

Tri-Campus Heating, Ventilation, and Air-Conditioning (HVAC) Strategy for Return to the University

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The University of Toronto is committed first and foremost to the health and safety of our entire community.

To ensure a thorough approach to maintaining a safe indoor environment, the role of HVAC systems and current maintenance practices in the context of COVID-19 was assessed against current public health evidence and industry guidelines.

Public health authorities continue to advise and evidence continues to support that droplet transmission (close contact with a confirmed COVID-19 case or touching a contaminated surface and your eyes, mouth or nose) is the dominant route of transmission.

Supporting the health and safety of our community

The University has implemented a series of measures, in keeping with public health directives, to reduce the risk of transmission:

- The majority of teaching, research, and operations continues to occur remotely to reduce the number of occupants on-campus,
- Practicing physical distancing (> 2 metres) throughout the campus by rearranging schedules and physical layouts,
- Requiring the wearing of a non-medical mask or face-covering in common use areas,
- Widely communicating COVID-19 precautions and symptoms such as hand hygiene and self-screening posters at all entrances, and
- Advising employees and students to stay home if they are ill and to contact our occupational health nurse who will provide further direction and will conduct contact tracing.

These remain the most effective measures against COVID-19.

To support efforts, building operations teams will continue maintaining a safe indoor environment through:

- ✓ **Regular maintenance of HVAC systems on all of our campuses**
- ✓ **Taking extra precautions suggested by industry guidelines to replace centralized HVAC system filters to enhanced MERV-13 filters or the highest compatible with the existing HVAC infrastructure**



Frequently Asked Questions

1. **How does transmission of COVID-19 occur?**

Public Health Ontario actively monitors, reviews and assesses relevant information related to COVID-19 and continues to emphasize that most cases are linked to person-to-person transmission through direct close contact with someone who is positive for COVID-19, and that is mainly due to contact with large aerosol droplets or indirect contact with contaminated surfaces. Airborne spread has not been a dominant or common mode of transmission.

2. **Is exposure to aerosol droplets the same as airborne transmission?**

Aerosols are liquid droplets which can travel through the air. COVID-19 forms predominately large aerosol droplets which are unlikely to travel beyond two meters. Aerosols can be generated by coughs and sneezes, and in healthcare settings by certain medical procedures, however the presence of aerosols does not constitute airborne transmission.

3. **What role do building HVAC systems play?**

The standard, basic COVID measures, including physical distancing, surface cleaning and disinfection, handwashing and use of face mask or covering are key to prevention and mitigation, and far more important than anything related to HVAC systems. HVAC systems in most non-medical buildings play only a small role in infectious disease transmission, including the transmission of COVID-19.

COVID-19 has not changed code or regulatory requirements for ventilation in workplaces. Consistent with the hierarchy of health and safety controls and the precautionary principle, public health agencies and industry organizations have developed guidelines for building ventilation during the pandemic.

4. **How is UofT implementing guidelines for building ventilation?**

The Tri-campus HVAC strategy references the guidelines mentioned above, and is being implemented by professional engineering and technical staff with the expertise required to interpret guidelines in relation to the variety and complexity of buildings and systems on our campuses.

Consistent with the guidelines, the HVAC Strategy focuses on verifying that systems are being properly maintained and operating properly, adjusting controls for parameters such as the amounts of total and outdoor air where feasible, and upgrading filtration where practicable.

Like many other large educational institutions, we have a variety of buildings and systems. Modifications and upgrades depend on the building and system under consideration. For example in heritage buildings, renovations and system changes may not be allowed.



Where central HVAC systems can't be upgraded and in workspaces where there is no mechanical ventilation, other practicable solutions may be considered, or per guidelines, measures to increase natural ventilation (i.e. using windows and/or doors) may be recommended. Unventilated spaces are being identified and evaluated on a case-by-case basis, as part of the HVAC Strategy and re-entry planning process.

It is important to note that the fact that a space does not have mechanical ventilation does not necessarily mean that there is elevated risk for COVID-19. Most work performed at UofT is classified as low risk. For example, office workers who do not have frequent close contact with coworkers, customers, or the public are classified as low risk for COVID-19. Reductions in onsite staffing levels and maximum occupancies based on public health guidelines significantly reduce transmission risk.

5. What role do portable air filtration units play, e.g. High-Efficiency Particulate Air (HEPA), standard air purifiers?

There are no specific public health or other requirements regarding portable air filtration. As for HVAC systems, there is no reliable evidence that portable air filtration units are effective in reducing transmission risk.

6. How has UofT prepared HVAC systems for the resumption of on-campus activities?

Despite significantly reduced building occupancy since the start of the pandemic, the majority of the HVAC systems were not completely shut off and have remained in operation. Filters have been regularly replaced based on best practises.

In preparation for a gradual and safe re-entry to each building, building operators have been performing the following inspections and maintenance:

- a. Ensuring filters have been replaced based on best practices.
- b. Ensuring all setbacks and setup modes are set to normal.
- c. Ensuring that fans are working and that air is moving in and out of the building.
- d. Ensuring that dampers (outside and return) are working properly to help ensure the flow of fresh air to the building.
- e. Ensuring that filters are operating appropriately.

7. How is UofT addressing the suggestions of some research papers that we should increase ventilation and air change rates, increase fresh air flow and/or run air change 24/7?

The University's HVAC Strategy was based on a review of and alignment with relevant legislative requirements and credible industry guidelines, including Public Health Ontario, the Ontario Building Code, Centre for Disease Control and Prevention (CDC) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).



ASHRAE, the CDC's and Ontario's primary authority on HVAC, has published COVID-19 guidelines for the industry. ASHRAE does not consider increased ventilation rate (ACH) and percentage of outdoor air circulation as processes that clearly reduce risk of transmission in non-health care facilities. In the event of an emergency, ASHRAE recommends flushing of a space with as much as outside air as possible for extended amounts of time. The University defines an emergency in the context of COVID-19 as an outbreak on campus. In the event of an outbreak on campus, the University will follow the recommendations of ASHRAE and local public health authorities.

8. Some resources suggest we should have MERV 13¹ filters installed on all centralized HVAC?

What is UofT doing?

In the event of an emergency, ASHRAE recommends upgrading central air filtration to MERV-13 or the highest compatible with the filter rack. Having a compatible filter in-place is critical to ensure that filter edges are sealed to limit air bypass.

All newer buildings/HVAC systems on-campus already utilize MERV-13 filters as the minimal standard for central air handling units. As a proactive measure, the University is in the process of replacing existing MERV-8 to MERV-13 filters, wherever MERV-13 filters are compatible with the existing infrastructure. In other cases, building operators are ensuring that filters are in good operating condition, clean and with sealed edges.

9. I use the stairs and there is no ventilation. Should I be concerned?

Stairwells are common use spaces and all users are expected to wear a non-medical mask or face covering per the UofT Policy on Non-medical Masks and Face Coverings. In addition, as per the Tri-Campus Caretaking Strategy, high touch surfaces such as railings and door handles will be disinfected twice daily. Physical distancing signage have also been posted and depending on the building, yield signage or designated stairwells are used to reduce traffic.

If you have concerns regarding your particular work space, please contact your supervisor who can work with Property Management on specific concerns as applicable.

¹The Minimum Efficiency Reporting Value (MERV) scale measures the effectiveness of air filters. Filters with higher MERV values capture a greater percentage of smaller particles from the air that passes through the filters.