UNIVERSITY OF TORONTO

DEFERRED MAINTENANCE ANNUAL REPORT 2021

TABLE OF CONTENTS

LAND ACKNOWLEDGEMENT

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

We have come a long way in a short time to ensure the future viability and sustainability of our campus facilities.

In 2019, internally, we pioneered a comprehensive and consultative approach to prioritizing our deferred maintenance needs and to allocating resources accordingly. At the same time, we began to assume an increasingly important leadership role in Ontario's post-secondary sector. We drove significant changes in the assessment and management of facility conditions and became a voice for advocacy for post-secondary infrastructure funding.

Last year, we set the institution on a path to close the gap between our historical spend on deferred maintenance, and the average spend among peer institutions in Ontario—increasing our annual deferred maintenance budget by $2.5M. This is a big step toward securing a stream of funding for the upkeep of our facilities. It is important today as a foundation for the massive growth planned for the St. George campus as it prepares to nearly double in size by 2050.

The reality is that deferred maintenance is not just an issue for facilities and administrative staff—it affects everyone on campus. It shapes the campus experience for students, researchers, librarians, and staff.

The ability to, year-over-year, address deferred maintenance needs has direct and unequivocal consequences on: our ability to maintain the organization's ranking and attract top research and teaching talent, the reliability of our building systems and the prevention of unexpected failures and incidents, the student experience on campus when participating in every facet of academic life and community, and the resilience of our facilities in the face of climate change and imminent environmental events.

As a world-class institution, we envision and strive for an even brighter future for our three campuses—with vibrant community spaces, iconic and historic buildings, operating with a minimal carbon and ecological footprint—all achieved with a smart use of dollars.

I am pleased to present to you the University's 2021 deferred maintenance report that presents last year's highlights and our ambitious plan for the future.

Ron Saporta
Chief Operating Officer
Property Services & Sustainability

OUR DEFERRED MAINTENANCE PROGRAM

The University of Toronto has three campuses with some of the most prestigious architecture and beautiful green space in the Greater Toronto Area.

With more than 115,000 students, faculty, librarians, and staff using more than 200 buildings spanning an area of 286 hectares, keeping up with maintenance on all the campus facilities is a challenging undertaking. These time-honoured facilities have significant deferred maintenance needs.

The University's deferred maintenance program systematically addresses many of these needs, including improved electrical and plumbing systems, ventilation, building envelopes, and interior finishes.

Properly maintained campus facilities reflect the pride and prestige of our institution. As a world-class university, our grounds and spaces must be kept safe, comfortable, reliable, and up to date in an energy efficient and fiscally responsible way to enable state-of-the-art research and learning for our entire community.

Deferred maintenance is the postponement of building and equipment capital repairs and infrastructure renewal from an organization's normal operating budget cycle due to a lack of funds.

THREE THINGS TO KNOW ABOUT DEFERRED MAINTENANCE AT THE UNIVERSITY

1. Taking care of deferred maintenance needs on our campus is imperative to creating a world-class student experience and supporting our academic and research mission.

2. We are leading Ontario's post-secondary sector in developing and putting into action deferred maintenance strategies.

3. We have a long-term plan to invest strategically and sufficiently in addressing infrastructure risk and meeting the University's needs.

OUR ANNUAL DEFERRED MAINTENANCE CYCLE

As Canada's largest university, the University of Toronto has a substantial backlog of deferred maintenance. In 2021, the backlog was $821M.

Managing it requires carefully allocating the annual budget to address our community's diverse and changing needs all while mitigating infrastructure risk.

The St. George campus uses a prioritization model for strategically allocating funding. This model is integrated into the yearly deferred maintenance cycle and considers a range of factors to inform short-term investment in the context of long-term planning for our growing campus.

Our deferred maintenance portfolio is shaped by operational and capital projects, property acquisitions, and fresh data.

Each year, new building audit data provides updated information on the condition of our facilities. The condition of our facilities, meanwhile, is continuously improved as deferred maintenance is addressed through maintenance and capital projects.

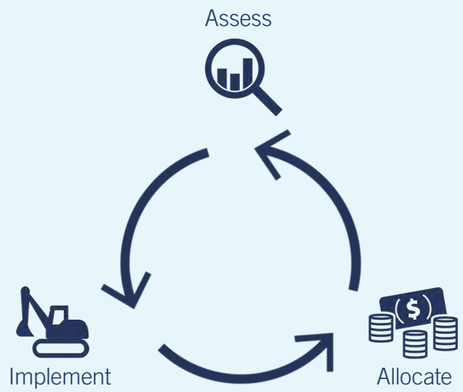
THE ANNUAL DEFERRED MAINTENANCE CYCLE

1 — **Assess** the condition of the University's facilities.

2 — **Strategically allocate** funding based on comprehensive risk scores.

3 — **Implement** projects that address deferred maintenance.

One of the greatest challenges of deferred maintenance is the allocation of the annual budget. We address this challenge with a strategic allocation methodology that considers a wide range of criteria.



ASSESSING THE CONDITION OF OUR FACILITIES

Our deferred maintenance cycle ensures that every year our data is reflective of the real physical state of our facilities and the needs of our community.

The annual cycle begins with a facility condition assessment. The assessment includes an audit of the physical state of our facilities and building equipment that considers many factors including age, design, physical state, and emerging design standards to identify deficiencies, cost to repair, and urgency of repair.

The condition of every building is audited every five years. With fresh, objective information on 20% of our total building area every year, the audit continuously updates our deferred maintenance dataset and ultimately, our understanding of the state of our infrastructure.

The audit identifies building systems requiring immediate repair and provides cost estimates for their repair. These costs are used to calculate a facility condition index (FCI) score for each building.

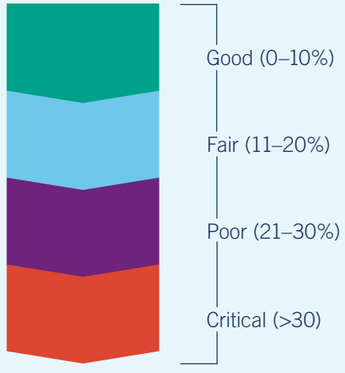
The FCI is a cross-industry standard measure that compares the cost of fixing a building's deficiencies with the cost of replacing it entirely. The FCI reflects the relative condition of buildings and allows the comparison of the condition of different buildings and equipment.

CALCULATING THE FACILITY CONDITION INDEX

The FCI is a cross-industry standard measure that compares the cost of fixing a building's deficiencies with the cost of replacing it entirely.

$$FCI = \frac{\text{total cost of existing deficiencies}}{\text{current replacement value}} \times 100\%$$

The FCI percentage is then categorized on a scale ranging from good (for percentages from 0 to 10) to critical (for percentages greater than 31).



Electrical and mechanical systems represent 43% of the total deferred maintenance cost for the St. George campus.

These systems are critical as they provide comfort, indoor air quality, and safety for building occupants. Routine maintenance is required to increase energy efficiency, lessen impact to secondary buildings systems, and to maintain productivity.

STRATEGICALLY ALLOCATING OUR FUNDING

Faced with the dual challenges of meeting diverse community needs and mitigating infrastructure risk, the University pioneered an approach to allocate limited dollars to address the deferred maintenance backlog.

We no longer rely solely on facility condition data derived from the yearly audit to inform how we spend our deferred maintenance budget.

Instead, we thoroughly assess and account for different factors to arrive at a more holistic weighted risk score for each building and facility system.

The score combines audit results with factors such as space use and impacts of failure—all within the context of long-range capital planning.

Funding is then prioritized for building systems with the highest risk scores, ensuring fiscally responsible spending.

The University of Toronto is the first post-secondary institution to use such a model. In June 2021, we presented our strategic funding allocation model at the annual Canadian Association of University Business Officers conference.

We are active proponents of fiscal responsibility in deferred maintenance spending and the broader adoption of strategic allocation funding in our sector.

ST. GEORGE DEFERRED MAINTENANCE COMPREHENSIVE RISK METHODOLOGY

In this comprehensive model, every year each asset is assigned a weighted risk score of one to five based on these five criteria.

1. The physical condition of the asset based on the facilities condition audit.
2. The current use of the facility that prioritizes academic and research uses.
3. The future use of the building based on the University's capital plan.
4. If the asset fails, the severity of impact to building occupants.
5. If the asset fails, the severity of impact to other building systems, where failures that have consequential impacts to other assets are prioritized.

University College is the oldest building at the University.

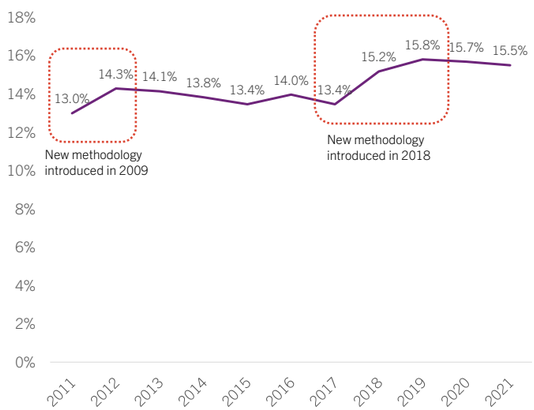
The St. George campus is home to 54 heritage buildings. Maintaining, conserving, and updating these buildings is no easy task.

A SNAPSHOT OF OUR DEFERRED MAINTENANCE IN 2021

In 2021, the current replacement value of all academic and administrative buildings at the University of Toronto increased to $5.3B.

The backlog of deferred maintenance remains high. The total cost of tri-campus deferred maintenance increased from last year by $26.8M to $820.5M. The combined facilities condition index remained stable at 15.5%.

TRI-CAMPUS HISTORICAL FACILITIES CONDITION INDEX



$5.3B

In 2021, the current replacement value of all buildings at the University increased to $5.3B.

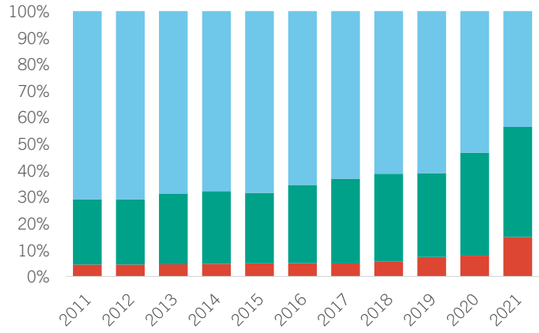
$820.5M

In 2021, the cost of the University's tri-campus deferred maintenance was $820.5M.

15.5%

The facilities condition index remained stable in 2021 at 15.5%.

TRI-CAMPUS PRIORITY DISTRIBUTION AS A PERCENTAGE OF TOTAL DEFERRED MAINTENANCE

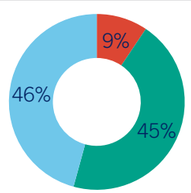
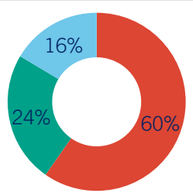
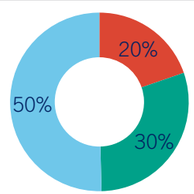


Deferred maintenance is not all made equal. During the audit, deficiencies in facilities are prioritized based on the urgency with which they must be addressed. Deficiencies are assigned one of three priority groups:

- **Priority one** deficiencies are recommended to be addressed within the next year. These tend to be assets that are **well beyond useful life and/or are currently failing**.
- **Priority two** deficiencies are recommended to be addressed in **one to three years**.
- **Priority three** deficiencies are recommended to be addressed within **five years**.

DEFERRED MAINTENANCE BY CAMPUS

The University of Toronto's deferred maintenance varies across our campuses, reflecting the overall size and condition of local building portfolios.

	St. George	Mississauga	Scarborough
Total replacement value of academic and administrative buildings	**$4.4B** for 96 buildings*	**$0.5B** for 22 buildings	**$0.4B**** for 9 buildings
Deferred maintenance backlog	**$665.4M** ▲ $5.2M***	**$72.4M** ▼ $0.3M	**$82.8M** ▲ $21.9M
Facilities condition index	**15.3%** ▼ 0.2%	**14.3%** ▼ 0.3%	**19.3%** ▼ 1.5%
Breakdown of deferred maintenance by priority			
Priority one needs	**$62.6M** ▲ $15.9M	**$43.2M** ▲ $28.7M	**$16.3M** ▲ $15.3M

*Eight of a total of 104 buildings on the St. George campus that have not yet been audited will be audited next year.
**This figure does not include $119M of 24,943 gross square metres to be audited.
***Arrows show change compared to 2020.

IMPLEMENTING MAJOR PROJECTS FOR FISCAL 2021–22

This year will see a variety of projects completed to address high-risk deferred maintenance.

Project types on the St. George campus	Estimate
Contribution to capital projects and renovations *(e.g., Landmark Project, Transforming the Instructional Landscape Project)*	$5.1M
Interior and fabric projects *(e.g., Ontario Institute for Studies in Education basement waterproofing, various mould abatement, and fire alarm upgrades)*	$0.6M
Roofs and building envelopes *(e.g., Ontario Institute for Studies in Education, Lash Miller Chemical Laboratories, Simcoe Hall roof replacement and repairs at various locations)*	$23.6M
Elevators *(e.g., Dentistry Building, Max Gluskin House, and repairs/upgrades to various lift locations)*	$1.5M
Road repairs and grounds *(e.g., various paving, irrigation, and landscaping upgrades)*	$0.8M
Electrical and mechanical systems *(e.g., 500 University and Medical Sciences Building cooling tower upgrades, domestic hot water system replacement at C. David Naylor Building, and various HVAC upgrades)*	$0.9M
Total	**$32.5M**

The University of Toronto's cost of deferred maintenance per square foot is 24.7% higher than the Ontario average.

We need to continue to increase our investment by $2.5M annually to match the 1.45% average level of investment by our peers in Ontario.

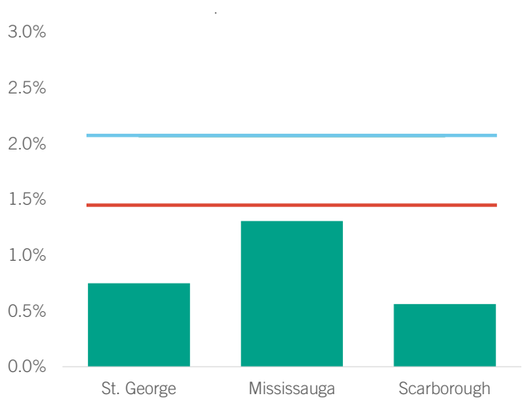
OUR COMMITMENT TO A VIBRANT CAMPUS EXPERIENCE

Historically, the University's deferred maintenance funding has lagged behind all provincial and national comparators. Meanwhile, our cost of deferred maintenance per square foot has been 27.4% higher than the Ontario average.

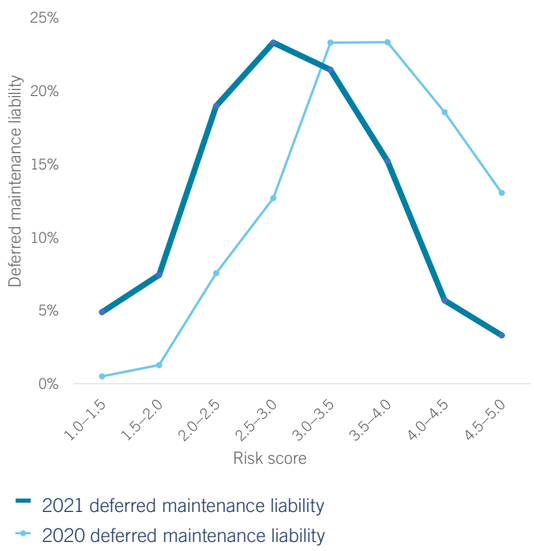
To catch up to average provincial spend while appropriately spending the deferred maintenance budget—we have been allocating our funding differently.

We are beginning to see early evidence that our targeted approach is effectively addressing the highest risk infrastructure on our campus. Between 2020 and 2021, we decreased the proportion of our deferred maintenance identified as highest risk.

TRI-CAMPUS 2020-21 FUNDING AS A PERCENTAGE OF CURRENT REPLACEMENT VALUE



SHIFTING THE RISK SCORE OF OUR DEFERRED MAINTENANCE THROUGH STRATEGIC INVESTMENT



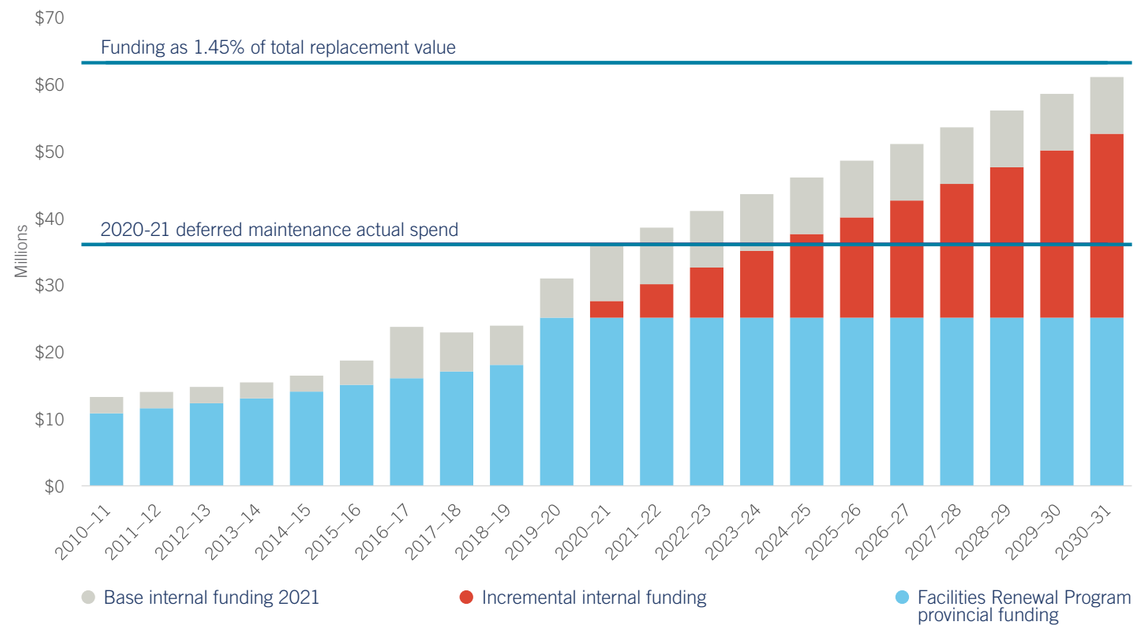
With continued targeted funding, we expect to bring down the risk profile of our entire deferred maintenance portfolio. This will stabilize infrastructure risk on our campus, increase system reliability, and allow us to allocate more resources towards preventative programs.

To improve the condition of the facilities and maintain a vibrant campus experience that enables and inspires world-class learning and research on the University's largest campus with the most significant deferred maintenance backlog—St. George—as well as to bridge the investment gap with our peers calls for a total annual investment of $63.2M, an increase of $27.1M.

Deferred maintenance is funded by the University with grant support from the provincial government's Facilities Renewal Program. Capital projects also indirectly address deferred maintenance costs through the renewal of buildings.

To reach the provincial average, we require a consistent year-over-year growth in the deferred maintenance budget while also leveraging provincial and federal funding programs.

FORWARD LOOKING ST. GEORGE DEFERRED MAINTENANCE FUNDING



23%

The University of Toronto's cost of deferred maintenance per square foot is 23% higher than the Ontario average.

$63.2M

Total annual investment needed to match the 1.45% average level of investment by our peers in Ontario.

WE ARE LEADING THE CHARGE IN THE POST-SECONDARY SECTOR

Deferred maintenance has been a persistent, major problem in the post-secondary sector for decades.

In 2020, the deferred maintenance backlog for Ontario's colleges and universities reached $4.7B. In 2021, University World News summed up the problem as a massive maintenance backlog.

We are challenged with taking care of aging facilities built during construction booms that now require significant renovations, while keeping up with quickly advancing technology, changing building standards, and allocating limited funding.

Without a focused strategy, deferred maintenance can be an overwhelming and insurmountable challenge. This is why the University believes it is important to bring the sector together to better understand the provincial landscape, develop better tools and supports, and form a collective voice on behalf of the sector.

Over the last several years, we stepped in to strengthen our sector's understanding of deferred maintenance. As the chair the Council of Ontario Universities table on deferred maintenance, the University of Toronto led the selection of a new auditor for the province and the establishment of key tools including a deferred maintenance database. Fully leveraging the robust new data, we dedicated resources to analyze trends for all institutions and develop forward-looking projections of facilities condition index for the entire province. Our role has also extended to advocate with the Ministry of Colleges and Universities and Ministry of Infrastructure for greater infrastructure funding for the sector.

We take pride in representing and advocating for the needs of all post-secondary institutions in the province.

WHAT'S NEXT FOR DEFERRED MAINTENANCE AT U OF T

Our deferred maintenance plan is tightly linked to our long-range capital planning, climate action, and day-to-day maintenance goals and strategies.

KEY FUTURE STEPS:

1. **Engaging government** in supporting large-scale infrastructure initiatives and continuing our role in chairing the Council of Ontario Universities committee to advocate for increased Facilities Renewal Program funding.
2. **Working with our peers** for stronger and more standardized provincial tools and data to adequately assess deferred maintenance and monitor the progress of investment efforts.
3. **Partnering with academics** to mobilize emerging knowledge and research to develop predictive models to improve asset reliability.
4. **Finding ways** to advance decarbonization whilst addressing deferred maintenance needs on our campuses.

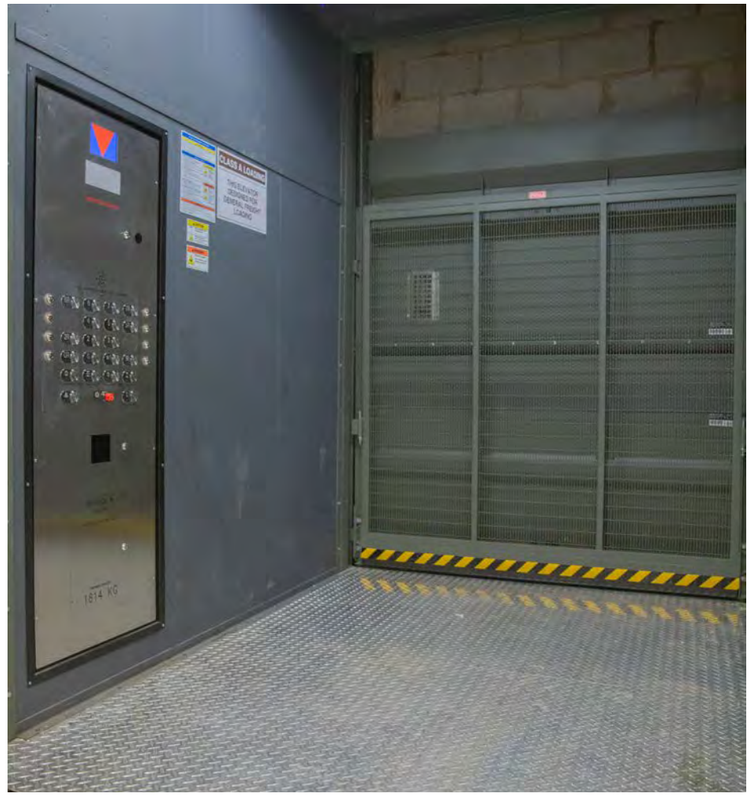
ELEVATOR MODERNIZATION

The University of Toronto is one of the largest elevator owners in Ontario. More than 260 elevators, lifts, and hoists carry people and cargo and are a critical building element for the accessibility community on the St. George campus.

Every year we undertake a variety of modernizations and major repairs to our elevating devices to reduce service interruptions and improve their safety for passengers and for the mechanics maintaining them.

In 2021, the freight elevator at Ramsey Wright Laboratories was transformed from a manual device with frequent malfunctions to a freight-capable elevator with a modern passenger elevator experience. The elevator cab is now fully renovated and furnished with automatic doors and digital display screens. The elevator was also connected to the fire safety system, enabling it to bring passengers to alternate floors in the event of a fire alarm for a safe exit. Entirely overhauling the updated traction mechanism and bringing all components up to code also makes the device energy efficient by recycling unused power and overall, much safer and faster.

In 2021, we upgraded the elevator pit at the Max Gluskin House. The pit—the basement at the bottom of an elevator shaft that houses the hydraulic mechanism pushing the elevator cab up—had been degraded over time by flooding from surrounding groundwater. By retrofitting the pit and protecting it with a waterproof seal, we have significantly reduced the need for future service disruptions and greatly improved all safety aspects of the elevator.



Bottom left and top right: the new freight elevator at Ramsay Wright Laboratories. Bottom right and top left: the new and old hydraulic mechanism in the elevator pit at Max Gluskin House.

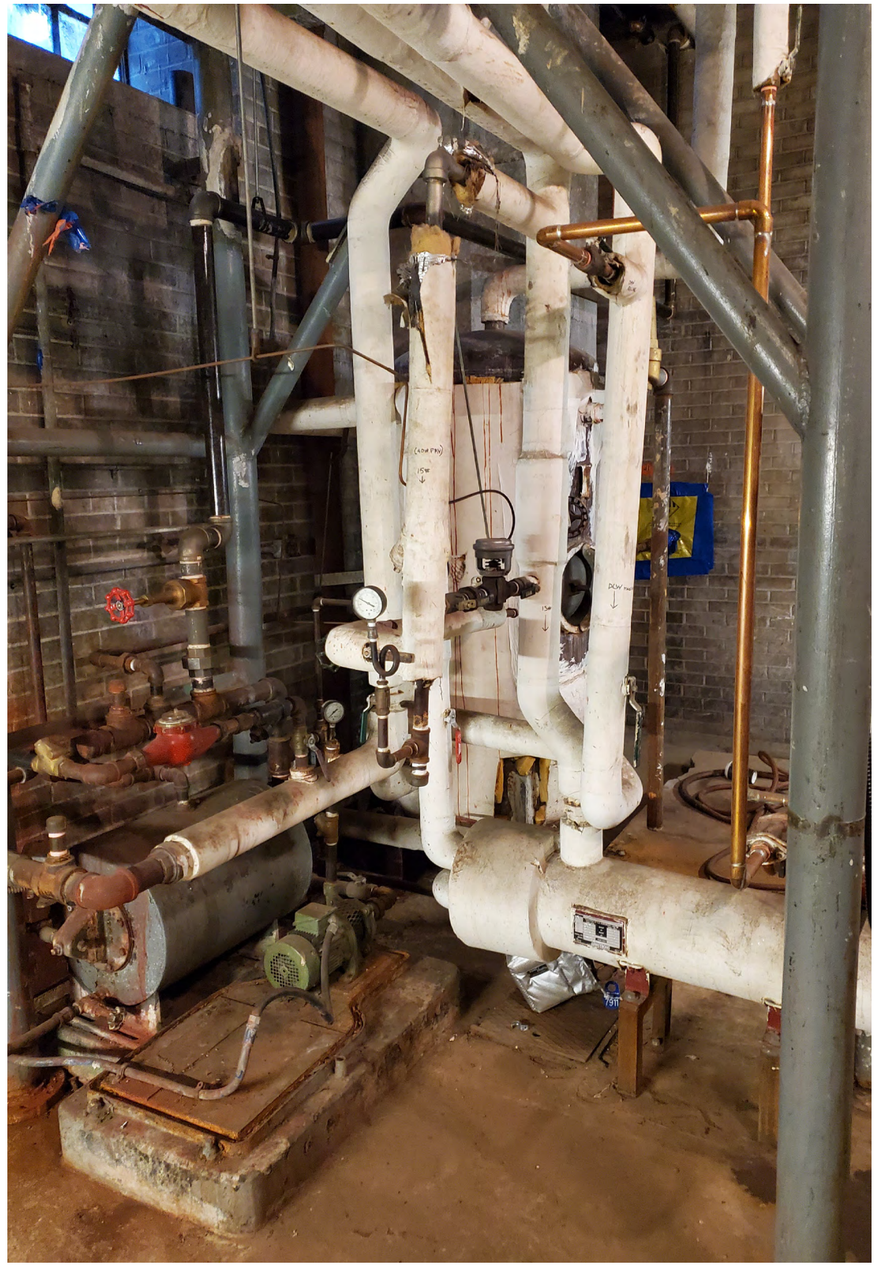
In 2021 we replaced the freight elevator at Ramsay Wright Laboratories with a new automatic freight elevator, and sealed and retofitted the elevator pit at Max Gluskin House.

REPLACING A DOMESTIC HOT WATER GENERATION SYSTEM

Domestic water heaters generate domestic hot water for research labs, kitchenettes, and washroom facilities. Hot water must be readily available and delivered safely to building occupants.

Built in 1931, the C. David Naylor Building is one of the homes of the Temerty Faculty of Medicine. Over the last 90 years, the building's steam-powered domestic hot water generation system outlived its lifetime and began falling behind modern health and safety standards.

Through the deferred maintenance program, we took the opportunity to not only bring the hot water generation system up to standard, but also to replace it with an electric, energy-efficient alternative—ensuring water quality for the Naylor building's community while moving us a small step closer to meeting the University's sustainability goals.



C. David Naylor Building

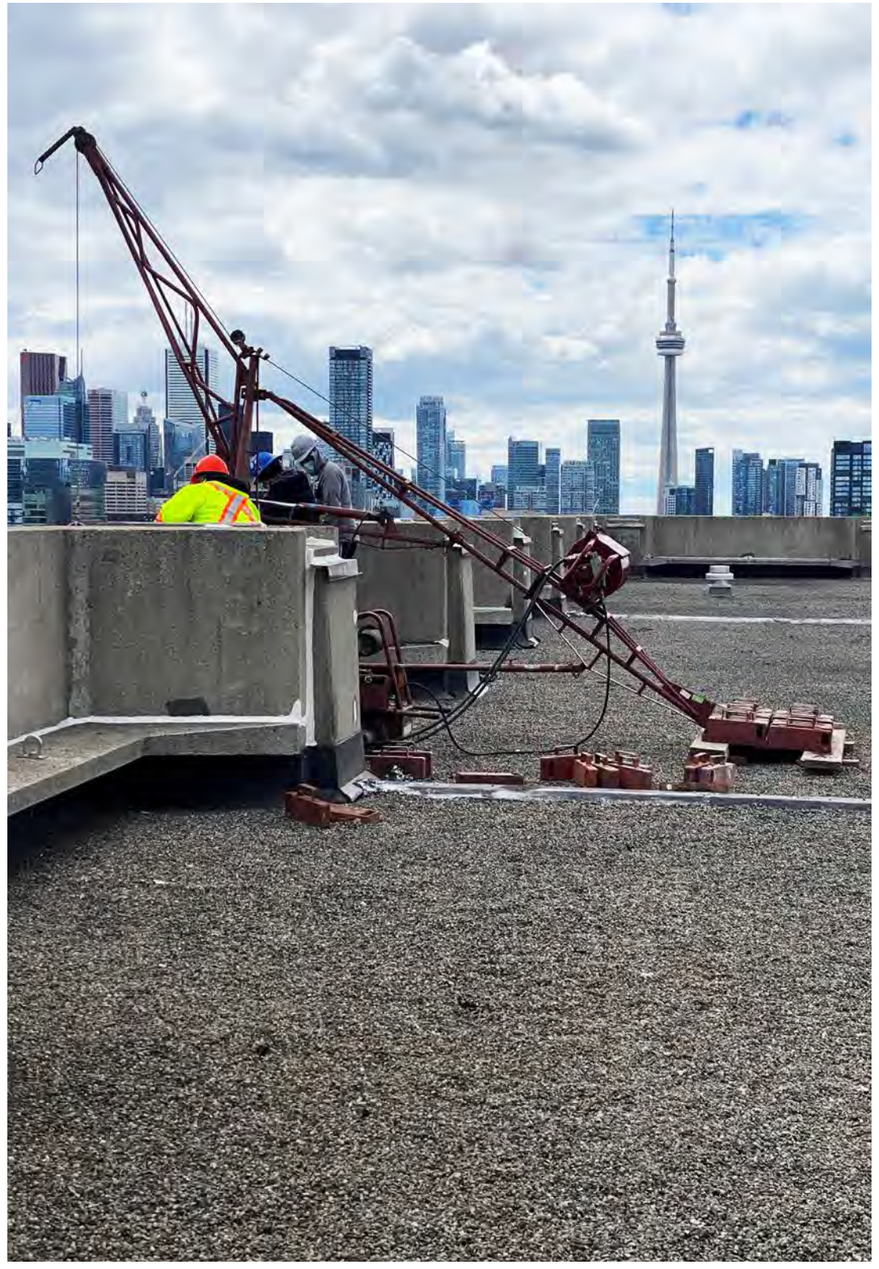
Through the deferred maintenance program, we replaced the domestic hot water generation system at the C. David Naylor Building with a new electric one, making it safer and more energy efficient.

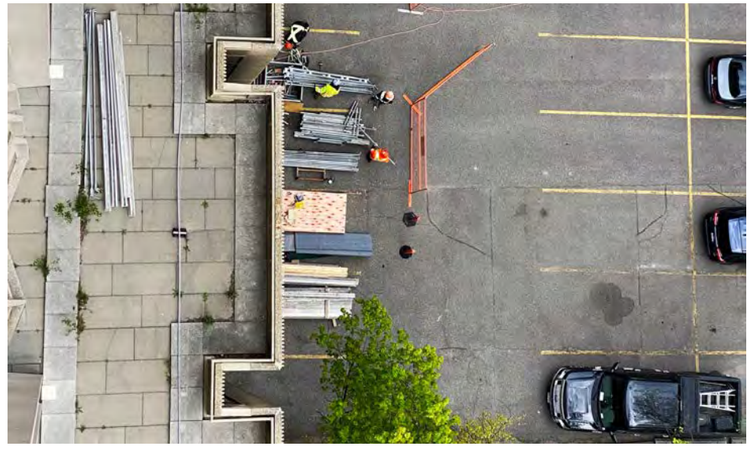
ROOF REHABILITATION

Roofs sit at the top of the University's highest risk infrastructure; they are critical to ensuring buildings are operating smoothly and safely. Damaged and leaky roofs could disrupt research and teaching operations, cause expensive interior damage, and lead to associated fire safety and mould hazards.

With 150 buildings on the St. George campus, the Property Management team uses a robust database to aid in prioritizing roof repair. They also work with a roofing consultant, who provides specifications and work scope for tender and inspects the construction. They also recommend standards for durable roofs with a long lifespan. Other tools used include drones and infrared scanning.

The roof on the Ontario Institute for Studies in Education building was installed in the 1950s. Sixty years later, sections of the roof were leaking, resulting in stained ceilings and other issues. In 2021, we replaced the entire roof, ensuring it is watertight for decades to come. We also used this roof renovation project as an opportunity to improve insulation and upgrade roof anchors, which are used during the window cleaning process.





Ontario Institute for Studies in Education (OISE)

In 2021, we replaced the entire roof of the Ontario Institute for Studies in Education, ensuring it is watertight for decades to come.

All photos provided by
University of Toronto
unless otherwise stated,
with acknowledgement to:

David Lee (Cover, 2)
Pratik Bassi (1)
Johnny Guatto (6)
Diana Tyszko (8)
Daria Perevezentsev (12)
Skyler Huang (18, 20)
Keelan Robinson (18)
Milan Cerovina (20)
Ron Shakespeare (22)

Deferred Maintenance Annual Report 2021
fs.utoronto.ca

UNIVERSITY OF TORONTO | **Facilities & Services**