The Regional Municipality of York

Committee of the Whole
Environmental Services
June 16, 2022

Report of the Commissioner of Public Works

2021 Corporate Energy Report

1. Recommendation

1. Council approve aligning the Region's long-term corporate greenhouse gas emissions target with the Federal government's 2050 net-zero emissions target as defined in the *Canadian Net-Zero Emissions Accountability Act*.

2. Summary

This report summarizes annual greenhouse gas emissions, energy consumption and costs from Regional corporate operations and service deliveries. It also provides a progress update on initiatives and targets detailed in the Region's Energy Conservation and Demand Management Plan.

Key Points:

- Corporate greenhouse gas emissions fell by 710 tonnes to 65,980 tonnes bringing total corporate emissions down by 1% to 18% below pre-pandemic emissions targets for 2021
- Corporate emission reductions are a result of advancing corporate greenhouse gas mitigation strategies to achieve Energy Conservation and Demand Management Plan's long-term emissions targets and operational changes in response to the global pandemic
- Corporate energy costs increased by 5% to $45.6 million in 2021 driven by rising prices for gasoline, diesel fuel, natural gas and federal carbon tax
- Annual costs associated with the carbon tax are projected to add $9.7 million to the Region's annual operating costs by 2030. Furthermore, price volatility in global markets has resulted in increased financial risk associated with fossil fuel consumption
- The Canadian Net-Zero Emissions Accountability Act, legislated in 2021, is anticipated to result in federal mandates and associated funding for municipalities in a national effort to meet 2030 Paris Accord commitments and achieve net-zero carbon emissions by 2050

3. Background

According to the Sixth Assessment Report from United Nation's Intergovernmental Panel on Climate Change, "the rise in weather and climate extremes has led to some irreversible impacts as natural and human systems are pushed beyond their ability to adapt. Climate resilient development prospects are increasingly limited, if current greenhouse gas emissions do not rapidly decline, especially if 1.5°C global warming is exceeded in the near term".

Energy Conservation and Demand Management Plans are legislatively required by all municipalities. The annual Corporate Energy Report is the primary tool for reporting progress toward achievement of York Region's Council approved emission targets. Reduced corporate emissions resulting from mitigation efforts support the Region's work to address priorities in the draft Climate Change Action Plan. Figure 1 describes the relationship between York Region's plans and strategies that address climate change.

Figure 1
York Region Climate Change Plans and Strategies

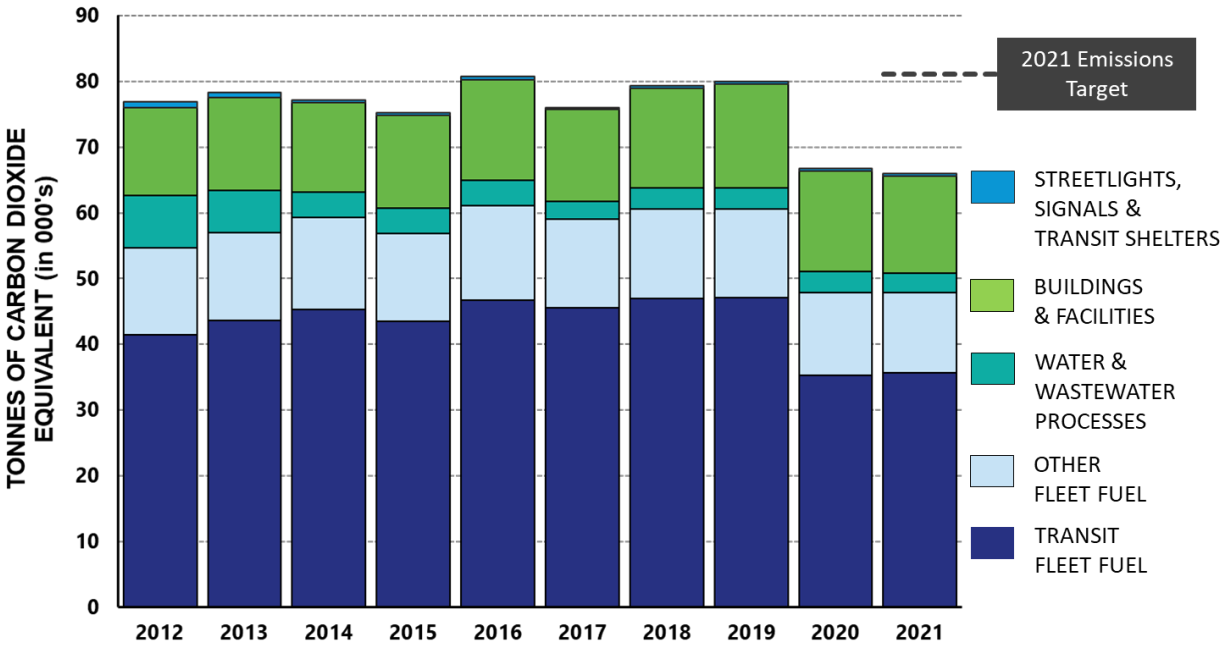
4. Analysis

Corporate emissions were 18% below 2021 greenhouse gas emission targets

York Region's corporate emissions fell by 710 tonnes in 2021 compared to 2020. Total emissions are now 18% below 2021 targets set in the Energy Conservation and Demand Management Plan. Successful efforts to advance long-term mitigation strategies continued throughout 2021. Operational changes, specifically to transit service, in response to the pandemic account for most of our corporate emission reductions. It is anticipated that corporate emissions will rebound with an increase in transit service while successes from long-term efforts will continue beyond the global pandemic.

Figure 2 below illustrates the ten-year corporate emissions trend by operational category. Throughout the pandemic, all categories have remained relatively consistent with their pre-pandemic emissions levels except for transit services, which was adjusted in response to a 60% drop in ridership.

Figure 2
Ten Year Corporate Emissions Trend



Expired leases and reduced employee mileage saved the Region $1.8 million and avoided 870 tonnes of greenhouse gas emissions in 2021

Satellite office leases, which expired in 2021 were not renewed in favour of consolidation into better performing Regional facilities like 17150 Yonge Street. This consolidation reduced York Region's annual energy costs by nearly $300,000 and avoided 210 tonnes of

greenhouse gas emissions. These emission reductions are primarily driven by more efficient use of natural gas for space heating. Retrofits and upgrades at existing buildings are required in the coming years to achieve mitigation and adaptation targets. Optimizing use of space will create opportunities to decommission underperforming buildings and leased spaces, reduce operating costs and emissions.

Conducting business through virtual meetings and migrating to more digital processes, has reduced employee mileage by 73% from pre-pandemic levels. These shifts in work modes resulted in annual savings of 660 tonnes of greenhouse gas emissions and $1.5 million in mileage reimbursements. Although innovations like these were advanced to safely conduct business during the pandemic, they have proven to be valuable tools for both financial savings and climate change action.

In 2021, total office consolidation and shifts in work mode amounted to $1.8 million and 870 tonnes of greenhouse gas emission reduction. York Region's update to hybrid work arrangements will afford eligible employees the opportunity to continue remote work while meeting service delivery, efficiency and effectiveness targets to our residents and communities.

Ontario's plan to increase natural gas generated electricity does not support Region's plan to meet its emission targets through fuel switching

Ontario has one of the cleanest electricity grids in North America. Provincial plans to replace lost generation due to decommissioning the Pickering nuclear power plant starting in 2024 and refurbishing Darlington nuclear over the next 12 years with natural gas generation has resulted in upward pressure on emissions from electricity generation and consumption. York Region's plan to decarbonize its fleets and buildings by switching from fossil fuels to electricity relies on zero-emission electricity generation.

Advocacy by 32 Ontario municipalities, including York Region (see Attachment 1), and 60 citizen groups, calling for the Province to choose zero-emission alternatives over natural gas generation resulted in a directive from the Minister of Energy to stop contracting additional natural gas generation and accelerate phase out of this high emission alternative at the earliest feasible opportunity.

Ontario will continue to move forward with natural gas generation already under contract, which will increase future emissions from electricity consumption. Assuming no change in corporate electricity consumption by 2030, increased natural gas electricity generation is projected to elevate corporate emissions from electricity consumption by 145% or 5,815 tonnes, and diminish gains the Region aims to achieve through its decarbonization strategy. A summary of forecasted impacts by service area is illustrated in Table 1 below.

Table 1

Forecasted Impact of Increased Electricity Emissions by 2030

Emissions Category	Incremental Emissions
Water and wastewater processing	2,800 tonnes
Buildings	2,400 tonnes
Streetlights, signals and beacons	570 tonnes
Transit bus chargers	45 tonnes
Total	**5,815 tonnes**

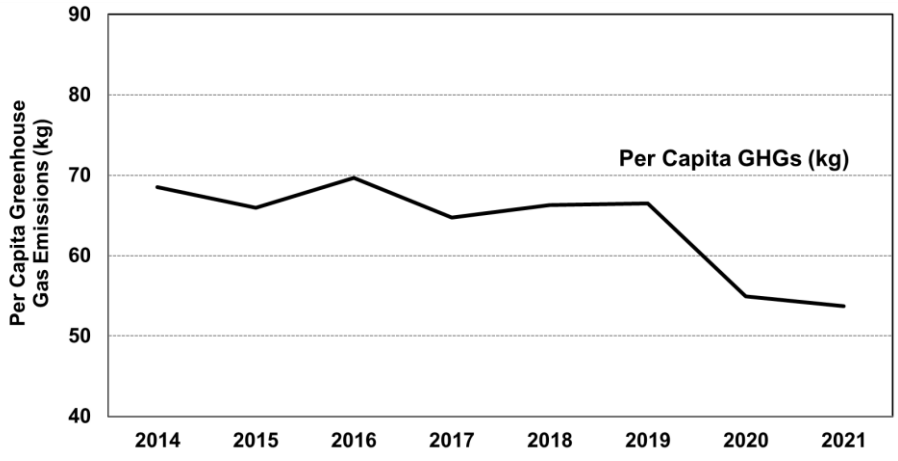
Given the importance of emission free electricity generation to York Region's decarbonization strategies, staff will continue to seek opportunities to advocate for Ontario electricity to be generated from zero-emission sources.

Operational changes in response to the global pandemic have resulted in a 2% reduction in per capita emissions

Figure 3 illustrates York Region's trend in per capita corporate emissions which fell by 2% in 2021 to 53.7 kilograms per resident. Per capita emissions are a Key Performance Indicator in York Region's 2019 to 2023 Strategic Plan and measure how the Region is delivering environmentally sustainable services to its residents. Like absolute emissions, recent results are from both long-term mitigation strategies and short-term actions associated with the pandemic, mostly from reduced transit service. Emissions are expected to rise in the post-pandemic Region but not to pre-pandemic levels.

Figure 3

2021 Per Capita Corporate Emissions Trend



Decreasing per capita emissions is consistent with the Region's 2019 to 2023 Strategic Plan while reductions in absolute emissions are key to reversing the cumulative impact of greenhouse gases on the environment.

Regional departments collaborated to advance long-term emission reduction strategies during the pandemic

Staff continue to prioritize efficiency and climate change action toward Energy Conservation and Demand Management Plan targets during the pandemic. Initiatives like replacement electric vehicles (including buses), building system upgrades and hybrid police patrol vehicles are producing immediate and measurable emission and cost reductions while long-term Climate Change Action Plans under development will guide future efforts to achieve net-zero carbon emissions. Table 2 highlights strategies pursued in 2021 across the corporation to reduce greenhouse gas emissions.

Table 2
2021 Greenhouse Gas and Cost Reduction Accomplishments

Initiatives (Service Area)
Hybrid Patrol Vehicles (York Regional Police) York Regional Police have deployed more hybrid patrol vehicles than any other police service in Canada and are planning for 50% of front-line patrol vehicles to be replaced with hybrids by the end of 2022. To date, these vehicles resulted in annual gasoline and cost savings of 217,500 litres or $241,000 and emission reductions of 510 tonnes, equivalent to average annual emissions from 93 cars or light trucks.
Electric Vehicle Charger Network (Public Works / Corporate Services / Housing York Inc.) York Region completed installation of 62 publicly accessible electric vehicle chargers at 11 Regional locations. With $310,000 (45% of total project cost) in financial support from Natural Resources Canada and a pay per use model, this project is expected to fully recover its capital and operating costs over the lifecycle of these chargers.
Electric Vehicles (Public Works / Community and Health Services) Two battery electric crossover vehicles have been purchased for integration into York Region's fleet. On May 5, 2022, Council approved plans to purchase ten electric light-duty pickup trucks and cargo vans to advance the Region's Fleet Optimization Policy. Staff continue to collaborate on electric ambulance and charging infrastructure pilot projects.

Initiatives (Service Area)

Lighting Upgrades (Public Works)

Lighting upgrades were completed at six water and wastewater facilities and two transit bus garages. Annual savings are projected at $186,000 or 1.2 million kilowatt hours resulting in reduced greenhouse gas emissions of 28 tonnes. Combined with provincial incentives, simple payback of the Region's invested capital amounts to 2.3 years. Over the lifecycle of these projects, cumulative savings will be $2.1 million for all eight facilities.

Social Housing Energy Audits (Community and Health Services)

Energy audits were completed on more than 1,400 units (50% of HYI portfolio) across 21 buildings as part of a five-year energy audit program established for York Region's affordable housing facilities.

Building Co-location Projects (Community and Health Services / Public Works)

Co-locating the Henderson Sewage Pump Station and Aurora Transitional and Emergency Housing shelter on a single property is expected to save the Region over $4 million in real estate, site preparation and utility servicing costs.

Electric Transit Bus Pilot (Public Works)

Twelve battery electric buses integrated into York Region's transit fleet have travelled over 251,000 kilometres reducing greenhouse gas emissions by 217 tonnes, a reduction of 97% over conventional diesel buses. Electricity versus diesel fuel (at 2020 prices) have reduced fuel costs by 25% in addition to maintenance costs savings of 50% compared to diesel buses. In 2021 staff submitted an expression of interest to the Federal Zero Emission Transit Fund to accelerate transit fleet electrification.

Climate Change Action Planning on Existing Buildings (Public Works)

Staff have developed an approach to identify mitigation and adaptation pathways for existing Regional buildings to outline projects and budgetary needs. Plans will chart custom retrofit alternatives to achieve net-zero carbon operations and increase resiliency to adapt to extreme weather. The first 2021 pilot study on the Administrative Centre investigated four paths allowing staff to evaluate and choose the most prudent and cost-effective option towards climate change action prior to 2050. This option involves improvements to building envelope, heat recovery, electrification, high intensity storm water management and on-site solar photovoltaic electricity generation.

Energy Efficiency Staff Training (Corporate Services / Housing York Inc. / York Regional Police / Public Works)

Held staff training for building and water and wastewater operators. Promoted a better understanding of energy consumption and tools to identify energy efficiency and emission reduction opportunities. 75% of training program paid for through Provincial and utility grants.

Initiatives (Service Area)

Building Energy Performance Reports (Public Works)

Analyzed annual energy performance for four of Region's largest energy consuming buildings. Staff collaborated to identify opportunities and implement measures for improved operational performance and greenhouse emissions reductions.

York Region's Draft Sustainable Buildings Policy Pilot Projects (Public Works / Community and Health Services)

In 2019, staff developed York Region's Draft Sustainable Buildings Policy, to address climate change action for construction of new Regional buildings. This draft policy is being validated on current projects prior to presentation to Council for approval in 2025. Current pilot projects include the Southeast Works Yard and Aurora Men's Shelter, which are targeting Passive House and LEED New Construction certifications. Designs to achieve these certifications have led to very high levels of building resiliency and energy efficiency, rendering net-zero carbon operations to be well within reach.

Wastewater Energy Exchange (Public Works)

In August 2021, Markham District Energy and York Region initiated discussions to explore wastewater energy exchange opportunities with the goal of decarbonizing Markham's district energy system. Efforts resulted in a signed Memorandum of Agreement in February 2022, and staff continue to collaborate to advance this innovative project.

Department efforts to meet Energy Conservation and Demand Management Plan targets have been tracked and monitored since 2015

Staff continue to track emissions generated by lines of business and monitor multi-year impacts resulting from conservation initiatives. Attachment 2 illustrates 2021 per capita emissions breakdown by department. Attachment 3 illustrates changes in emissions over time compared to the Energy Conservation and Demand Management Plan 2014 baseline. Monitoring enables staff to focus efforts on specific lines of business to optimize results.

Canadian Net-Zero Emissions Accountability Act legislated a national target of net-zero greenhouse gas emissions by 2050

The *Canadian Net-Zero Emissions Accountability Act*, which passed in 2021, enacts requirements for federal strategies and reporting of national efforts to meet 2030 Paris Accord commitments and achieve net-zero carbon emissions by 2050. To meet these goals, it is anticipated that updated policies, codes, targets and reporting requirements will be federally mandated to provinces and municipalities in the next two years. In Q1 2022, the Federal government announced $9.1 billion in new investments to grow the economy and cut emissions. Funding has been allocated to electric vehicles, greening homes and buildings, community climate change action plans and enhancing natural environments. Initiatives such as the Existing Buildings Climate Change Action Plans mentioned in Table 2 will serve the

Region well in applying for such incentives and demonstrate our focus on practical solutions and fiscal responsibility.

Staff recommend revising York Region's long-term greenhouse gas emissions target date from 2051 to 2050 to align with federal legislation

Aligning the Region's greenhouse gas emissions target date with the *Canadian Net-Zero Emission Accountability Act* will facilitate clear target setting and link Region's efforts with broader national, provincial and municipal efforts to mitigate climate change. Following consultation with internal stakeholders, staff recommend changing York Region's previous long-term greenhouse gas emission target from 2051 to 2050. Further analysis on absolute emission targets previously approved by Council will be considered through updates made to the Region's Energy Conservation and Demand Management Plan that will be presented to Council in Q2 2024.

Work is underway to update the 2019 Energy Conservation and Demand Management Plan

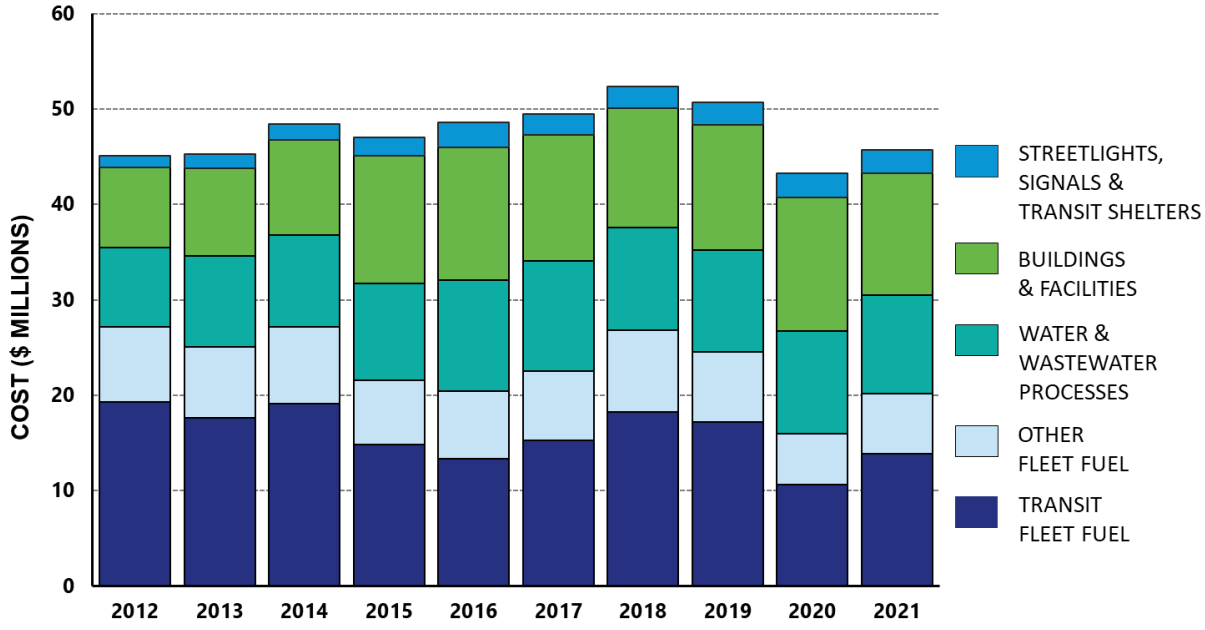
Legislation requires the Region to update our Energy Conservation and Demand Management Plan every five years to ensure it remains aligned with evolving technologies, legislation and funding. The next iteration, due for Council approval in Q2 2024, will start in early 2023 and is currently undergoing procurement.

Staff will continue to monitor regulatory impacts of the Federal government's Canadian Net-Zero Emissions Accountability Act and evaluate what changes may be necessary to adjust mid-to-long-term corporate emissions targets when updating the Energy Conservation and Demand Management Plan. A net-zero emissions target is achievable based on a framework of conservation, higher efficiency, renewable alternatives and low emission energy sources. Staff will continue to ensure fiscally responsible decision-making through evaluation of associated costs and feasibility through robust business case analysis.

5. Financial

Total energy costs for Regional operations in 2021 were $45.6 million, an annual increase of 5%, equivalent to $2.4 million. Fossil fuel prices increased in concert with crude oil prices and cost of carbon tax but were offset by reduced fuel consumption. Figure 4 summarizes the ten-year trend in Regional energy costs.

Figure 4
Ten-Year Regional Energy Cost Trend



York Region's dependence on fossil fuels will be a growing financial risk due to the influence of price volatility on our service delivery costs

Oil prices directly influence York Region's cost of gasoline and diesel fuel. In May 2020, global oil prices averaged $25 per barrel. By March 2022, global oil prices peaked at $123 per barrel. Price volatility is permanent in global oil markets and directly impacts York Region's cost of service delivery. York Region's budgets were largely protected in 2021 from the current market volatility. During the pandemic, while prices rose, less energy was purchased due to adjustments to service delivery. A return to pre-pandemic transit service levels and fuel consumption will add about $4.5 million to the Region's cost of service delivery without factoring in further increases to fuel prices and cost of carbon taxes.

Electrification of buildings and fleets will reduce the Region's financial exposure to the $9.7 million per year in carbon taxes forecasted by 2030

In 2021, the Federal carbon tax was $40 per tonne. By 2030, the carbon tax will grow to $170 per tonne and cost York Region an estimated $9.7 million annually. Carbon taxes are embedded directly into underlying fuel prices and charged to the Region on its supplier invoices. Table 3 illustrates additional fuel costs from increasing carbon taxes net of conservation measures proposed in the Energy Conservation and Demand Management Plan.

Table 3
Forecasted Financial Cost of Carbon Taxes (in $000's)

Fuel	2022	2024	2026	2028	2030
Diesel Fuel	$ 2,300	$ 3,600	$ 4,300	$ 4,800	$ 4,750
Natural Gas/Propane	700	1,100	1,550	2,050	2,500
Gasoline	650	1,050	1,500	1,950	2,450
Total	**$ 3,650**	**$ 5,750**	**$ 7,350**	**$ 8,800**	**$ 9,700**

Global events and government policies have made fossil fuel consumption a financial pressure to York Region budgets and provide an incentive to switch to low-carbon, locally generated electricity. Electrification of buildings and vehicles reduce Region's financial exposure and provide means to reducing Regional greenhouse gas emissions.

Electricity cost savings at York Region's five largest electricity consuming facilities were achieved through the active demand response program

Building on the success of electricity savings programs in past years, staff piloted an active electricity demand response strategy in 2021 that increased electricity savings on York Region's five largest electricity accounts by an additional $250,000. The successful pilot has been transitioned into a permanent operating strategy and award of a 36-month contract for services that support future demand response efforts and cost savings.

6. Local Impact

York Region's corporate emissions are approximately 4% of total community emissions

Though York Region's contribution compared to overall community emissions is small (approximately 4%), staff recognize the importance of their role in leading emission reduction initiatives with the goal of achieving a sustainable future. Staff continue to collaborate internally and with local municipalities to exchange information including fleet electrification, best practices and initiatives towards reduced energy consumption and greenhouse gas emissions.

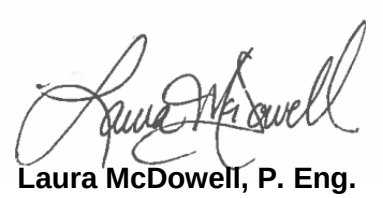
7. Conclusion

Weather and climate extremes are leading to irreversible impacts pushing human and natural systems beyond their ability to adapt. Climate change requires efforts from all countries and levels of government to mitigate greenhouse gas emissions and limit global warming.

In comparison to 2020, York Region's corporate energy emissions in 2021 dropped by 710 tonnes to 65,980 tonnes. Total corporate emissions are 18% below Energy Conservation and Demand Management targets. Despite lower consumption, volatility and higher fossil fuel prices led to budgetary pressures of $2.4 million or 5% to $45.6 million compared to 2020.

Emissions and expenditures are expected to rise in a post-pandemic Region, but not necessarily to their pre-pandemic levels. Strategies and technologies employed over the past year have been effective in reducing emissions while meeting levels of service. Staff have begun the process of evaluating and implementing strategies which can be operationalized in a post-pandemic work environment.

For more information on this report, please contact David Szeptycki, Director, Strategy & Innovation, Public Works Department at 1-877-464-9675 ext. 75723. Accessible formats or communication supports are available upon request.



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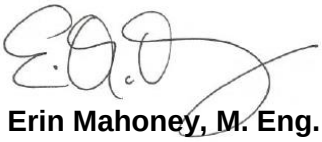

Erin Mahoney, M. Eng.
Commissioner of Public Works

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Chief Administrative Officer

May 27, 2022
Attachments (3)
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