

LONG-TERM FACILITIES PLAN



Section 3.1: Facility Operations

Preventative Maintenance Plan

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.

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.

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.

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.

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, School Renewal Allocation and Proceeds of Disposition expenditures are currently required to be reported in VFA.

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 department 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

School Facilities Fund

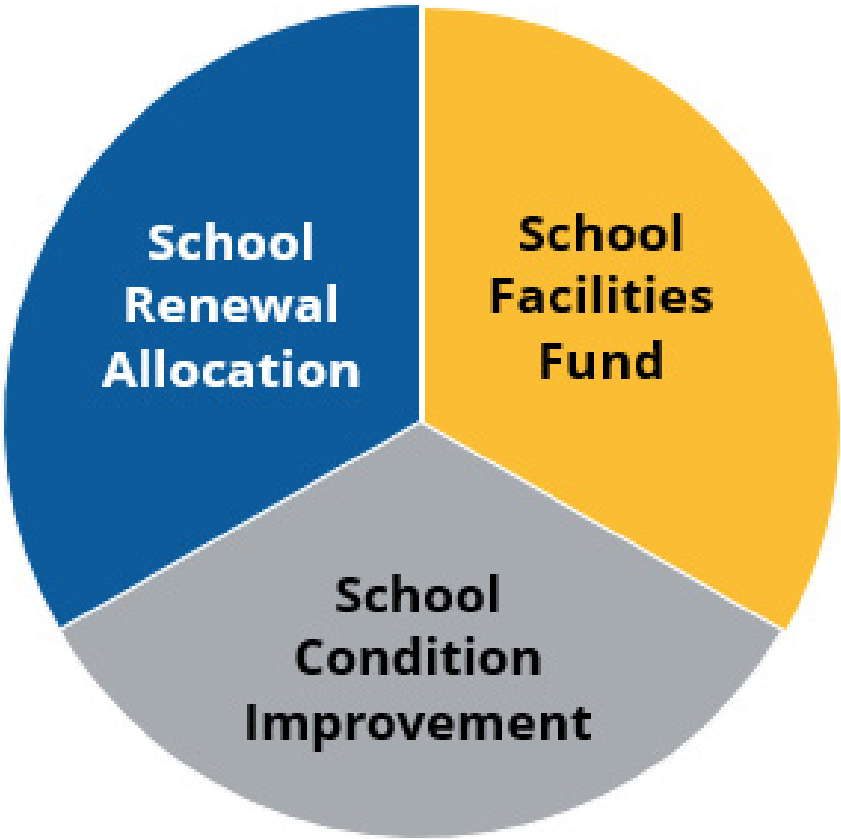
School boards receive funding for maintenance and minor repairs through the School Facilities Fund (SFF). This funding source is also reserved for other costs associated with facilities such as utility, insurance, cleaning, maintenance, security and custodial staffing. The amount we receive from the 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 Improvement

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 School Facilities Fund under Core Education Funding. This funding 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 Department has identified ten building system assets for ongoing preventative maintenance planning, outlined in the table to the right.

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:

Category	Examples of Events Included in Category
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 13 event requirements at 11 schools, as identified in VFA, were completed in 2024.

VFA assigns a value to each component listed in the requirements. Estimated costs are based on those predetermined values. Actual costs for repairs will vary and will depend on a number of factors including market conditions, variations in cost of labour and materials and availability of service providers.

In 2024, estimated costs were reduced by \$1,258,300 by completing building exterior, building interior and mechanical & electrical projects. A summary of estimated costs, based on VFA calculations is as follows:

Category	Estimated Cost (VFA)
Building - Exterior	\$ 227,227
Building - Interior	\$ 114,487
Mechanical & Electrical	\$ 916,585
Total	\$ 1, 258,300

Asset	Preventative Maintenance Plan
Elevators	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.
Lifts and LULAs (Limited Use, Limited Application)	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.
Boilers	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.
Pumps	Pumps circulate liquid to building areas. Preventative maintenance for pumps involves lubrication, inspection of moving parts, inspection for leaks and replacement of worn parts.
Compressors	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.
Chillers	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). 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.
Fan Units	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.
Roof Systems	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.
Unit Ventilators	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.
Heat Pumps	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.
Cooling Towers	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.
Kitchen Exhaust Systems	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.



Education Sector Background

Under the Green Energy Act 2009 (O. Reg. 397/11) as well as the Electricity Act, 1998 (O. Reg. 507/18) now amended to (O. Reg 25/23) public agencies such as municipalities, municipal service boards, school boards, universities, colleges and hospitals are required to report on their energy consumption and greenhouse gas (GHG) emissions beginning in 2013 and to develop and implement energy Conservation and Demand (CDM) plans starting July 1, 2014.

Hamilton-Wentworth District School Board possessed a total of 102 buildings with utility consumption in the fiscal year 2024. Of the 102 buildings, 80 were elementary and 13 secondary schools, with a total enrollment of 50,920 students. The additional 9 buildings are categorized as “other” which include administrative, leased, under construction, closed or demolished.

HWDSB endeavors to continue our commitment to reducing both its energy consumption and resulting associated generated greenhouse gases. We have a responsibility to reduce or eliminate unnecessary consumption as part of the community and moral responsibility to our students who will inherit the planet.

The Board currently uses and continually upgrades a large variety of energy-efficient heating and ventilation and air conditioning (HVAC) equipment. These include items such as fully condensing boilers, advanced technology air handling equipment such as heat recovery units & energy recovery units, roof top air handlers with economizers, heat pumps, chillers and variable frequency drives on pump and fan motors.

HWDSB has 100+ sites with varying levels of computerized building automation systems (BAS). The BAS controls and monitors the operation of a variety of items including HVAC and lighting. While providing proper Indoor Air Quality (IAQ) for our occupants, the building automation systems (BAS) allows more flexible operation and scheduling of equipment.

Both exterior and interior lighting have been upgraded to more efficient means while maintaining an excellent learning environment for our staff and students. In addition, a wide variety of lighting controls are used to reduce unnecessary electrical consumption. This includes motion detectors, daylight harvesting and building automation systems (BAS).

HWDSB ensures the selection of building products used for both new construction and renovations are of a high standard as they relate to “R” insulation value. Examples of these are window glazing, wall and roof insulation, pipe insulation, and insulated exterior doors.

The Board also endeavors to promote environmental stewardship amongst our schools by participation in the Ministry of Education’s Eco-School Program. The program for grades 1-12 students is intended to develop ecological literacy while engaging them in practices to become environmentally responsible citizens.

HWDSB currently has rooftop photovoltaic solar panels installed at nine locations. There is one system at the Education Centre, one system at Waterdown District High School and seven elementary schools (Ancaster Meadows, Gatestone, Janet Lee, Lawfield, Ray Lewis, Sir William Osler and Templemead) all generating power back to the local distribution company hydro grid.

HWDSB's Asset Portfolio

The table to the right outlines the energy-related variables/metrics in the HWDSB's asset portfolio that changed yearly from the baseline fiscal year 2023 to fiscal year 2028. From the table below, over the year the number of buildings has decreased, since many of the closed schools were sold. The amount of portables increased as well as the daily enrolment number. Data for fiscal year 2025-2028 will be available in future years.

Energy Consumption Data for HWDSB

The below table shows the metered² consumption values in the common unit of ekWh comparing baseline fiscal year 2023 to the current reporting fiscal year 2024, looking at the variance between the Total Electricity (kWh), Total Natural Gas (ekWh), Total District Heat (ekWh), Total Energy Consumed (ekWh) and overall Energy Intensity (ekWh/ft²). The Energy Intensity (ekWh/ft²) increased slightly in fiscal year 2024 when compared to baseline, even though the total energy consumed was less due to the decrease of floor area from sold buildings. After covid there has been a significant emphasis placed on ventilation which has led to the increase in the natural gas consumption.

Metered Data	Fiscal Year 2023 (Baseline)	Fiscal Year 2024 Current)	Fiscal Year 2025	Fiscal Year 2026	Fiscal Year 2027	Fiscal Year 2028	Year over Year Variance
Total Electricity (kWh)	43,855,460	41,185,640	TBD	TBD	TBD	TBD	-2,669,820
Total Natural Gas (ekWh)	68,628,392	71,193,260	TBD	TBD	TBD	TBD	+2,564,868
Total District Heat (ekWh)	0	0	TBD	TBD	TBD	TBD	0
Total Energy Consumed (ekWh)	112,483,856	112,378,900	TBD	TBD	TBD	TBD	-104,956
Energy Intensity (ekWh/ft ²)	15.34	15.40	TBD	TBD	TBD	TBD	+0.065

	Fiscal Year 2023 (Baseline)	Fiscal Year 2024 (Current)	Fiscal Year 2025	Fiscal Year 2026	Fiscal Year 2027	Fiscal Year 2028	Year over Year Variance
Total Number of Elementary Schools	80	80	TBD	TBD	TBD	TBD	0
Total Number of Secondary Schools	13	13	TBD	TBD	TBD	TBD	0
Total Number of Other ¹ Buildings	13	9	TBD	TBD	TBD	TBD	-4
Total Number of Buildings	106	102	TBD	TBD	TBD	TBD	-4
Total Number of Portables/Portapaks	169	194	TBD	TBD	TBD	TBD	+25
Total Floor Area (ft ²)	7,335,066	7,297,838	TBD	TBD	TBD	TBD	-37,228.67
Average Daily Enrolment	49,936	50,920	TBD	TBD	TBD	TBD	+984

Weather Normalized Energy Consumption Values

In Ontario, 25-35% of energy consumption for a facility is impacted by weather. To put the impact of weather in context, the following chart shows the Weighted Average Heating Degree Days (HDD)³ and Cooling Degree Days (CDD)⁴ for the six most common Environment Canada weather stations in the Ontario education sector.

Ontario Degree Days	Fiscal Year 2018	Fiscal Year 2019	Fiscal Year 2020	Fiscal Year 2021	Fiscal Year 2022	Fiscal Year 2023
HDD	3989	4196	3837	3696	3799	3,611
CDD	432	334	415	392	340	267

The best way to compare energy consumption values from one year to another is to use weather normalized values as they take into consideration the impact of weather on energy performance and allow an “apple-to-apple” comparison of consumption across multiple years. However, a straight comparison of Total Energy Consumed between one or more years does not take into consideration changes in a board’s asset portfolio, such as changes in buildings’ attributes, and newly implemented programs which will significantly impact energy consumption. As a result, weather normalized Energy Intensity is the most accurate measurement that allows the evaluation of a board’s energy consumption from one year to another as it negates any change in floor areas.

The table below shows the normalized consumption values in the common units of ekwh comparing baseline fiscal year 2023 to the current reporting fiscal year 2024, looking at the variance in the Total Electricity (kWh), Total Natural Gas (ekWh), Total District Heat (ekWh), Total Energy Consumed (ekWh) and overall Energy Intensity (ekWh/ft2). The chart indicates that electricity consumption has decreased, natural gas consumption increased slightly with an overall reduction in total energy consumed year over year leading to a decrease in energy intensity indicating positive energy conservation efforts.

Weather Normalized Data	Fiscal Year 2023 (Baseline)	Fiscal Year 2024 (Current)	Fiscal Year 2025	Fiscal Year 2026	Fiscal Year 2027	Fiscal Year 2028	Year over Year Variance
Total Electricity (kWh)	44,442,052	41,037,690	TBD	TBD	TBD	TBD	-3,404,362
Total Natural Gas (ekWh)	65,078,648	65,722,250	TBD	TBD	TBD	TBD	+643,602
Total District Heat (ekWh)	0	0	TBD	TBD	TBD	TBD	0
Total Energy Consumed (ekWh)	109,520,704	106,759,900	TBD	TBD	TBD	TBD	-2,760,804
Energy Intensity (ekWh/ft ²)	14.93	14.63	TBD	TBD	TBD	TBD	-0.30

Newly Implemented Programs/ Factors

The Conservation Goals were forecasted in Spring 2014. Since then, a number of factors that impact energy consumption have been introduced to the education sector. These factors may either increase or limit a board’s ability to achieve the forecasted Conservation Goals. In addition, it takes a minimum of one full year after an energy management strategy has been implemented before an evaluation can determine the associated actual energy savings achieved. Some of these factors include:

Full Day Kindergarten (FDK)

The introduction of FDK resulted in many new spaces being created through new additions or extensive renovations of existing facilities. These new spaces resulted in more floor area and in some cases more energy-intensive designs due to factors such as higher ventilation requirements, the implementation of air conditioning etc. which increase the energy intensity of a building. In Ontario, more than 470,000 new students were added to the education sector due to the implementation of FDK.

Before and After School Programs

These programs were implemented to support the introduction of FDK spaces. Before and After School Programs require a facility’s HVAC system to operate for an extended period of time on a daily basis, which increases overall energy intensity.

Community Use of Schools

The Ministry of Education introduced funding to all school boards designed to make school space more affordable for use after hours. Both indoor and outdoor school space is available to not-for-profit community groups at reduced rates, outside of regular school hours. As a result of this funding, the use of school space, typically gymnasiums and libraries, increased to maximum utilization. The use of these spaces during non-school hours requires a facility’s HVAC system to operate for an extended period of time on a daily basis, which increases overall energy intensity.

Community Hubs

In 2016, the Ministry of Education introduced funding for boards to implement Community Hubs within their asset portfolios. As a result, many schools now offer a wider range of events (cultural), programs (arts, recreation, childcare) and services (health, family resource centres). The dramatic increase in community use means that many schools now operate from 6:00 a.m. until 10:00 p.m. during weekdays and are open for long durations of time on weekends. As a result, a facility’s HVAC system must operate for significantly longer to support community hubs and overall energy consumption/intensity is increased.

Air Conditioning

Historically schools had minimal or no air conditioning within the facility. However with changing weather patterns, “shoulder seasons” such as May, June and September which are experiencing higher than normal temperatures and requests from parents, the amount of air conditioning within facilities is significantly increasing correlating to an increase in a facility’s energy consumption.

Compliance with current Ontario Building Code (OBC)

When renovations occur or an addition is built onto an existing school, in-place equipment such as HVAC systems, lighting etc., may be required to meet current OBC standards which may result in increased energy consumption. For example, under the current OBC, buildings constructed today have increased ventilation requirements meaning more outside air is brought into a facility. As a result, HVAC systems need to work longer to condition the increased amount of outdoor air, further increasing the energy consumed.

Covid-19 Pandemic Response

Due to the covid-19 pandemic response, fiscal year 2021 had a significant increase in energy intensity due to numerous factors including increased filter MERV ratings, running equipment longer to provide air flushing before and after school, increased fresh air intake, opening windows and operating numerous HEPA air purifier units further increasing the energy consumed.

FY2023- FY2028 Energy Conservation Goals and Results

In 2023, the HWDSB set annual energy conservation goals for the next five fiscal years targeting a cumulative total 3% year over year reduction in Energy Intensity using fiscal year 2023 data as a new baseline. The following chart compares the Energy Intensity Conservation Goal with the Actual Energy Intensity Reduced for each year using both metered and weather normalized data. By the end of fiscal year 2028 the HWDSB hopes to reach a raw energy intensity of 14.88 ekWh/ft² and a weather normalized energy intensity of 14.49 ekWh/ft².

Annual Energy Intensity Conservation Goals	Fiscal Year 2023 (Baseline)	Fiscal Year 2024 (Current)	Fiscal Year 2025	Fiscal Year 2026	Fiscal Year 2027	Fiscal Year 2028	FY2023 - FY2024 Percent (%) Change
Projected Conservation Target Reduction in (%)		1.0%	0.5%	0.5%	0.5%	0.5%	
Raw Projected Energy Intensity Target (ekWh/ft²)	15.34	15.18	15.11	15.03	14.96	14.88	-1.01%
Raw Actual Energy Intensity (ekWh/ft²)	15.34	15.40	TBD	TBD	TBD	TBD	+0.42%
Weather Normalized Projected Energy Intensity Target (ekWh/ft²)	14.93	14.78	14.71	14.63	14.56	14.49	-1.01%
Weather Normalized Actual Energy Intensity (ekWh/ft²)	14.93	14.63	TBD	TBD	TBD	TBD	-2.06%

In fiscal year 2024, the Hamilton-Wentworth District School Board (HWDSB) increased raw energy intensity by 0.42%, which fell short of its 1% reduction goal. However, a deeper analysis of the weather normalized data showed that the HWDSB exceeded its target with a reduction of 2.06%. This suggests that weather played a crucial role in higher energy consumption values. With new trends for higher school use, increased ventilation, increased filtration, increased fresh air, increased air conditioning requirements we expect to see higher energy consumption as years go on. Even with all those factors the board is committed to continuously strive to lower energy consumption and reduce greenhouse gas emissions in the years to come.

1. Other buildings refers to either administrative, leased, under construction, closed or demolished.

2. Metered consumption is the quantity of energy used and does not include a loss adjustment value (the quantity of energy lost in transmission), does not take into consideration the impact of weather on energy usage and as a result, it does not allow an accurate analysis of energy performance from one year to the next.

3. Heating Degree Day (HDD) is a measure used to quantify the impact of cold weather on energy use. In the data above, HDD are the number of degrees that a day's average temperature is below 18C (the balance point), the temperature at which most buildings need to be heated.

4. Cooling Degree Day (CDD) is a measure used to quantify the impact of hot weather on energy use. In the data above, CDD are the number of degrees that a day's average temperature is above 18C, the temperature at which most buildings need to be cooled. It should be noted that not all buildings have air conditioning and some buildings have partial air conditioning. The UCD only applies CDD to meters that demonstrate an increase in consumption due to air conditioning.

5. Energy Intensity (EI) is the quantity of total energy consumed divided by the total floor area. EI is typically expressed as ekWh/ft2, GJ /m2 etc., depending on the user's preference.