



TOWN OF STONY PLAIN

PARTNERS FOR CLIMATE PROTECTION



- MILESTONE 3: LOCAL ACTION PLAN
- MILESTONE 4: IMPLEMENTATION PLAN

JANUARY
2009



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INTRODUCTION

Sustainable development practices remain at the forefront of the decision making process for Stony Plain. Balancing our social, cultural, environmental, and economic needs is necessary for future growth and management of our community. Moreover, the Town is committed to reducing our ecological footprint and being ambassadors for our community.



In the fall of 2006, the Town joined *Partners for Climate Protection*, a program designed to assist municipalities reduce their greenhouse gas emissions and ecological footprint. In March 2008, Stony Plain Town Council and the Partners for Climate Protection program (PCP) endorsed Milestone 1: Emissions Inventory and Forecast, as well as Milestone 2: Emission Reduction Targets in May 2008.

Furthermore, in June 2007, the Town Council endorsed a comprehensive **Community Sustainability Plan (CSP)**, which proactively addresses Social Equity, Environmental Responsibility, Economic Viability, and Cultural Vitality. Ultimately, sustainability planning is an opportunity for municipalities to constructively address challenges and move towards a sustainable future, one where a strong *economy* and participative *governance* model protects *ecological* integrity, contributes to a vibrant *cultural* scene, and preserves strong *social* cohesion.¹

In February 2007, Town Council also endorsed the **Stony Plain Environmental Stewardship Strategy** which aims to systematize and steer the environmental priorities of the Town in a unified and lasting direction.

Additionally, in 2008, nine working groups were established to facilitate the directives of the CSP—Downtown Redevelopment, Environmental Stewardship, Transportation, Recreation Master Plan, Architectural Guidelines, Highway Corridor, Safe Communities, West Development, and Affordable Housing. The mandates of these working groups will overlap with the PCP action plan, and are identified where applicable.

The Town has now completed the next two milestones and presented them in this report:

Milestone 3: Develop a Local Action Plan

Milestone 4: Implement the Local Action Plan

The following Local Action Plan (LAP) will align strategies from the Community Sustainability Plan, the Environmental Stewardship Strategy, the CSP Working Groups, and current practices to ensure that the emission reduction targets are achieved by 2016. For further information, the completed Milestone 1 and 2 reports can be found online at www.stonyplain.com, along with other reference material identified in this report.

¹ Resource Binder for Municipal Sustainability Planning. "Municipal Sustainability Planning Guide." *Alberta Urban Municipalities Association*. November 2006.

Acknowledgments

Special acknowledgments go to the Town of Stony Plain ***Environmental Stewardship Working Group*** which has assisted in facilitating many of the Town's environmental initiatives.





EXECUTIVE SUMMARY

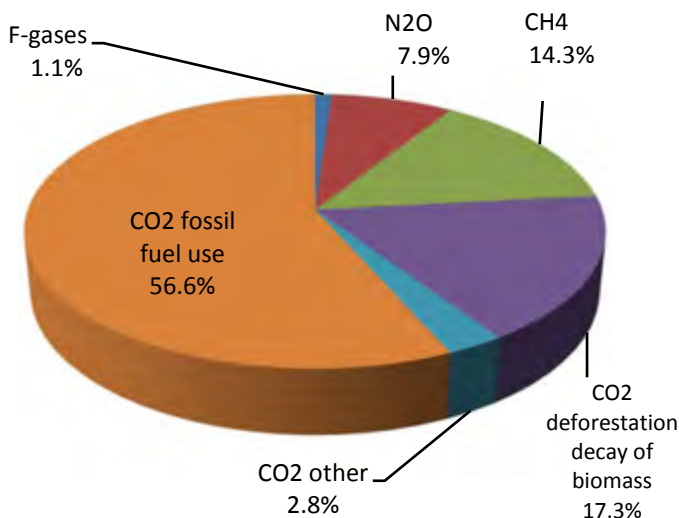


CLIMATE CHANGE AND GHG EMISSIONS OVERVIEW

The Intergovernmental Panel on Climate Change (IPCC) indicates that there is an inexorable link between anthropogenic (human induced) actions and climate change.

“Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea levels.”²

According to the IPCC, human activities result in emissions of four long-lived GHGs: Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), and Halocarbons (a group of gases containing fluorine, chlorine, or bromine)³:



Increased GHG emissions and their effects can be attributed to the following human activities⁴:

- Atmospheric concentrations of GHGs increase when emissions are larger than the removal process, and have increased markedly as a result of human activities since 1750 which now far exceeds pre-industrial values.
- The atmospheric concentrations of CO₂ and CH₄ in 2005 exceed by far the natural range over the last 650,000 years.
- Global increases in CO₂ are due primarily to fossil fuel use, with land-use providing another significant, but smaller contribution.
- It is very likely that the observed increase in CH₄ concentration is predominantly due to agriculture and fossil fuel use.
- The increase in N₂O concentration is primarily due to agriculture.
- F-gases (Fluorinated gases) are widely used in refrigeration and air conditioning but have a high global warming potential and can sometimes stay in the atmosphere for thousands of years⁵.

² Climate Change 2007: Synthesis Report: **An Assessment of the Intergovernmental Panel on Climate Change.**

This underlying report, adopted section by section at IPCC Plenary XXVII (Valencia, Spain, 12-17 November 2007), represents the formally agreed statement of the IPCC concerning key findings and uncertainties contained in the Working Group contributions to the Fourth Assessment Report. 2007. Page 30. < <http://www.ipcc.ch/index.htm>>

³ Climate Change 2007: Synthesis Report: **An Assessment of the Intergovernmental Panel on Climate Change.** 2007 p 37

⁴ Climate Change 2007: Synthesis Report: **An Assessment of the Intergovernmental Panel on Climate Change.** 2007 p 37

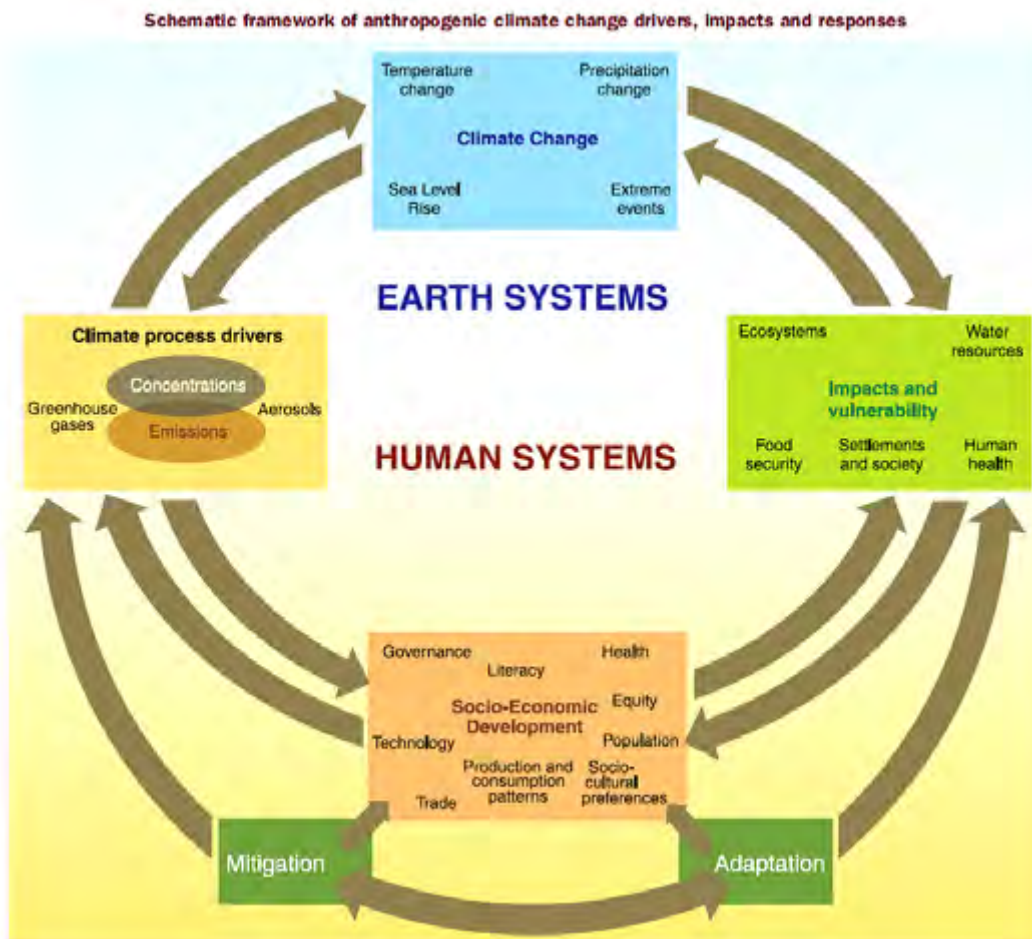
⁵ “Fluorinated Gases and Climate Change” *Eru-active.* 2004 <<http://www.euractiv.com/en/climate-change/fluorinated-gases-climate-change/article-117491>>

There is a high confidence among the IPCC that natural systems are affected by climate change. Examples include⁶:

- Enlarged and increased numbers of glacial lakes
- Increasing ground instability in permafrost regions and rock avalanches in mountain regions
- Changes in some arctic and antarctic ecosystems, those in sea-ice biomes, and predators at high levels of the food chain

There is medium confidence among the IPCC that human systems are affected in the following ways⁷:

- Agricultural/forestry management at Northern Hemisphere latitudes-- earlier spring crop planting and disturbances of forests due to fire and pests
- Excess heat-related mortality and changes in infectious disease vectors in Europe, and earlier onset of, and increase in, seasonal production of allergenic pollen in Northern Hemisphere high and mid latitudes
- Some human activities in the Arctic (i.e. hunting and shorter travel seasons over snow and ice)



Climate Change 2007: Synthesis Report: **An Assessment of the Intergovernmental Panel on Climate Change**. 2007. Page 26.

⁶ Climate Change 2007: Synthesis Report: **An Assessment of the Intergovernmental Panel on Climate Change**. 2007 p 31

⁷ Climate Change 2007: Synthesis Report: **An Assessment of the Intergovernmental Panel on Climate Change**. 2007 p 33

GHG EMISSIONS SUMMARY

STONY PLAIN CORPORATE SUMMARY:

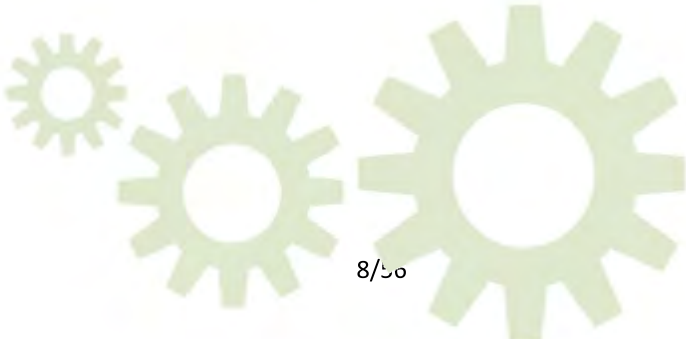
Table 1a:

| Corporate Summary | | | | | |
|-----------------------------|------------------------|---------------------------|---------------------------------|------------------------|---------------------------|
| 2000 (Baseline Year) | | | 2006 (Benchmarking Year) | | |
| <i>SECTOR</i> | <i>Total Cost (\$)</i> | <i>eCO2 Emissions (t)</i> | <i>SECTOR</i> | <i>Total Cost (\$)</i> | <i>eCO2 Emissions (t)</i> |
| Municipal Buildings | 152,576 | 1534 | Municipal Buildings | 179,824 | 1753 |
| Vehicle Fleet | 84,540 | 352 | Vehicle Fleet | 128,294 | 395 |
| Street Lights | 133,561 | 372 | Street Lights | 237,064 | 675 |
| Water & Sewer | 59,428 | 752 | Water & Sewer | 20,887 | 742 |
| TOTAL | \$430,106 | 3,010 | TOTAL | \$566,069 | 3,565 |

TABLE 1a: Corporate findings in Total eCO2 (t). This is a unit that allows emissions of GHG's of different strengths to be added together. Corporate Waste was included in the community summary.

Table 1b:

| Corporate Summary Percentage Breakdown | | | | | |
|---|-----------------------|---------------------------|---------------------------------|-----------------------|---------------------------|
| 2000 (Baseline Year) | | | 2006 (Benchmarking Year) | | |
| <i>SECTOR</i> | <i>Total Cost (%)</i> | <i>eCO2 Emissions (%)</i> | <i>SECTOR</i> | <i>Total Cost (%)</i> | <i>eCO2 Emissions (%)</i> |
| Municipal Buildings | 35.5% | 51% | Municipal Buildings | 31.7% | 49% |
| Vehicle Fleet | 19.7% | 12% | Vehicle Fleet | 22.7% | 11% |
| Street Lights | 31.0% | 12% | Street Lights | 41.9% | 19% |
| Water & Sewer | 13.8% | 25% | Water & Sewer | 3.7% | 21% |
| TOTAL | 100% | 100% | TOTAL | 100% | 100% |



STONY PLAIN COMMUNITY SUMMARY:

Table 2a:

| Community Summary | | | |
|-----------------------------|---------------------------|---------------------------------|---------------------------|
| 2000 (Baseline Year) | | 2006 (Benchmarking Year) | |
| SECTOR | eCO2 Emissions (t) | SECTOR | eCO2 Emissions (t) |
| Residential | 45,090 | Residential | 64,816 |
| Commercial (incl. Indust) | 18,638 | Commercial (incl. indust) | 30,179 |
| Transportation | 21,259 | Transportation | 29,331 |
| Waste | 1,287 | Waste | 1,200 |
| TOTAL | 86,274 | TOTAL | 125,522 |

TABLE 2a: Community findings in Total eCO2 (T). The Town did not separate Industrial figures from commercial as any industrial sectors in the community are smaller and after consultation with Alberta Energy, they would use the same amount on average as the commercial sector. Therefore, industrial assumptions were made and included within the commercial figures

Table 2b:

| Community Summary Percentage Breakdown | | | |
|---|---------------------------|---------------------------------|---------------------------|
| 2000 (Baseline Year) | | 2006 (Benchmarking Year) | |
| SECTOR | eCO2 Emissions (%) | SECTOR | eCO2 Emissions (%) |
| Residential | 52.2% | Residential | 51.6% |
| Commercial (incl. Indust) | 21.7% | Commercial (incl. indust) | 24% |
| Transportation | 24.6% | Transportation | 23.4% |
| Waste | 1.5% | Waste | 1.0% |
| TOTAL | 100% | TOTAL | 100% |



STONY PLAIN FORECAST:

The following chart outlines a forecast of emissions if the Town continues with Business as Usual practices. Business as Usual can be defined as the municipality continuing on a similar pattern of development without proactively addressing climate change or emission targets.

The percentage in eCO2 changes from 2000-2006 is roughly a 4.4% increase/year. With Business as Usual practices, the following forecast is estimated for the year 2016:

| Total Corporate Emissions | | | |
|----------------------------------|------------------------------------|----------------------|------------------------------------|
| Base Year | GHG Emissions (tonnes eCO2) | Forecast Year | GHG Emissions (tonnes eCO2) |
| 2000 | 3,565 | 2016 | 5757.12 |

| Total Community Emissions | | | |
|----------------------------------|------------------------------------|----------------------|------------------------------------|
| Base Year | GHG Emissions (tonnes eCO2) | Forecast Year | GHG Emissions (tonnes eCO2) |
| 2000 | 86,274 | 2016 | 180,752 |



GHG EMISSIONS TARGET SUMMARY

In order to avoid the “Business as Usual” forecast numbers, the following targets were set in Milestone 2 of the PCP program for Stony Plain.

CORPORATE TARGET SUMMARY:

Utilizing FCM’s recommendations, the Town has set an Emissions Reduction Target of 20% below the 2000 corporate emissions to be achieved within 10 years.

Table 3:

| Corporate Targets | | | |
|----------------------------|---------------------------|-----------------------------|---------------------------|
| 2000 (BaselineYear) | | 2016 (Forecast Year) | |
| SECTOR | eCO2 Emissions (t) | SECTOR | eCO2 Emissions (t) |
| Municipal Buildings | 1534 | Municipal Buildings | 1228 |
| Vehicle Fleet | 352 | Vehicle Fleet | 282 |
| Street Lights | 372 | Street Lights | 298 |
| Water & Sewer | 752 | Water & Sewer | 602 |
| TOTAL | 3,010 | TOTAL | 2,410 |

COMMUNITY TARGET SUMMARY:

Utilizing FCM’s recommendations, the Town has set an Emissions Reduction Target of 6% below the 2000 community emissions to be achieved within 10 years.

Table 4:

| Community Targets | | | |
|----------------------------|---------------------------|-----------------------------|---------------------------|
| 2000 (BaselineYear) | | 2016 (Forecast Year) | |
| SECTOR | eCO2 Emissions (t) | SECTOR | eCO2 Emissions (t) |
| Residential | 45,090 | Residential | 42,385 |
| Commercial (incl. Indust) | 18,638 | Commercial (incl. Indust) | 17,520 |
| Transportation | 21,259 | Transportation | 19,984 |
| Waste | 1,287 | Waste | 1,210 |
| TOTAL | 86,274 | TOTAL | 81,099 |



LOCAL ACTION & IMPLEMENTATION PLAN

OVERALL OBJECTIVES

TO CREATE A LOCAL ACTION AND IMPLEMENTATION PLAN THAT WILL:

1. ACHIEVE AND COMPLETE THE *PARTNERS FOR CLIMATE PROTECTION* PROGRAM MILESTONE 3 & MILESTONE 4;
2. REDUCE GHG EMISSIONS PRODUCED BY THE TOWN OF STONY PLAIN, AS ESTABLISHED IN THE PCP MILESTONE 2 TARGETS;
3. ALIGN WITH THE STRATEGIC ACTION ITEMS IDENTIFIED IN COMMUNITY SUSTAINABILITY PLAN AND ENVIRONMENTAL STEWARDSHIP STRATEGY;
4. ENDEAVOR TO BUILD A STABLE AND SUSTAINABLE FUTURE FOR STONY PLAIN THAT WILL PROVIDE FOR THE SOCIAL, CULTURAL, ENVIRONMENTAL, AND ECONOMIC NEEDS OF THE PRESENT, WITHOUT COMPROMISING THE ABILITY OF FUTURE GENERATIONS TO MEET THOSE NEEDS⁸; AND
5. ENCOURAGE RESIDENTS OF STONY PLAIN TO BE RESPONSIBLE GLOBAL CITIZENS

⁸ Gro Harlem Brundtland, The World Commission on Environment and Development, (1987)



A. CORPORATE ACTION PLAN

A.1 MUNICIPAL BUILDINGS 15

- A.1.1 MUNICIPAL GREEN BUILDING PROGRAM
- A.1.2 AMSC ENERGY AGGREGATION PROGRAM
- A.1.3 OUTDOOR POOL SOLAR WATER HEATING
- A.1.4 ARENA UPGRADES
- A.1.5 TOWN OFFICE UPGRADES
- A.1.6 GOLF COURSE UPGRADES
- A.1.7 COMMUNITY CENTRE UPGRADES
- A.1.8 PUBLIC WORKS UPGRADES
- A.1.9 NEW FIRE HALL
- A.1.10 PARKLAND BUILDING UPGRADES

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- A.3.1 TRAFFIC SIGNAL, CROSS WALK, SIGN LIGHTING CONVERSION
- A.3.2 DECORATIVE LIGHT CONVERSION
- A.3.3 STREET LIGHT PROGRAM

A.4 WATER/SEWER 29

- A.4.1 STONY PLAIN WATER SUPPLY AND DISTRIBUTION
- A.4.2 WATER CONSERVATION MEASURES BYLAW
- A.4.3 INFLOW AND INFILTRATION



A.1 MUNICIPAL BUILDINGS

A.1.1 MUNICIPAL GREEN BUILDING PROGRAM

Green buildings are an essential component of municipal environmental and sustainability programs. On average, buildings in Canada:⁹

Consume:

- 50% of natural resources
- 33% of energy produced
- 12% of water usage (excluding process water for industry)

Produce:

- 35% of GHG
- 25% of landfill waste
- 10% of airborne particulates

In order to ensure that new or retrofit municipal buildings reduce our ecological footprint, the Town will create a Municipal Green Building Program. This program will ensure that all new or retrofit municipal buildings within 500 square meters (5,400 square feet) will comply with LEED™ Canada (Leadership in Energy and Environmental Design) Certified standards.

Through LEED™, there are four ratings that buildings can receive:

- **Certified:** 26 to 32 points (25-35% energy savings)
- **Silver:** 33 points to 38 points (35-50% energy savings)
- **Gold:** 39 Points to 51 Points (50-60% energy savings)
- **Platinum:** Gold 52 or more (>60% energy savings)

A.1.2 AMSC ENERGY AGGREGATION PROGRAM

The Town of Stony Plain purchases energy from the AMSC Energy Aggregation Program. The Alberta Municipal Services Corporation (AMSC) is a wholly-owned subsidiary of the AUMA (Alberta Urban Municipalities Association). AMSC's Energy Aggregation Program is an Energy Management Program, by which municipalities enter into a 5 year contract with the AMSC's energy provider, NEXEN. Currently, the Town of Stony Plain purchases 20% green energy, and is eligible to purchase up to 100% green energy in 20% increments.

In 2009, the Town will be renegotiating its contract with the Energy Aggregation program and will continue to purchase 20% green energy, with the opportunity to increase this percentage in future years.

A.1.3 OUTDOOR POOL SOLAR WATER HEATING

The Town of Stony Plain owns and operates the Stony Plain Outdoor Pool and will investigate the feasibility of incorporating solar water heating.

Preliminary research indicates that glazed collectors can be used to capture the energy from the sun to heat the pool water. Glazed collectors are commonly used for applications requiring energy delivery at moderate temperatures (domestic hot water, space heating, and process heating applications at 50°C or less) in medium to cold climates. They can be operated year round with freeze protection and thermal losses to the environment are relatively low. In 2006, the pool consumed 37,035kWh of electricity (costing over \$6,000.00 annually) and 1,951.7GJ of Natural Gas (costing \$15,613.60 annually). In total, the pool alone emitted 133 tonnes of GHG in 2006. By utilizing solar water heating, it is estimated that

⁹ Canada Green Building Council. "The Context of Green Buildings" *Municipal Green Building Toolkit*. Page 2. 2007.

there will be a 21% reduction in energy consumption, a financial savings of \$2,889/year, and a GHG reduction of 17.22 tonnes per year.

The financial payback is dependent upon the escalation rate of energy costs:

- If energy costs increase by 5% -- 24.3 year payback
- If energy costs increase by 10% -- 17.5 year payback
- If energy costs increase by 15% -- 14 year payback

A.1.4 CENTENNIAL ARENA UPGRADES¹⁰

The Centennial Arena was built in 1968 and most systems are original equipment. The existing heating system is a combination of newer mid-efficiency gas fired forced air furnaces, infrared tube heaters, and roof top heat systems that supply all areas. These systems are capable of a more efficient operating efficiency such as utilizing direct digital controls (DDC), lighting upgrades, and installing a new condensing hot water heater.

Direct Digital Controls allows for additional adjustment to crucial individual control points maximizing energy consumption by matching with occupant usage patterns. It also allows for more user friendly system monitoring and tracking of energy consumption factors. Ideally the controls are tied to and monitored by a computer and software located in the mechanical room. Replacing the hot water heater with a more efficient one will increase efficiency to 92% (compared to 65%).

The fiscal and energy estimates are illustrated below:

- Total capital investment -- \$75,000.00
- Total annual savings -- \$7,490.00 (10% of the annual utility budget)
- Annual electrical savings – 50,105 kWh (180.4 GJ or 9.95% of the electrical consumption)
- Annual natural gas savings – 401.3 GJ (18.58% of natural gas consumption)
- TOTAL
 - Combined electrical and natural gas savings – 581.7 GJ
 - 65.50 tonnes of GHG emissions

Furthermore, the Town will begin investigating the feasibility of constructing of a new Arena in 2012, which would incorporate energy efficiencies, and would comply with the Municipal Green Building Policy where feasible.

A.1.5 TOWN OFFICE UPGRADES

In 2003, the Town built the new Town Office, which utilizes a number of energy efficient practices such as:

- comprehensive air barrier membrane
- complete and unbroken wrap of insulation
- maximum use of natural day light
- ground water cooling system throughout building
- low flow plumbing fixtures
- occupancy sensors to control the lighting in virutally all areas

¹⁰ This information was taken from the 2007 ATCO Energy Sense Audit on Town of Stony Plain facilities. Full reports on the findings can be obtained from the Town.

In 2000, the old building emitted 126 tonnes of eCO₂ emissions. In 2006, the new building emitted 121 tonnes of eCO₂ emissions. This is substantial in that there was an increase in employees between 2000 and 2006, as well as a larger surface area with the newer building (16,000 square feet for the new building, versus 5,000 square feet for the old building).

Future actions for the Town Office include enhancing the ground water cooling system to incorporate heating.

A.1.6 GOLF COURSE UPGRADES

The Golf Course building was built in the 1980s with an upgrade done in the late 1990s. The existing heating system is a combination of gas fired forced air furnaces, AC Units, and supply air. While major retrofits may not be economically feasible at this time, there are still lighting retrofits and electronic thermostat upgrades that can be incorporated.

Any original T-12 magnetic ballast fluorescent fixtures can be changed to the more efficient T-8 digital ballast fluorescent light fixtures. Electronic setback thermostats will allow for adjustment to individual control points maximizing energy consumption by matching with occupant usage patterns.

The fiscal and energy estimates are illustrated below:

- Total capital investment -- \$7,492.00
- Total annual savings -- \$1,835.00 (4.49 % of the annual utility budget)
- Annual electrical savings – 10, 674 kWh (38.4 GJ or 5.80 % of the electrical consumption)
- Annual natural gas savings 86.1 GJ (4.88% of natural gas consumption)
- TOTAL
 - Combined electrical and natural gas savings -- 124.5 GJ
 - 13.98 tonnes of GHG emissions

The Town will also purchase a new, higher efficiency furnace in 2009, for the Golf Course.

A.1.8 PUBLIC WORKS UPGRADES

The main Public Works building uses a combination of gas fired forced air furnaces, AC units, and ceiling mounted unit heaters that supply all areas. Two new furnaces will increase efficiency, as the current ones are circa 1970 and have an estimated 60% efficiency. Also, the installation of new higher efficiency unit heaters to forced sealed combustion units is also recommended.

The fiscal and energy estimates are illustrated below:

- Total capital investment -- \$43,407.00
- Total annual savings -- \$4,587.00 (22.88 % of the annual utility budget)
- Annual electrical savings – 17,245 kWh (30.42% of the electrical consumption)
- Annual natural gas savings – 350.6 GJ (25.57% of natural gas consumption)
- TOTAL
 - 33.14 tonnes of GHG emissions

A.1.7 COMMUNITY CENTRE UPGRADES

The Community Centre was built in the 1960s and most systems are original equipment. The existing heating system is a combination of four gas fired forced air furnaces that supply all areas.

In 2009, the Town will retrofit the Community Centre with five new furnaces, lighting upgrades, and washroom fixtures including toilets, urinals, sink, partitions, vanities, etc. using low flow plumbing fixtures where possible

- The fiscal and energy estimates of this option are illustrated below:
 - Total capital investment -- \$60,000.00
 - Total annual savings -- \$2,645.00 (16.76 % of the annual utility budget)
 - Annual electrical savings – 2,236 kWh (8.0 GJ or 3.79 % of the electrical consumption)
 - Annual natural gas savings – 297.9 GJ (34.25% of natural gas consumption)
 - TOTAL
 - Combined electrical and natural gas savings – 305.9 GJ
 - 16.88 tonnes of GHG emissions

Furthermore, the Town will begin investigating the construction of a new Community Centre in 2011. This would be of LEED standard, ultimately resulting in energy savings and GHG reductions.

A.1.9 NEW FIRE HALL

The New Fire Hall was built in 2006, using energy efficient practices such as:

- An envelope (walls, windows, roof) with overall heat loss coefficient 25% below the reference case, despite overhead doors that account for 35% overall heat loss
- Combination of radiant slab with condensing boilers for apparatus bay heating
- Heat recovery system for outside air supply to staff areas – heat is transferred from the outgoing air stream to the incoming air stream.
- Variable refrigerant flow system for staff area cooling
- Motion sensors for automatic lighting control in most spaces.

The new fire hall is 12,800 square feet. The old fire hall was approximately 5,000 square feet, and is currently being leased out to Parkland Search and Rescue.

A.1.10 PARKLAND BUILDING UPGRADES

The Parkland Building was built in the 1930s. The existing heating system is a gas fired forced air furnace that supplies all areas. The existing windows and building envelope are in poor condition and very energy inefficient. The majority of savings in the facility are related to mechanical retrofits.

In 2009, the Town will retrofit the building with a new furnace, lighting upgrades, and exterior upgrades with the replacement of windows, stucco repairs, painting, and repairs to the wood siding, and window trim.

- The fiscal and energy estimates are illustrated below:
 - Total capital investment -- \$21,000.00
 - Total annual savings -- \$2,165.00 (18.06 % of the annual utility budget)
 - Annual electrical savings – 3,310 kWh (11.9 GJ or 7.56 % of the electrical consumption)
 - Annual natural gas savings – 222.3 GJ (41.17% of natural gas consumption)
 - TOTAL
 - Combined electrical and natural gas savings – 234.2 GJ
 - 14.09 tonnes of GHG emissions

Municipal Buildings Action & Implementation Plan

| Actions Required | Implementation Tactics | Implications | Performance Measures |
|---|---|--|---|
| <p>A.1.1 Municipal Green Building Program</p> | <p>Develop a Stony Plain Municipal Green Building Policy and Framework</p> | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Implications: Graphic Design (\$2000.00) • Source of Funding: BS&S operating budget • LEAD: Business & Strategic Services Department | <ul style="list-style-type: none"> • Estimated energy savings of 25-50% on new or retrofit municipal projects |
| <p>A.1.2 Purchase % of green energy</p> | <p>Negotiate AMSC Energy contract in 2009 to continue to purchase 20% green energy from renewable resources</p> | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Implications: N/A • Source of Funding: N/A • LEAD: Finance & Administration Department | <ul style="list-style-type: none"> • 20% green energy consumption, with a continual review for opportunities to increase green energy consumption |
| <p>A.1.3 Investigate Outdoor Pool Solar Water Heating</p> | <p>Hire a consultant to research the feasibility of outdoor pool solar water heating</p> | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Considerations: \$5,000.00 • Source of Funding: Community Services Operating Budget • LEAD: Community Services Department | <ul style="list-style-type: none"> • Consultative recommendations on the feasibility of incorporating solar water heating |
| | <p>Pending consultative recommendations, incorporate solar water heating</p> | <ul style="list-style-type: none"> • Timeframe: 2010 • Budget Considerations: \$125,000.00 • Source of Funding: <ul style="list-style-type: none"> ○ Natural Resources Canada eco-Energy for Renewable Heat Incentives (\$30,000.00) ○ TBD (\$95,000.00) • LEAD—Community Services Department | <ul style="list-style-type: none"> • 21% reduction in energy consumption, a financial savings of \$2,889/year, and a GHG reduction of 17.22 tonnes per year |
| <p>A.1.4 Arena Upgrades</p> | <p>Retrofit Arena with:</p> <ul style="list-style-type: none"> • Direct Digital Controls (DDC) • Replace current hot water heater with a more efficient one | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Considerations: <ul style="list-style-type: none"> ○ DDC: (\$35,000.00) ○ Hot Water Heater: (\$40,000.00) • Sources of Funding: <ul style="list-style-type: none"> ○ Parkland County (\$26,250.00) ○ Arena Reserve (\$48,750.00) • LEAD: Community Services Department | <ul style="list-style-type: none"> • Total annual savings of \$7,490.00 • Annual electrical savings – 50,105 kWh (180.4 GJ or 9.95% of the electrical consumption) • Annual natural gas savings – 401.3 GJ (18.58% of natural gas consumption) • TOTAL GHG savings: <ul style="list-style-type: none"> ○ 65.50 tonnes GHG emissions |

| | | | |
|----------------------------------|--|--|---|
| | Construction of a new Arena | <ul style="list-style-type: none"> • Timeframe: 2012 • Budget Considerations: \$14,000,000.00 • Sources of Funding: <ul style="list-style-type: none"> ○ Parkland County (\$6,000,000.00) ○ MCFP (Municipal Community Facilities Program) (\$5,000,000.00) ○ TBD (\$3,000,000.00) • LEAD : Community Services Department | <ul style="list-style-type: none"> • Incorporate energy efficiencies |
| A.1.5 Town Office Upgrades | Research the feasibility of enhancing the Town Office groundwater cooling system to incorporate heating | <ul style="list-style-type: none"> • Timeframe: 2010 • Budget implications: Consulting fees \$5,000 • Sources of Funding: TBD • LEAD: Community Services Department | <ul style="list-style-type: none"> • Pending recommendations, develop an implementation strategy to incorporate ground water heating |
| | Pending consultative recommendations, incorporate groundwater heating system | <ul style="list-style-type: none"> • Timeframe: 2011 • Budget Considerations: TBD • Source of Funding: TBD • LEAD: Community Services Department | <ul style="list-style-type: none"> • Reduction in natural gas consumption and GHG emissions |
| A.1.6 Golf Course Upgrades | Retrofit Golf Course with: <ul style="list-style-type: none"> • electronic setback thermostats • additional lighting upgrades | <ul style="list-style-type: none"> • Timeframe: 2011 • Budget implications: <ul style="list-style-type: none"> ○ Lighting upgrades: \$6,000.00 ○ Electronic thermostats: \$1,000.00 • Sources of Funding: TBD • LEAD: Community Services Department | <ul style="list-style-type: none"> • Total annual savings -- \$1,835.00 (4.49 % of annual utility budget) • Annual electrical savings – 10, 674 kWh (38.4 GJ or 5.80 % of the electrical consumption) • Annual natural gas savings 86.1 GJ (4.88% of natural gas consumption) • TOTAL GHG savings: <ul style="list-style-type: none"> ○ 13.98 tonnes of GHG emissions |
| | Install new energy efficient furnace | <ul style="list-style-type: none"> • Timeframe: 2009 Complete | <ul style="list-style-type: none"> • Increased energy efficiency |
| A.1.7 Community Centre | Retrofit current building with the following: <ul style="list-style-type: none"> • New Furnaces • Lighting Retrofits • Low Flow Plumbing Fixtures | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Implications: <ul style="list-style-type: none"> ○ Furnace: \$22,000.00 ○ Lighting: \$8000.00 ○ Fixtures: \$30,000.00 • Sources of Funding: -- Community Centre Reserve (\$60,000.00) • LEAD: Community Services Department | <ul style="list-style-type: none"> • Total Annual Savings -- \$2,645.00 (16.76% of annual utility budget) • Annual electrical savings – 2,236kWh (8.0 GJ or 3.79% of the electrical consumption) • Annual natural gas savings – 297.9 GJ (34.25% gas consumption) • TOTAL GHG savings <ul style="list-style-type: none"> ○ 16.88 tonnes of GHG emissions |

| | | | |
|--------------------------------------|---|---|---|
| | Investigate the feasibility of constructing a new recreational/cultural centre to replace community centre | <ul style="list-style-type: none"> • Timeframe: 2011 • Budget Implications of a new centre: \$6,000,000.00 • Sources of Funding: TBD • LEAD: Community Services Department | <ul style="list-style-type: none"> • The new centre would be LEED standard, achieving $\geq 25\%$ reduction in energy consumption |
| A.1.8 Public Works Upgrades | Retrofit Public Works with: <ul style="list-style-type: none"> • 5 New Unit Heaters • 2 New Furnaces • Lighting Upgrades | <ul style="list-style-type: none"> • Timeframe: 2012 • Budget Implications: <ul style="list-style-type: none"> ○ Unit Heaters: \$20,900.00 ○ Furnaces: \$7,700.00 ○ Lighting: \$14,000.00 • Sources of Funding: TBD • LEAD: Public Works Department | <ul style="list-style-type: none"> • Total Annual Savings -- \$4,587.00 (22.88% of annual utility budget) • Annual electrical savings – 17,245kWh (30.42% of the electrical consumption) • Annual natural gas savings – 350.6 GJ (25.57% of natural gas consumption) • TOTAL GHG savings <ul style="list-style-type: none"> ○ 33.14 tonnes of GHG emissions |
| A.1.9 New Fire Hall | Construct a new fire hall (2006) | <ul style="list-style-type: none"> • Timeframe: 2006 (Complete) | <ul style="list-style-type: none"> • Construction finished end of 2006 (figures unavailable for milestone 1 reporting), performance measures will be measured in Milestone 5 to evaluate reduction targets |
| A.1.10 Parkland Building Upgrades | Retrofit the Parkland Building with the following: <ul style="list-style-type: none"> • Furnace Replacement • Exterior Improvements • Window Replacements • Lighting Upgrades | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Implications: <ul style="list-style-type: none"> ○ Furnace: \$10,000.00 ○ Exterior: \$14,000.00 ○ Window: \$6,000.00 ○ Lighting: \$5,000.00 • Sources of Funding: Parkland Building Reserve • LEAD: Community Services | <ul style="list-style-type: none"> • Total Annual Savings -- \$2,165.00 (18.06 % of annual utility budget) • Annual electrical savings – 3,310 kWh (11.9 GJ or 7.56 % of the electrical consumption) • Annual natural gas savings – 222.3 GJ (41.17% of natural gas consumption) • TOTAL GHG savings <ul style="list-style-type: none"> ○ 14.09 tonnes of GHG emissions |

A.2 VEHICLE FLEET

A.2.1 GREEN FLEET BUSINESS CASE

Transportation is the second largest source of greenhouse gas (GHG) emissions in Canada representing 27% of total GHG emissions. From 1990-2005, this figure grew by 33%.¹¹ Other air pollutants emitted include ground level ozone (O₃), nitrous oxide (N₂O), volatile organic compounds (VOCs), and particulate matter (PM). Stony Plain's vehicle fleet represented approximately 12% of the Town's corporate greenhouse gas emissions in 2000, and 11% of the Town's corporate greenhouse gas emissions in 2006.

In order to fully understand the implications of the Town's fleet, a green fleet business case will be completed. This will document the impact of fleet activities by conducting an inventory of fleet vehicles, including the types of vehicles, how many there are of each type, and the use of the vehicles. Once the fleet has been characterized, realistic goals can be set and measured to reduce fuel use, criteria air pollutants, and GHG emissions.

Some implementation strategies may include right-sizing vehicle fleets, optimizing travel and operation, substituting travel modes, and purchasing fuel efficient or alternative fueled vehicles. The Town has begun greening its fleet with the purchase of a Hybrid Town vehicle and electric ice resurfer in 2008. The Stony Plain Golf Course also purchased 40 electric golf carts in 2008, ultimately eliminating emissions from these frequently used vehicles.

A.2.2 MUNICIPAL ANTI-IDLING

According to Natural Resources Canada, for every liter of gasoline used, a vehicle produces about 2.3 kg of carbon dioxide. If Canadian motorists avoided idling for just three minutes every day of the year, CO₂ emissions could be reduced by 1.4 million tonnes annually. This would be equal to saving 630 million liters of fuel and equivalent to taking 320,000 cars off of the road for the entire year.¹²

In April 2008, the Stony Plain Town Council endorsed the *Anti-Idling for Town Owned Vehicles Policy*. Town vehicles will not idle unnecessarily in excess of five minutes, with some exceptions (i.e. during a parade or completing a maintenance procedure). Construction equipment such as graders, loaders, skid steers, and backhoes will not idle in excess of 10 minutes when not operating.

In addition to his policy, the Town also initiated a communications campaign among Town employees, encouraging them to voluntarily support the anti-idling in their personal vehicles. Free anti-idling window decals were created for employees to place in their windows. This program will be enhanced in 2009.

A.2.3 EMPLOYEE CARPOOLING

The Town will also begin investigating measures to assist employees in carpooling to and from work, during corporate wide events/meetings, and during individual meetings whereby some schedules may align. As part of the Community Sustainability Plan (CSP), a number of working groups were established to fulfill the mandates of the CSP. Employee and public carpooling initiatives will be addressed as per the mandate of the Sustainable Transportation Working Group.

¹¹ "Transportation and the Environment" *Transportation Canada, Government of Canada*. 2007
<http://www.tc.gc.ca/pol/en/Report/anre2007/4_environment.html>

¹² "Emission impacts resulting from vehicle idling" *Natural Resources Canada, Office of Energy Efficiency*. 2008. <<http://oee.nrcan.gc.ca/transportation/idling/impact.cfm?attr=28>>

Municipal Vehicle Fleet Action & Implementation Plan

| Actions Required | Implementation Tactics | Implications | Performance Measures |
|------------------------------------|--|--|---|
| A.2.1 Green Fleet Business Case | Draft a report on the Stony Plain fleet, complete with green implementation strategies | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Implications: N/A • Source of Funding: N/A • LEAD: Environmental Stewardship Working Group | <ul style="list-style-type: none"> • Comprehensive plan to reduce the impact of the municipal fleet on greenhouse gases |
| | Purchase a Hybrid Town vehicle | <ul style="list-style-type: none"> • Timeframe: 2008 (complete) | <ul style="list-style-type: none"> • Estimated reduction in CO2 Emissions by 1680 kg/year |
| | Purchase electrical ice resurfacer | <ul style="list-style-type: none"> • Timeframe: 2008 (complete) | <ul style="list-style-type: none"> • Reduction in Particulate Matter buildup in the arena |
| | Purchase of electric golf carts | <ul style="list-style-type: none"> • Timeframe: 2009 (complete) | <ul style="list-style-type: none"> • Elimination of GHG emissions |
| A.2.2 Municipal Anti-Idling | Initiate a policy for anti-idling of Town vehicles | <ul style="list-style-type: none"> • Timeframe: 2008 (complete) | <ul style="list-style-type: none"> • Endorsed by Council (2008) |
| | Create a communications campaign surrounding the Town's commitment, and encourage staff to voluntarily reduce their idling time | <ul style="list-style-type: none"> • Timeframe: 2008 (complete) • Ongoing | <ul style="list-style-type: none"> • Anti-idling window decals provided to staff, along with advertisements in the local paper and internal communications |
| A.2.3 Employee Carpooling | Create a mechanism that will encourage employees to carpool to/from work, to general corporate meetings, and to individual/department meetings | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Considerations: N/A • Source of Funding: N/A • LEAD: Transportation Working Group | <ul style="list-style-type: none"> • Reduction in GHG emissions from individual employee car use |

A.3 OUTDOOR LIGHTING

A.3.1 TRAFFIC SIGNAL, CROSS WALK, AND SIGN LIGHTING CONVERSION

Outdoor lighting is a substantial contributor to a municipality's ecological footprint. It accounts for an average of 15% of greenhouse gas emissions from the corporate sector, with 10-25% of that being energy consumed by traffic lights.¹³

Outdoor lighting is used in the following applications in Stony Plain (2006 figures):

- Streetlights – cobra head HPS (approx. 1,224)
- Traffic Signals and Cross Walks
- Decorative Lighting
- Sign Lighting
- Building Lighting, Park Lighting, Town Facilities, etc.

In 2006, the Town consumed nearly 725,000 kWh of electricity on lighting, spending over \$230,000.00. This totaled 19% of the Town's corporate eCO2 emissions.

The Town will investigate replacing the traffic signals, cross walks and sign lighting owned by the Town to Light Emitting Diode (LED) fixtures. One of the key advantages of LED-based lighting is its high efficiency, as measured by its light output¹⁴:

Incandescent 60-100 watt light bulb:

- produces 15 lumens/watt
- sudden failure (burnt out)

LED 5 watt light bulb:

- produces 18-22 lumens/watt
- a common reason for failure is the gradual lowering of light output and loss of efficiency.

A.3.2 DECORATIVE LIGHT CONVERSION

The Town also has a number of decorative street lights around Town, primarily in the downtown core along mainstreet.

Decorative lights alone emitted 45 tonnes of eCO2 emissions in 2006. The Town will expand the LED conversion program to also include a phased approach to the decorative lights around Town.

A.3.3 STREET LIGHT CONVERSION

Street lights also account for a large percentage of GHG emission in Stony Plain. There are three types of streetlight lamps commonly used in municipalities. (When referring to Town streetlights, this refers to the HPS cobra head street lights):

High Pressure Sodium (HPS) –the most dominant lamp in outdoor streetlight applications due to its efficiency.

Metal Halide (MH) – widely used in street light applications and other outdoor applications where accurate color rendering is important.

¹³ "Quick Action Guide: Municipal Action on Climate Protection. *Partners for Climate Protection* Federation of Canadian Municipalities.

¹⁴ "Light Emitting Diode" *Wikipedia* 2007 <http://en.wikipedia.org/wiki/Light-emitting_diode>

White Light Emitting Diode (WLED) –not widely used in street lighting or other outdoor area illumination, however, is starting to enter the market. It is commonly used in Christmas lights and traffic signals because of its higher efficiency, small size, long life, and instantaneous on/off capabilities.

The Town of Stony Plain’s 1,224+ streetlights use high pressure sodium lamps, and while the Town does pay for the streetlights, they are owned by Fortis Alberta.

The Town has investigated two different mechanisms for lessening the ecological impact of these streetlights, and will develop a pilot project in the community using the most feasible technology for this purpose.

1. LED STREETLIGHT CONVERSION:

Advantages of LED Street Lighting¹⁵:

Fortis Alberta has completed research in the area of LED street lighting. There are a number of different colors of LED’s that are used for different functions, and white LED’s (WLED) are used for street light replacement. Current laboratory WLED efficiency levels are nearly double that of MH.

WLED’s have an extremely long life and excellent lumen maintenance, which are double that of HPS and three times that of MH. WLED’s and MH produce a white light, which gives excellent color rendition, thus allowing an observer to identify objects and persons better, also creating a physiologically pleasing atmosphere. Moreover, being solid state components, they are difficult to damage with external shock or vibration

WLEDs contain a phosphor, epoxy, and semiconductor, which is not harmful to the environment. Also, because the WLEDs last twice as long as HPS, less waste will go to the landfill¹⁶.

Disadvantages of LED Street Lighting:

One of the biggest obstacles that WLED’s still must overcome is “heat management.” All WLED’s are rated at a junction temperature of 25°C —which often can be surpassed in the hot summer months. Driving an LED hard in high ambient temperatures may result in overheating of the LED package, eventually leading to device failure¹⁷.

Moreover, in order to meet the Illumination Engineering Society of North America (IESNA) standards, a light must be able to adequately illuminate a roadway at its lowest efficiency. As LED’s are not shaped like a bulb, light is typically cast in one direction, or at a narrow angle. Therefore, more LED’s would have to be put in to cover a surface adequately, rather than the regular HPS streetlights that provide more of a wash over the surface.

Lastly, while LED’s are widely used in sign lighting, traffic signals, and individual decorative/purpose lights, the technology for street lighting is largely in the research and development stages.

¹⁵ “WLED Outdoor Lighting Report” *Fortis Alberta*. September 2007.

¹⁶ “WLED Outdoor Lighting Report” *Fortis Alberta*. September 2007.

¹⁷ “WLED Outdoor Lighting Report” *Fortis Alberta*. September 2007.

WLED, HPS, and MH Comparisons:¹⁸

AVERAGE LIFE SPAN-calculated in hours

| LAMP | AVERAGE LIFE SPAN |
|------|-------------------|
| HPS | 24,000hrs |
| MH | 20,000hrs |
| WLED | 50,000hrs |

LUMEN MAINTENANCE – 70% of original lamp lumen, resulting in bulb replacement

| LAMP | LUMEN MAINTENANCE |
|------|-------------------|
| HPS | 24,000hrs |
| MH | 16,000hrs |
| WLED | 50,000hrs |

LIGHT SOURCE COST EFFECTIVENESS

| LAMP | WATTS | AVAILABLE YEARS OF USE | ASSUMED LUMENS NEEDED | COST/LAMP | PRESENT VALUE COST |
|---|-------|------------------------|-----------------------|-----------|--------------------|
| HPS | 100 | 6 | 9500 | \$10 | \$404 |
| WLED (laboratory research for future use) | 45 | 13 | 9500 | \$141 | \$415 |
| MH | 78 | 4 | 9500 | \$24 | \$423 |
| WLED (current commercial use) | 100 | 13 | 9500 | \$308 | \$887 |

The comparison has the lamps burning everyday for 10.5 hours/day for 13 years. (10.5 hours is the average night time hours of Canadian Prairie Cities, and 13 years is the time it takes for the lamps to reach 70% lumen output. Random burnouts are also taken into account.)¹⁹

2. ADAPTIVE LIGHTING

Adaptive lighting integrates intelligent controls for outdoor lighting. This involves using dimmers and timers on various applications for increased efficiency and can be used as an alternative to conventional street lighting.

One example of adaptive lighting is with Streetlight Intelligence Inc. (STI), which is a Victoria based company who designs and manufactures adaptive lighting. They have been working with BC Hydro, testing and validating the technology. BC Hydro has now begun offering incentives through the Powersmart program for BC Municipalities purchasing STI technology.

The STI product, the Lumen IQ™ Adaptive Lighting System, uses dimming and control systems to efficiently utilize outdoor lighting. According to STI, if the majority of street lights in Canada could be dimmed by 50% from 11p.m. to 6:00am, while still maintaining Illumination Engineering Society of North America (IESNA) standards—estimated power savings would be over 1.5 billion kilowatt hours/year, enough electricity to meet the annual demand of nearly 150,000 homes in Canada²⁰

¹⁸ McKinlay, Gord. "White Light Emitting Diode (WLED) Outdoor Lighting Report" *Fortis Alberta* December 2006

¹⁹ McKinlay, Gord. "White Light Emitting Diode (WLED) Outdoor Lighting Report" *Fortis Alberta* December 2006

²⁰ "The concept of adaptive lighting" *The STI Lumen IQ™ Adaptive Lighting System*. Streetlight Intelligence Inc. August 2007.

The system has been designed to work within existing roadway lighting standards: the IESNA, Transportation Association of Canada, and International Dark Sky Society.

Due to the inherent depreciation of HPS lamps over its life, they are usually dramatically over-lit in the early stage of life to ensure that as they dim, they still provide the necessary lumens on the roadway. This over-lighting (16,000 foot candles) ensures that at the 5 year end of life for the lamp, it still provides enough lumen output (10,000 foot candles) to meet or exceed IES standards.

The system is most cost effective with a minimum of 250 streetlights, and the system is expandable for future additions. According to STI, \$40,000.00-\$50,000.00 would be an accurate estimate for a complete 250 unit install. This was calculated using the following assumptions: 250 streetlights, \$0.86/kWh, average input of 200W per lamp, 50% light reduction for 8 of the 11 hours per night that the streetlight burns.

Payback is estimated at 4.5 years, after which the annual savings would be about \$6300/light. Moreover, the 73,000kWh savings/year would result in a reduction of approximately 63 tonnes of CO₂ for each of the 250 streetlights annually.

Municipal Lighting Action & Implementation Plan

| Actions Required | Implementation Tactics | Implications | Performance Measures |
|---|---|--|---|
| <p>A.3.1 Traffic Signal, Cross Walk, and Sign Lighting Conversion</p> | <p>Replace Traffic Signals, Cross Walks, and Sign Lighting owned by the Town to LED fixtures where applicable</p> | <ul style="list-style-type: none"> • Timeframe: 2010 • Budget Implications: \$10,000 • Source of Funding: Operating budget transfer to capital • LEAD: Planning & Infrastructure | <ul style="list-style-type: none"> • Completion of conversion on Town owned traffic Signals, Cross Walks, and Sign Lighting |
| <p>A.3.2 Decorative Light Conversion</p> | <p>Replace Decorative Lights with LED fixtures</p> | <ul style="list-style-type: none"> • Timeframe: 2011 • Budget Implications: \$50,000 • Source of Funding: TBD • LEAD: Planning & Infrastructure | <ul style="list-style-type: none"> • Replace all decorative lights with LED fixtures, and ensure new lights are energy efficient |
| <p>A.3.3 Streetlight Conversion</p> | <p>Initiate adaptive lighting pilot project for 250 streetlights</p> | <ul style="list-style-type: none"> • Timeframe: 2012 • Budget Considerations: \$50,000 • Source of Funding: TBD • LEAD: Planning & Infrastructure | <ul style="list-style-type: none"> • Review success of system, and investigate feasibility of expanding the project |
| | <p>Investigate the feasibility of a Streetlight LED conversion pilot program for streetlights in a new development in partnership with Fortis Alberta</p> | <ul style="list-style-type: none"> • Timeframe: 2013 • Budget Considerations: TBD • Source of Funding: TBD • LEAD: Planning & Infrastructure | <ul style="list-style-type: none"> • Pilot area in Town completed with new LED Street lighting |

A.4 WATER AND SEWER

A.4.1 STONY PLAIN WATER SUPPLY AND DISTRIBUTION

Water for the Town of Stony Plain is supplied by the Capital Region Parkland Water Services Commission, which receives water for distribution from EPCOR. The Town currently operates a SCADA system which has central and monitoring control of the water distribution system; the sewage pumping station; the two reservoir pump houses; sanitary, storm, and groundwater; and lift stations. Central display and alarm monitoring is provided at the Public Works location.

This system provides data from various locations including flows, pressure, and operating pumps, as well as allows for remote changes such as starting or stopping pumps from the main control terminal in response to alarms.

The Town will continue to ensure water is being properly utilized and monitored and investigate further actions that can enhance the system. Over the last 4 years, Water Volume Usage has decreased by 4% per year in Stony Plain, even though the number of meters installed per year has increased 6%.

A.4.2 WATER CONSERVATION MEASURES BYLAW

In 2007, Town Council endorsed the Water Conservation Measures Bylaw. Under this bylaw:

1. Building Permits for new construction, renovation, or basement development projects for residential properties, including multi-unit residential buildings, will be required to have Low Flow Plumbing Fixtures.
2. Building Permits issued for new construction development, retrofitting, or restoration of commercial, institutional, industrial, or municipal buildings will be required to have Low Flow Plumbing Fixtures.

Building plans submitted to the Town are required to identify low flow fixtures that are to be installed. Failure to meet the criteria will result in a \$100.00 fine. This bylaw commenced on January 1st, 2008. Furthermore, Building Permit applicants are encouraged to incorporate voluntary water conservation measures such as xeriscaping, low impact development practices, and proper irrigation systems.

Savings by Changing to Water Efficient Fixtures²¹

| Fixture | Average water use with older fixture | Average water use with a water efficient fixture | Water Savings over the year * | That older fixture is costing you ... per year** |
|--------------------------|--------------------------------------|--|-------------------------------|--|
| Toilet | 16.5 L per flush | 6.0 L per flush | 52,479 litres | \$80.29 |
| Dual Flush Toilet | 16.5 L per flush | 4.3 L per flush | 56,776 litres | \$86.87 |
| Clothes Washer | 170 L per load | 90 L per load | 25,848 litres | \$39.55 |
| Showerhead | 15 L per minute | 9.5 L per minute | 26,599 litres | \$40.70 |
| Faucet Aerator | 12.5 L per minute | 9.5 L per minute | 22,451 litres | \$34.35 |
| Dishwasher | 40 L per load | 22.5 per load | 1,574 litres | \$2.41 |

²¹ "Water efficient fixtures" City of Calgary 2006 <

http://www.calgary.ca/portal/server.pt/gateway/PTARGS_0_2_526104_0_0_18/Water+Efficient+Fixtures.htm>

A.4.3 INFLOW AND INFILTRATION

In 2008, the Town completed Inflow and Infiltration smoke testing of the sanitary sewer lines to determine any storm water inflow. In so doing, the Town was able to determine possible leaks or inflows into the sanitary sewer lines.

A number of locations throughout Town were identified as having storm and/or rain water entering the Town of Stony Plain sewer lines. These identified areas will further be examined and prescribed actions as needed.

By lessening the amount of rainwater entering the sewer system, which would otherwise go through unnecessary treatment, the Town will reduce the energy used in the waste water treatment process.

Municipal Water & Sewer Action & Implementation Plan

| Actions Required | Implementation Tactics | Implications | Performance Measures |
|--|--|--|--|
| A.4.1 Stony Plain Water Supply and Distribution | Monitor water supply and distribution with SCADA system | <ul style="list-style-type: none"> Timeframe: 2006 (complete) | <ul style="list-style-type: none"> Ongoing |
| | Research feasibility of enhancing the Towns water supply and distribution | <ul style="list-style-type: none"> Ongoing | <ul style="list-style-type: none"> Ongoing |
| A.4.2 Water Conservation Measures Bylaw | Establish a Water Conservation Measures Bylaw requiring Low Flow Plumbing Fixtures in new or retrofit projects | <ul style="list-style-type: none"> Timeframe: 2008 (complete) | <ul style="list-style-type: none"> Enforce the Water Conservation Measures Bylaw |
| A.4.3 Inflow and Infiltration | Conduct Inflow and Infiltration smoke testing of the sanitary sewer lines throughout Town | <ul style="list-style-type: none"> Timeframe: 2008 (complete) | <ul style="list-style-type: none"> Address maintenance issues as needed through regular Town operations |

B. COMMUNITY ACTION PLAN

B.1 RESIDENTIAL SECTOR 32

- B.1.1 EDUCATION AND PROMOTION
- B.1.2 BUILDING PERMIT REBATE PROGRAM
- B.1.3 AFFORDABLE HOUSING PLAN
- B.1.4 ALBERTA CAPITAL AIRSHED ALLIANCE

B.2 COMMERCIAL/INDUSTRIAL SECTOR 35

- B.2.1 SUSTAINABILITY AWARD
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- B.4.1 WASTE MANAGEMENT PROGRAM
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- B.4.4 ZERO WASTE EVENTS
- B.4.5 EVENTS AND PROMOTION

B.1 RESIDENTIAL SECTOR

B.1.1 EDUCATION AND PROMOTION

Currently, the Town of Stony Plain has taken a proactive role in providing education and promotional products to residents and stakeholders in all realms of environmental stewardship

In 2008, the Town participated in the *One Change: Project Porchlight Campaign* by which every household in the community was given one compact fluorescent light bulb (CFL) and information regarding household energy consumption. Residents, community groups, Town employees, and Council Members volunteered their time to hand deliver these light bulbs.

Traditional incandescent light bulbs waste 95% of the electricity they consume as heat. Ultimately, CFLs use 25% of the energy that incandescent bulbs do and last 10 times longer²². While more expensive, they easily pay for themselves with longer life spans and decreased energy costs.



The Town also sells a number of items aimed at sustainability:

- Sale of Water Conservation Kits (\$13.00)
- Sale of Organic Kitchen Catchers (\$7.00)
- Sale of Rain Barrels (sold between April – September) (\$50.00)
- Sustainable promotional products (seed packages, organic clothing, consumable/reusable products, products made from recyclable material, etc.)

Furthermore, the Town has focused on creating a theme for community events based on sustainable living. One example of this is the Town's participation in the Tri-Regional Trade Show. The last two years have focused on a sustainable theme (2007: Community Sustainability; 2008: Water Conservation). Subsequent years will focus on air quality, energy consumption, and ecological footprints. During the trade show, information on the Town's environmental initiatives along with mechanisms in which residents can become responsible global citizens is available. For example, in 2008 information on water conservation such as low flow plumbing fixtures, toilet leak detectors, rain barrels, and xeriscaping practices was available.

Lastly, in 2009, through the mandate of the Environmental Stewardship Working Group, the Town will facilitate "Environmental Roadshows." This will involve venturing into neighborhoods or schools showcasing current and future environmental endeavors, along with providing tools on how residents can be ambassadors for their community.

²² "Energy Efficiency Information kit" *Alberta Environment* <<http://environment.gov.ab.ca/info/library/5902.pdf>>

B.1.2 BUILDING PERMIT REBATE PROGRAM

Typically, green buildings strive to balance environmental, economic, and social considerations in design, construction, and operation. Energy, water, and resource efficiency; occupant comfort and well-being; site development and community context; and the economics of building construction and operation are key considerations²³.

In order to encourage new development that fosters the above sustainable practices and reduce GHG emissions, the Town incorporated a Building Permit Rebate Program in 2009.

To be eligible for the rebate, builders are required to register with a chosen LEED, Built Green, or R-2000 standard and complete all requirements.

| Certified Program | | Green Rebate Percentage |
|-------------------|-----------|-------------------------|
| Built Green | Bronze | 10% |
| | Silver | 15% |
| | Gold | 20% |
| | Platinum | 25% |
| LEED | Certified | 15% |
| | Silver | 20% |
| | Gold | 30% |
| | Platinum | 50% |
| R-2000 | Certified | 40% |

B.1.3 AFFORDABLE HOUSING PLAN

As mandated in the Stony Plain Community Sustainability Plan, the Town will be addressing various forms of social equity, including a comprehensive affordable housing plan.

The Town will be approaching various partners in facilitating not only a plan, but also a pilot project that will include energy efficient practices. This initiative is being spearheaded by the Stony Plain Housing Working Group under the directive of the Community Sustainability Plan.

B.1.4 ALBERTA CAPITAL AIRSHED ALLIANCE

In 2007 the Town joined the Alberta Capital Airshed Alliance (ACAA), which is a multi-stakeholder group representing a diverse range of regional air quality interests. The ACAA was established as part of an Alberta-wide initiative to monitor air quality and address these issues within the province.

The Town participates as an Executive Board Member, and will assist in developing and implementing the ACAA's mandate to ensure the air quality in the capital region remains safe. The current business plan for the ACAA addresses two specific contaminant exceedances (Particulate Matter and Ozone), however, in the future will also investigate other contaminants such as sulfur dioxide, methane, and noxious gases. More information can be found on the ACAA website: <http://www.capitalairshed.ca/>

²³ Canada Green Building Council. "The Context of Green Buildings" *Municipal Green Building Toolkit*. Page 3. 2007.

Residential Sector Action & Implementation Plan

| Actions Required | Implementation Tactics | Implications | Performance Measures |
|--|---|--|---|
| <p>B.1.1 Education and Promotion</p> | <p>Continue to facilitate an open forum to the public on environmental stewardship initiatives through a variety of mediums</p> | <ul style="list-style-type: none"> • Timeframe: ongoing • Budget Implications: N/A • Source of Funding: Business & Strategic Services Operating Budget • LEAD: Business & Strategic Services | <ul style="list-style-type: none"> • Increased public awareness surrounding environmental stewardship on a local, regional, provincial, national, and international level |
| <p>B.1.2 Building Permit Rebate Program</p> | <p>Develop a building permit rebate program as an incentive to builders and developers to construct residential, commercial, or industrial projects at either a Built Green, R-2000, or LEED standard</p> | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Implications: \$5,000 • Source of Funding: Planning & Infrastructure Operating Budget • LEAD: Planning & Infrastructure | <ul style="list-style-type: none"> • Implementation of the Building Permit Rebate Program • Annual monitoring of applicants and projects that are a recognized environmental standard |
| <p>B.1.3 Affordable Housing Plan</p> | <p>Ensure energy efficient practices are incorporated in affordable housing plans or projects where feasible</p> | <ul style="list-style-type: none"> • Timeframe: 2009-ongoing • Budget Considerations: TBD • Source of Funding: TBD • LEAD: Housing Working Group | <ul style="list-style-type: none"> • Completion of a pilot affordable housing project incorporating energy efficiencies |
| <p>B.1.4 Alberta Capital Airshed Alliance</p> | <p>Ensure that air quality issues are being addressed in the region</p> | <ul style="list-style-type: none"> • Timeframe: ongoing • Budget Considerations: \$1,000/year membership • Source of Funding: Business & Strategic Services Operating Budget • LEAD: Business & Strategic Services | <ul style="list-style-type: none"> • Continued membership and participation on the Alberta Capital Airshed Alliance |

B.2 COMMERCIAL/INDUSTRIAL SECTOR

B.2.1 SUSTAINABILITY AWARDS

The business community as well as the building and development industry have a valuable role in the future development of Stony Plain. For one, a vibrant economic base is imperative for sustainable and long term growth. Secondly, builders and developers exponentially shape the look and function of the community.

In 2009 the Town will launch a new annual award for the business community and developer/builder stakeholders.

1. **Ambassadors of Action: Sustainable Business Award** – recognizes a business in the Town of Stony Plain that has endeavored to build upon the concepts under the Town’s Community Sustainability Plan
2. **Ambassadors of Action: Sustainable Builder Award / Sustainable Developer Award** – recognizes a builder or developer in the community that has embraced the Community Sustainability Plan with particular emphasis on affordability, equitability, and sustainability.

Through both of these awards, the Town will foster an open dialogue with businesses, builders, and developers ultimately encouraging sustainable practices.

B.2.2 AREA STRUCTURE PLAN SUSTAINABILITY CRITERIA

In order to ensure that environmentally, economically, equitable, and culturally responsible growth is realized, Stony Plain has established the Area Structure Plan Sustainability Criteria. It attempts to ensure that the location, composition, density, and design of new developments will sustain a healthy economy and reasonable cost of living; to provide effective and accessible public services; to secure adequate choice and opportunity for present and future generations of residents; to protect our environment; and continue to provide for a high quality of life.

Developers and their consultants are important partners in maintaining and improving our community’s high quality of life. By providing the sustainability criteria at an early stage in developing an Area Structure Plan, the Town enables developers and their consultants to work towards creating the most sustainable project possible.

The following criteria are consistent with the policies contained within the Town’s Municipal Development Plan, in addition to the strategies of the Community Sustainability Plan. Area Structure Plan applications will be evaluated by Town staff according to their alignment with the following criteria categories:

- Economic and Commercial Development;
- Environmental Management;
- Neighborhood Design;
- Community Services;
- Transportation and Infrastructure ; and
- Stakeholder Involvement.

The ASP Sustainability Criteria will attempt to reduce GHG emissions in the community sector through smart growth strategies. In regards to environmental management the criteria specifically addresses:

- Enhancing and preserving natural features and other environmentally sensitive areas
- Addressing possible issues such as soil erosion, flooding, or other geotechnical hazards
- Provides for native species habitat restoration or improvement, including wildlife corridors
- Reduces development footprint and site disturbance through minimizing land usage
- Incorporates energy efficiencies, such as orienting streets to maximize solar gain, or district-scale energy technologies and efficiencies
- Facilitates efficient stormwater management design

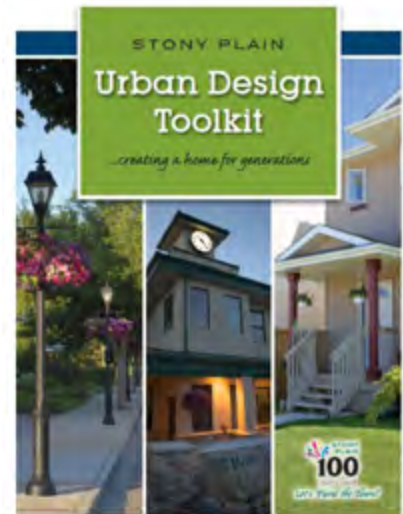
B.2.3 URBAN DESIGN TOOLKIT

In 2008, the Town created the “Urban Design Toolkit” which provides stakeholders in the community with information on the architectural, urban design, and aesthetic vision for the Town. This toolkit can be used by residents, commercial/industrial owners, developers, or institutions in new or retrofit projects.

Ultimately, the Urban Design Concepts represent the style of development the Town of Stony plain encourages.

In regards to environmental stewardship, one of the five concepts presented addresses sustainability, encouraging practices such as green design, development, and infrastructure.

The Urban Design Toolkit is on the Town’s website at www.stonyplain.com.



Commercial/Industrial Sector Action & Implementation Plan

| Actions Required | Implementation Tactics | Implications | Performance Measures |
|--|--|--|--|
| B.2.1 Sustainability Awards | Develop and Implement a sustainability award for Businesses that incorporate sustainable practices | <ul style="list-style-type: none"> • Timeframe: 2009-ongoing • Budget Implications: N/A • Source of Funding: N/A • LEAD: Business & Strategic Services | <ul style="list-style-type: none"> • Recognition awarded at the 2009 Joint Chambers of Commerce, and in subsequent years |
| | Develop and Implement a sustainability award for Builders and Developers who incorporate sustainable practices | <ul style="list-style-type: none"> • Timeframe: 2009-ongoing • Budget Implications: N/A • Source of Funding: N/A • LEAD: Business & Strategic Services | <ul style="list-style-type: none"> • Recognition awarded at the 2010 Builders & Developers Reception, and in subsequent years |
| B.2.2 Area Structure Plan Sustainability Criteria | Develop an Area Structure Plan Sustainability Criteria for new developments in the community | <ul style="list-style-type: none"> • Timeframe: Complete (2008) | <ul style="list-style-type: none"> • ASPs will be judged and revised to incorporate sustainability elements |
| B.2.3 Urban Design Toolkit | Develop and Implement an Urban Design Toolkit for new or retrofit projects | <ul style="list-style-type: none"> • Timeframe: Complete (2008) | <ul style="list-style-type: none"> • New or retrofit projects will align with the Urban Design Concepts |

B.3 COMMUNITY TRANSPORTATION

B.3.1 COMMUNITY CARPOOLING

As part of the CSP Transportation Working Group mandate, community carpooling is identified as a key priority.

In 2008, the Town supported the *Carpool.ca* communications campaign and placed large billboard signs in the community encouraging residents to carpool, as well as advertised online and in the local paper.

Carpool.ca is an organization that actively promotes the development of rideshare programs, responsible automobile use, and public awareness of the environmental and economic benefits of rideshare programs.

In 2000, *Carpool.ca* received funding from the Climate Change Action Fund to establish the first internet carpooling site in Canada. Currently, over 120 employers and post secondary institutions rely on Carpool.ca to manage rideshare programs, along with thousands of private individuals. Commuters that live near each other form a simple arrangement that best suits their needs. Participants register online (www.carpool.ca) and are contacted by others whose needs are similar.

B.3.2 SUSTAINABLE TRANSPORTATION AND TRANSIT STUDY

The Transportation Working Group will also be completing a Sustainable Transportation Study in 2009. Not only will the study research the traditional transportation elements such as vehicular mobility, but will also investigate transportation in regards to sustainability.

Some of the issues to be addressed include:

- Mainstreet/Downtown Core access and walkability
- Bicycle networks
- Trail system
- Transit service
- Population growth and needs
- Safety

Specifically in regards to public transit, the study will address roadway networks and the ability to accommodate public transit. Furthermore, commuter transit will also be analyzed, specifically indicating the feasibility of integrating with regional partners.

B.3.3 WALKABILITY

In 2005 the Town developed a Trail System Master Plan to create a comprehensive, interconnected, recreational trail system to serve existing and newly developing areas within the Town of Stony Plain, ultimately lessening the reliance on single occupant vehicles—a major contributor of greenhouse gases.

Some key objectives of the plan include:

- Promoting trail development, wellness, and increased quality of life
- Supporting the idea of linked parks and open spaces
- Advancing the establishment of a distinctive trail system that encourages the conservation of natural and heritage resources
- Integrating the regional trail system with other transportation system

- Utilizing construction standards that are environmentally sensitive, sustainable, and have low impact on the land
- Promoting the use of trails as alternative transportation routes that connect activity centers, parks, open spaces, schools, and civic amenities

Since 2005, the Town has been annually implementing the strategies identified.

Moreover, providing safe and welcoming public spaces is essential for encouraging non-vehicular travel, as well as fostering healthy lifestyles. The Urban Design Toolkit encourages safety and accessibility as a key urban design concept through the following tactics:

- Strategic Lighting: Use aesthetic lighting that can act as natural surveillance
- Natural Surveillance: Ensure that public spaces are easily observable, doors and windows look out onto streets/parking areas, and walkways are inviting. Where possible, include open design concepts, such as front porches that encourage a visual connection with the street
- Connection and Walkability: Provide linkages to the Town's trails system by incorporating user friendly features such as benches, trees, and bike racks, etc.

The Town is incorporating this design concept through the enhancement of its Trail System and possibly Rotary Park. In 2009, the Town will investigate placing solar lighting along the Trail System and in Rotary Park. This will not only help to illuminate areas and accommodate for walking/cycling, but will also utilize solar technology aimed to reduce GHG emissions which may otherwise be emitted through conventional lighting.

Additionally, the Safe Communities Working Group, the Transportation Working Group, and the Recreation Master Plan Working Group will be focusing on fostering these objectives through programming, projects, and communications.

B.3.4 FESTIVAL TRANSPORTATION

The Town of Stony Plain is home to a number of annual festivals and events, including but not limited to, the Great White North Triathlon, Blueberry Bluegrass and County Music Festival, Farmers' Days and Kinsman Rodeo, Cowboy Poetry Gathering, Rotary Run for Life, New Years Eve Celebrations, Christmas Light Up, and many more.

In order to not only support these events and others, but also to lessen the reliance on single occupant vehicles, the Town will investigate providing Festival Transportation. This will endeavor to lessen GHG emissions during these events, reduce parking and infrastructure demands, as well as increase attendance from local residents and encourage support for these events from the Stony Plain community.

Community Transportation Action & Implementation Plan

| Actions Required | Implementation Tactics | Implications | Performance Measures |
|---|--|--|--|
| B.3.1 Community Carpooling | Continue to promote carpooling in the community, through such initiatives as Carpool.ca | <ul style="list-style-type: none"> • Timeframe: Ongoing • Budget Implications: N/A • Source of Funding: N/A • LEAD: Transportation Working Group | <ul style="list-style-type: none"> • Enhanced residents registered on the carpool.ca website |
| B.3.2 Sustainable Transportation & Transit Study | Complete a Sustainable Transportation & Transit Study | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Implications: \$250,000 • Source of Funding: Municipal Sponsorship Grant • LEAD: Transportation Working Group | <ul style="list-style-type: none"> • Completion of Transportation Study and implementation plan |
| B.3.3 Walkability | Incorporation of the Trail System Master Plan | <ul style="list-style-type: none"> • Timeframe: ongoing • Budget Considerations: ongoing • Source of Funding: Public Reserve • LEAD: Community Services Department | <ul style="list-style-type: none"> • Completion of the Trail System Master Plan |
| | Programming and Communications to public on the health and environmental benefits of active lifestyles | <ul style="list-style-type: none"> • Timeframe: ongoing • Budget Considerations: N/A • Source of Funding: N/A • LEAD: Transportation & Recreation Working Groups | <ul style="list-style-type: none"> • Enhanced public awareness on the benefits of active lifestyles |
| | Install Solar Lighting through Trails Systems and at Rotary Park | <ul style="list-style-type: none"> • Timeframe: 2009 • Budget Considerations: &76,500.00 • Source of Funding: <ul style="list-style-type: none"> • Policing and Public Safety Reserve (\$25,000.00) • Rotary Club (\$25,000.00) • Chamber of Commerce (\$26,500.00) • LEAD: Transportation & Recreation Working Groups | <ul style="list-style-type: none"> • Solar lighting installed in Rotary Park |
| B.3.4 Festival Transportation | Establish Festival Transportation during events in Stony Plain | <ul style="list-style-type: none"> • Timeframe: 2010-ongoing • Budget Considerations: TBD • Sources of Funding: TBD • LEAD: Transportation Working Group | <ul style="list-style-type: none"> • Equitable transportation to festivals in and around town |

B.4 WASTE

B.4.1 WASTE MANAGEMENT PROGRAM

In 2006 the Town of Stony Plain enhanced the waste management program to include curbside blue bag and organics collection. In the last 1.5 years of operation (mid 2006-2008), the Town has achieved a 45% landfill diversion rate.

Between 2000 and 2006, although the Town experienced almost a 30% growth in population, GHG emissions from the waste sector actually reduced by nearly 6%--already achieving the PCP milestone target.

Furthermore, the waste management program has been expanded to ensure that commercial, multi-family, and institutions have access to on-site recycling. If one of these sectors chooses to have onsite collection, the Town will act as a liaison between the waste collector and the user to establish a recycling collection contract.

B.4.2 ROTARY RECYCLING CENTRE

In 2006, the Town also constructed the Rotary Recycling Centre to assist in achieving landfill diversion rates. Currently the recycling centre collects the following items all year round:

- Blue Bag Items
- Organic Items
- Newspaper
- Cardboard
- Electronics (through the Alberta Recycling Management Authority Electronic Recycling Program: www.albertarecycling.ca)
- Paint (through the Alberta Recycling Management Authority Paint Stewardship Program www.albertarecycling.ca)

B.4.3 REGIONAL COMPOST FACILITY

The Town has also investigated the possibility of partnering in the construction of a regional compost facility with the City of Spruce Grove and Parkland County.

Landfill diversion rates for compost are extremely important as the amount of landfill gas produced is dependent upon the amount of organic matter landfilled, and the rate at which the gas is generated is dependent on the distribution and the types of organic matter in the landfill.²⁴ The first phase of this process typically begins after waste has been in a landfill for 10 to 50 days. Although the majority of methane and carbon dioxide is generated within 20 years of landfilling, emissions can continue for 100 years or more.²⁵

²⁴ "Landfill Gas Capture and Combustion Quantification Protocol" *Environment Canada*. Nov 2006. <http://www.ec.gc.ca/pdb/ghg/guidance/protocols/lfg_protocol_e.cfm>

²⁵ "Landfill Gas Capture and Combustion Quantification Protocol" *Environment Canada*. Nov 2006. <http://www.ec.gc.ca/pdb/ghg/guidance/protocols/lfg_protocol_e.cfm>

B.4.4 ZERO WASTE EVENTS

In the effort to reduce waste in the community, Town Council endorsed the Zero Waste Event Package in 2008. Zero waste is an attempt to limit, if not eradicate, waste generated from events.

The package is available to community event planners and outlines voluntary waste minimization actions. The program is reviewed annually, should new mechanisms for waste minimization need to be included.

The Town also incorporates zero waste minimization strategies in all Town-run events as outlined in the program.

Zero waste strategies include:

- Using biodegradable cutlery, plates, cups, napkins, etc.
- Purchasing condiments, drinks, supplies, etc. in bulk to reduce waste from packaging
- Purchasing post consumer and recyclable products
- Providing proper compost and recycling receptacles
- Educating and informing volunteers and patrons at the events



The Zero Waste Event Package can be found online at www.stonyplain.com

B.4.5 EVENTS AND PROMOTION

Along with all other environmental stewardship initiatives, the Town also promotes waste reduction through a number of events:

- **Household Hazardous Toxic Roundup** – Spring and Fall collection of hazardous material including paint products, lights, batteries, electronics, and prescription medication
- **Treasure Hunt** – Residents can place unwanted useful items on their front yards for other people to come and pick up to use
- **Large Item Pick Up** – The Town collects the large items left from the Treasure Hunt and properly disposes of them
- **Pitch in Canada** – The Town is recognized as a Gold Level Member for Pitch in Canada, and holds an annual pitch in event whereby municipal employees and residents pick up litter in the community (<http://www.pitch-in.ca/Pitch-In.php>)
- **Earth Day** – The Town recognizes the annual Earth Day celebrations each year, and also provides information to Town employees regarding environmental practices. This has included calculating the individual ecological/carbon footprints of interested employees.
- **Waste Reduction Week** – The Town has held two annual Community Craft Drives during the national *Waste Reduction Week* (<http://www.wrwcanada.com/>). Residents can donate craft supplies that they would normally throw out, such as shoe boxes, jars, containers, buttons, fabric, flowers, baskets, etc. These are then given away free to teachers, seniors, children, daycares, churches, or any residents wishing to pick up free supplies.

Waste Action & Implementation Plan

| Actions Required | Implementation Tactics | Implications | Performance Measures |
|------------------------------------|---|---|--|
| B.4.1 Waste Management Program | Curbside pickup of Blue Bag Recycling and Organicart collection | <ul style="list-style-type: none"> • Timeframe: 2006 (complete--ongoing) | <ul style="list-style-type: none"> • 85% landfill diversion rate by 2015 • Reduction of GHG emissions from waste by 6% below 2000 levels |
| B.4.2 Rotary Recycling Centre | Construction of the Rotary Recycling Centre | <ul style="list-style-type: none"> • Timeframe: 2006 (complete-ongoing) | <ul style="list-style-type: none"> • 85% landfill diversion rate by 2015 • Reduction of GHG emissions from waste by 6% below 2000 levels |
| B.4.3 Regional Compost Facility | Investigate the feasibility of constructing a regional compost facility | <ul style="list-style-type: none"> • Timeframe: 2012 • Budget Considerations: \$1,000,000.00 • Source of Funding: Tri-Regional Partnership, GMF • LEAD: Business & Strategic Services | <ul style="list-style-type: none"> • 85% landfill diversion rate by 2015 • Reduction of GHG emissions from waste by 6% below 2000 levels |
| B.4.4 Zero Waste Events | Develop a Zero Waste Event Package | <ul style="list-style-type: none"> • Timeframe: 2008 (complete-ongoing) | <ul style="list-style-type: none"> • 85% landfill diversion rate by 2015 • Reduction of GHG emissions from waste by 6% below 2000 levels |
| B.4.5 Events and Promotion | Continue to participate in local regional, provincial, and national waste events and programs | <ul style="list-style-type: none"> • Timeframe: ongoing | <ul style="list-style-type: none"> • 85% landfill diversion rate by 2015 • Reduction of GHG emissions from waste by 6% below 2000 levels |



APPENDIX A:
PROJECT TIME LINE



2009 PROJECTS

- Municipal Green Building Guidelines no major budget implications
..... (Lead: Business & Strategic Services)
- AMSC Energy Aggregation Programno major budget implications
..... (Lead: Finance & Administration)
- Solar Panel Heating Consulting fees: \$5,000
..... (Lead: Community Services)
- Arena Upgrades \$75 000
..... (Lead: Community Services)
- Community Centre Upgrades \$60 000
..... (Lead: Community Services)
- Parkland Building upgrades \$35 000
..... (Lead: Community Services)
- Green Fleet Business Caseno major budget implications
..... (Lead: Business & Strategic Services)
- Employee Carpooling.....no major budget implications
..... (Lead: Transportation Working Group)
- Sustainability Awardsno major budget implications
..... (Lead: Business & Strategic Services)
- Transportation/Transit Study \$250 000
..... (Lead: Transportation Working Group)
- Install Solar lighting in Rotary Park..... \$76 500
..... (Lead: Community Services/Public Works)

2010 PROJECTS

- Town Upgrades Consulting Fee:\$5 000
..... (Lead: Community Services)
- Pool Solar Water Heating \$125 000
..... (Lead: Community Services)
- Traffic Signal/Cross walk/Sign Lighting LED Conversion \$10 000 (TBD)
..... (Lead: Planning & Infrastructure)
- Festival Transportation TBD
..... (Lead: Transportation Working Group)

2011 PROJECTS

- Golf Course\$7,000
..... (Lead: Community Services)
- Decorative Light Conversion.....\$50 000
..... (Lead: Planning & Infrastructure)
- New community centre\$6m
..... (Lead: Community Services)

INTERIM MONITORING STAGE 1:

- RE-CALCULATE CORPORATE AND COMMUNITY GHG EMISSIONS INVENTORIES FOR THE YEAR 2010 TO COMPARE TO 2000 AND 2006 LEVELS
- MAKE ADJUSTMENTS TO ACTION AND IMPLEMENTATION PLAN AS REQUIRED TO CONTINUE TO MEET TARGETS

2012 PROJECTS

- Construction of a new arena\$14 million
..... (Lead: Community Services)
- PW upgrades.....\$43 000
..... (Lead: Planning & Infrastructure)
- Regional Compost Facility.....\$350 000
..... (Lead: Business & Strategic Services)
- Adaptive lighting Street light conversion\$50 000
..... (Lead: Planning & Infrastructure)

2013 PROJECTS

- Investigate feasibility of streetlight LED conversion project with Fortis TBD
..... (Lead: Planning & Infrastructure)

INTERIM MONITORING STAGE 2:

- EVALUATE PROGRESS ON CURRENT LOCAL ACTION STRATEGIES AND ANALYZE ACTIONS REQUIRED TO CONTINUE TO REACH TARGETS BY 2016
- IN 2014, RE-CALCULATE CORPORATE AND COMMUNITY GHG EMISSIONS INVENTORIES FOR THE YEAR 2013 TO COMPARE TO 2000, 2006, AND 2010 LEVELS



APPENDIX B:

COMMUNICATIONS STRATEGIES

COMMUNICATIONS STRATEGIES

The Town is committed to an open communications model, both externally and internally. Since adopting the Community Sustainability Plan and Environmental Stewardship Strategy in 2007, the sustainable initiatives in the community have actively been communicated through a number of forums. Moreover, in 2008, Town Council endorsed the Corporate Communications Strategy that aims to be proactive, provide two-way connectivity, facilitate openness, and remain reflective. The tactics target residents, Town employees, news media, regional governments and partners, and public segments.

In regards to the environmental and sustainable initiatives in Stony Plain, with specific emphasis on the PCP milestones, the following strategies are either underway, or planned for the upcoming year:

| Internal Environmental Communications | External Environmental Communications |
|---|--|
| <p>Ambassadors Newsletter Information, tips, and facts on topics such as water conservation, energy consumption, and ecological footprints</p> | <p>Tri-Regional Trade Show Annual trade show in which environmental initiatives are the theme for each year (i.e. Walkability; Water Conservation; Energy)</p> |
| <p>Working Groups Internal sustainability working groups ensure that all employees have access to information and opportunities to participate in activities outside their normal work requirements. The Environmental Stewardship Working Group has provided a number of presentations to staff on the PCP milestones, and other initiatives.</p> | <p>Waste Mgmt The Waste Management Program is constantly being advertised to the public through utility “Trash Talk” newsletter inserts, Town page advertising, website information, press releases, recycling centre signage, and waste packages provided to new utility customers</p> |
| <p>Lunch n’ Learn Series Departments host lunch information sessions. Past environmentally focused sessions include a movie series (<i>Planet in Peril</i>, <i>Inconvenient Truth</i>) and presentations</p> | <p>Environmental Roadshows Going out into the community and neighborhoods with information on the PCP program and other environmental initiatives.</p> |
| <p>General Staff Meeting Annual event with departmental overviews, including the Community Sustainability Plan</p> | <p>Community Satisfaction Survey In 2008, the Town completed its second Community Satisfaction Survey, and covered sustainability topics such as waste mgmt, development, transportation, etc.</p> |
| <p>Staff Events All Staff Events are Zero Waste with compostable and recyclable supplies</p> | <p>Waste Events See section B.4.5</p> |
| <p>Social Club Included in the employee social club is an annual environmental event supported by the club</p> | <p>Year in Review publication Annual publication of major Town initiatives, including PCP milestones</p> |
| <p>Pitch in Canada Annually, staff volunteer during Pitch-in Canada week to pick up litter in the community</p> | <p>Website Website section focused on sustainability www.stonyplain.com</p> |

| Internal Environmental Communications | External Environmental Communications |
|---|---|
| <p>Council Information Items</p> <p>Council is formally (through council agendas) or informally (through events or internal communications) informed on all environmental initiatives, as well as provided information to take to regional/community boards and committees</p> | <p>Working Group Communications</p> <p>A number of the internal working groups provide communication to the public for specific topics, including:</p> <ul style="list-style-type: none"> ■ Transportation--consulting public on sustainable transportation study; carpool.ca; alternative modes of transportation ■ Recreation—working with community groups and programmers on alternative transportation that also support health and wellness ■ Environmental Stewardship—providing community involvement in all environmental events, strategies, and initiatives ■ Downtown Redevelopment—conducting design charrettes with the public on sustainable urban design focused on the downtown ■ Housing—Public consultation/open houses on affordable housing which will incorporate energy efficiencies |
| | <p>Stakeholder Engagement</p> <p>To inform business, industry, builders, and developers, the Town liaises with partners on environmental issues, including:</p> <ul style="list-style-type: none"> ■ Annual Builders/Developers Reception (In 2008, the theme was on Sustainable Design with information, key note speakers, and displays focusing on environmental design ■ Annual Chamber Gala (i.e. Sustainability Award, zero waste events, etc.) ■ Distribution of the Urban Design Toolkit |



APPENDIX C:

MILESTONE 1: CORPORATE AND COMMUNITY GHG EMISSIONS INVENTORIES
FULL REPORTS CAN BE FOUND ONLINE AT WWW.STONYPLAIN.COM

Table 5a:

2000 Municipal Buildings

| Buidling | Electri- city (kWh) | Electr- icity Cost | Electri- city eCO2 | Natural Gas (cum) | Natural Gas Cost | Natural Gas eCO2 | Total Cost (\$) | Total eCO2 Emissions (t) |
|-------------------------------|------------------------|--------------------------|--------------------------|-------------------------|---------------------|---------------------|-----------------------|--------------------------------|
| Parkland Building | 39,840 | 4,241 | 37 | 12,730 | 2,675 | 25 | 6,916 | 61 |
| Swimming Pool | 50,220 | 3,747 | 47 | 44,000 | 7,563 | 83 | 11,310 | 130 |
| Arena Lighting | 175,472 | 14,243 | 164 | | | 0 | 14,243 | 164 |
| Arena Ice Plant | 394,885 | 29,896 | 369 | | | 0 | 29,896 | 369 |
| Meridian Heights Rink | 3,607 | 634 | 3 | | | 0 | 634 | 3 |
| Forest Green Rink | 14,176 | 1,365 | 13 | | | 0 | 1,365 | 13 |
| John Paul II Rink | 4,308 | 585 | 4 | | | 0 | 585 | 4 |
| Football Clock | 287 | 239 | 0 | | | 0 | 239 | 0 |
| 5300 52ST Rink | 3,472 | 704 | 3 | | | 0 | 704 | 3 |
| Town Office | 96,880 | 8,418 | 91 | 19,000 | 3,923 | 36 | 12,340 | 126 |
| Fire Hall | 30,825 | 3,022 | 29 | 20,000 | 3,950 | 38 | 6,971 | 66 |
| Public Works | 50,520 | 5,387 | 47 | | | 0 | 5,387 | 47 |
| Library | 63,800 | 6,286 | 60 | 8,700 | 2,160 | 16 | 8,445 | 76 |
| Golf Course Maint Building | 27,087 | 2,184 | 25 | 13,500 | 2,567 | 25 | 4,751 | 51 |
| GC Club House | 103,785 | 13,343 | 97 | 48,240 | 9,610 | 91 | 22,953 | 188 |
| Arena Building | | | | 65,000 | 13,705 | 122 | 13,705 | 122 |
| Community Centre | | | | 17,661 | 3,866 | 33 | 3,866 | 33 |
| Forest Green Gazebo | | | | 1,447 | 488 | 3 | 488 | 3 |
| MH Gazebo | | | | 2,519 | 602 | 5 | 602 | 5 |
| PW GARAGE | | | | 17,965 | 3,437 | 34 | 3,437 | 34 |
| PW SHOP | | | | 17,447 | 3,277 | 33 | 3,277 | 33 |
| Exhibition Grounds | | | | 1,474 | 460 | 3 | 460 | 3 |
| TOTALS | 1,059,164 | 94,294 | 990 | 10,878 | 58,282 | 20 | 152,576.09 | 1,534.32 |

Table 5b:

2006 Municipal Buildings

| Buidling | Electri- city (kWh) | Electr- icity Cost | Electri- city eCO2 | Natural Gas (cum) | Natural Gas Cost | Natural Gas eCO2 | Total Cost (\$) | Total eCO2 Emissions (t) |
|----------------------|------------------------|--------------------------|--------------------------|-------------------------|---------------------|---------------------|-----------------------|--------------------------------|
| Arena Lighting | 340,428 | 19,505 | 318 | | | 0 | 19,505 | 318 |
| Arena Ice Plant | 163,177 | 22,148 | 152 | | | 0 | 22,148 | 152 |
| GC Clubhouse | 183,879 | 23,211 | 172 | 47,302 | 10,159 | 89 | 33,370 | 261 |
| MH Outdoor Rink | 4,391 | 973 | 4 | | | 0 | 973 | 4 |
| EX Grounds | 33,005 | 8,795 | 31 | 2,626 | 1,758 | 5 | 10,554 | 36 |
| Community Centre | 59,011 | 7,205 | 55 | 23,316 | 4,069 | 44 | 11,274 | 99 |
| PW Building | 56,693 | 11,211 | 53 | 18,465 | 3,563 | 35 | 14,773 | 88 |
| FG Plaza | 106,745 | 9,933 | 100 | 12,140 | 4,700 | 23 | 14,633 | 123 |
| FG Gazebo | 16,531 | 1,587 | 15 | 1,260 | 596 | 2 | 2,183 | 18 |
| John Paul II Rink | 3,055 | 891 | 3 | | | 0 | 891 | 3 |
| TOWN OFFICE (OLD) | 92,177 | -3,402 | 86 | | | 0 | -3,402 | 86 |
| TOWN OFFICE (NEW) | 0 | 43,930 | 0 | 18,438 | 7,413 | 35 | 51,342 | 35 |
| Youth Centre | 23,325 | 4,735 | 22 | 0 | 1,003 | 0 | 5,738 | 22 |
| Fire Hall (OLD) | 29,608 | 3,001 | 28 | 18,787 | 3,957 | 35 | 6,958 | 63 |
| Fire Hall (NEW) | 19,352 | 3,907 | 18 | 0 | 1,443 | 0 | 5,350 | 18 |
| Parkland Building | 43,770 | 6,633 | 41 | 14,365 | 1,718 | 27 | 8,350 | 68 |
| Swimming Pool | 37,035 | 6,113 | 35 | 52,314 | 10,331 | 98 | 16,445 | 133 |
| GC Maintenance Shop | 24,051 | 5,604 | 22 | 14,981 | 2,142 | 28 | 7,746 | 51 |
| Rotary Park Fountain | 18,729 | 3,837 | 18 | | | 0 | 3,837 | 18 |
| Centennial Rink | 3,092 | 4,548 | 3 | | | 0 | 4,548 | 3 |
| GC Fountain | 9,163 | -4,540 | 9 | | | 0 | -4,540 | 9 |
| PW Garage | | | 0 | 18,304 | 3,993 | 34 | 3,993 | 34 |
| Arena | | | 0 | 57,888 | 17,740 | 109 | 17,740 | 109 |
| MH Gazebo | | | 0 | 2,626 | 797 | 5 | 797 | 5 |
| PW Annex | | | 0 | 0 | 7,050 | 0 | 7,050 | 0 |
| TOTALS | 1,267,217 | 179,824 | 1,184 | 302,812 | 82,432 | 569 | 262,255.63 | 1,753.00 |

Table 6a:

2000 Vehicle Fleet

| Vehicle | Gasoline (L) | Cost | Gas eCO2 | Diesel (L) | Cost | Diesel eCO2 | Total Cost (\$) | Total eCO2 (t) |
|---------------|----------------|---------------|------------|---------------|---------------|-------------|-----------------|----------------|
| Unit 47 | 4,018 | 2,022 | 9 | | | 0 | 2,393 | 9 |
| Unit 7 | 1,215 | 698 | 3 | | | 0 | 1,133 | 3 |
| Unit 19 | 4,064 | 2,426 | 10 | | | 0 | 1,317 | 10 |
| Unit 21 | 2,034 | 1,168 | 5 | | | 0 | 4,364 | 5 |
| Unit 40 | 4,615 | 2,600 | 11 | | | 0 | 24,753 | 11 |
| Unit 22 | 2,044 | 1,096 | 5 | | | 0 | 958 | 5 |
| Unit 25 | 10,694 | 5,724 | 25 | | | 0 | 1,172 | 25 |
| Unit 66 | 1,734 | 968 | 4 | | | 0 | 1,153 | 4 |
| Unit 78 | 1,290 | 741 | 3 | | | 0 | 868 | 3 |
| Unit 43 | 4,564 | 2,644 | 11 | | | 0 | 552 | 11 |
| Unit 31 | 4,149 | 2,393 | 10 | | | 0 | 332 | 10 |
| Unit 71 | 1,995 | 1,133 | 5 | | | 0 | 302 | 5 |
| Unit 46 | 2,404 | 1,317 | 6 | | | 0 | 441 | 6 |
| FIRE | 3,032 | 1,691 | 7 | 5,350 | 2,673 | 15 | 1,064 | 22 |
| Other | 9,440 | 5,268 | 22 | 37,935 | 19,484 | 104 | 967 | 126 |
| Unit 19 | 1,654 | 958 | 4 | | | 0 | 473 | 4 |
| Unit 54 | 1,958 | 1,172 | 5 | | | 0 | 1,917 | 5 |
| Unit 56 | 1,985 | 1,153 | 5 | | | 0 | 330 | 5 |
| Unit 9 | 1,541 | 868 | 4 | | | 0 | 140 | 4 |
| Unit 42 | 960 | 552 | 2 | | | 0 | 19,827 | 2 |
| Unit 35 | 568 | 332 | 1 | | | 0 | 2,393 | 1 |
| Unit 6 | 526 | 302 | 1 | | | 0 | 1,133 | 1 |
| Unit 41 | 754 | 441 | 2 | | | 0 | 1,317 | 2 |
| Unit 51 | 1,667 | 1,064 | 4 | | | 0 | 4,364 | 4 |
| Unit 45 | 1,611 | 967 | 4 | | | 0 | 24,753 | 4 |
| Unit 2 | 821 | 473 | 2 | | | 0 | 958 | 2 |
| Unit 28 | 330 | 201 | 1 | 3,345 | 1,716 | 9 | 1,172 | 10 |
| Unit 23 | | | 0 | 709 | 330 | 2 | 1,153 | 2 |
| Rentals | | | 0 | 352 | 140 | 1 | 868 | 1 |
| GOLF COURSE | 14,000 | 16,133 | 33 | 6,986 | 3,694 | 19 | 552 | 52 |
| TOTALS | 351,060 | 56,503 | 202 | 54,678 | 28,037 | 150 | 84,540 | 352 |

Table 6b:

2006 Vehicle Fleet

| Vehicle | Gasoline (L) | Cost | Gas eCO2 | Diesel (L) | Cost | Diesel eCO2 | Total Cost (\$) | Total eCO2 (t) |
|-----------------------|---------------|----------|------------|---------------|---------------|-------------|-----------------|----------------|
| Arena Equipment Lease | | | 0 | | | 0 | 1,944 | 0 |
| Miscellaneous | 41 | 31 | 0 | | | 0 | 31 | 0 |
| BULK Diesel | | | 0 | 67,692 | 49,815 | 185 | 49,815 | 185 |
| Unit 10 | | | 0 | 6,311 | 5,428 | 17 | 5,428 | 17 |
| Unit 28 | | | 0 | 459 | 378 | 1 | 378 | 1 |
| Unit 59 | | | 0 | 1,597 | 1,342 | 4 | 1,342 | 4 |
| FIRE DEPARTMENT | 1,075 | 975 | 3 | 8,156 | 7,093 | 22 | 8,068 | 25 |
| Unit 31 | | | 0 | 4,010 | 3,278 | 11 | 3,278 | 11 |
| PW | 47,539 | 42,679 | 112 | | | | 42,679 | 112 |
| GC | 2,632 | 3,377 | 6 | | | | 3,377 | 6 |
| Bylaw | 3,477 | 3,139 | 8 | | | | 3,139 | 8 |
| Town Car | 549 | 491 | 1 | | | | 491 | 1 |
| Handi Bus | 9,951 | 8,324 | 24 | | | | 8,324 | 24 |
| TOTALS | 65,263 | 0 | 154 | 88,226 | 67,334 | 241 | 128,294 | 395 |

Table 7a:

2000 Lighting

| Light | Electricity (kWh) | Total Cost (\$) | Total eCO2 (t) |
|----------------------------|-------------------|-----------------|----------------|
| All Street Lights | 280,000 | 124,337 | 262 |
| Decorative Lights | 48,000 | 4,801 | 45 |
| 4801 49TH AVE | 5,000 | 622 | 5 |
| South Park Dr 44 AVE | 19 | 552 | 0 |
| South Park Dr 44 AVE | 6,200 | 858 | 6 |
| East Boundary Sign | 3,400 | 147 | 3 |
| 44 Meridian RD | 5,000 | 283 | 5 |
| Chamber 48th ST and 44 AVE | 5,000 | 174 | 5 |
| West Boundary Sign | 3,400 | 174 | 3 |
| 5202 48ST | 5,000 | 387 | 5 |
| 5501 48ST | 5,000 | 147 | 5 |
| 5710 48 ST | 5,000 | 150 | 5 |
| CN Underpass | 6,900 | 180 | 6 |
| North Business Park | 6,900 | 147 | 6 |
| 5201 45 ST | 5,000 | 147 | 5 |
| 4901 Brown ST | 5,000 | 180 | 5 |
| Golf Course Sign | 3,400 | 274 | 3 |
| TOTALS | 398,219 | 133,561 | 372 |

Table 7b:

2006 Lighting

| Light | Electricity (kWh) | Total Cost (\$) | Total eCO2 (t) |
|--------------------------------------|-------------------|-----------------|----------------|
| High Park RD 79 AVE XWALK LIGHTS | 3,308 | 605 | 3 |
| East Boundary Sign Light | 3,463 | 490 | 3 |
| Chamber Sign | 3,464 | 490 | 3 |
| West Boundary Sign | 3,464 | 490 | 3 |
| Football Clock | 1,427 | 431 | 1 |
| South Business Park Sign | 5,198 | 610 | 5 |
| Decorative Lights | 48,503 | 4,443 | 45 |
| CN Underpass | 6,929 | 720 | 6 |
| North Business Park Sign | 6,929 | 720 | 6 |
| Forest Green XWALK | 3,463 | 490 | 3 |
| Brown Street XWALK | 3,464 | 490 | 3 |
| Golf Course Sign | 3,464 | 490 | 3 |
| Traffic Lights 44 AVE Golf Course RD | 5,542 | 632 | 5 |
| Traffic Lights 44 AVE South Park DR | 6,235 | 677 | 6 |
| All Street Lighting FORTIS | 620,902 | 225,283 | 580 |
| TOTALS | 725,755 | 237,064 | 675 |

Table 8a:

2000 Water & Sewer

| Facility | Electricity (kWh) | Cost | Electricity eCO2 | Natural Gas (cum) | Cost | Natural Gas eCO2 | Total Cost (\$) | Total eCO2 (t) |
|----------------------------|-------------------|---------------|------------------|-------------------|--------------|------------------|-----------------|----------------|
| North Lift Station | 4,642 | 613 | 4 | | | 0 | 613 | 4 |
| Meridian heights Reservoir | 426,484 | 32,154 | 399 | 9,166 | 1,724 | 17 | 33,878 | 416 |
| Forest Green Dewatering | 207,912 | 8,967 | 194 | 590 | 265 | 1 | 9,232 | 195 |
| Southridge Lift Station | 3,234 | 680 | 3 | 3,296 | 801 | 6 | 1,481 | 9 |
| Woodland Storm Water | 2,721 | 410 | 3 | | | 0 | 410 | 3 |
| Glens Storm Water | 290 | 191 | 0 | | | 0 | 191 | 0 |
| High Park Reservoir | 87,495 | 9,718 | 82 | 9,005 | 1,673 | 17 | 11,391 | 99 |
| GC Irrigation | 27,675 | 2,233 | 26 | | | 0 | 2,233 | 26 |
| TOTALS | 760,453 | 54,966 | 711 | 823 | 4,462 | 42 | 59,428 | 752 |

Table 8b:

2006 Water & Sewer

| Facility | Electricity (kWh) | Cost | Electricity eCO2 | Natural Gas (cum) | Cost | Natural Gas eCO2 | Total Cost (\$) | Total eCO2 (t) |
|----------------------------------|-------------------|----------------|------------------|-------------------|--------------|------------------|-----------------|----------------|
| North Business Park Lift Station | 8,615 | 1,018 | 8 | | | 0 | 1,018 | 8 |
| MH Reservoir | 390,448 | 44,840 | 365 | 9,434 | 2,525 | 18 | 47,366 | 383 |
| Forest Green Dewatering | 196,976 | 33,448 | 184 | 456 | 388 | 1 | 33,836 | 185 |
| Southridge Lift Station | 4,145 | 852 | 4 | 3,323 | 890 | 6 | 1,742 | 10 |
| Woodlands Storm Sewer | 3,124 | 310 | 3 | | | 0 | 310 | 3 |
| Glens Storm Sewer | 336 | 547 | 0 | | | 0 | 547 | 0 |
| HP Reservoir | 81,548 | 12,574 | 76 | 7,826 | 2,195 | 15 | 14,770 | 91 |
| Country Plains Lift Station | 855 | 517 | 1 | | | 0 | 517 | 1 |
| GC Irrigation | 65,000 | 7,796 | 61 | | | 0 | 7,796 | 61 |
| TOTALS | 751,047 | 101,902 | 702 | 21,039 | 5,999 | 40 | 107,901 | 742 |

Table 9a:

2000 Community Residential

| Fuel Type | Total Use | Total eCO2 (t) |
|-------------------|-------------------|-----------------------|
| Electricity (kWh) | 24,960,000 | 23,323 |
| Natural Gas (cum) | 11,577,600 | 21,767 |
| TOTAL | 36,537,600 | 45,090 |

Table 9b:

2006 Community Residential

| Fuel Type | Total Use | Total eCO2 (t) |
|-------------------|-------------------|-----------------------|
| Electricity (kWh) | 35,880,000 | 33,527 |
| Natural Gas (cum) | 16,642,800 | 31,290 |
| TOTAL | 52,522,800 | 64,816 |

Table 10a:

2000 Community Commercial/Industrial

| Fuel Type | Total Use | Total eCO2 (t) |
|-------------------|-------------------|-----------------------|
| Electricity (kWh) | 11,400,000 | 10,652 |
| Natural Gas (cum) | 4,247,400 | 7,985 |
| TOTAL | 15,647,400 | 18,638 |

Table 20b:

2006 Community Commercial/Industrial

| Fuel Type | Total Use | Total eCO2 (t) |
|-------------------|-------------------|-----------------------|
| Electricity (kWh) | 18,624,000 | 17,403 |
| Natural Gas (cum) | 6,795,840 | 12,777 |
| TOTAL | 25,419,840 | 30,179 |

Table 11a:

| 2000 Community Transportation | | |
|--------------------------------------|----------------------|----------------------|
| Fuel Type | Total Use (L) | Total CO2 (t) |
| Gasoline (L) | 8,479,107 | 20,011 |
| Diesel (L) | 493,920 | 1,248 |
| TOTAL | 8,973,027 | 21,259 |

Table 11b:

| 2006 Community Transportation | | |
|--------------------------------------|----------------------|----------------------|
| Fuel Type | Total Use (L) | Total CO2 (t) |
| Gasoline (L) | 11,279,202 | 26,619 |
| Diesel (L) | 993,225 | 2712 |
| TOTAL | 12,272,427 | 29,331 |

Table 12a:

| 2000 Community Waste | | |
|-----------------------------|--------------------------|-----------------------|
| TYPE OF WASTE | Waste Tonnage (t) | Total eCO2 (t) |
| Garbage to Landfill | 2,672.00 | 1,287 |
| TOTAL | 2,672 | 1,287 |

Table 12b:

| 2006 Community Waste | | |
|-----------------------------|--------------------------|-----------------------|
| TYPE OF WASTE | Waste Tonnage (t) | Total eCO2 (t) |
| Blue Bag Recycling | 606.64 | 0 |
| Organic Composting | 848.59 | 0 |
| Garbage to Landfill | 2,491.00 | 1,200 |
| TOTAL | 3,946 | 1,200 |