

## APPENDIX C: CORPORATE LOCAL ACTION PLAN

AIR							
<p><b>Goal</b> <i>In 2055, we will have good quality air that is clean to breathe and supports healthy ecosystems.</i></p> <p><b>Strategic Directions</b> <b>Strategy 1:</b> Proactively control air pollutants generated from all sectors, including commercial, industrial, institutional (ICI) and residential. <b>Strategy 2:</b> Reduce air pollution.</p>							
Sector	Potential Actions	Timeframe		Responsibility	Potential GHG Reductions	Estimated Cost	Additional Information
		Immediate (<5 yrs)	Longer-term (>5 yrs)				
Fleet	Develop a strategy to invest in energy efficient vehicles and low emissions equipment.	✓		Operations & Environmental Services	Approximately 50% reduction in corporate fleet emissions for converting to hybrid <sup>1</sup>	Nominal to develop the strategy; Cost per vehicle noted below	
Fleet	Reduce emissions from Town fleets and equipment by investigating the use of cleaner fuels.	✓		Operations & Environmental Services	GHG reduction corresponds roughly to the blend of biodiesel that is used: B20 = ~20% reduction	Nominal to explore options; increased fuel costs, additional infrastructure (tanks)	
Fleet	Create a policy to modify/restrict the use of gas powered grounds maintenance and construction equipment on smog days.	✓		Operations & Environmental Services	N/A	Nominal	
Fleet	Expand existing corporate vehicle anti-idling program to include ongoing education and seasonal and new hire training.	✓		Operations & Environmental Services	Maintain current reductions as staff change	Nominal	

<b>Fleet</b>	Continue to reduce emissions from Town fleet through routine maintenance.	✓		Operations & Environmental Services	Efficiency can be improved by as much as 19% through car maintenance – GHG emissions from the Town’s fleet vehicles could therefore be reduced by 19% by ensuring proper vehicle maintenance <sup>2</sup>	Completed through both life cycle management and equipment management plans being funded through the annual budget process	
<b>Fleet</b>	Match size of equipment and vehicles to use.	✓		Operations & Environmental Services	Light duty truck switch to light duty vehicle: 0.4 tonnes/year/vehicle  Light duty truck switch to light duty hybrid vehicle: 2.8 tonnes/year/vehicle <sup>3</sup>	Nominal – Based on Fleet life cycle policy that is typically funded through the Fleet Reserve	
<b>Fleet</b>	Require specifications for new acquisitions to reflect the lowest emissions currently available in the industry that is available for that piece of equipment.	✓		Operations & Environmental Services	Unknown	Completed through both life cycle management and equipment management plans being funded through the annual budget process	

Other	Create preferred parking spaces at Town facilities for staff that drive hybrid and electric vehicles.	✓		Operations & Environmental Services	Non-direct	Nominal	
Other	Investigate the feasibility of installing electric vehicle charging stations at Town Facilities.	✓		Operations & Environmental Services	Non-direct	Charging station approximately \$5,000	
Other	Explore the provision of additional incentives for employees to purchase green vehicles.		✓	Office of the CAO	Non-direct	Nominal to explore; incentive dependent on level	The Province of Ontario offers an Electric Vehicle incentive program that can provide \$5,000 to \$8,500 towards the purchase or lease of a new plug-in hybrid electric or battery electric vehicle

ENERGY							
<p><b>Goal</b>  <i>In 2055, we will conserve the amount of energy we use and will generate most of the energy that we do use from clean and renewable sources.</i></p> <p><b>Strategic Directions</b>  <b>Strategy 1:</b> Reduce the amount of electricity and gas that residents use in their homes.  <b>Strategy 2:</b> Reduce the amount of energy that the Town, businesses and institutions use in their operations.  <b>Strategy 3:</b> Meet more of the community’s energy needs through renewable sources.  <b>Strategy 4:</b> Use vehicles that are energy efficient and that use alternative fuel sources.</p>							
	Potential Actions	Timeframe		Responsibility	Potential GHG Reductions	Estimated Cost	Additional Information
		Immediate (<5 yrs)	Longer-term (>5 yrs)				
<b>Buildings/facilities</b>	Develop a Sustainable Municipal Buildings Policy for new municipal buildings that follows Leadership in Energy and Environmental Design (LEED) principles.		✓	Operations & Environmental Services; Planning & Development	Non-direct; 15 – 500 tonnes/building) <sup>4</sup>	Nominal to develop policy; incremental construction cost of 1%-15% depending on building type, level of technology	
<b>Buildings/facilities</b>	Prepare an Energy Conservation and Demand Management Plan for Town facilities that addresses lighting, heating, ventilation, building automation, building envelope, and renewal energy applications).	✓		Operations & Environmental Services	Non-direct	\$50,000 - \$100,000	
<b>Buildings/facilities</b>	Implement Energy Conservation and Demand Management Plan for Town facilities on an ongoing basis. <ul style="list-style-type: none"> <li>• Lighting</li> <li>• HVAC</li> <li>• Building automation</li> <li>• Building envelope</li> <li>• Renewable energy</li> <li>• Education/awareness</li> </ul>	✓	✓	Operations & Environmental Services	Approximately 935 tonnes/year (25% reduction from corporate facilities) <sup>5</sup>	\$500,000 - \$1,000,000/year	

<b>Buildings/ facilities</b>	Implement power management on computers and electronic equipment.	✓		Legislative & Information Services	10 – 15 tonnes/year <sup>6</sup>	Nominal	
<b>Buildings/ facilities</b>	Upgrade to more efficient appliances and technology with the aim of improving building performances.			Operations & Environmental Services	Unknown	Nominal – Completed through life cycle management being funded through the annual budget process	
<b>Buildings/ facilities</b>	Conduct energy audits of Town facilities (8 major facilities) on an as-needed basis.	✓	✓	Operations & Environmental Services	Non-direct	~\$60,000/audit	
<b>Buildings/ facilities</b>	Complete analysis of all Town facilities and identify opportunities for renewable energy generation.	✓		Operations & Environmental Services	Non-direct	Approximately \$5,000/building	
<b>Buildings/ facilities</b>	Install renewal energy generating technologies at all facilities (buildings, pools and splashpads) where it is technically and financially feasible.		✓	Operations & Environmental Services	Solar hot water systems for pools: 20-25% reduction (~50 tonnes/pool) <sup>7</sup>	Solar Photovoltaic (PV) ~\$7,000 - \$11,000 per KW of installed capacity. Pools: \$115,000 - \$225,000/pool <sup>8</sup>	
<b>Fleet</b>	Purchase energy efficient Town vehicles as needed.	✓		Operations & Environmental Services	Approximately 2-2.5 tonnes/vehicle/year <sup>9</sup>	Hybrid sedans: \$25,000/vehicle Hybrid SUVs: \$40,000 Hybrid pick-up trucks: \$45,000/vehicle	
<b>Fleet</b>	Purchase energy efficient Town equipment to replace aging/obsolete equipment.	✓	✓	Operations & Environmental Services	Unknown	Nominal – Completed through life cycle management being	

						funded through the annual budget process	
<b>Street lighting</b>	Implement energy efficiency retrofit program for Town's street lighting and parking lot lights.	✓	✓	Operations & Environmental Services	Approximately 480 tonnes/year <sup>10</sup>	\$400-\$600/fixture  \$100,000 - \$200,000/year	
<b>Street lighting</b>	Switch Christmas lights to energy efficient technologies.	✓		Operations & Environmental Services	Approximately 2 tonnes/year  LED Christmas lights can reduce energy consumption by as much as 90% compared to conventional incandescent lights. <sup>11</sup>	Nominal on annual basis	
<b>Other</b>	Develop and implement program for Town IT staff to become Green IT certified.	✓		Legislative & Information Services	Non-direct	Green IT Course: \$1,800/person Internal training: Nominal	
<b>Other</b>	Upgrade current ISO 9001 certification to ISO 50001 standards at the Town of Ajax to recognize efforts in energy efficiency and management	✓		Office of the CAO	Non-direct	I have placed a call to David Forget regarding cost related to this cert. ??	GHG emissions reductions dependent on policies developed through the new ISO Energy Management System standard.

TRANSPORTATION							
<p><b>Goal</b>  <i>In 2055, we will have an integrated, efficient, and accessible transportation system that has sustainable options available for the movement of people and goods within the community and beyond.</i></p> <p><b>Strategic Directions</b>  <b>Strategy 1:</b> Create complete streets in Ajax to allow multiple modes of transportation.  <b>Strategy 2:</b> Design neighbourhoods to facilitate walkability and other active transportation opportunities as convenient alternatives to the use of private automobiles.  <b>Strategy 3:</b> Enhance public transportation opportunities to make public transportation convenient and a feasible alternative to the private automobile.  <b>Strategy 4:</b> Reduce congestion and commute times.</p>							
	Potential Actions	Timeframe		Responsibility	Potential GHG Reductions	Estimated Cost	Additional Information
		Immediate (<5 yrs)	Longer-term (>5 yrs)				
Other	Install biker lockers and/or canopies on bike racks at Town facilities for staff.	✓		Operations & Environmental Services	Low (~1 tonnes/year/employee) <sup>12</sup>	\$1,200-1,600 for 2 bike storage locker	Average employee travel distance about 21km (Commuting Survey, Durham Smart Commute)
Other	Develop campaign/program to encourage transit ridership amongst staff.	✓		Human Resources; Operations & Environmental Services	Low (~1 tonnes/year/employee) <sup>9</sup>	\$2,000 – \$5,000/year	
Other	Promote transit, carpooling, and active options for commuting (e.g., through Smart Commute Durham)	✓		Human Resources; Operations & Environmental Services	Low (~1 tonnes/year/employee) <sup>9</sup>	Nominal – align with existing events, programs, etc.	

WASTE							
<p><b>Goal</b>  <i>In 2055, we will use materials wisely, maximizing the lifecycle of materials and reducing the amount of waste generated.</i></p> <p><b>Strategic Directions</b>  <b>Strategy 1: Reduce the consumption of material things.</b>  <b>Strategy 2: Provide education and awareness relative to waste management practices.</b>  <b>Strategy 3: Facilitate reuse and recycling of goods and materials in all sectors that are currently identified as waste.</b>  <b>Strategy 4: Reduce the amount of waste generated in manufacturing processes.</b></p>							
	Potential Actions	Timeframe		Responsibility	Potential GHG Reductions	Estimated Cost	Additional Information
		Immediate (<5 yrs)	Longer-term (>5 yrs)				
<b>Solid waste</b>	Develop and implement a Green Procurement Policy.	✓		Office of the CAO	Low-Medium	Nominal	
<b>Solid waste</b>	Develop a Green Event Policy.	✓		Office of the CAO	Low	Nominal	
<b>Solid waste</b>	Continue to promote the "Quit the Print" campaign (e.g., use collaborate software to edit documents, implement duplex printing, move orientation binders to intranet servers, encourage paperless meetings and electronic agendas, etc.).	✓		Legislative & Information Services	Low <sup>13</sup>	Nominal – ongoing	
<b>Solid waste</b>	Coordinate efforts to encourage the use of reusable mugs, water bottles and reusable lunch containers.	✓		Operations & Environmental Services	Low	Nominal – ongoing	
<b>Solid waste</b>	Continue with staff education and awareness related to waste minimization and management.	✓		Operations & Environmental Services	Low – maintain participation levels for new hires	Nominal – ongoing	
<b>Solid waste</b>	Continue to support and expand the municipal waste	✓		Operations &	Low-Medium	Nominal – funded	



	diversion program.			Environmental Services		through the annual budget process	
<b>Solid waste</b>	Ensure that appropriate waste diversion receptacles are available in all facilities.	✓		Operations & Environmental Services	Low	\$1,600/3-stream receptacle plus related servicing cost	
<b>Solid waste</b>	Recycle concrete and asphalt and reuse it in municipal infrastructure.	✓		Operations & Environmental Services	Non-direct	Nominal	

NOTES

<sup>1</sup> The average light-duty gasoline vehicle in Canada has a fuel efficiency of 10.7 L/100 km and travels 15,400 km per year, consuming 1,647.8 L of gasoline and producing 3.8 tonnes of CO<sub>2</sub>e per year. In contrast, a 2012 Toyota Prius has a fuel efficiency of ~4.0 L/100 km. Travelling the same 15,400 km per year, the Prius would consume 616 L of gasoline and produce 1.4 tonnes of CO<sub>2</sub>e--an annual GHG reduction of approximately 2.4 tonnes.

An average light-duty gasoline truck (includes SUVs) in Canada has a fuel efficiency of 11.8 L/100 km and travels 15,400 km per year, consuming 1,817.2 L of gasoline and producing 4.2 tonnes of CO<sub>2</sub>e per year. In contrast, a 2012 Ford Escape Hybrid has a fuel efficiency of 6.2 L/100 km. Travelling the same 15,400 km per year, the hybrid would consume 955 L of gasoline and produce 2.2 tonnes of CO<sub>2</sub>e per year--an annual GHG reduction of approximately 2 tonnes.

Note that GHG reductions will vary depending on annual vehicle kilometres travelled.

<sup>2</sup> The [US EPA](#) estimates that fuel efficiency can be improved by as much as 19% through car maintenance. GHG emissions from the Town’s fleet vehicles could therefore be reduced by 19% through proper vehicle maintenance.

<sup>3</sup> See Endnote 1.

<sup>4</sup> The table below summarizes typical costs and payback periods for LEED buildings. The payback includes only annual utility energy savings.

	LEED Rating			
	Certified	Silver	Gold	Platinum
Energy Savings	25-30%	30-50%	50-60%	>60%
Annual Utility Savings	\$0.75/ft2	\$1.00/ft2	\$1.25/ft2	\$1.50/ft2
Typical Payback	Under 3 years	3-5 years	5-10 years	10+ years
Incremental Construction Cost				
Small Buildings	3%	7%	10%	15%
Large Buildings	1%	3%	5%	8%

Source: Enermodal Engineering. *LEED™ Green Building Rating System 2009 Explained*. [Accessed electronically](#) on November 21, 2012.

Based on a quick review of LEED projects in the National PCP Measures Database, LEED certification for new buildings can result in GHG reductions ranging from 15 tonnes to over 500 tonnes. The potential GHG reduction varies depending on the size of the facility, the energy types that are used in the province, the green building features that are incorporated, etc.

<sup>5</sup> In 2005 the Town of Ajax produced 3,741 tonnes of GHG from buildings (Ajax Community Greenhouse Gas Emission Inventory, 2010). Assuming a 25% reduction from implementation of the Energy Conservation and Demand Management Plan = ~935 tonnes/year

<sup>6</sup> In 2010, the City of Thunder Bay installed a ‘Nightwatchman’ program at City facilities to turn off computers left on at the end of the day. During the day the program also puts monitors that have not been used for one hour into sleep mode. This initiative has been coupled with the installation of new energy efficient servers. The program has resulted in annual electricity savings of 102,768 kWh, annual cost savings of \$10,332, and an annual GHG reduction of ~13 tonnes. Implementation costs were minimal. Source: PCP National Measures Report 2011.

<sup>7</sup> In 2011, the City of Saskatoon installed solar hot water systems at two of its pools (90 solar collector panels at one pool and 72 at the other). The panels supply approximately 20-25% of the energy needed to heat the pools. Total implementation cost was \$452,363. Natural gas savings are approximately 53,360 m<sup>3</sup> per year, resulting in an annual GHG reduction of 100 tonnes. The City of Burlington installed 90 solar collector panels at one of its pools; the system supplies ~ 25% of the energy needed to heat the pool. Total implementation cost for this project was \$116,970.

<sup>8</sup> According to the [Alberta Solar Showcase](#), a solar PV system costs about \$10,000 per kilowatt of installed capacity. Based on the solar PV projects in the PCP Measures Database, a reasonable estimate of the costs is likely \$7,000 - \$11,000 per kilowatt of installed capacity. Sample projects include:

- City of Ottawa - Rooftop Solar Pilots (2010) - Installed 2 x 10 kW solar PV systems for \$220,000. Cost per kW = \$11,000.
- City of Ottawa - Large Rooftop Solar Energy Program (2011) - Plan to install 5,450 kW for \$42,000,000. Cost per kW = \$7,706.
- City of Toronto - Solar PV program for City facilities (2011) - Plan to install 2,000 kW for \$16,000,000. Cost per kW = \$8,000.
- City of Markham - Rooftop solar array at 8100 Warden Avenue (2010) - Installed a 250 kW system for \$1,766,000. Cost per kW = \$7,064.

<sup>9</sup> See Endnote 1.

<sup>10</sup> High-pressure sodium (HPS) fixtures can range in wattage from 70 W to 400 W. Assuming the average HPS fixture in Ajax is 150 W, and that average operating hours are 12 hours/day, baseline electricity consumption data would be somewhere around 5,913,000 kWh per year ( $12 \times 365 \times 150 \times 9000 / 1000$ ). LED fixtures have wattages around 56 W = annual electricity consumption around 2,207,520 kWh, a reduction of 3,705,480 kWh, or 482 tonnes GHGs per year.

The City of Hamilton has done several LED street lighting pilot projects. Energy savings range from 57% to 68%. Additional information is available on the [LightSavers Canada website](#).

<sup>11</sup> According to BC Hydro, decorating “with LED lights could reduce holiday lighting energy use by up to 90%. A typical 50-bulb incandescent strand of lights uses 250 watts and an equivalent 70-bulb LED strand uses only three watts.” Source: BC Hydro. Switch to LED Holiday Lights. [Accessed electronically](#) on November 21, 2012.

130 sets of incandescent lights @ 250 W each, operating all night (15 hours) for the entire month of December =  $31 \times 15 \times 250 \times 130 / 1000 = 15,113$  kWh electricity consumption. 130 sets of LED lights @ 3 W each, operating the same amount of time =  $31 \times 15 \times 3 \times 130 / 1000 = 181$  kWh. Electricity savings =  $15,113 - 181 = 14,932$  kWh; GHG reduction =  $14,932 \times 0.00013 \text{ t/kWh} = \sim 2$  tonnes.

<sup>12</sup> Average employee travel distance for work is about 21km (Town of Ajax Commuting Survey, Durham Smart Commute). Assumes an average employees would travel to work 250 days out of a year. Tonnes of CO<sub>2</sub>e reductions = [average commute distance (km)]\*[average fuel efficiency of a Canadian midsize vehicle: 9.1L/100km]\*(emission factor for gasoline: 0.002299 tonnes of CO<sub>2</sub>e/L).

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<sup>13</sup> In 2008, the Regional Municipality of Stanley, Manitoba, purchased a system called All-Net from a Manitoba-based company for \$8,000. The municipality pays an annual maintenance cost for All-Net of close to \$3,000. All-Net is a web-based hosting service that allows the municipality to store council meeting information and other documents virtually, rather than on-site. Rather than print council meeting packages – which can be up to 175 pages – all council meeting work is done in an electronic environment. Taking only council and committee meetings into account, Stanley has reduced its printing needs by at least 45,000 pages per year. This reduction equals 0.6 tons of avoided greenhouse gas (GHG) emissions (environmental impact estimates were based on Stanley’s use of non-recycled paper and were made using the [Environmental Defense Fund Paper Calculator](#)). Source: [PCP Greenhouse Gas Reduction Initiative of the Month \(March 2011\)](#).