Climate Action Annual Report, 2022

To: Planning and Priorities Committee

Date: 1 December, 2022

Report No.: 12-22-4444

Strategic Directions

- Transform Student Learning
- Create a Culture for Student and Staff Well-Being
- Provide Equity of Access to Learning Opportunities for All Students
- Allocate Human and Financial Resources Strategically to Support Student Needs
- Build Strong Relationships and Partnerships Within School Communities to Support Student Learning and Well-Being

Recommendation

It is recommended that the Annual Report 2022: Climate Action be received.

Context

At its December 2019 meeting, the Board of Trustees endorsed the City of Toronto's climate emergency declaration.

In October 2021, the Board established net-zero greenhouse gas (GHG) emissions by 2050 as an aspirational goal for the TDSB. It also decided that the Director would present an annual climate action plan, including an update on building-related GHGs, vehicle fleet emissions, and the Environmental Legacy Fund's revenue and projected expenditures.

Both the TDSB's Environmental Sustainability Community Advisory Committee and the Joint Management–Labour Environment Committee have had opportunities to comment on the actions outlined in this report.

A Climate in Crisis

> *"The cumulative scientific evidence is unequivocal: Climate change is a threat to human well-being and planetary health. Any further delay … will miss a brief and rapidly closing window of opportunity to secure a liveable and sustainable future for all."* – Intergovernmental Panel on Climate Change[1]

The devastating effects of the climate crisis are mounting. Extreme weather events, such as droughts, floods, heat waves, wildfires, and hurricanes plague the globe with increasing frequency and severity.

The years 2015 to 2021 were the warmest seven years on record.[2] This summer, average temperatures in Europe were 0.4°C higher than the previous record set in 2021.[3] In the United Kingdom, temperatures exceeded 40°C for the first time in recorded history.

At the same time, atmospheric GHG concentrations keep rising, bringing the planet closer to a tipping point where the risk of irreversible physical changes in the climate system cannot be ruled out.[4]

Without immediate and ambitious action, the climate crisis will become more devastating, with the world's most vulnerable populations suffering the most.

In Pakistan this year, unprecedented floods submerged one-third of the country, killing an estimated 1,500 people.[5] The flooding—caused by record monsoon rains and melting glaciers in northern mountains—has impacted 33 million people. Homes, crops, and livestock were destroyed, totalling an estimated US$30 billion in damage.[6] The result is widespread human misery, which is expected to increase in the coming months with food shortages, famine, and disease.[7]

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[1] Intergovernmental Panel on Climate Change (IPCC). Climate Change 2022: Impacts, Adaptation and Vulnerability - Summary for Policy Makers. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf

[2] World Meteorological Organization. United in Science 2022, Retrieved from: https://library.wmo.int/doc_num.php?explnum_id=11309

[3] Mortillaro, N. (2022, September 8). Europe experienced record heat this summer, but also record solar power. *CBC News*. https://www.cbc.ca/news/science/europe-summer-record-heat-solar-1.6575949

[4] World Meteorological Organization. United in Science 2022, Retrieved from: https://library.wmo.int/doc_num.php?explnum_id=11309

[5] Rannard, G. (2022, September 2). How Pakistan floods are linked to climate change. *BBC News.* https://www.bbc.com/news/science-environment-62758811

[6] *Death Toll in Pakistan floods nears 1,500 as hundreds of thousands sleep in open air, Globe and Mail, Sept. 16, 2022* (Print copy)

[7] Meer Baloch, S., & Taylor, M. (2022, September 17). Pakistan reels from floods: 'We thought we'd die of hunger. Now we fear death from water. *The Guardian* https://www.theguardian.com/world/2022/sep/17/drought-floods-pakistan-devastation-climate-crisis

A Case Study in Moral and Economic Injustice

Pakistan's 220 million people have one of the smallest carbon footprints in the world, an estimated 0.9 metric tonnes per capita. Canada's per capita footprint is 15.4 metric tonnes, almost double Germany's (7.9) and nearly triple that of the U.K. (5.2). Canada has one of the highest carbon footprints in the world by a long measure.[8]

After visiting the devastation in Pakistan, United Nations Secretary-General António Guterres called climate change "our suicidal war against nature" and "the defining issue of our time." He added, "it must be the first priority of every government. And yet climate action is being put on the back burner … The climate crisis is a case study in moral and economic injustice."[9]

The Most Vulnerable at Home

It is not just the global south that is suffering the impact of the climate crisis. In the wealthier, developed countries, the most vulnerable people are being hit the hardest.

In June 2021, the Pacific Northwest experienced an unprecedented heat dome that caused record high temperatures over several days, during which time British Columbia experienced a sudden and significant increase in deaths; 619 of these deaths were later identified as being heat-related. Afterward, the BC Coroners Service convened a panel of experts to review the deaths. The panel concluded that:

- heat deaths were higher among people with chronic diseases (e.g., schizophrenia, substance abuse disorder, depression, asthma, mood and anxiety disorders, and diabetes), and
- most of the deceased lived in homes without adequate cooling systems, and more lived in socially or materially deprived neighbourhoods than the general population.[10]

Modelling suggests that by 2049, Toronto will experience 46 additional days (on top of the current 20) where temperatures exceed 30°C. Toronto Public Health reports that the most vulnerable people are those with pre-existing conditions, infants and young children, seniors, socially isolated individuals, and the homeless.[11]

A Generation in Crisis

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[8] The World Bank. CO2 emission (metric tons per capita) – Canada. Retrieved from: https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=CA

[9] Address to the General Assembly of the United Nations, September 20, 2022

[10] Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021, Report to the Chief Coroner of British Columbia, 7 June 2022

[11] A Climate of Concern: Climate Change and Health Strategy for Toronto, Toronto Public Health, p. 7

Young people today are acutely aware of the threat of the climate crisis, and this has taken a heavy toll on their mental health.

A large-scale investigation of climate anxiety in children and young adults published in *The Lancet* found that:

- 76% consider the future to be frightening;
- 56% think humanity is doomed; and
- 55% believe that the things they value the most will be destroyed.

The 2021 study, which surveyed 10,000 youth in ten countries, also found widespread feelings of betrayal and abandonment by governments and adults:

- 64% said that governments are not doing enough to avoid a climate catastrophe, and feel that they are lying about the effectiveness of the actions they are taking, and
- 59% believe that governments are betraying future generations.[12]

In the Canadian context, a 2021 survey undertaken by the Centre for Addiction and Mental Health found that 50% of Ontario students are depressed about the future because of climate change.[13]

If Not Now, When?

The climate crisis is occurring now—it's no longer a hypothetical problem in the distant future.

Young people are feeling frightened and betrayed. Since the raison d'être of educational institutions is to promote the health and wellbeing of students and prepare them for the future, it is surely time for Canada's educational institutions—Ministries of Education and school boards—to take action to address the climate crisis.

And in the absence of leadership at the provincial level, the TDSB must lead the way by making concerted and sustained efforts to reduce its greenhouse gas emissions. Our students must see that we can act and achieve meaningful results.

Actions for Change

To bring about tangible progress, this report details 24 actions the TDSB will undertake in response to the climate emergency, divided into seven areas of focus:

I – Buildings

[12] Hickman, E., & Marks, E. (2021, December 1). Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. The Lancet: Planetary Health, Volume 5, Issue 12.
[13] The Centre for Addiction and Mental Health. The Well-Being of Ontario students: findings from the 2021 Ontario Student Drug Use and Health Survey. Retrieved from: https://www.camh.ca/-/media/files/pdf---osduhs/2021-osduhs-report-pdf.pdf

A. Building System Operations
B. State of Good Repair
C. New Schools

II – Transportation
III – Grounds
IV – Climate Education and Engagement
V – Communications
VI – System Improvements
VII – Environmental Legacy Fund

Part I – Buildings

The natural gas used to heat nearly 44 million square feet of real estate and the electricity needed to operate lighting, air conditioning, pumps, fans, computers, and other equipment comprise 97% of greenhouse gas emissions (GHG) at the TDSB. Vehicle fleet emissions account for about 3% of GHG emissions, as outlined in more detail under Transportation below.

For the last 20 years, as shown in Appendix A, the TDSB's annual GHG emissions from natural gas and electricity has been steadily declining, from 163,119 metric tonnes in 2000/01 to 110,661 metric tonnes in 2019/20.

In the last two school years, however, an increase in the use of natural gas has raised emissions to 120,247 metric tonnes, a 9% increase from the year before (but still far below 2000/01 levels).

This increase in natural gas consumption can be attributed to the COVID-19 pandemic when more fresh air was introduced into buildings by extending run times for ventilation systems and opening windows.

A. Building System Operations

Building systems are primarily the mechanical and electrical systems and equipment that heat, cool, and ventilate buildings.

The climate emergency demands a new mindset, particularly in wealthy countries like Canada that have enjoyed abundant energy and relatively low costs, compared to many other parts of the world.

We can no longer justify operating our buildings systems inefficiently or running them when they are not needed. Every time we do, greenhouse gases (GHG) are

unnecessarily released into the atmosphere, contributing to the extreme weather events that are all too common and will get worse in the years ahead.

That is why we need to break old habits and take a firm stand against energy waste. The actions below are effective ways to minimize the release of GHGs by improving the operations of our building systems.

Action 1: Launch the new Building Systems Help Desk

A top priority this year will be to launch a new Building Systems Help Desk, an initiative that was introduced in the 2021 Climate Action Report. The rollout will be gradual, starting with a pilot in the schools of one of the Learning Networks.

The Help Desk will provide real-time, technical support to caretakers about how their school's mechanical and electrical systems operate. Caretakers will be able to contact the Help Desk during normal school operating hours with questions or concerns. The Building Systems Help Desk will also identify equipment performance issues so that repairs can be completed quickly and efficiently. Caretakers in need of additional training will be guided on how to seek support.

Energy Analysts will support the Help Desk by closely monitoring building energy consumption to identify unexpected increases in energy consumption, investigate causes, and pinpoint solutions with the goal of eliminating unnecessary emissions. Energy Analysts will follow up with caretakers and Facility Team Leaders when issues are identified.

Action 2: Establish customized schedules for the operation of mechanical equipment

The current practice in some schools is to operate all building systems as if the building were full of people, even after regular school hours when only a small portion of the building is occupied.

The pilot rollout of the Help Desk will include an onboarding process for schools that will facilitate Facility Team Leaders (FTLs) and caretakers working together to establish site-specific schedules for the operation of mechanical equipment. Schedules will be customized for each building based on the configuration of the building systems, occupancy (including weekends and holidays), permits, and the cleaning routines of Caretakers.

The building systems will be expected to operate according to the established schedules. Changes to the schedules would only be made for good reasons. FTLs will

be responsible for ensuring that their buildings are operating according to established schedules. Simple measures such as this, when implemented at every TDSB school, will result in significant energy and GHG savings.

Action 3: Further develop an interactive online platform using a Geographic Information System (GIS)–based web application

The TDSB operates over 600 buildings spread throughout the city. These facilities have a range of mechanical systems that were designed and installed over many generations. Extensive solar PV arrays are in place in 358 facilities.

To improve the management of this vast network of mechanical and electrical systems, an interactive online platform is being developed using a Geographic Information System (GIS)–based web application.

Through this platform, caretakers, maintenance trades, and other staff will have access to site-specific GIS-based profiles for all TDSB sites that detail the mechanical and electrical systems within each physical plant. Each system component will include a picture and link to detailed information in TDSB's SAP database, including warranty information and manuals.

This platform will be instrumental in providing the knowledge necessary to facilitate the site-specific scheduling of building systems in every school as outlined above, and it will be a valuable tool for the TDSB's maintenance team.

The development of the online platform started last year and is expected to take a couple more years.

Action 4: Energy/GHG Profiles for Every School

As outlined in the 2021 Climate Action Report, energy and GHG profiles have been developed for each TDSB school. The profiles will help staff and students understand the environmental footprint of each school and compare energy intensity rankings to other similar schools. The school profiles are an important step towards providing staff and students with access to energy and GHG data presented in a graphical format that is easy to understand. The goal is to improve our ability to benchmark the energy performance of schools so that issues related to excessive consumption and energy waste can be identified and corrected.

School energy/GHG profiles are currently accessible to staff via the TDSB's intranet portal. A version of the profiles that can be accessed by the public is under development.

B. State of Good Repair

The TDSB has a building-repair backlog valued at close to $4 billion. School Condition Improvement (SCI) funding for the 2022/23 school year will be $246,158,224.

Seventy percent of this funding must be used to replace building components (e.g., roofs, windows, boilers) and systems (e.g., mechanical, electrical) that have been identified as either urgent or high priority, based on assessments of school condition that are recorded in the Ministry's Facility Condition database (VFA).

An advantage of having such a large repair backlog is that it provides a once-in-a-generation opportunity to invest in targeted "state of good repair" projects that will result in significant reductions in GHG emissions.

The actions below are designed to focus on the biggest opportunities to reduce greenhouse gas emissions while addressing deficient components and systems that have been deemed to be urgent and high priority.

Action 5: Replace building systems at the end of their life with low-carbon impact choices, when it is feasible to do so

Many building renewal projects are completed every year at the TDSB. These projects include boilers, air handling units, and lighting replacements that directly impact building energy usage and GHG emissions. As part of the design process for these projects, engineering consultants are retained to develop the drawings and specifications that are then tendered for construction.

A simple improvement to this process would require that consultants include options that are low-carbon-emitting, such as heat pumps or heat recovery systems. TDSB design staff can then choose which option is best, based on specific site conditions and requirements, project costs, the availability of proven technology, operating costs, and GHG emissions.

The process to implement low carbon design choices has already been applied in the current project to rebuild York Memorial C.I. Instead of a like-for-like replacement of the existing chilled water system, the new system is based on heat pump technology that will be able to deliver both cooling and heating to the building and is estimated to cost less to install than a traditional replacement system. Heat pumps are very energy efficient, and because they are electrically powered, their carbon footprint is much lower than gas-fired equipment.

A list of building renewal projects where low-carbon design options were implemented in lieu of conventional building systems or equipment will be included in the annual *Climate Action* report.

Action 6: Initiate deeper building retrofits to reduce GHG emissions at schools considered to be good candidates

In addition to considering low-carbon emitting options for the many mechanical equipment replacements spread out across TDSB schools, there is also an opportunity to undertake more holistic, deeper retrofits in a smaller group of targeted schools.

The TDSB's Schools Educational Facilities, known as SEF schools, are very good candidates for deeper building energy retrofits aimed at reducing GHG emissions. The 33 SEF schools were designed and built in the 1960s and 1970s and are characterized by open-concept classroom layouts and few windows. A particular mechanical feature of these schools is the use of air-sourced heating and cooling systems. This differs from most other TDSB schools, which use water-sourced heating systems based on hot water boilers and perimeter radiators in classrooms.

These air-sourced heating and cooling systems are conducive to a retrofit using heat pumps. In colder climates like Toronto, heat pumps will not eliminate natural gas boilers, which will still be required to provide supplemental heating on the coldest days. However, for most of a typical heating season, a heat pump can adequately heat a school without using gas-fired boilers. Gas consumption and building GHG emissions are both significantly reduced.

Deep energy retrofits will also be approached in a more coordinated and holistic way, which means looking for opportunities to upgrade lighting (replacing fluorescent tubes to LED), replace windows, and even install new roofs (including additional insulation) where needed.

This program will start with investment-grade feasibility studies at selected schools, funded by the Environmental Legacy Fund, followed by a few pilot projects. Retrofitting of buildings with the greatest GHG savings potential over a five- or six-year period will then be given priority.

An update on deep energy retrofits of buildings and related initiatives will be reported to Board in the annual *Climate Action* report.

C. New Schools

Action 7: Undertake full-life-cycle costing analysis as part of the design development for new schools

Every time any new building is designed and constructed, there is an opportunity to achieve net zero or near net zero GHG emissions. This means reducing the operating costs from the first day of a building's decades-long lifespan. New schools that are not designed to be either net zero or near net zero will be added to our inventory of 600 existing buildings that need to be retrofitted at a higher cost in the future.

Unfortunately, the Ontario Ministry of Education mandates that new schools be designed and built to its construction cost benchmark, which forces school boards to keep the initial construction cost as low as possible, without regard to operating costs over its life cycle or its GHG contribution to the climate emergency.

Despite the Ministry's construction cost benchmark, the TDSB could make a persuasive business case for high-performance building designs that deliver significantly reduced energy consumption and carbon emissions, based on full-life-cycle costing. The business case will be used to seek additional funding to achieve our net zero goals and to receive permission from the Ministry of Education to undertake the work.

Modelling for many high-performance buildings designed to minimize carbon emissions has shown that these buildings deliver lower full-life-cycle costs when compared to conventionally designed buildings that just meet current building codes. While the business case may not necessarily be approved by the Ministry, the TDSB has a moral obligation to look for creative and resourceful ways to reduce its GHG emissions, for the sake of the future of our students.

An account of the full-life cycle costing analysis that has been undertaken as part of the design development of new schools will be included in the annual *Climate Action* report.

Part II – Transportation

The TDSB operates a fleet of 775 owned and rented vehicles, as well as 110 tractors, excavators, and related heavy equipment. Most vehicles are presently powered by either gasoline or diesel engines. Fleet GHG emissions represent about 3% of the TDSB's total emissions. The fleet is primarily used by staff providing maintenance, construction, and operations support to schools.

In 2021/22, TDSB GHG emissions from fleet operations amounted to 3,245 metric tons of CO_2, which is a 17.7% increase over 2020/21 emissions. As the fleet is used to

support construction, maintenance, and operations activities at schools, much of the increase in emissions can be attributed to below normal school-based activities during the previous year due to COVID-19 restrictions.

The operational efficiency of the vehicle fleet is managed using GPS-based software that monitors individual vehicle usage, idling time, and speed. The collected data is used to optimize vehicle utilization and route selections to minimize annual fleet fuel usage.

Action 8: Continue the transition of vehicle fleet to electric vehicles

The 2021 Climate Action Report signalled the intention to start procuring fully electric vehicles to add to the TDSB's fleet of more than 700 vehicles. Since then, four Ford Transit electric cargo vans have been purchased, two of which have been delivered.

An attempt was made to procure a Ford Lightning electric pickup truck, but the prices obtained through tendering were excessive and could not be justified.

Supply chain challenges in the automotive industry have not only contributed to long delivery timelines but also to significantly increased costs, not just for electric vehicles, but also for those with conventional internal combustion engines.

Reuters reports that the automotive sector will invest $1.2 trillion in electric vehicle (EV) and battery production through 2030, and automakers have forecast plans to build 54 million EVs in 2030, representing more than 50% of total vehicle production. With increased production and more competition, the cost of electric vehicles is expected to drop significantly in coming years.

To further the TDSB's transition to electric vehicles, the Environmental Legacy Fund (ELF) will continue to be used to subsidize the cost of procuring electric vehicles as part of its annual replacement program. The ELF will be used to cover the cost difference between procuring a conventional vehicle and a comparable electric vehicle. Specific details will be reported to the Board through the contract awards process.

While staff expect to pay a premium for electric vehicles over the next few years, purchases will only be made when costs are reasonable.

Action 9: Issue a Request for Proposals for two pilot projects for electric school buses

In June 2022, the TDSB and the Toronto Catholic District School Board issued a Request for Expressions of Interest for two electric school bus pilot projects.

Submissions were received from eight vendors, garnering sufficient interest to justify going back to the market with a more specific Request for Proposals. This will be part of the next competitive procurement process for overall student transportation services serving the two school boards.

The first pilot project is for 20 to 30 electric school buses to service staff and students at TDSB and TCDSB schools.

The bidder will be required to cover all the costs associated with the pilot, including procuring the buses and associated charging infrastructure. There will be no additional premiums paid by the two school boards, beyond what they would normally pay for the procurement of conventional student transportation services.

The bidder will also be required to install electric charging equipment at their facility and participate in a vehicle-to-grid (V2G) solution. “Vehicle to grid” technology means that electric charging stations are bi-directional: electricity from the grid charges the vehicle, while electricity stored in the vehicle can be pushed back into the grid when needed. V2G is needed to make the pilot financially feasible because of government incentives for establishing vehicle-to-grid systems.

The second pilot project will service the Island Public/Natural Science School on the Toronto Island. Currently, school buses on the island must be ferried back and forth to the mainland to be refueled, which is logistically challenging and increases operating costs.

This bidder will be required to provide five electric school buses to service staff and students at the Island School. Bus charging facilities will be provided by the TDSB at the school location or at the City-provided location on the Island. The school is an overnight outdoor education facility visited by many schools every year; the electric buses will be a model of sustainability visible to thousands of students.

Part III – Grounds

Action 10: Ensure all landscaping projects strive to incorporate tree planting

Site improvement or landscaping projects present an ideal opportunity to incorporate more trees into schoolyards. This will enhance the impact of the project and be an efficient and cost-effective way to add trees to school grounds.

As indicated in the 2021 Climate Action Report, trees provide critical environmental benefits, such as filtering air pollutants, shade protection, absorption of carbon dioxide,

and habitats for wildlife. The presence of trees on school grounds has been linked to improved mental health and proven to support student learning. Recent research from the University of Toronto found the proportion of tree cover on TDSB school grounds to be a positive predictor of student achievement and that the effects of tree cover were most pronounced in schools that had the highest level of external challenges.[14]

Action 11: Plant 1,000 large-caliper trees in 2023

The 2021 Climate Action Report committed to doubling large-tree plantings to a total of 600 trees a year, along with continuing ongoing care of existing trees. This commitment was reiterated in the January 2022 *Revitalizing School Grounds and Building Exteriors* report.

Our new goal is to plant up to 1,000 trees in the 2023 planting season. The majority, 650 of these trees, will be planted as part of the comprehensive renewal of school grounds at 13 high-needs schools that are in very poor condition. Most of these schools are in the City's Neighbourhood improvement Areas, are park-deficient, have little green space, and suffer from more heat vulnerability compared to many neighbourhoods in more affluent areas of the city.

Tree species and planting locations will be strategically selected to enhance the long-term health of our city's urban canopy by making it more climate change resilient and biodiverse. Trees will be planted to meet or exceed the *Toronto Green Standard's* soil volume requirements.

The remaining 350 trees will be distributed across a larger number of schools that require tree replacements or have requested memorial and dedication trees, and as part of other site projects, many of which are at high-needs schools.

Action 12: Ensure trees are planted in generous soil volumes, particularly in harsh growing conditions

There is not much point in planting trees if they end up dying after a few years or their growth is forever stunted. The goal should always be to plant trees in conditions where they will thrive over long periods of time.

Small school sites in densely populated neighbourhoods, particularly in areas with a lot of hard surfaces, are often harsh environments for trees. For trees to thrive in the

[14] Sivarajah, S., Smith, S. and Thomas, S. (2018, February 23) Tree cover and species composition effects on academic performance of primary school students, PLOS ONE. Retrieved from https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0193254

harshest of conditions, soil cells below ground are a very successful strategy as they provide generous soil volumes and help prevent soil compaction. Staff will endeavor to use soil cells when planting trees in harsh conditions as part of large landscaping projects, subject to available funding and on a case-by-case basis.

Many schools have trees that are planted in concrete and asphalt areas, where they have inadequate soil volume for long-term growth. Where possible, we will increase the soil volumes for these trees by using shared planters and removing hardscaping.

Action 13: Identify sites that have excessive paving in poor condition and develop a program to replace deteriorated asphalt with grass and trees

As summer temperatures become more extreme, vulnerable people without the means to escape the heat are suffering and, in some cases, dying prematurely. Extreme heat in Europe in June and July of this year killed at least 4,600 people in Portugal, Spain, Germany, and Britain.

High-needs and under-served areas of large cities like Toronto are particularly vulnerable to the extreme heat that is expected to increase in temperature, frequency, and duration. These areas tend to have more hard, dark surfaces like rooftops and parking lots that amplify the heat, and fewer trees and other vegetation, which have a cooling effect and provide relief.

As the City of Toronto's second-largest property owner, next to the city itself, the TDSB has an obligation to identify and remove the excessive asphalt at schools, particularly when it is in poor condition, and plant grass and trees in its place. A study will be undertaken this year to identify schools that have more asphalt than they need and prioritize its removal when it is in poor condition.

School sites where old asphalt has been removed and replaced with grass and trees as part of this action, will be identified in the annual *Revitalizing Schools* report.

Action 14: Start the transition to cordless electric outdoor power tools

Gasoline-powered lawn and garden equipment such as lawn mowers, string trimmers, and leaf blowers are a source of GHG emissions that also generate hazardous toxic and carcinogenic exhaust and fine particulate matter. Extensive evidence exists on the adverse health effects of exhaust emissions and other fine particulates, including cardiovascular disease, respiratory disease, and cancer.[15] At the same time, the

[15] *National Emissions from Lawn and Garden Equipment,* US Environmental Protection Agency.

technology of cordless electric power tools, particularly for push mowers, leaf blowers and string trimmers, is mature.

Transitioning to battery-electric tools not only benefits the health of workers and the public, but it eliminates the time-consuming burden of purchasing the fuel, transporting, and storing it safely, and mixing gasoline and oil (which is needed for some of the equipment). The maintenance backlog associated with gasoline-powered equipment is also expected to be reduced as they are replaced by battery-powered equivalents.

Currently, the team responsible for renovating playing fields at the TDSB has started to use cordless electric string trimmers, leaf blowers, and even a commercial-grade ride-on lawn mower.

Over the coming year, staff will undertake a thorough competitive procurement process to select vendors that can supply quality equipment at competitive prices and put in place a battery-return system to ensure that old batteries are managed in an environmentally responsible manner.

The procurement process will involve extensive piloting of the equipment before the final selection from the shortlisted vendors is made. The piloting stage will take place in 2023, and the final selection of the vendors should be complete by January 2024. The full rollout of the equipment will take several years, depending on available funding.

Part IV – Climate Education and Engagement

Action 15: Establish a TDSB Student Environment Network

To amplify the climate action work and voices of youth, an environment-focused network will be established for TDSB secondary students. The TDSB Student Environment Network (SEN) will aim to foster a vibrant community of TDSB students committed to acting for environmental justice and sustainability.

TDSB SEN members will gain leadership skills, mentorship opportunities, and volunteer hours as they collaborate with TDSB EcoSchools staff and partners. They will empower other youth by hosting youth-led climate action conferences, webinars, and events.

Members of SEN will also help youth at their schools learn about climate change and take meaningful action. They will plan activities and do outreach at their schools, to inspire their peers and community members to take climate action. Members of SEN will also be invited to provide their perspectives to staff on how to increase youth engagement, participation, and action to address climate change.

Youth in grades 9 to 12 will be invited to apply to join SEN. Selected members will attend monthly virtual meetings and up to three in-person meetings a year. The Toronto Youth Environment Council (TYEC), a post-secondary student, and two secondary teachers will also be recruited to support the SEN.

In selecting members, the TDSB EcoSchools staff will make their best effort to ensure that committee membership reflects the diversity—e.g., cultural, regional, gender, and ability—of the TDSB. The SEN will operate with an Anti-Oppressive, Anti-Racist lens.

Action 16: Increase schools' capacity to address climate change through targeted programs

a. **EcoSchools Certification:** Through the EcoSchools Canada Program, participating EcoTeams engage their school community to examine their environmental practices and take action to reduce their footprint. In 2021/22, an extremely challenging school year due to COVID-19 and staff shortages, 104 TDSB schools (approximately 20%) were certified in the EcoSchools Canada Program. Of those schools, 52 received platinum status, 31 gold, 12 silver, and 9 bronze. In addition, 7 Outdoor Education centres were certified. In addition to EcoSchools Canada resources, participating schools will have access to TDSB-specific resources and supports designed to meet the unique needs of TDSB schools.

b. **Environmental Art Murals:** To increase opportunities for students "to explore and articulate the social and political impact of issues related to the environment,"[16] a School Mural Toolkit will be developed with detailed instructions on how to create and install student-generated murals. In 2022/23, select schools will engage in school-based pilot mural projects to communicate the issues and imagery important to them.

c. **Youth Climate Action Grants:** In 2021-22, the City of Toronto created a Youth Climate Action Grant program, providing funding grants of up to $1,000 to support youth-led projects, activities, and events that directly or indirectly reduce GHG emissions.

   Another round of funding will be made available to TDSB students in 2022-23 through both the City of Toronto and a contribution from Intuit Inc, with whom we partner on programs preparing students for the future.

   TDSB staff will continue to support students in applying for these grants by

[16] The Ontario Curriculum, Grades 1-8: The Arts, 2009 (revised)

coaching, providing tools and resources, and maintaining, updating, and promoting the TDSB Youth Climate Action Guide. The Environmental Legacy Fund will be used to fund workshops to support youth with developing climate action projects.

d. **Green Organics Bin Program:** The City of Toronto has an ambitious strategy to reduce GHG emissions to net zero by 2040. Waste accounts for about 7% of such GHG emissions, primarily from landfills, organics, and yard waste, and wastewater treatment processes.

   To reduce GHG emissions generated through school organic waste contributing to landfill emissions, staff will re-introduce the City of Toronto green bin program to schools. Schools will receive detailed instructions with multiple entry points such as paper towel collection to food waste reduction and diversion. Schools will also have access to tools and resources such as posters and bin labels and rebates for green bin purchases.

e. **Climate change education programming for schools offered by educational partners:** TDSB EcoSchools staff will continue to work with TDSB-approved Educational Partners to enhance the quality of climate change education programming during instructional time.

f. **Earth Index Challenge Kits**: Staff are currently exploring the idea of creating interconnected Challenge Kits that build and strengthen teacher and student knowledge, resilience, and empathy around the climate crisis, resulting in innovative and actionable solutions. The goals include helping to build student voice for deep knowledge and engagement on climate change and decarbonization and inspire student-led environmental stewardship action that addresses the climate crisis and decarbonization in their local and global communities.

Action 17: Launch TDSB climate action videos

In 2022/23, the TDSB Climate Action Video Project will be launched. It will provide content-rich videos that highlight staff and students' climate actions, provide "how to" training, and present case studies and testimonials to illustrate the benefits of an action, procedure, or product.

For Facilities Services staff, videos will be created to show how staff can improve energy efficiency and reduce GHG emissions in their buildings, demonstrating effective greening practices such as mulching leaves.

For EcoSchools staff and students, videos will highlight effective and innovative climate action practices, and with the aim to elevate representation of those with diverse identities (e.g., racial, cultural, gender, regional, abilities) who are engaged in climate action within the TDSB.

Videos will be shared using existing communication channels such as the Facility Services and the Environment, Energy and Climate Action websites and the TDSB EcoSchools YouTube channel.

Action 18: Continue to offer professional learning opportunities for educators to support teaching and learning that moves beyond climate change awareness toward empowerment and action

The TDSB's longstanding collaboration with the Ontario Institute for Studies in Education at the University of Toronto (OISE/UT) has helped to equip educators, and in turn the students they teach, with the knowledge, skills, and competencies to promote climate change awareness and action. In the 2022/23 school year, the following professional learning opportunities will continue to be made available at the TDSB through this collaboration:

- An annual environmental education conference that will bring TDSB teachers and OISE/UT pre-service students together to deepen their knowledge of and competencies in environmental, ecological, and sustainability literacy.
- Multiple professional learning events, including lectures, workshops, and webinars, on a wide range of climate action and sustainability topics.
- A TDSB action research team of EcoSchools teachers who will develop evidence-informed approaches to Environmental & Sustainability Education (ESE) and share their research with others through presentations and publications, helping to model shared leadership in ESE.
- An end-of-year event for EcoSchools educators to share best practices and celebrate their achievements.
- Additional Qualification Courses in Environmental Education for Ontario College of Teacher members and other educators, e.g., early childhood educators and outdoor education specialists, supported by subsidies from the Environmental Legacy Fund.

Part V – Communications

Action 19: Develop system-wide communications to share climate action initiatives underway at the TDSB

Staff will leverage the TDSB's existing communication channels to provide regular updates on the status of climate actions. These communication channels include the EcoSchools newsletter, System Leaders Bulletin, Trustees' Weekly, TDSB Connects, TDSB Web and the TDSB public website.

Part VI – System improvements

Action 20: Make organizational improvements to put more focus on effective climate action

In March 2020, staff reported to Board that a technical team would be assembled within Sustainability to put more emphasis on reducing the TDSB's GHG emissions. The team was comprised of 10 staff: four from the Utilities Group and six from Design and Renewal.

In the October 2021 Climate Action Report, staff indicated that they would review the duties and responsibilities of this team to prioritize activities that are directly related to reducing GHG emissions and accelerating progress towards the TDSB's aspirational goal of achieving net zero by 2050.

In the coming months, formal changes to the organizational structure will be made within the Energy and Climate Action Team and the broader Sustainability department. Some reporting relationships within the department will be changed and duties will be updated (some eliminated, and others added). In a few cases, more significant changes to roles and job titles are anticipated.

Addressing the climate crisis will be an enormous challenge in the years ahead. The purpose of these changes is to make the team more effective at taking meaningful and effective climate action.

Action 21: Establish a Climate Action Coordinating Committee

If the initiatives outlined in this report are to be implemented, attention must be paid to how the work is done; otherwise, the risk is that the improvements will be of poor quality or not materialized at all.

For this reason, a new Climate Action Coordinating Committee will be established. At minimum, this group will include the staff responsible for executing the initiatives. The purpose of the committee will be to check on progress and to identify and overcome barriers that will naturally arise through implementation.

This committee will also be an ideal venue for generating new ideas for actions, which could be brought forward in advance of future climate reports.

The committee will also be well-positioned to facilitate and promote interdepartmental coordination and collaboration.

Action 22: Invest in professional development for staff who are leading efforts to reduce GHG emissions

Reducing the TDSB's GHG emissions requires breaking out of old mindsets and ways of working. For the TDSB to be successful, the staff leading these efforts will need to be supported, particularly through access to professional learning opportunities that will equip them with the required knowledge and skills. For this reason, the Environmental Legacy Fund will be used as a funding source for staff to attend workshops, conferences, and courses. Staff who are leading the way toward making the changes to reduce the TDSB's emissions will be given priority. Failure to invest in these frontline staff members will reduce the likelihood of successful initiatives.

Action 23: Revisioning ArtsJunktion

In 1980, the Toronto Board of Education created the ArtsJunktion (AJ) program, providing schools with access to free supplies to enrich programming and offering an innovative approach to recycling and reuse.

As a result of budget reductions in the 2019/20 school year, the 0.6 full-time equivalent (FTE) ArtsJunktion position was eliminated and responsibility for ArtsJunktion was transferred from the Arts Department to the Sustainability Office. Sustainability staff volunteered to operate ArtsJunktion out of the basement of Ossington Old Orchard PS with reduced hours, until the pandemic started, at which time the centre was closed.

Reopening ArtsJunktion would require finding a more suitable location, with a loading dock, more space, sufficient parking, and access to public transit. A dedicated staffing position would also need to be funded, since it is not realistic for Sustainability staff to continue volunteering to keep the program open. Funding would also be needed to pay for the moving costs to a new location, and the fit-up of the space.

Proposal for a TDSB Commons

For these reasons, staff will undertake a revisioning of ArtsJunktion, looking first at the feasibility of creating a TDSB Commons, which would be an innovative physical space bringing together multiple services for staff in one central location.

As a starting point, the Commons could house a new and revitalized ArtsJunktion and Science Kit Centre, Library Learning Resources, and Printing Services.

While the TDSB Commons will be designed to serve all schools, higher needs schools that do not have equity of access to resources to support student needs will be given priority.

The Commons would also include multi-use spaces of various sizes to bring people together for professional learning and would offer meeting rooms and workstations that could be booked online.

The feasibility study will look at how existing TDSB spaces can be optimized to accommodate a TDSB Commons that supports staff programming and space needs. TDSB Commons' space requirements will be considered through both the long-term accommodation plan and the Administrative Site Review currently underway.

Part VII – Environmental Legacy Fund

The TDSB's Environmental Legacy Fund was approved by the Board of Trustees in 2010. Since that time, revenue from the sale of carbon credits, income from the sale of electricity generated by 11 TDSB-owned solar photovoltaic (PV) projects, and sale of TDSB e-waste has been directed into the Fund. In 2021/22, utility incentives from "state of good repair" projects that reduce energy consumption were added as an additional revenue source to the Environmental Legacy Fund.

The Environmental Legacy Fund's balance at the time of writing this report is $2.79 million.

Action 24: Annual report on revenue and projected expenditures for the Environmental Legacy Fund

As outlined in the Annual Report 2021: Climate Action, the projected revenue and expenditures for the Environmental Legacy Fund will be reported annually.

The Environmental Legacy Fund accrued $311,309 in revenue in 2021/22 from solar PV projects and utility incentives and the fund's total expenditures amounted to $329,214

In 2022-23, the Environmental Legacy Fund's projected expenditures total $818,800. For more details, refer to Appendix B.

Action Plan and Associated Timeline

Action 1: Launch the new Building Systems Help Desk – Winter 2022.

Action 2: Establish customized schedules for the operation of mechanical equipment – Start in Fall 2022; complete by September 2024.

Action 3: Further develop an interactive online platform using a Geographic Information System (GIS)–based web application – To be completed by September 2024.

Action 4: Energy/GHG Profiles for Every School – Beta version currently available on the intranet.

Action 5: Replace building systems at the end of their life with low-carbon impact choices, when it is feasible to do so – Implementation on new project design work to start in Fall/Winter 2022.

Action 6: Initiate deeper building retrofits to reduce GHG emissions at schools considered to be good candidates – Feasibility studies and subsequent pilot projects to be initiated in the 2022/23 school year.

Action 7: Undertake full-life-cycle costing analysis as part of the design development for new schools – Pilot project to be undertaken in the 2022/23 school year.

Action 8: Continue the transition of vehicle fleet to electric vehicles – Will continue to procure electric vehicles as soon as market conditions improve.

Action 9: Issue a Request for Proposals for two pilot projects for electric school buses – The RFP is expected to be released in January 2023.

Action 10: Ensure all landscaping projects strive to incorporate tree planting – Currently underway.

Action 11: Plant 1,000 large-caliper trees in 2023 – To be completed by December 2023.

Action 12: Ensure trees are planted in generous soil volumes, particularly in harsh growing conditions – Currently underway.

Action 13: Identify sites that have excessive paving in poor condition and develop a program to replace deteriorated asphalt with grass and trees – Complete the study by September 2023.

Action 14: Start the transition to cordless electric outdoor power tools – The piloting stage will take place in 2023, and the final selection of the vendors should be complete by January 2024. The full rollout of the equipment will take several years, depending on available funding.

Action 15: Establish a TDSB Student Environment Network – Planning will occur in 2022/23 and the launch is scheduled for Fall 2023.

Action 16: Increase schools' capacity to address climate change through targeted programs – 2022/23 school year.

Action 17: Launch TDSB climate action videos – First videos will be produced in the 2022-23 school year.

Action 18: Continue to offer professional learning opportunities for educators to support teaching and learning that moves beyond climate change awareness toward empowerment and action – 2022/23 school year.

Action 19: Develop system-wide communications to share climate action initiatives underway at the TDSB – Ongoing.

Action 20: Make organizational improvements to put more focus on effective climate action – To be completed by July 2023.

Action 21: Establish a Climate Action Coordinating Committee – Launch in Winter 2022/23.

Action 22: Invest in professional development for staff who are leading efforts to reduce GHG emissions – Ongoing.

Action 23: Revisioning ArtsJunktion – The feasibility study would aim to develop a pathway to creating the TDSB Commons in the medium term, which is approximately three to five years from now.

Action 24: Annual report on revenue and projected expenditures for the Environmental Legacy Fund – N/A

Resource Implications

Action 1: Launch the new Building Systems Help Desk – Team Leader position funded from the Environmental Legacy Fund.

Action 2: Establish customized schedules for the operation of mechanical equipment – Existing resources will be used. No new funding required.

Action 3: Further develop an interactive online platform using a Geographic Information System (GIS)–based web application – Two temporary AutoCAD specialists are being funded from the Environmental Legacy Fund.

Action 4: Energy/GHG Profiles for Every School – No funding required.

Action 5: Replace building systems at the end of their life with low-carbon impact choices, when it is feasible to do so – Only projects that qualify for School Condition Improvement (SCI) funding will be undertaken.

Action 6: Initiate deeper building retrofits to reduce GHG emissions at schools considered to be good candidates – Feasibility studies to be funded from the Environmental Legacy Fund. Projects that proceed to detailed design and construction will be funded from School Condition Improvement (SCI) Funding.

Action 7: Undertake full-life-cycle costing analysis as part of the design development for new schools – Professional services to be funded from the Environmental Legacy Fund.

Action 8: Continue the transition of vehicle fleet to electric vehicles – Premiums, charging infrastructure to be funded from the Environmental Legacy Fund.

Action 9: Issue a Request for Proposals for two pilot projects for electric school buses – Existing resources will be used. No new funding required.

Action 10: Ensure all landscaping projects strive to incorporate tree planting; Action 11: Plant 1,000 large-caliper trees a year in 2023; and Action 12: Ensure trees are planted in generous soil volumes, particularly in harsh growing conditions – Multiple funding sources: (1) Donation of large trees by the City of Toronto, (2) City of Toronto $90,000 grant, (3) Renewal, as reported in the Revitalizing School Grounds Report, January 2022. Some of the tree planting will be incorporated into larger projects, such as new schools and additions, or larger landscaping projects funded from SCI. An application has also been made to Infrastructure Canada’s Natural Infrastructure Fund.

Action 13: Identify sites that have excessive paving in poor condition and develop a program to replace deteriorated asphalt with grass and trees – The only projects undertaken in the future will be those that qualify for SCI Funding.

Action 14: Start the transition to cordless electric outdoor power tools – Funding from the Environmental Legacy Fund will be used to support the pilot phase.

Action 15: Establish a TDSB Student Environment Network – Existing resources will be used. No new funding required.

Action 16: Increase schools’ capacity to address climate change through targeted programs:

a. EcoSchools Certification – Existing resources will be used. No new funding required.

b. Environmental Art Murals – Pilot projects funded by the Environmental Legacy Fund.

c. Youth Climate Action Grants – Grants funded by the City of Toronto and a donation from Intuit Inc. as well as funding from the Environmental Legacy Fund to offer workshops to support youth with developing climate action projects.

d. Green Organics Bin Program – Existing resources will be used. No new funding required.

e. Climate change education programming for schools offered by educational partners – Existing resources will be used. No new funding required.

f. Earth Index Challenge Kits – Up to $50,000 from the Environmental Legacy Fund will be used to create interconnected Challenge Kits that build and strengthen teacher and student knowledge, resilience, and empathy around the climate crisis.

Action 17: Launch TDSB climate action videos – Existing resources will be used. No new funding required.

Action 18: Continue to offer professional learning opportunities for educators to support teaching and learning that moves beyond climate change awareness toward empowerment and action – Existing resources will be used. No new funding required.

Action 19: Develop system-wide communications to share climate action initiatives underway at the TDSB – Existing resources will be used. No new funding required.

Action 20: Make organizational improvements to put more focus on effective climate action – Existing resources will be used. No new funding required.

Action 21: Establish a Climate Action Coordinating Committee – Existing resources will be used. No new funding required.

Action 22: Invest in professional development for staff who are leading efforts to reduce GHG emissions – Funded by the Environmental Legacy Fund.

Action 23: Revisioning ArtsJunktion – Since a revitalized ArtsJunktion would be an important component of the Commons, the Environmental Legacy Fund will be used for consulting services that could support the feasibility study. Staff support for this feasibility study, including oversight of the consultant, will be provided by the TDSB’s Service Excellence Team.

Action 24: Annual report on revenue and projected expenditures for the Environmental Legacy Fund – Existing resources will be used. No new funding required.

A new Design Coordinator position will also be created to support innovation and special projects with the focus on reducing the TDSB's GHG emissions, funded by the Environmental Legacy Fund.

Communications Considerations

N/A

Board Policy and Procedure Reference(s)

Policy P028 – The Environment

Appendices

- Appendix A: Annual Building-Related GHG Emissions
- Appendix B: Environmental Legacy Fund 2022-23 Forecasted Revenue and Expenditures

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