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# RENEWED 5 - YEAR FACILITY MAINTENANCE PLAN

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Facility Services

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HAMILTON-WENTWORTH DISTRICT SCHOOL BOARD  
20 Education Court, Hamilton, Ontario L9A 0B9

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## Introduction

Hamilton-Wentworth District School Board (HWDSB) believes all students have the right to learn in equitable, affordable, and sustainable schools. The Renewed 5-Year Facility Maintenance Plan has been developed to support HWDSB's Strategic Directions, Board Improvement Plan and Long-Term Facilities Plan (LTFP). This Plan addresses specific non-renewal maintenance requirements in our facilities. The Board's Multi-Year Capital Plan addresses major renewal work such as window, boiler or roof replacements and major renovation projects.

## Purpose

The Renewed 5-Year Facility Maintenance Plan provides us with a framework for addressing repairs and preventative maintenance events to ensure the ongoing operations of HWDSB facilities. The Plan provides a means of measuring actual progress against planned accomplishments. Through tracking of trending analysis, deficiencies may be maintained at a manageable level or used to reflect an unmanageable area of concern that should be addressed in future budget processes.

## Objectives

The ultimate objective of the plan is to transition from a reactive plan to a predictive and preventative (proactive) plan that will permit the proper allocation of funds to the needs of the inventory, reduce emergency spending, and prolong the lifecycle of assets in the inventory.

Specific objectives include:

- Ensuring that facilities are operated in an effective, safe, and economical manner.
- Providing maintenance planning for buildings, grounds, and equipment, which eliminates or reduces, the risk of failure and safety hazards; thereby, protecting the occupants as well as the investment.
- Providing minor alterations to facilitate the continued functionality of buildings as their educational needs and uses change over time.
- Providing continuous use of facilities without disruption to programs by applying the principles of Preventive Maintenance (PM), thus reducing the possibility of emergency repairs.

## Resources

The execution of the Renewed 5-Year Facility Maintenance Plan is led by the Facility Operations Manager, who is supported by a team of 14 Facility Operation Supervisors. Those supervisors are each assigned to a Secondary School and a group of Elementary Schools and are responsible to oversee custodial and maintenance activities and staffing throughout the operating school day. Facility Operations Supervisors rotate supervision during the afternoon and evening caretaking shifts.

## Methodology

Facility Services staff regularly review the Facility Condition Index (FCI) prepared by VFA Canada for each of the 93 schools in the current HWDSB inventory. In addition, reactive and proactive facility needs are tracked utilizing the work order system and facility operations software adopted by HWDSB.

The Renewed 5-Year Maintenance Plan was developed utilizing data from the FCI. FCI is a ratio used to measure the relative condition of a building taking into account all building systems. It is calculated by

dividing the cost of repairs for the building by the replacement value. Currently, FCI is only determined by requirements that have been identified under the School Condition Improvement (SCI) funding source. School Condition Improvement is one of the funding sources the ministry requires to be reported in VFA. Requirements that were addressed using a different funding source are not currently included in the FCI calculation. It is expected that SCI, SRA and Proceeds of Disposition (POD) will be reflected in future VFA/FCI reporting. As such, HWDSB Facility Services staff will be tracking these costs in preparation for future FCI enhancements.

Facility condition assessments occur on a five-year cycle. These assessments are derived from visual inspections undertaken for the architectural, structural, mechanical and electrical elements of the building. The assessment is used to determine the remaining service life of a specific building component. FCI assessors determine the replacement timing of a building component and the estimated cost to address the replacement. It is with the replacement timing and estimated cost that the FCI can be calculated.

### Renewal VS Non-Renewal Requirements

A **renewal** requirement is a requirement record that is automatically generated based on a system renewal event in VFA. A system renewal event is the cyclical repair or replacement of a VFA system as it reaches the end of its useful life. System renewal is forecast to occur at the end of a system's lifetime in its renewal year, which is based on the system's expected lifetime or its observed condition.

A **non-renewal** requirement is a facility need or a deficient condition that should be addressed, including deferred maintenance, code issues, functional requirements, and capital improvements. A non-renewal requirement can affect an assembly, piece of equipment, or any other system.

Maintenance plan projects are typically non-renewal requirements. However, for this plan, both renewal and non-renewal requirements have been considered. For example, a roof replacement would be considered a renewal and a major roof repair is considered a non-renewal requirement as it does not involve an entire system replacement.

### Other Exclusions

VFA tracks and records the lifecycle of building components from the year of install. There are some systems, such as standard foundations or structural frames, which have a lifecycle of 150 years and require extensive work and funding to address as a replacement project. In these cases, VFA recommends that a study take place to determine the cost of major renewal or replacement for these systems. As such, cost estimates identified in VFA are based only on a visual inspection.

Studies for standard foundations and structural frames are not included in this plan. Electrical components are also not included in this plan as assessments are limited to visual inspection only, making it difficult to determine actual conditions.

### Preventative Maintenance Plan

A Preventative Maintenance Plan has also been developed to support the objectives of the 5-Year Facility Maintenance Plan. Preventative maintenance is scheduled maintenance to equipment in buildings ensuring that building systems are operating properly in order to avoid any unscheduled breakdown or downtime. Preventative maintenance is completed by CUPE Maintenance and Caretaking

staff, who regularly inspect and service equipment on a scheduled basis. Services are also provided by certified third party providers when required.

### Asset Management

HWDSB utilizes a facility operations system that includes an asset management module. The Facility Services division is currently in the process of cataloguing vital building assets for the purposes of scheduling regular maintenance and for lifecycle management.

The asset management tool allows us to:

- Capture and store major capital assets within the building envelope including mechanical, electrical and architectural components and systems
- Track complete lifecycle information for all physical assets, including theoretical life, estimated replacement date and current value
- Plan inspections and routine maintenance according to your preventative maintenance plan using the built-in scheduler
- Search and report on work orders by asset and by type of maintenance schedule

### Funding

The Renewed 5-Year Facility Maintenance Plan is financed through three main sources of funding:

#### School Facilities Fund

School boards receive funding for maintenance and minor repairs through the School Facilities Fund (SFF). This fund is also reserved for other costs associated with facilities such as utility, insurance, cleaning, maintenance, security and custodial staffing. The amount we receive from the Ministry through the School Facilities Fund is calculated based on enrolment numbers and a square footage factor. HWDSB determines percentage allocations to the various components of our operations. Currently HWDSB allocates approximately \$3.5M to maintenance repairs and minor renovations. Preventative Maintenance is funded in part through this grant.

#### School Condition Index

School Condition Improvement (SCI) SCI is intended to address the renewal backlog from the data collected to date through the Ministry's 5-year Condition Assessment Program. 70 percent of SCI funding must be directed to key building components (foundations, roof, windows and HVAC / plumbing systems). The remaining 30 percent may be directed to the costs to improve any locally identified renewal needs that are listed in VFA.

#### School Renewal Allocation

School Renewal Allocation (SRA) is an annual amount that is provided through the Ministry funded under School Facilities Fund under Core Education Funding. This grant is available to address the costs associated with repairs and renovations to schools. Up to 15% of the SRA can be spent on renewal and repair of building systems. Historically, HWDSB received approximately \$8M in SRA funds, of which \$1.1M can be utilized to address renewal needs as identified through VFA.

## Implementation

### Preventative Maintenance Planning

The Preventative Maintenance Plan is intended to reduce reactive repairs on facility equipment. This program will also reduce down-time for equipment and potential loss of service for buildings. The items listed in the plan are deemed to be essential pieces of equipment to which service schedules can be assigned.

Service schedules are determined through various sources. In some cases, preventative maintenance is mandatory and directed through regulated requirements. For example, the Technical Standards and Safety Authority (TSSA) sets industry standards in Ontario for boilers and pressure values and elevating devices. In other cases, preventative maintenance schedules are established by following manufacturers suggested service intervals or industry standards.

The estimated costs for conducting preventative maintenance plans on each component is estimated to be \$240,000 annually over the 5-year period.

Preventative maintenance is tracked through recurring work orders scheduled for each asset identified. Asset tracking allows us to monitor the performance of an asset throughout its lifecycle and foresee future replacement. The asset tracker also allows us to review all maintenance work performed on the asset and ensure that routine inspections are performed as required in the plan.

The Facility Services Division has identified ten building system assets for ongoing preventative maintenance planning. They are as follows:

<b><i>Asset</i></b>	<b><i>Preventative Maintenance Plan</i></b>
<i>Elevators</i>	Elevators are serviced through a third-party licensed mechanic. Preventative maintenance includes inspections both inside and outside the car. Repairs and adjustments are made as inspections are completed.
<i>Lifts and LULAs (Limited Use, Limited Application)</i>	Lifts and LULAs are intended for limited use to address specific accessibility needs. Lifts are also serviced through a third-party licensed mechanic. Preventative maintenance includes examination and adjustments to the power unit, hydraulics, lifting and mounting points, and railings.
<i>Boilers</i>	A boiler is a closed vessel or arrangement of vessels and tubes, together with a furnace or other heat source, in which steam or other vapor is generated from water to supply heat. Preventative maintenance for boilers involves three steps: fireside maintenance, waterside maintenance, and system diagnostics.
<i>Pumps</i>	Pumps circulate liquid to building areas. Preventative maintenance for pumps involves lubrication, inspection of moving parts, inspection for leaks and replacement of worn parts.
<i>Compressors</i>	Air compressors are devices that pressurizes air and are used to power shop equipment or air powered devices such as thermostats. Preventative maintenance for compressors involves inspecting all moving parts, inspecting and replacing belts as necessary, and checking for proper operation.
<i>Chillers</i>	A typical chilled water cooling plant is comprised of one or more chiller(s), chilled water circulation pump(s), condenser water pump(s), and cooling tower(s).

<b><i>Asset</i></b>	<b><i>Preventative Maintenance Plan</i></b>
	Preventative maintenance for chillers involves inspecting all moving parts, ensuring a leak free unit, cleaning the tubes, testing and treating the water and analyzing oil and refrigerant.
<i>Fan Units</i>	A fan unit distributes air to areas of buildings for the purposes of heating, cooling or ventilation. Preventative maintenance on fan units includes inspecting the unit and removing any visible debris and dust, oiling and lubricating moving parts and checking and replacing belts.
<i>Roof Systems</i>	Roof systems include components such as the membrane, ballast, insulation and curbs. The preventative maintenance for a roofing system involves detailed inspections, condition assessments and repairs to areas of concern.
<i>Unit Ventilators</i>	Unit ventilators heat or cool air to provide warmth or cooling to a single room. Preventative maintenance for unit ventilators is inspecting the outside and inside of the unit and removing any visible debris and dust, oiling and lubricating moving parts and checking and replacing belts.
<i>Heat Pumps</i>	Heat pumps use energy to transfer heating or cooling to a space. Preventative maintenance for heat pumps involves inspecting for dirt and other obstructions and lubricating motors, inspecting belts for tightness and wear and replacing belts as necessary.
<i>Cooling Towers</i>	A cooling tower is a specialized heat exchanger in which air and water are brought into direct contact with each other in order to reduce the water's temperature. Preventative maintenance for cooling towers includes monitoring conductivity readings and checking valves, bolts and fan belts.
<i>Kitchen Exhaust Systems</i>	A kitchen exhaust system is a device that has a mechanical fan hanging above a cooktop which helps to remove odors, airborne grease, fumes, combustion products, smoke, heat, and steam from the air by evacuation of the air and filtration. Systems are inspected, degreased, cleaned and serviced.

## Plan to Address VFA Requirements

The Renewed 5-Year Facility Maintenance Plan focuses on addressing requirements grouped into the following categories; building exterior, roof, building interior, mechanical, and site. Examples of events included in each category are as follows:

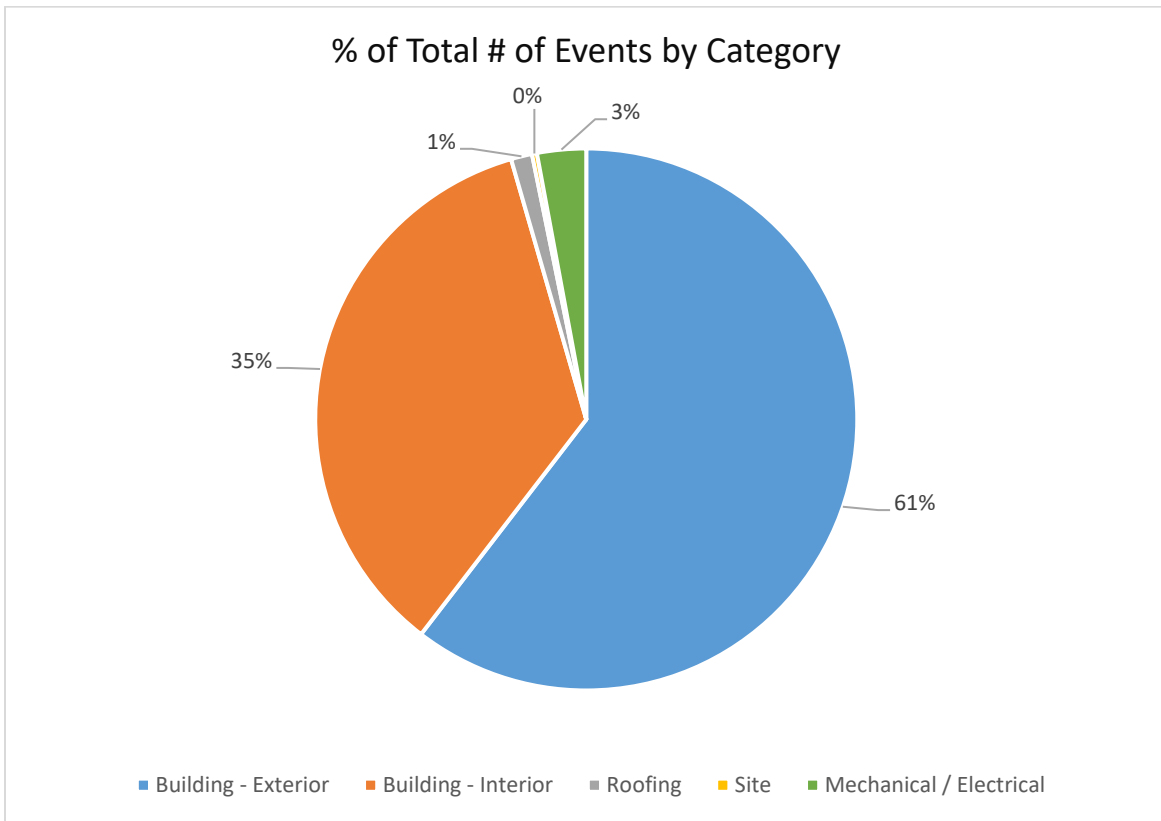
<b>Category</b>	<b>Examples of Events Included in Category</b>
Building - Exterior	concrete, masonry, framing, and windows
Building - Interior	partition walls, millwork, flooring, stairs, ceilings and elevators
Roof	roof repair replacement, shingles
Mechanical & Electrical	HVAC, plumbing, branch wiring
Site	asphalt, paving, concrete, grass, retaining walls

A total of 37 event requirements at 26 schools have been identified in VFA using the methodology described earlier in this report.

VFA assigns a value to each component listed in the requirements. Estimated costs as based on those predetermined values. Actual costs for repairs will vary over the five years and will depend on a number of factors including market conditions, variations in cost of labour and materials and availability of service providers. The total estimated cost over the five years is provided below and has been grouped by requirement categories.



Category	Estimated Cost
Building - Exterior	\$ 2,356,221.00
Building - Interior	\$ 1,368,010.00
Mechanical & Electrical	\$ 49,177.00
Roof	\$ 11,482.00
Site	\$ 113,810.00
<b>Total</b>	<b>\$ 3,898,700.00</b>



All events identified through the methodology have been addressed in the 5-Year Facility Maintenance Plan. The criteria for selecting the year in which a project will be completed is based on factors such as available funding, alignment with other capital projects, and potential equipment failure.

Not all schools assessed as “Fair” in the condition assessment are included in this five-year plan. This may be due to the timeline criteria that was used to select events from VFA. It may also be that these schools are identified for renovation work, replacement or closure through the LTFP or through the Multi-Year Capital Plan. Other influencing factors such as building emergencies, changes in funding or changes to Board priorities have the potential to influence or alter the current priorities.

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## Summary

As the Renewed 5-Year Facility Maintenance Plan is implemented, it is our expectation that we will continue to improve our ability to predict and prevent failures in our building systems. Addressing VFA requirements in a systematic way will allow us to track and measure our progress on an annual basis. Through the execution of this plan, areas of concern will be identified in a proactive way and managed more effectively through budget forecasting and project planning, thus reducing the need for emergency repairs and replacements to our building assets.