Section 1 – Background, Objectives & Scope

Climate change is recognized as one of our most serious global environmental problems, and results from an accumulation of greenhouse gases (GHG) in the atmosphere. There are three principal greenhouse gases: carbon dioxide, nitrous oxide and methane. These gases are produced in a number of ways, including by burning fossil fuels, from decomposing organic waste in landfills and are also emitted during wastewater treatment.

The concentrations of population, wealth, infrastructure, and vehicles make cities highly susceptible to the potential effects of climate change. Recognizing the importance of dealing with climate change, on November 25, 1998, the City of Winnipeg committed to the Federation of Canadian Municipalities (FCM) Partners for Climate Protection (PCP). This program requires submission of a climate change action plan detailing how specific greenhouse gas emissions targets will be met and how progress will be measured.

Winnipeg is one of more than 180 Canadian municipalities that have signed on to the Partners for Climate Protection program. The City's participation in the PCP program commits the City to working towards reducing greenhouse gas emissions in municipal operations by 20 per cent below a selected baseline year within 10 years. The completion of a Climate Change Action Plan (CCAP), and the subsequent implementation and evaluation of the program, will satisfy the five milestones that constitute the basis of the Partners for Climate Protection Program:

Milestone 1 Conduct an energy and emissions inventory and forecast.
Milestone 2 Establish an emissions target.
Milestone 3 Develop and obtain approval for a Local Action Plan.
Milestone 4 Implement policies and measures.
Milestone 5 Monitor and verify results.

The objectives of the City's CCAP is to develop a comprehensive greenhouse gas emissions reduction strategy for the municipal operations of the City of Winnipeg.

In addition, the CCAP:

- Aligns with the policy direction on Environmental Stewardship in **Plan Winnipeg** (5A-01; 5A-01-iii).
- Is consistent with the recommendations in the former Civic Environmental Committee's report **Sustainable Winnipeg: A Comprehensive Environmental Strategy** (Chapter 2-1, Climate Change).
- Meets the administrative commitment as outlined in **Embracing Sustainability: An Environmental Priority and Implementation Plan for the City of Winnipeg, 2004-2006** (Chapter 2 – Climate Change and Air Quality).

Methodology

In 2005, an interdepartmental task force comprising representatives from a number of City departments and agencies was established to develop a GHG emissions reduction plan for civic operations. Funding was secured from the Federation of Canadian Municipalities and from the Province of Manitoba to assist with the development of this plan.

The two major undertakings in developing the CCAP included the development of a GHG inventory and development of a set of GHG reduction strategies. An existing inventory containing data from 1998 was refined and updated, and a second inventory (based on 2003 data) was developed. City staff worked with ICF International to complete the inventory.

The inventory was developed by examining the energy used in the course of civic operations. In the case of Winnipeg, the most significant sources of greenhouse gas emissions are from:

- Gasoline and diesel (vehicles and other outdoor equipment)
- Natural gas (used in both space heating and to power water pumps and sewage treatment)
- Organic waste deposited in landfills
- Methane gas arising from sewage and wastewater treatment

While the inventory work was being done, the task force met over a period of approximately seven months to develop a set of strategies for emissions reduction. Some of the strategies reflect policy decisions made in recent years, for which work is already underway.

In addition, some strategies will contribute to GHG reduction in a more indirect way. For example, one of the strategies is to carry on the City's membership and support of the local chapter of the Red River Valley Clean Cities Association. While this will not result in direct GHG reductions, the research and networking opportunities provided through the City's membership will likely have an impact on future emissions from the City's vehicle fleet.

Section 2 – Greenhouse Gas Emissions Inventory

To begin with and to put this section into context, on average, each resident of Winnipeg produces approximately 8 tonnes of greenhouse gases (GHG's) per year. The municipality as a whole produces 5.2 million tonnes (also know as megatonnes or MT's) of GHG's annually, a significant portion of Manitoba's overall GHG emissions of 21.3 MT per year.

GHG reductions are measured against a baseline year, which serves as a basis for setting an emissions reduction target and acts as a point of comparison for the future. The PCP program suggests using GHG inventory data from 1990 (the baseline year for the Kyoto Protocol targets).

However, data from this time is not as reliable. Rather than rely on uncertain data, we have selected 1998 as our baseline year. We have also chosen to develop an inventory from 2003, to provide a 'progress report' of sorts, as there were a number of changes to civic operations during this period. 2003 will also mark the start of our actions on climate change, and this means that Winnipeg will need to meet its GHG reduction target by the end of 2012.
It must be noted that although the data used was reliable, there are still instances where estimation and extrapolation was required, and the numbers presented here are as close as we can

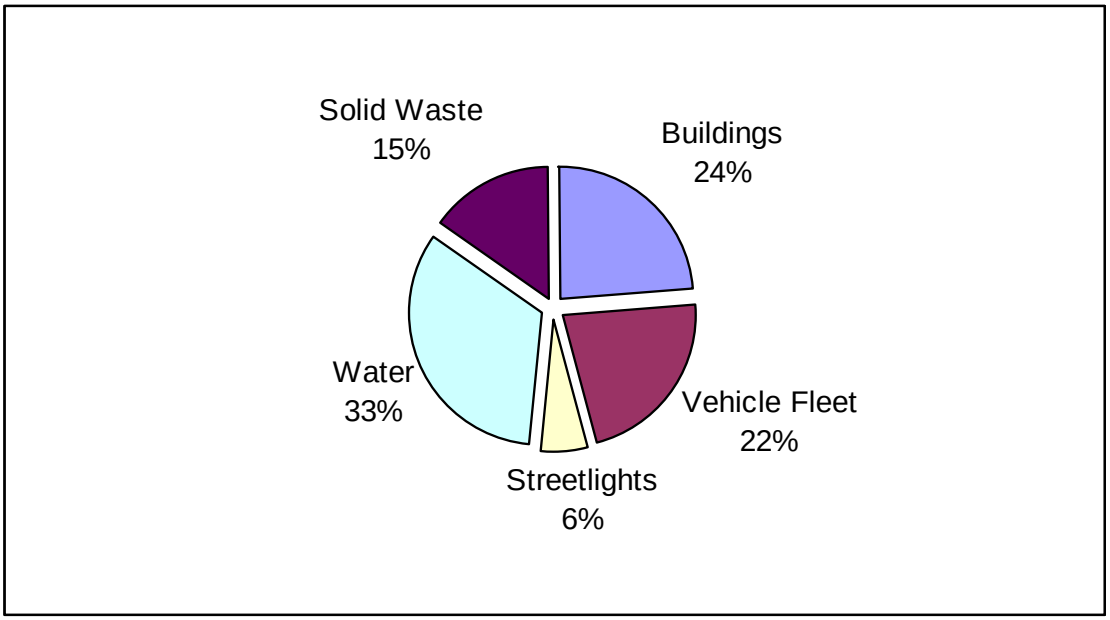
get based on the available data. It is also important to point out that this is our first attempt at a GHG inventory. We expect that future updates and progress reports will be even more thorough and accurate, as data collection is centralized and a reporting network is developed.

In 1998, corporate operations at the City of Winnipeg produced approximately 87,000 tonnes of greenhouse gases from the following sources:

Corporate Greenhouse Gas Emissions in 1998		
Sector	**Tonnes of eCO_2 (1)**	**% of total**
Buildings	20,763	24
Vehicle Fleet	19,024	20
Streetlights	4,813	6
Water/Wastewater	29,022	34
Solid Waste[2]	13,311	16
Total	**86,933**	**100**

Notes:
1) eC02 = equivalent tonnes of CO_2
2) Solid waste refers only to corporate waste produced by municipal operations.

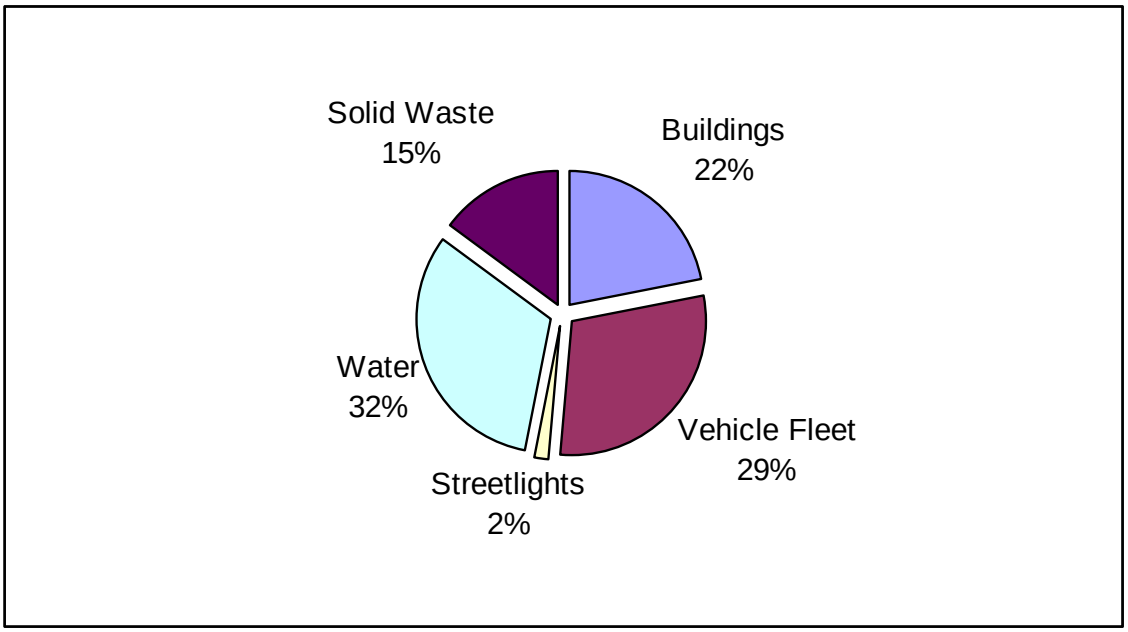
Corporate Greenhouse Gas Emissions in 1998



And in 2003, corporate operations at the City of Winnipeg produced just over 73,300 tonnes of greenhouse gases.

Corporate Greenhouse Gas Emissions in 2003		
Sector	**Tonnes of eCO_2**	**% of total**
Buildings	16,179	22
Vehicle Fleet	21,498	29
Streetlights	1,268	2
Water/Wastewater	23,331	32
Solid Waste	11,022	15
Total	**73,298**	**100**

Corporate Greenhouse Gas Emissions in 2003



This represents a reduction of approximately **13,600 tonnes** or a **15.5% reduction in emissions**.

The key point here is found in the trends, rather than the total emissions. As shown in the chart below, by examining the two baseline years, we can see a clear trend developing.

Sector	1998	2003	As a % of the total
Buildings	24%	22%	**-2%**
Vehicle Fleet	20%	29%	**+9%**
Streetlights	6%	2%	**-4%**
Water/Wastewater	34%	32%	**-2%**
Solid Waste	16%	15%	**-1%**

During the period 1998 to 2003, emissions from buildings, streetlights and water/wastewater have gone down. Corporate waste has remained stable, while emissions from vehicle use have risen during this period.

The trends are likely as a result of four significant events and policy decisions:

- The decision to proceed with PowerSmart projects in civic facilities (including water treatment systems, civic buildings and traffic signals) has reduced the City's use of both electricity and natural gas, which is beginning to show in our emissions. As more work has been completed since 2003, it is likely that future inventories will find further reductions in the buildings and water/wastewater sectors.

- One of the first PowerSmart projects was a retrofit involving parts of the Pam Am Pool complex. This project involved a lighting upgrade and an innovative structural retrofit, which reduced greenhouse gas emissions by an estimated 46 tonnes. In addition, the decision to close the Henry Street incinerator reduced the City's emissions by an estimated 140 tonnes per year.

- The sale of Winnipeg Hydro displaced a large amount of emissions. These are not actual greenhouse gas reductions, but these emissions are no longer part of the City's corporate inventory and fall outside the scope of this plan.

- In 2003, the Equipment and Materials Services branch officially became a Special Operating Agency (SOA), under the name of Winnipeg Fleet Management Agency (WFMA). Operating as an SOA, the Agency has implemented a number of environmental initiatives, including reducing the overall size of the fleet and purchasing hybrid vehicles. The impact of these initiatives is not reflected in the current inventory, but are expected to yield significant reductions in the next inventory.

    - Increased efficiencies and improved tracking of fuel usage by the Winnipeg Fleet Management Agency. The 1998 data is less reliable, as it was provided by a number of individual departments. All the fuel usage data for 2003 was provided by WFMA.

    - Diesel fuel is more energy efficient and less costly than gasoline. As a result, the percentage of diesel engines vehicles in the fleet in 2003 was far greater then it was in the late 1990's. Diesel fuel, due to its sulphur content, produces more greenhouse gas emissions than gasoline, contributing to the increase GHG levels. These emissions are expected to decline in the next inventory due to new federal legislation restricting the sulphur content of on-road diesel. As of September 1, 2006, the sulphur content of Canadian produced and imported on-road diesel will be reduced from 500 part per million (ppm), referred to as low sulphur diesel (LSD), to 15 ppm, referred to as ultra low sulphur diesel (ULSD).

- Manitoba Hydro has switched the source of fuel at its Selkirk generating station (which supplied power to customers in Winnipeg) from coal to natural gas, reducing emissions by approximately 200,000 tonnes of CO_2 per year. This was reflected in the database software used to develop the inventory

As a final note, while our emissions measure very favourably with other similarly-sized Canadian municipalities, it is important to point out that Winnipeg enjoys an advantage over other cities because of our use of hydro-electric power. Hydro power does not produce anywhere near the greenhouse gas emissions of fossil fuels.

The following section outlines a number of initiatives which are in progress or are planned, and which will further reduce GHG emissions coming from civic operations.

Section 3 – Proposed Emissions Reduction Initiatives

Under the Partners for Climate Protection program, the City has committed to achieving a 20% reduction in GHG emissions from the 1998 total. This must be achieved within ten years of implementing the CCAP. In the City's case, this means that we must achieve this target by 2018.

Based on the inventory numbers, we can see that the GHG reduction required under Winnipeg's commitment to the PCP is close to being met. The City of Winnipeg has reduced emissions by approximately 15.5% from 1998 to 2003. It is likely that the remaining 4.5% will be met after analyzing the 2006 data (which will include a number of major building retrofits and further fleet improvements). The City's challenge now is to ensure that emissions do not rise again.

In order to ensure that GHG emissions do not rise, the City will monitor emissions carefully over the next two years to see if current trends continue. To ensure that GHG reductions continue, a series of strategies have been developed. These are as follows:

Civic Facilities

1. Continue to seek out and implement opportunities for energy efficiency and renewable energy upgrades in civic facilities

For several years now, the City has been working to identify and implement energy efficiency projects in civic buildings. Many projects have been completed and City staff will continue to seek out and implement opportunities for energy savings in civic buildings.

Most recently, a project in partnership with Manitoba Hydro has allowed larger-scale implementation of energy-conserving strategies at City facilities. These projects began after 2003, and the savings will be reflected in the next inventory.

Opportunities for enhancing the efficiency of civic facilities begin with day-to-day maintenance decisions to replace equipment at end-of-life with higher efficiency systems. The opportunities continue to grow in scope to include major system upgrades if the business case warrants.

While the vast majority of the City's electricity comes from hydro electric power, there still may exist opportunities for renewable energy at individual civic buildings. Winnipeg's climate is well-suited to the use of passive solar heating. Two swimming pools have had passive solar walls installed and plans are in the works to look at other facilities. This technology may also be used to displace natural gas.

Status	Lead Departments
New/Ongoing	Public Works, PP&D

2. **Adopting elements of green building standards for new civic facilities**

City facility design and/or renovation teams will be encouraged to adopt elements of the LEED standards or other equivalent building standards (i.e. CBIP, BOMA or C-2000) when opportunities are available to do so. In addition, the City will study the possibility of shifting to an asset management/lifecycle costing model to account for energy consumption and other ongoing maintenance & operational costs during the design process. This cost model best takes into account the impact of capital investment on operating cost over time.

Status	Lead Departments
New/Ongoing	Public Works, PP&D

3. **Ensure that building management and other key staff members are LEED accredited**

The LEED standards, developed by the United States Green Building Council are one of the sets of standards recognized in the green building industry. One of the services that LEED offers is certification for building and design professionals. Ensuring that key City staff hold LEED certification will benefit the design, construction and operation of civic facilities in the future.

In addition to training for key staff members, the City will organize workshops to assist maintenance & project staff with information on LEED and a greater awareness of how it could impact their work.

The training will not only familiarize staff with a specific standard, but will also introduce alternative building technologies and design standards to improve facility design even when LEED certification is not sought for a project.

Status	Lead Departments
New/Ongoing	Public Works, PP&D, CAO

4. **Retain membership in the Manitoba Chapter of the Canada Green Building Council and other relevant professional associations**

Through the Department of Public Works, the City of Winnipeg is a member of the Manitoba Chapter of the Canadian Green Building Association. Retaining membership in this organization allows City staff to keep up with the latest trends and developments in building technology. A corporate presence in this and other technical and professional associations positions the City of Winnipeg as a leader and ensures that City staff are involved in ongoing developments in strategies, resources, and technologies.

Status	Lead Departments
Ongoing	Public Works

5. Develop a building user energy efficient practices education/promotion program

An essential element in ongoing energy conservation success is the involvement of staff and facility occupants. Individual building users play a great role in shaping the energy usage of the facility, and if they are informed of the goal of a program, they are re more likely to help sustain it. For instance, if office lights are turned off when staff members leave the room for long periods (over 30 minutes), other staff and the public will understand and won't interpret that as empty space, but someone taking control of the energy used in their space.

An announcement campaign and roll-out help with initial buy-in. Regular updates and reminders are very important, as "slippage", falling back into old patterns occurs when waning publicity makes it appear that energy savings are no longer a priority.

The measurability of this is well-proven in the energy industry. Recently and locally, the Pembina Trails School Division ran a multi-year program with a focus on low-cost/no-cost energy solutions. The low-cost solutions involved training and promoting energy conservation in classrooms and empowering students to track and innovate ways to save energy.

Status	Lead Departments
New	Public Works, PP&D

Civic Vehicle Fleet

6. Develop a vehicle information package for Fleet customers to allow them to consider fuel efficiency and other environmental options when purchasing vehicles.

The Fleet Management Agency (FMA) and the Environmental Coordinator will research and prepare a new information kit for FMA customers. This package would include information on new vehicle technologies (including anti-idling, LED lights, greater fuel efficiencies and hybrid vehicles) and provide FMA customers with this information to assist them in making vehicle purchases.

Status	Lead Departments
New	WFMA, CAO Secretariat

7. **Explore opportunities to introduce a "Smart Driving" Program (fuel efficient driving techniques course)**

This strategy would explore the possibility of having City driver training courses include a component on fuel-efficient driving techniques. Transit already does this with considerable success, and Public Works can use their experience in determining if a similar program could fit into existing courses.

Status	Lead Departments
New	CAO Secretariat

8. **"Right Size" the fleet and replace obsolete vehicles with more fuel-efficient, cleaner burning units**

Since their incorporation in 2003, the Fleet Management Agency (FMA) has been engaged in a process of reducing the municipal vehicle fleet to better suit the City's needs. This has resulted in the fleet being reduced by approximately 30%, from over 2300 vehicles to just under 1600. In addition, the municipal fleet contained many older, less efficient vehicles. The newer vehicles being purchased to replace these are in many cases more fuel efficient and cleaner.

Status	Lead Departments
Completed	WFMA

9. **Develop an administrative directive to reduce vehicle idling in the City's fleet**

In March 2004, the City of Winnipeg joined Climate Change Connection's "Healthy Communities Don't Idle" campaign by posting voluntary Idle Free Zone Signs on City signposts at civic facilities – libraries, community centres, pools, and arenas - across the city. In becoming one of many partners in the program, the City of Winnipeg also committed to developing an Idle Free Administrative Directive to establish idling guidelines for the City's fleet. The Idle Free Directive will incorporate the innovative programs being developed by Transit and the Winnipeg Fleet Management Agency to create a comprehensive idle-free program to reduce GHG emissions, save energy, and promote better air quality.

Status	Lead Departments
New	CAO Secretariat, WFMA

10. Provide administrative support for the RRVCCC and use their resources to determine best 'Green Fleet' practices from other jurisdictions

Red River Valley Clean Cities Coalition (RRVCCC) Winnipeg Chapter Inc. is a voluntary partnership between government, business, non-profit organizations and post-secondary institutions with a mandate to promote alternative fuels, advanced vehicle technologies, idle reduction and fuel-economy in Manitoba. It is the only Clean Cities chapter in Canada, and is well-placed to research and report on best practices in this field. As a member of the Coalition, the City has access to a large body of knowledge which might otherwise not be available.

Status	Lead Departments
Ongoing	WFMA

11. Run a biodiesel demonstration project to confirm the suitability of this fuel for use in the City's fleet

The City of Winnipeg is in negotiations with potential funding partners to assist with the implementation of a biodiesel demonstration project at one fueling location from 2007 to 2009. Twenty municipal vehicles will run on a blend of 10% biodiesel and 90% regular diesel. If the project is successful, the City may consider including a biodiesel requirement in the next fuel tender, subject to a guarantee of adequate supply.

Status	Lead Departments
New	WFMA, CAO Secretariat

12. Innovation in the City's vehicle fleet

The Winnipeg Fleet Management Agency owns a number of hybrid sedans and SUVs, which are being monitored in order to assess vehicle performance and fuel efficiency. To date the vehicles have performed well in all seasons and have proven to be the most fuel-efficient vehicles in the fleet. The performance and efficiency data collected throughout the evaluation will allow the Agency to provide departments with advice and recommendations regarding the "greening' of their fleet.

In addition, WFMA is in the midst of technology evaluation with an Ottawa-based company that manufactures an affordable, wireless vehicle monitoring system that tracks vehicle usage data, such as engine hours, odometer readings and idling, as well as abnormal vehicle operating conditions, including reporting trouble codes. The expected benefit of this initiative is a reduction in idling time and the associated fuel waste and resulting greenhouse gas emissions.

Status	Lead Departments
Ongoing	WFMA

13. Diesel-electric hybrid buses

In order to further reduce emissions from Transit buses, the City of Winnipeg will be purchasing twenty new sixty-foot articulated diesel-electric hybrid buses. Not only will this reduce transit vehicle emissions by using hybrid technology, but the buses themselves will hold more passengers and further reduce the requirement to operate regular diesel buses.

Under the Partners for Climate Protection protocol, which has guided the City through the development of this plan, transit buses are considered to be part of the community inventory, covering the community as a whole. As such, the reduced emissions from these buses will not count towards the City's inventory.

Despite this, the City feels that it is important to take a leadership role in reducing greenhouse gas emissions. The purchase of these larger, hybrid buses further demonstrates the City's commitment to reducing emissions.

Status	Lead Departments
New	Winnipeg Transit

Water Consumption

14. Continue efforts to reduce water consumption through "Slow the Flow" program

This ongoing program is focused on reducing water consumption for the long-term. Measurable water consumption reductions have been observed in industrial, commercial and residential demands. In addition, the Department of Water & Waste partners annually with the Fort Whyte Centre to deliver a water efficiency youth education program.

Status	Lead Departments
Ongoing	Water & Waste

Traffic Signals & Streetlights

15. Continue to replace existing traffic signals with high-efficiency LED systems

The City of Winnipeg is in the process of replaced the older incandescent bulb traffic signals with newer LED technology. The newer technology is more reliable, has a longer lifespan and

uses considerably less energy. As of July 31, 2006, the Department of Public Works had installed approximately 5,950 LED systems out of a total of 18,700 units. This process will continue, and will help to reduce the City's energy consumption even further.

Status	Lead Departments
Ongoing	Public Works

Corporate Waste and Solid Waste

16. Implement methane gas recapture project at the Brady Road Landfill

The Brady Road Landfill accepts about 400,000 tonnes per year of garbage from Winnipeg residential and commercial locations. The organic fraction of the garbage (approximately one-third of the total) decomposes naturally and landfill gas is released to the atmosphere. The landfill gas is comprised of 50% methane, which is a harmful greenhouse gas and contributes to the global warming. It is estimated that the Brady Road Landfill generates 1.7% of the total greenhouse gas emissions in Manitoba and is the largest single emitter.

It is important to note that methane emissions from Winnipeg's landfill are not accounted for in the corporate inventory. Under the Partners for Climate Protection protocols, they are considered to be part of the community inventory, covering the community as a whole. However, the City of Winnipeg, as the owner and operator of the landfill, recognizes that it is the only organization that can realistically initiate a plan to address these GHG emissions.

In addition, the City has an interest in seeing local GHG emissions decline, regardless of whether they are considered to be part of the corporate or the community inventory. For these reasons, the interdepartmental working group chose to include the methane gas recapture project in the City's CCAP.

The Water and Waste Department, along with Manitoba Hydro, has conducted some field testing to determine the quality and quantity of the landfill gas that could be captured using a series of wells. Study was also done on the economic feasibility of utilizing the landfill gas for various end uses. Work is continuing on this project and the results should be finalized in early 2007.

Status	Lead Departments
New	Water & Waste

Other Strategies

17. Annual collection of GHG indicators (fuel, energy, etc.) among all departments and special operating agencies.

In order to monitor the progress of the CCAP, the City needs to ensure that all GHG indicators are tracked annually according to a standardized system. Relevant departments received a request for this information in February of 2006, and the same information would be collected annually where necessary.

Status	Lead Departments
New	CAO Secretariat

18. Develop an environmental promotion web page on the City's intranet site, including information on reducing paper use, alternative forms of commuting and reducing energy consumption in civic facilities.

This page would also profile innovative environmental projects developed by City departments and act as a resource for individuals and departments.

Status	Lead Departments
New	CAO Secretariat

Section 4 – Timeline and Next Steps

Many of the individual strategies are already in place, and others will be phased in over the next few years. However, the first step in implementing the City's CCAP will be to refine the tracking and reporting system used to measure GHG emissions.

Instead of tracking emissions from single baseline years (i.e. 1998 or 2003), departments and other City agencies will be asked to provide data on an annual basis. Reporting forms have already been provided and contacts have been established with key members of each department and agency. GHG emissions data will now be tracked annually, and the City's inventory will be updated every year. Annual reviews will take place and the CCAP may be revised on an annual basis to reflect current trends.

Tracking and measurement of the Climate Change Action Plan will begin in 2007 (measuring data from 2006), and will be measured for five years, concluding in 2012. A progress report will be delivered to Council in 2008. At the end of the five-year time period covered by this plan, the Administration will report back to Council to seek direction on further work to address climate change.