontario a Member of Parliament recently introduced a private members Bill requiring changes to the Ontario Building Code that calls for the mandatory provision of sprinkler protection in all new residential developments in the Province.

Future Considerations

The majority of fire deaths over the course of the last 20 years in the City of Winnipeg occurred in residential occupancies, primarily one and two family homes. Citizens are at greatest risk from fire in their very own homes – a place in which they should feel the safest! One of the most successful fire prevention initiatives over the course of the last few decades has been the introduction of smoke alarms. Smoke alarms provide a means of early warning to building occupants but they do not extinguish a fire. Automatic sprinkler systems confine and extinguish fires during their incipient stage (early or first stage of burning) thereby dramatically reducing fire deaths and injuries as well as property losses. Support for residential sprinkler systems is rapidly growing. The introduction of residential sprinkler legislation throughout North America is on the rise, especially for one and two family homes. The benefits of residential sprinkler systems have been clearly demonstrated in communities who have had residential sprinkler requirements for some time.

The Tri Data Corporation of Arlington, Virginia completed a comprehensive risk analysis for the Department in May of 2000. One of the many recommendations that were made in their final report was:

> ***"Consider requiring sprinklering for all new structures, including homes.*** At a minimum, require that all new homeowners be advised of the availability and benefits of home sprinkler systems."

The concept of sprinklers for residential buildings fits the *PLAN WINNIPEG 2020 VISION* of making communities safer by *"providing fire suppression services in conjunction with fire prevention initiatives, including public education, to assist in the prevention, detection, or extinguishment of fires."*

Financial Impact Statement **Date:** 8-Sep-06

Project Name:

Requirement of Sprinklers in New and Existing Buildings

COMMENTS:

This report comments on the state of regulations and codes related to sprinkler systems. Therefore no financial impact is envisioned at this time.

original signed by
Bodo G. W. Roloff, CMA
Manager of Finance & Administration

IN PREPARING THIS REPORT THERE WAS:

Internal Consultation With and Concurrence By:
Planning, Property & Development

External Consultation With:
National Fire Protection Association
Office of the Fire Commissioner
Canadian Automatic Sprinkler Association
Vancouver Fire and Rescue Services
Calgary Fire Department
Edmonton Fire Rescue Services
Regina Fire Department
Hamilton Emergency Services Department
Toronto Fire Services
Ottawa Fire Service
Mississauga Fire Department
St. John's Fire Department
Halifax Regional Fire and Emergency Services
Charlottetown Fire Department
Yellowknife Fire Department

THIS REPORT SUBMITTED BY:

Department: Fire Paramedic Service
Division: Fire Prevention Branch
Prepared by: Peter W. Kloos, Director of Fire Prevention

Approved:

Original signed by

W.H. (Wes) Shoemaker

APPENDIX A

SPRINKLER REQUIREMENTS IN OTHER JURISDICTIONS

CITY	ADOPTED CODES	SPRINKLER BY-LAW IN PLACE	PROPOSING SPRINKLER BY-LAW	TYPES OF OCCUPANCIES COVERED BY CURRENT OR PROPOSED LEGISLATION
Vancouver	National Building Code	Yes	--	All residential occupancies including 1 and 2 family homes.
Calgary	Alberta Building Code	No	Yes	Proposed legislation to include all new 1 and 2 family homes.
Edmonton	Alberta Building Code	No	No	N/A
Saskatoon*				
Regina	National Building Code	No	Yes	Single family dwellings
Hamilton	National Building Code	No	No	N/A
Toronto	National Building Code	No	Yes	Proposed legislation to include all new detached, semi-detached and row housing.
Ottawa	National Building Code	No	Yes	Proposed legislation to include all new detached, semi-detached and row housing.
Mississauga	National Building Code	No	No	N/A
Montreal*				
St. John's	National Building Code	Yes	--	Some 1 and 2 family homes in low water pressure districts
Halifax	National Building Code & The Nova Scotia Sprinkler Act	No	Yes	Proposed legislation - Types of residential occupancies to be determined
Charlottetown	National Building Code	Yes	--	Single family homes and "Bed & Breakfast" establishments
Yellowknife	National Building Code	Yes	--	All 2 family and other multiple family dwellings

*No information received.

COMMENTS

Vancouver	Existing Fire & Building By-laws amended in April of 1990 requiring all new residential occupancies (including 1 and 2 family homes) to be sprinklered.
Calgary	Currently in the preliminary stages of enacting a by-law to require the sprinklering of all new 1 and 2 family homes. They currently use NFPA 101 but have not adopted it.
Edmonton	No by-laws are in place requiring sprinklering of 1 and 2 family homes and there are no plans in place to do so in the future.
Saskatoon	No information received.
Regina	Regina Fire Department is currently conducting a study and researching the possibility of enacting a by-law to require sprinklering in all single family homes and possibly other residential buildings.
Hamilton	No plans at this time to introduce additional sprinklering requirements.
Toronto	Bill 141, *The home Fire Sprinkler Act, 2004* is currently before the Ontario Provincial Parliament. The bill would amend the Ontario Code to require all new detached, semi-detached and row housing to be equipped with a fire sprinkler system.
Ottawa	Nothing currently planned at this time, pending the outcome of the Province's Bill 141, *The Home Fire Sprinkler Act, 2004.*
Mississauga	No plans at this time for any new sprinkler requirements.
Montreal	No information received.
St. John's	Due to low water pressure for fire fighting, some areas of the City require newly constructed 1 and 2 family homes to be sprinklered. They use the NFPA 101 Life Safety Code.
Halifax	At this time there is no additional legislation in place requiring sprinklers. There is however a Halifax Regional Municipalities task force/committee which consists of members from the industry, fire services, and other interested parties to promote residential sprinklers.
Charlottetown	Several single family homes and "Bed and Breakfast" establishments are required to be sprinklered under their Fire Prevention By-law. The Province is currently reviewing the requirements for sprinklering 1 and 2 family homes under the NFPA 101 Life Safety Code.
Yellowknife	As of March/2002 the Yellowknife Building By-law requires all 2 family dwellings and all other multiple family dwellings to be sprinklered.