

Facilities and Services – Fire Prevention  
Annual Report

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University Affairs Board

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## **Fire Prevention Annual Report - 2006**

### Introduction

The U of T Fire Prevention Section reports to the Director of Buildings and Grounds Services, and is tasked with addressing the fire and life safety needs of the St. George Campus. In this role, the Section acts as an agent of the owner, with a strong emphasis on reduction of liability, risk mitigation and due diligence with respect to legislated fire and life safety requirements. Fire Prevention is comprised of seven FTEs: the Section Manager and three Fire Prevention Officers, who are involved in broad-based prevention program activities, two staff who are fire sprinkler Tradespersons (focused on sprinkler suppression systems and fire standpipe systems), and an administrative assistant, who manages much of the required record-keeping and the associated support duties.

### Mission Statement

U of T Fire Prevention is responsible for providing a comprehensive, dynamic fire and life safety program that provides a safe environment for students, faculty and staff, while demonstrating accountability, transparency, and due diligence to all stakeholders.

### Guiding Principles

The Fire Prevention program is guided by a number of underlying moral and professional principles, as follows:

- Risk mitigation and due diligence
- Education and awareness
- Effective, efficient program administration
- Reputation
- Innovation
- Partnerships

The program itself involves a spectrum of interrelated services and activities that work collectively to deliver this essential safety element to the U of T community. The

majority of this work is driven by either legislated requirements or the need to demonstrate due diligence with respect to public safety.

## Driving Legislation

### Ontario Fire Code

Fire safety requirements in occupied buildings are legislated by the Ontario Fire Code, which addresses public education, fire drills, emergency pre-planning, regular prescribed systems testing, and control of hazards and hazardous processes through routine inspections. This legislation is the most dominant factor in defining Fire Prevention's role as an agent of the owner, as it sets a minimum level of fire safety in U of T buildings and specifies criteria that must be met and maintained in this respect. With the diversity of buildings, processes, and culture on the St. George Campus, this in itself can be a demanding and challenging role. U of T Fire Prevention has been actively involved with the Ontario Fire Marshal's Office in two Fire Code development committees in recent years to ensure representation of the University's best interests as the Code evolves. To illustrate the importance of this work, the changes made while serving on one committee saved the University an estimated \$30,000,000 in laboratory-related construction and renovation work.

### Ontario Building Code

The Ontario Building Code is also highly influential in the Fire Prevention program, since it applies to the construction of new buildings and renovations to existing buildings, and references a number of other Codes and Standards. Fire Prevention's involvement in new construction projects helps to ensure that designs meet the intent of the Code, that the safety needs of the University are met, that fire systems are designed wisely for ease of use in an emergency, and that long-term maintenance costs are kept in check. New construction can also have a major impact on safe exiting from adjacent buildings, so regular reviews of exit routes are needed. Renovation projects raise additional concerns due to the safety impact in adjacent occupied spaces in a building, and requirements for the elimination of false alarms that can be caused by internal construction and demolition processes.

### Municipal By-Laws

Finally, municipal by-laws play their part in defining certain aspects of the program, since they set additional requirements above and beyond the Fire Code. These currently include by-laws addressing the following:

- Fines levied by the City of Toronto for nuisance and malicious fire alarm activations
- Requirements for availability of emergency keys for building access in the event of a fire emergency
- Requirements for a permanently mounted fire safety plan receptacle in each occupied building

U of T Fire Prevention recently secured assurance from the Chief of Fire Prevention for the City of Toronto that they will have a voice in the development of future fire related by-laws. This representation will help to ensure the best interests of the University are served, and that the impact on our unique community is taken into proper consideration.

### The Program: Services Provided

A successful fire safety program must be dynamic and responsive to changes in public thinking, technology, current events, trends, and legislation. A comprehensive program that addresses the needs of its environment is more effective than the sum of its parts. The Fire Prevention program is framed within the priority objectives of the University's Academic Plan, and also fosters relationships with Municipal and Provincial Authorities. Key elements are broken down as follows:

- Emergency response & investigation
  - Responding to scene for fire alarms during regular office hours
  - Off-site management of after-hours calls in the event that fire alarm systems remain in alarm or other complications arise
  - Response to fire alarm systems with maintenance trouble alert during regular office hours, dispatch contractors for repairs as required
  - After-hours management of fire alarm maintenance trouble alert conditions when standard operating procedures are inadequate

- Response to chemical spill if deemed a fire hazard, investigate gas or smoke odours, and assist Campus Police for bomb/biohazard threats
- Responding to the scene for fires of any consequence, day or night
- 24-hour site response for fire sprinkler flow and sprinkler piping breaks
- Follow-up investigation after fires, consultation with Fire Department & Ontario Fire Marshal's representative
- Directing & administering routine and emergency testing, maintenance, and repair of fire safety systems
  - 112 fire alarm systems, with over 21,000 automatic fire detection devices
  - 7500 portable fire extinguishers
  - 20 kitchen hood suppression systems
  - 318 fire sprinkler systems
  - 120 fire standpipe systems
  - 2100 fire hose cabinets
  - distributed fire alarm central monitoring system network
- Construction & renovation involvement
  - Review plans & specifications for compliance with Ontario Building Code, Fire Code (intended use and processes), and internal design standards
    - Electrical (fire alarm system & safety implications of security systems)
    - Mechanical (sprinkler and standpipe systems, fire pumps)
    - Architectural (egress, exiting, and fire separations)
  - Develop and continue to improve fire protection design standards with the following emphasis:
    - reduction of long-term maintenance costs
    - ability to maintain a stock of emergency parts at lower cost
    - system reliability and longevity
    - staff familiarity and ease of system operation under emergency conditions

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- Attend construction meetings as required, providing direction regarding safety protocols or clarification of U of T requirements
- Arrange for fire protection system isolations to avoid nuisance alarms in occupied buildings
- Issue welding permits under a hot work hazard control system
- Site inspections to review ongoing and completed fire protection systems work, identify and follow-up on deficiencies
- Attend commissioning and accept systems on behalf of U of T
- Provide Fire Safety Plan direction and templates, review and mark-up draft version prior to submission to Toronto Fire Service
- Inspections
  - Routine scheduled fire safety inspections
  - Inspections initiated by a complaint
  - Construction/renovation site inspections
  - Inspections for issue of welding permit (hazard control)
  - Inspections resulting from JH&S committee reports
- Fire & Building Code consulting & application
  - Conceptual design proposal review
  - Hazardous process review
  - Retrofit audits & recommendations
  - Provide direction for seeking compliance alternatives to meet Code intent
  - General fire safety advice for departments and individuals
  - Advise UTSC and UTM upon request
- Education, training, drills & public awareness
  - Training for JH&S committee members
  - Lab safety seminars
  - Residence safety seminars
  - Training for Campus Police & dispatchers
  - Fire emergency & systems training for contracted security staff
  - Fire drills
  - Safety bulletins via LISTSERV

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- Involvement with SAC for Orientation and special activities
- Fire safety posters
- Deferred maintenance and system renewal
  - Over \$500k in deferred maintenance for life safety equipment/systems renewal and Code related upgrades for each of the past two years
  - Major projects this year included:
    - Replacement of obsolete fire alarm system at Warren Stevens
    - Replacement of problematic hose reels – Rosebrugh
    - Replacement of antifreeze system at Fitzgerald Bldg (replaced with standard dry-pipe sprinkler system)
    - Central monitoring upgrades to meet new Code requirements
    - Replacement of a number of major sprinkler system components that were corroded to the point of becoming a maintenance burden or flood hazard
    - Replacement/refurbishing of fire pumps that are corroded to the point of impacting their effectiveness
    - Replacement of all pressurized water extinguishers in Medical Sciences Building with multi-purpose dry chemical extinguishers
- Liaise with Authorities Having Jurisdiction
  - Regular meetings with representatives from the Ontario Fire Marshal's office to discuss code intent and initiatives
  - Meetings with Toronto Fire Services' upper management levels to discuss common goals, trends, and challenging issues
  - Joint operations with Fire Services suppression crews, including fire drills, familiarization tours, emergency pre-planning, and public awareness opportunities
  - Site meetings with Toronto Fire Inspectors to discuss construction deficiencies, partial or full occupancy requirements, and address any anonymous complaints routed through Toronto Fire Services.

## Program Emphasis in 2006

### Overview

2006 was a year of important new undertakings for U of T Fire Prevention. Although the majority of their man-hours were invested in two core program elements (testing & maintenance and construction/renovation), the Section made significant progress in enhancing the student experience through public awareness initiatives, and made great strides with important partnerships, specifically with different levels of Toronto Fire Services. In addition, Fire Prevention took on investigational research into a new technology in the interest of enhancing fire safety and exiting during building power failures.

### Testing & Maintenance / Construction & Renovation

During the past year, testing/maintenance and construction involvement accounted for over 60% of the section's time. Both of these are critical functions that impact the immediate level of fire and life safety, as well as long-term maintenance costs and system reliability.

### Public Awareness

In 2006, Fire Prevention placed an increased emphasis on public awareness, increased visibility, and an overall accountability to the community. This change, which was undertaken to further align the program with the University's mission, included the following initiatives:

- Fire Prevention attire to clearly identify staff to the community and to Toronto Fire Services during emergency response
- Draws for gift certificates during fire drills and student residence fire safety presentations
- Give-aways and increased presence during student orientation
- Development of fire safety posters with 4 messages that target common problems (3 of the designs were used on decks of playing cards for give-aways)
- The launch of a fire safety LISTSERV to deliver important announcements to the community



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- Fire Prevention Week
  - Introduction of posters
  - Interview on CIUT radio
  - Article on U of T's front Webpage
- A renewed dedication to fire drills across campus, supported by the Provost's office and U of T's recently adopted Policy on Crisis Preparedness and Response resulted in the success of 85 fire drills in 2006
- Development of a fire safety display with the theme of a safer Campus under the working partnership of U of T Fire Prevention and Toronto Fire Services
- Installation of "Fire Safety Plan" receptacles in all buildings across campus
- Oversaw installation of fire alarm "pull station guards" in Sandford Fleming/Galbraith and Warren Stevens to reduce malicious alarms during exams

### Partnerships

This year, Fire Prevention strengthened their relationship with a number of groups within Toronto Fire Services through several projects. Many fire drills in May and October were carried out in concert with Toronto Fire suppression crews, adding to credibility, awareness, and a sense of teamwork. Our Fire Prevention Officers carried out pre-planning building audits for response crews, helping to familiarize them with our facilities and ultimately streamlining emergency response. This year, several Toronto firefighters attended a student orientation as well, boosting awareness and associating themselves with our own Fire Prevention staff. Another first was a hands-on sprinkler training day for new Toronto Fire Inspectors that was provided by Fire Prevention's sprinkler staff. Lastly, our Fire Prevention group arranged for a meeting with the new Chief of Prevention for the City of Toronto, to lay the groundwork for a solid working relationship and initiate discussions to ensure U of T involvement in the formation of fire safety by-laws.

Investigational Research

A number of events that have unfolded over the past several years have raised a number of new concerns regarding safety and emergency planning. One important issue that relates to U of T buildings is the potential failure of the power feeds to emergency lighting and the resulting impact on safe exiting in an emergency. Where exit stairs are devoid of external windows, occupants could be left pitch black in the event of main power failure combined with an emergency power cut (for example, a fire in an electrical distribution room), even during the daytime. This is compounded further in high buildings, such as Robarts Library, where the combination of darkness and a fear of heights can completely immobilize a person during evacuation.

In order to ensure safe evacuation in an emergency, Fire Prevention is currently investigating the feasibility of using photo luminescent tape and signage in these specific types of areas, to provide occupants with depth perception and a low level of glowing light that will permit a safe evacuation under total lighting failure conditions. The product being tested is able to absorb and store light energy, producing a glow for several hours after electrical lighting is lost. Although the lighting level that the product provides is insufficient to *replace* emergency lighting, it may be used to augment it for these specific exit stair situations and alleviate the potential for a very hazardous evacuation. Pending the outcome of this research and testing, this type of product may be incorporated in future U of T Fire & Life Safety design standards for new construction and considered as a deferred maintenance retrofit to existing buildings.

Significant 2006 Data

Fire Alarm Calls

	2004	2005	2006
Fire Alarm Activations	179	173	176

Fire alarm activation statistics only include instances where the fire alarm bells are activated in a building. They do not include other issues such as fire alarm trouble alerts or occupant calls for gas or smoke odours, nor do they include fires that occur outdoors

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(i.e. – outdoor garbage cans). These figures show a consistent number of alarms each year, despite continuing campus growth. This suggests a lower number of alarms per device, or per unit of building area, indicating an overall reduction ratio. Reduction of alarms is important, as unnecessary alarms contribute to occupant apathy and inefficiency, loss of credibility, and result in fines for nuisance alarms that are levied by the City of Toronto.

### Fires & Fire Damage

	2004	2005	2006
Fires & Fire Damage	3 (\$500)	19 (\$18,000)	10 (\$33,500)

Although fire damage increased in 2006 over the previous two years, the number of fires was significantly decreased from 2005. It should be noted that a single fire occurrence at 89 Chestnut St. contributed \$20,000 in damage to the 2006 figure. Damage from a single fire can exceed \$200,000 depending on the room(s) involved, its contents, and the type of fire detection installed in the area. Many smaller fires remain unreported by building occupants.

### Isolations

	2004	2005	2006
Isolations	200	124	141

Isolations involve temporarily disabling a portion of a fire alarm or sprinkler system in order to prevent accidental activation. This procedure is a temporary measure used to accommodate renovations, construction, asbestos abatement, and some types of routine cleaning and maintenance. A successful isolation program reduces unwanted alarms without increasing the risk to building occupants. Isolation figures are expected to rise in future, as more buildings become equipped with smoke detectors due to designs involving interconnected floorspaces and atria.

### Future Opportunities

In the immediate future, Fire Prevention's plans include the continuation of two important initiatives from 2006, as well as the pursuit one additional key goal. Continuing with their momentum in public awareness will be a high priority, as will an ongoing focus on fostering relationships - both on campus, and with Municipal and Provincial authorities. A new priority will be the reinstatement of a regimen of scheduled campus-wide, semi-annual building fire safety inspections. These inspections will have a fourfold benefit, as they provide opportunities to meet with the community, improve staff familiarity with buildings, help to ensure the elimination of fire hazards or unsafe conditions to achieve Code compliance, and increase the level of public awareness. This incentive will be yet another channel for positive integration in the overall U of T experience, and will serve the community well in many respects.

### Conclusion

University of Toronto Fire Prevention embraced a new paradigm in 2006, bringing new ideas and initiatives to the community in an effort to align more effectively with U of T's mission, and improving their contribution to the U of T experience. The Section also renewed their emphasis on development of relationships with Municipal and Provincial authorities, which has proven to be highly beneficial, and continues to serve the University's best interests well. Undertakings in both of these areas have been very well-received, and have provided encouragement and positive feedback that will continue to reshape Fire Prevention's program in coming years.