

CITY OF MISSISSAUGA GREEN DEVELOPMENT STRATEGY PHASE 3 REPORT

October 14, 2009



EXECUTIVE SUMMARY

This report provides recommendations on how Mississauga can develop and implement a Green Development Strategy to ensure that new development proposals address sustainable development practices. The recommendations provide a multi-faceted approach that Mississauga can take to encourage green development through performance-based targets, leadership, incentives, pilot projects, and education.

A successfully implemented Green Development Strategy would provide numerous environmental, social, and economic benefits for Mississauga by:

- Improving the air, water, and land of the city while reducing greenhouse gas emissions through efficiency and building- and transportation-related best practices;
- Improving the health and well-being of the residents of Mississauga, making the City a more desirable place to live;
- Reducing the demand on municipal services;
- Providing a marketplace shift and raising the bar of the building industry to adopt green development practices; and
- Attracting leading edge businesses.

This report builds upon the work that was completed in the Phase 1 Preliminary Report, including an evaluation of the lessons that other municipalities have learned in developing and implementing their own green development strategies. Along with the feedback that was gathered from relevant Mississauga stakeholders during a workshop that took place in June, 2009, this helped inform a “Made in Mississauga” approach to green development.

The recommended “Made in Mississauga” approach incorporates the successes, while trying to mitigate the shortfalls, of green development strategies implemented across North America. The resulting Strategy will focus on issues important to Mississauga (“drivers”) and be directly incorporated within the City’s planning and development process.

The recommendations go beyond implementing existing third party standards, which do not necessarily effectively address Mississauga’s drivers and development processes. Based on precedent research, no other green development strategy incorporated all elements within these recommendations, but those who addressed the greatest number of similar recommendations were typically more successful.

The Federation of Canadian Municipalities may provide funding for developing and/or implementing some or all elements of the Strategy. Their website should be consulted prior to proceeding with Strategy development to assess current funding opportunities and requirements.

The recommendations outlined below are presented in more detail within this report. A phased implementation approach is recommended to build and continue momentum; a suggested timeline is included in this report.

LEADERSHIP FROM CITY COUNCIL

Leadership and commitment demonstrated by City Council can strongly motivate City employees and private industry to consider green development and help to ensure the successful implementation of the GDS and provide visible credibility to those in the private sector.

1. Have a political as well as a community or industry champion
2. Demonstrate clear commitment
3. Establish a Green Development Task Force

PERFORMANCE-BASED TARGETS

Developers should be provided with clear, performance-based, green development targets, which are embedded directly in by-laws, policies, and guidelines, rather than creating a stand-alone Green Development Standard document.

4. As an interim step before targets and incentives are developed, encourage the use of LEED® and interim standards during the site plan review process
5. Avoid non-measurable targets
6. Rely on existing regulatory and planning tools for implementing mandatory requirements
7. Rely on existing City (i.e. Living Green Strategic Pillar for Change) and third party (i.e. LEED®) targets
8. Consider general vs. localized targets
9. Incent best practice

INCENTIVES

Providing incentives (monetary and non-monetary) can encourage developers to meet green building criteria that go beyond Mississauga's minimum standards, or to improve performance in areas outside the City's legislative jurisdiction.

Awards

10. Provide awards and recognition

Feebates

11. Determine tiered green building requirements
12. Develop a revenue neutral pricing structure for a 'feebate' incentive program
13. Develop the feebate application guidelines and determine how the reward process will be managed

Development Charge Discounts

14. Determine development charge (DC) discount eligibility criteria
15. Establish a value of the DC discount
16. Consider revisions to the next DC update

Fast-Track Approvals

17. Determine expedited review eligibility criteria
18. Streamline reviews of green development projects
19. Slow the approval process for non-green development projects

Bonusing Opportunities

- 20. Determine bonusing eligibility criteria
- 21. Establish critical areas applicable for bonusing
- 22. Define the bonusing application process

Existing Incentives and Initiatives

- 23. Raise awareness of existing incentives and initiatives
- 24. Provide further support for those interested in incentives

Green Loans

- 25. Conduct research on existing green loan programs
- 26. Assess funding opportunities for green loans
- 27. Define green loan eligibility criteria and application process

PILOT PROJECTS

Pilot projects can be used to motivate other developers to pursue green strategies. They can also be used to test and refine elements of the GDS before being released to the wider development community.

- 28. Select suitable pilot project sites (i.e. owned by City to be sold for private development or redeveloped by the City)
- 29. Incorporate exemplary performance of innovative technologies into pilot projects
- 30. Market the features and successes of pilot sites

ENSURING ONGOING SUCCESS

To be truly successful, the GDS must be treated as an ongoing initiative that constantly evolves and improves. Providing resources to the development industry and general public through knowledgeable municipal staff, education centres, and websites will provide the knowledge capacity necessary to ensure ongoing success. Keeping the GDS current and up-to-date will ensure that it remains relevant to Mississauga's priorities and goals.

- 31. Provide adequate training for municipal staff
- 32. Create an education center
- 33. Provide online resources
- 34. Plan future Strategy revisions
- 35. Coordinate effort with existing policies
- 36. Consider interaction with new policies
- 37. Expand scope of the Strategy to neighbourhood and community scale

Ideally, after five years of implementation, most elements of the Strategy will be incorporated into Mississauga's planning process such that the Strategy, and its continuous improvements, will be seen as business as usual. This will put Mississauga in place to be recognized as a leader in municipal green development.

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1. INTRODUCTION

1.1. Purpose

This report provides recommendations on how Mississauga can develop and implement a Green Development Strategy ("GDS", "Strategy") to ensure that new development proposals address sustainable development practices. The recommendations within this report provide a multi-faceted approach that Mississauga can take to encourage green development through performance-based targets, leadership, incentives, pilot projects, and education.

For the purpose of this report, "green development" refers to any measure, technology, or practice that, when compared to a business as usual approach, will:

- reduce energy demand and consumption;
- increase renewable energy capacity;
- decrease the impact to the natural environment (water, air, and soil); and/or
- enhance the well-being of the community.

If the recommendations within this report are followed, the resulting final Strategy will provide a "Made in Mississauga" approach to green development by considering the City's climate, geography, urban infrastructure, and vision, to achieve the environmental objectives unique to Mississauga. The recommendations go beyond implementing existing third party standards, which don't address Mississauga's drivers and development processes effectively. Based on precedent research (see Appendix), no other Green Development Strategy incorporated all elements within these recommendations, but those who addressed a greater number of these issues were typically more successful.

1.2. Scope

The scope of this study is limited to development projects that are regulated by Site Plan Control. The resulting Strategy will therefore apply to high-rise residential, commercial, industrial, and institutional; it excludes single-family residential. Rezoning applications and Official Plan amendments should also be considered as part of the Strategy.

The regulatory environment in Mississauga was evaluated and outlined in the Phase 1 Report. This discussion is presented as an Appendix. One key issue is the limitation of Ontario municipalities to affect construction practices mandated by the Ontario Building Code. Mandating energy performance and materials selection inside buildings, for example, are beyond municipalities' jurisdiction. Mississauga's regulatory environment was taken into account for this study. The current Application for Site Plan Approval is included in the Appendix for reference on Mississauga's current application process.

1.3. Why Create a Green Development Strategy?

Implementing a Green Development Strategy for Mississauga would have numerous environmental, social, and economic benefits.

Environment

A successfully implemented Green Development Strategy will have a positive effect on the natural environment of Mississauga and the region. The key environmental drivers identified for the Strategy include:

- Protect and Enhance Natural Areas
- Provide Green Space
- Create Efficient Urban Structure
- Reduce Greenhouse Gas (GHG) Emissions
- Stormwater Management

Social

Environmental issues are now at the forefront of public concern. A successfully implemented GDS would resonate positively with the public, making Mississauga an even more desirable city to live in. The GDS can improve the lives and well-being of Mississauga residents by incorporating site-level measures to increase green space, promote pedestrian friendly design, and promote active modes of transportation (i.e. cycling and public transit access).

Economic

As new development in Mississauga adapts green building practices, the city can benefit from reduced demand on municipal services for water treatment, stormwater management, and energy supply.

As the number of green developments increases, the market demand for related services will also increase. Mississauga could use a GDS to position itself as the location of choice for leading edge businesses.

1.4. Mississauga as a Leader in Green Development

Mississauga has the opportunity to become a leader in municipal development policies by creating, implementing, and monitoring the success of a green development strategy. The City's Green Building Standard for Municipal Buildings, currently being developed with assistance from Halsall Associates, demonstrates that the City is "walking the walk" in addition to supporting green development in the private sector. The current draft version of the Green Building Standard identifies 16 critical LEED® credits and prerequisites that all new construction and major renovation of municipal facilities are to achieve. Larger projects are to target LEED® Silver certification, while small projects are to focus on the 16 critical credits and prerequisites and attempt to achieve LEED® Silver certification, where possible.

1.5. Work to Date

1.5.1. Phase 1 Report

A Phase 1 Preliminary Report provided options for preparing an effective and implementable GDS applicable to Mississauga. The Report presented:

- An overview of how a GDS would fit into and complement the Strategic Plan and other related City documents and initiatives;
- A summary of Mississauga's existing regulatory environment;
- A precedent review of over 100 municipalities across the world and how they have approached developing a sustainability strategy;
- Four broad approaches to a green building standard:
 - Use an existing standard or certification system previously developed by others;
 - Modify an existing standard or certification system;
 - Create a new, custom standard; or
 - Incorporate requirements within other City documents and programs (i.e. Zoning By-Laws, Site Plan Application Requirements, and education).
- Options for implementing the strategy, such as education, use of pilot projects, awards, and training;
- A summary of lessons learned in other municipalities;
- A list of existing national, provincial, and regional green programs and initiatives; and
- Recommendations for next steps.

The findings of this report provided a basis on which to conduct a workshop to gain feedback from various stakeholders.

1.5.2. Workshop

On June 16, 2009, a presentation and workshop was held at Mississauga Living Arts Centre bringing together various stakeholders in the development, municipal, consulting, and non-profit community that would have a direct stake in the outcome of the proposed Green Development Strategy. The objectives of the workshop were to:

- Set the stage for the Strategy by discussing sustainability drivers relevant to Mississauga, the regulatory environment, and existing initiatives and incentives;
- Obtain a variety of perspectives from the various stakeholders;
- Provide specific recommendations for how each driver would be considered in the different proposed frameworks;
- Determine what strategies would provide success;
- Identify which metrics should be used to determine success;
- Establish how best to motivate each stakeholder; and,
- Determine the constraints imposed and opportunities available.

The workshop participants were divided into different breakout groups organized by five sustainability drivers:

- Protect and Enhance Natural Areas
- Provide Green Space
- Create an Efficient Urban Structure
- Reduce Greenhouse Gas Emissions
- Stormwater Best Management Practices

A technique called “mind mapping” was used for facilitating discussion and presenting discussion topics in a graphical format.

The key questions asked to each breakout group were:

1. What are some of the techniques we can employ to address the driver?
2. How do we achieve the techniques identified in Question 1?

The following list outlines some of the general key recommendations made by the stakeholders during the breakout session (a summary of the recommendations is provided as an Appendix):

- **Consistency:** Create a Green Development Strategy that is consistent with other City planning processes.
- **Support and Resources:** The City should create a system that doesn't just encourage green development, but also provides ample support in all stages of green development. The City will need to have adequate resources to ensure that this support is successful on an ongoing basis. Support also needs to be given to City staff in order to maintain in-house expertise.
- **Leadership:** The City should demonstrate leadership in green development if they are to encourage private industry to pursue the same. A senior member of City staff should champion this initiative and take an active role in providing support and advocacy. The City can demonstrate leadership by requiring green development standards for municipal buildings and through pilot projects.
- **Pilot Projects:** Creating pilot projects that showcase examples of successful implementation of specific technologies and/or integrated green building design is a good way to promote green development. Pilot projects should be innovative and clearly demonstrate that green building strategies can be implemented in Mississauga. Pilot projects should vary in scope and scale.
- **Phase-in Implementation:** Rather than implementing all requirements of the Green Development Strategy at once, requirements should be phased in at different stages. Projects and goals should be allocated on a timeline, such as 'less than one year', 'one to five years', and 'greater than five years'.
- **Alignment with City Initiatives:** The Strategy should align with other existing City documents and initiatives to allow for ease of adoption and reduced logistical obstacles. Future City documents and initiatives should consider how it affects or is affected by the Strategy.

- **Financial Incentives:** Voluntary requirements should be encouraged through a wide range of financing mechanisms and incentives. Incentives should address specific technologies and practices and general green development. The incentives should be awarded at varying scales. Existing incentive opportunities should be supported and referenced in the GDS-related documents and websites.
- **LEED®:** LEED® is the preferred method for spurring the growth of green buildings and ensuring that it is done in such a way that is standardized and recognized. LEED® should not be made mandatory, but rather used as a voluntary tool with appropriate incentives to encourage green development.
- **Performance Standard:** Instead of implementing a standard that identifies only one compliance path, a “shopping list” of strategies should be created that would help developers meet specific performance requirements. Performance standards should also have tiered thresholds that provide projects with compliance options.

2. ELEMENTS OF A SUCCESSFUL STRATEGY

The following sections outline the main recommendations coming out of our discussions with City Staff and Stakeholders for Mississauga to consider during future implementation phases of the Green Development Strategy. The main headings are in sequential order, showing the relative timeline of each element of the Strategy; a proposed schedule is provided in the next section of the report. The Federation of Canadian Municipalities may provide funding for developing and/or implementing some or all elements of the Strategy. Their website should be consulted prior to proceeding with Strategy development to assess current funding opportunities and requirements.

2.1. Leadership from City Council

Mississauga’s Green Development Strategy will be used to implement, encourage, and support green development in the private sector. Leadership and commitment demonstrated by City Council can strongly motivate City employees to find ways to implement green policy, motivate private industry to consider green development, and help both ensure the successful implementation of the GDS. The cities of Portland, OR, and Chicago, for example, are recognized as two of the greenest cities in North America and both have built this reputation through strong political leadership for green development. Their comprehensive approach to “greening” the city is transparent, results-oriented, and visionary relative to the approaches of many other cities. This creates momentum that can carry through to the private sector. Portland’s initiatives included the creation of a Bureau of Planning and Sustainability, a merger of the Bureau of Planning and the Office of Sustainable Development, which is dedicated to integrating all citywide efforts related to sustainability.

Recommendations

1. **Have a political or credible community champion(s):** This individual (or group) would be responsible for implementing the GDS. The Champion(s) should be committed to green development, have experience with development processes, and remain in the position for at least one year. The Champion(s) could be selected by council following a formalized application process that clearly explains the expectations of the position.
2. **Demonstrate clear commitment:** The City should communicate their intent to ensure the success of not only the GDS, but to sustainability practices citywide. All existing and future City initiatives should be considered in light of the GDS. The City's Green Building Standard for municipal buildings, currently under development (also with Halsall Associates), is a good example - it shows that the City is committed to green development not only in the private sector, but the public sector as well.
3. **Establish a Green Development Task Force:** Create an internal "Green Development Task Force" responsible for overseeing the implementation and maintenance of the Strategy. A clear communication pathway between the Champion, City Planning Staff (and other key City staff), industry experts, and the Task Force is imperative to a transparent, consistent Strategy.

2.2. Performance-Based Targets

Developers should be provided with clear, performance-based, green development targets. These should be a combination of mandatory and voluntary targets. It is recommended that a stand-alone Standard (i.e. a single document outlining targets and documentation requirements) not be used; instead, by-laws, policies, and procedures should be revised, or created, to raise the bar on sustainability targets. The education portion of the Strategy outlined in this report should be used to communicate the City's sustainability goals and provide resources to help development applications comply with the regulations. Voluntary targets should be communicated as part of incentive packages, as discussed further in this report.

Examples of measures within site plan control that can be considered include:

- Minimum green space areas
- Maximum window-to-wall ratios
- Minimum bicycle storage facilities
- Maximum setbacks for pedestrian comfort
- Minimum site lighting requirements

Specific requirements, targets, and verification procedures should be developed during future phases of the GDS development.

Recommendations

4. **Encourage LEED® and interim standards during the site plan review process:** Since it will take some time to review and revise existing by-laws, policies, and guidelines, LEED® Silver certification should be encouraged on a voluntary basis as an interim measure. While the City does not have the ability to mandate LEED® certification, it could be used as a discussion point between City planners and developers during the site plan review process. See recommendation 7 below for a discussion on why LEED® is the third party standard of choice. The Core Project Team has begun developing a preliminary Standard with some easily implemented targets; a draft of this document with recommended revisions and next steps is provided as an Appendix. Implementing interim targets will get developers used to the City's green development focus before the full Strategy is developed.
5. **Avoid non-measurable targets:** Measurable, performance-based targets allow for less subjective interpretation of requirements and will allow Mississauga to benchmark and measure the success of the GDS.
6. **Rely on existing regulatory and planning tools for implementing mandatory requirements:** Where possible, rely on existing policies, guidelines, by-laws, etc. to communicate targets and requirements rather than reproducing requirements in a stand-alone Standard. Mandate specific requirements for issues that are already enforced or easily added to the by-laws or site plan approval. This could include minimum bicycle spaces, parking lot tree coverage, and night-sky friendly site lighting design. The Site Plan Application package should be revised to reference all relevant documents and the documentation required to demonstrate compliance with targets within the by-law/policy/guideline.
7. **Rely on existing City and third party targets:** When revising existing by-laws, policies, and guidelines, set targets that are consistent with existing City and third party standards, where applicable. Policy decisions should be checked against Mississauga targets such as the Living Green Strategic Pillar for Change goal to become a net-zero carbon city. Where City targets do not effectively address the City's drivers, LEED® is the recommended reference for third party targets as it is the leading green building rating system on the market. Discussions with stakeholders at the workshop confirmed that the local industry is not opposed to incorporating LEED® into the Strategy. The targets should be reviewed for applicability in Mississauga (for example, LEED®'s storm water management requirements may not align with the work already conducted to develop Mississauga-specific best practices). Where possible, aligning targets with a standard that developers are already familiar with can help improve uptake and reduces the work required by developers to demonstrate compliance with more than one system.
8. **Consider general vs localized targets:** When developing measures and targets, the City should consider whether targets are suitable for all development in Mississauga or if they are better dealt with at the community level. For example, appropriate minimum setbacks for the City Centre may not be applicable for residential communities.

- 9. Incent best practice:** Use incentives to encourage voluntary measures to achieve performance targets. Incentives could promote measures that are outside of Mississauga's regulatory control, or targets that greatly exceed business as usual. More detail on incentives is provided below. A more detailed discussion on incentives is presented in the following section.

2.3. Monetary and Non-Monetary Incentives

Incentives could be an important component of implementing a successful Green Development Strategy in Mississauga. Providing incentives can encourage developers to meet green building criteria that go beyond Mississauga's minimum standards, or to improve performance in areas outside the City's legislative jurisdiction, such as energy performance. Providing rewards will allow Mississauga to shift the market towards green development beyond any mandatory requirements. Incentives can be used effectively to develop capacity in the market to allow easier acceptance of future mandatory requirements. The following sections outline incentive models that should be considered for the first version of Mississauga's green development strategy.

2.3.1. Awards

Presenting awards to those involved in green development projects that meet high standards and demonstrate exemplary performance is a good way for the City to recognize achievement. Awards do not necessarily have to be monetary; instead they could include a ceremony with a plaque and/or recognition through websites and newspapers.

Recommendations:

- 10. Provide awards and recognition:** Promote, recognize, and honour projects that meet high standards for green development. The Mississauga Urban Design Awards could be expanded to include a specific award for green design. Alternatively, a separate award program could recognize examples of exemplary green development.

2.3.2. Feebates

A feebate is a market-based financial incentive instrument that combines a fee for conventional building construction, a waiver option for moderate green improvements, and a reward for high performance green building projects. By using fee revenues from buildings constructed to code to finance the rewards for high performance buildings, the feebate system remains self-sustaining and revenue-neutral.

Portland, Oregon is an example of a municipality that uses the feebate system to encourage green development for new commercial and residential construction. The

monetary value of the incentive is divided into tiers based on building size and level of LEED® certification (with specific LEED® credit requirements) and is awarded to the building owner upon receipt of the LEED® Rating Certificate or Final LEED® Review. The feebate is intended to complement existing financial incentives offered by the state for implementing green building measures.

The City expects the program to be self-sustaining, with the fees from lower-performance buildings financing the incentives for higher-performance buildings. However, buildings can usually achieve the waiver stage with a modest effort. Therefore, there may not be enough fee-paying buildings to fund the incentives. Officials have said that they will make adjustments to the feebate structure as necessary. Portland's fee and incentive structure is illustrated graphically in the image below.

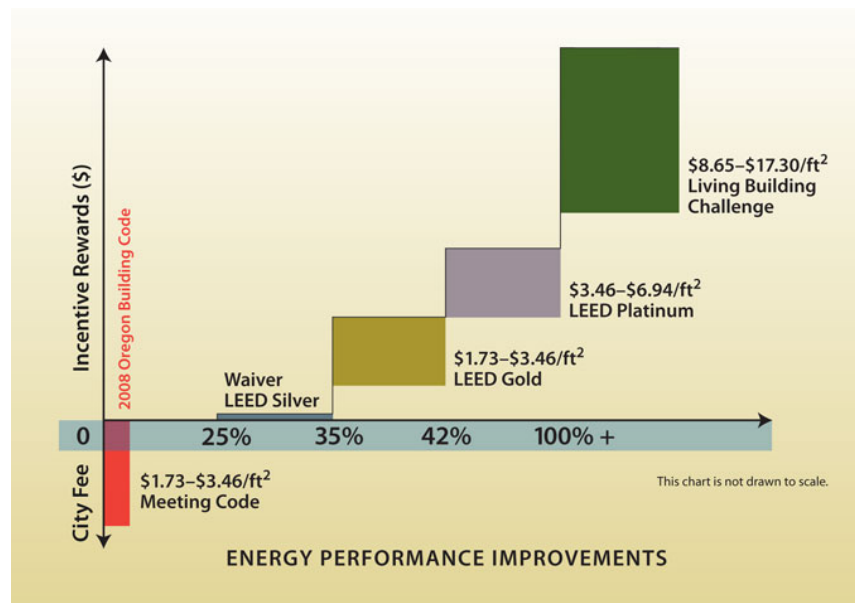


Figure 1 - Portland's feebate structure (From <http://www.buildinggreen.com/auth/article.cfm/ID/4119/>)

Feebates would allow Mississauga to reward projects that exceed minimum requirements in areas beyond their legislative jurisdiction, such as energy performance thresholds that exceed the Ontario Building Code. This method of incentive could also provide the City a way of encouraging developers to build LEED®-certified buildings voluntarily rather than by mandate.

Recommendations:

11. **Determine tiered green building requirements:** Establish the green building requirements (i.e. level of LEED® certification, energy performance relative to the Model National Energy Code for Buildings (MNECB), etc.) related to each tier of the feebate (fee, waiver, reward). This would include any additional specific LEED® credits or performance targets.

12. **Develop a pricing structure:** Establish the value of the feebate (fee and reward) for each tier. Mississauga should carefully analyze the feebate levels and criteria to ensure the program motivates the behaviour intended and is revenue neutral.
13. **Develop the application guidelines and determine how the reward process will be managed:** The requirement and application process should be clear, unambiguous, and transparent. Staff should be available for questions to revise the program as necessary. Allow for flexibility so that the program can be revised as lessons are learned through implementation.

2.3.3. Development Charge Discounts

Municipalities often issue development charge (DC) discounts where projects implement specific green technologies or meet specific green building criteria. Toronto, for example, gives a 20% DC rebate for projects that achieve Tier 2 of the Toronto Green Standard (Tier 1 is mandatory and includes measures within the City's Site Plan Review jurisdiction; Tier 2 goes beyond the City's jurisdiction). The 20% discount is based on the fact that combined water, sanitary sewer, and stormwater management services comprise 18% of the total residential DC costs and 31% of the non-residential DC costs. These are the DC-funded services which most closely align with the Tier 2 Toronto Green Standard requirements. In Caledon, ON, DC discounts of 20% to 27.5% are given for buildings that achieve various levels of LEED® certification, and 5% for projects that incorporate specific green technologies such as stormwater cisterns, permeable pavement, and solar thermal and photovoltaic systems.

Based on discussions with City staff, the DC rates for developments in Mississauga are based on the expected costs required to service those developments. The City needs to obtain a certain amount of money through DCs for these DC-funded services; therefore, if discounts are given to green development projects, non-green development projects would have to pay higher DCs to compensate. However, future capital cost of DC-funded services could be reduced due to the measures taken in a green development project. For example, the expansion of a stormwater treatment plant could be avoided due to the implementation of enhanced stormwater management measures. Therefore, the overall expected future costs could be reduced in anticipation of the results of green development. The budget for this incentive would likely have to be developed initially without factoring in reduced capital cost of utility upgrades to remain conservative, and until uptake of green building technologies demonstrates a reduced demand for DC-funded services.

In Mississauga, DCs are revised every five years. The most recent update occurred in June, 2009, and, therefore, will not be revised until 2014. During the revision process to the latest update, green development and/or green development discounts were not discussed.

Recommendations:

- 14. Determine DC discount eligibility criteria:** This includes developing an application process with clear submittal requirements and discount opportunities. Consider the level of performance above and beyond business as usual is required for a discount. Performance criteria should be given if discounts will be awarded for specific green technologies.
- 15. Establish a value of the DC discount:** Consider providing different levels of DC discounts depending on level of LEED® certification achieved or which green technologies are used. The value of the discount could be based on the downstream cost savings expected for DC-funded services, when it has been demonstrated that downstream savings will be realized. This system could function similar to the feebate system discussed earlier in that green projects would benefit from the compensation given by non-green projects, thereby making the incentive essentially revenue-neutral.
- 16. Consider revisions to the next DC update:** Determine what changes should be made to the DC rates to accommodate a discount. This needs to be done early in the revision process.

2.3.4. Fast-Tracker Approvals

Several municipalities have used fast-tracking of the approvals process or priority review for building permits or site plans as an incentive for projects that meet certain green building standards. In Ontario this is difficult to implement because, in most cases, the municipality is not in sole control of the approval process. Other agencies such as conservation authorities, the Region, or the Ministry of Transportation must also review and approve proposed developments. Delaying projects that don't meet sustainability criteria would be a strategy that would have the same impact, but the Planning Act dictates maximum review times for site plan approvals, seriously limiting the opportunity.

Recommendations:

- 17. Determine expedited review eligibility criteria:** Criteria should be clear and performance-based to reduce ambiguity.
- 18. Streamline reviews of green development projects:** Green development projects often face delays because of new technologies used. Therefore, Mississauga should, at a minimum, ensure that reviews of projects incorporating green building measures are streamlined so that they do not take any more time to process than regular projects. This will require dedicated City staff to support developers through the green development application process.
- 19. Slow the approval process for non-green development projects:** Since green development projects cannot necessarily be fast-tracked, the process for projects that are business as usual could be slowed where allowed under the Planning Act.

2.3.5. Bonusing Opportunities

Using the bonusing provisions contained in Section 37 of the Planning Act may be an appropriate way to achieve and secure sustainability objectives for new developments over and above what can otherwise be achieved through the use of more traditional planning tools. This strategy allows builders to construct a project with an increased height and/or density if it can be demonstrated that certain requirements are met (in this case, with respect to green development).

A separate study to define bonusing opportunities is currently underway and should be reviewed in conjunction with the Green Development Strategy, once complete. This study currently indicates that bonusing is not an option in all areas of the City. For example, it could not be used in the City Centre since there are currently no density or height restrictions in the City Centre. Other large areas of Mississauga, such as residential subdivisions and employment areas are not identified as areas of intensification and therefore could not use bonus incentives. It appears from preliminary discussions that bonus incentives may also be restricted to geographic areas that are targeted for intensification; this includes most new development.

Recommendations:

- 20. Determine bonusing eligibility criteria:** Determine the eligibility criteria for green development projects that could be awarded height/density bonusing. Criteria should be clear and performance-based to reduce ambiguity.
- 21. Establish critical areas applicable for bonusing:** The City should identify areas where bonusing is feasible and desirable. Providing a map of areas that are eligible would be beneficial.
- 22. Define the bonusing application process:** Mississauga should clearly define the procedure for applying for bonusing within the Strategy.

2.3.6. Existing Incentives and Initiatives

There are several existing initiatives and incentives related to green building and renewable energy technologies that could help support green development in Mississauga. Some of these are summarized below; see the Appendix for more detail.

At the national level, there are financial incentives provided by Natural Resources Canada for incorporating renewable energy technologies into buildings; the Federation of Canadian Municipalities' Green Municipal Fund also provides financial incentives for sustainable community plans, feasibility studies, and capital projects.

The provincial government offers rebates and retail sales tax exemptions for renewable energy technologies. The Ontario Power Authority (OPA) offers several financial incentives

applicable to development in Mississauga, including a feed-in tariff for renewable energy technologies and rebates for high performance new construction.

Recommendations:

- 23. Raise awareness of existing incentives and initiatives:** Raise awareness to building professionals, property managers, and owners that financial incentives exist for green building projects and renewable energy technologies. Consider using advertising through a dedicated GDS website, hosting workshops, and organizing training seminars. Promote participation in existing initiatives such as the Partners in Project Green: A Pearson Eco-Business Zone.
- 24. Provide further support for those interested in incentives:** As discussed previously, establish an internal Green Development Task force that would be responsible for, among other things, providing further technical and administrative support and assistance to those interested in taking advantage of these incentives. Developers and building professionals are often interested in applying for these incentives, but need assistance interpreting and demonstrating compliance with the rules, regulations, and requirements of the application process.

2.3.7. Green Loans

Much of the financial benefit of green buildings comes from operational savings and reduced maintenance costs. In the long-term, this will benefit the building occupants, not the developer. This is why it can often be hard for developers to justify even a small increase in capital costs for green improvements. To overcome this apparent disparity in the motivation to build green, Mississauga could provide financing for high performance, energy efficient systems for buildings.

The Toronto Atmospheric Fund currently provides “green loans” to condo developers in Toronto. The process involves three steps:

1. The builder specifies and installs energy efficient upgrades (equipment, windows, or other measures).
2. The lender finances the developer’s incremental capital costs for these items. The loan advance occurs after the condo building has been substantially completed and the energy performance measures have been verified by a third party.
3. The Condo owners, through the Condominium Corporation, pay the money back to the lender with funds that are saved on operational costs.

The program is designed such that the green loan will be paid back in seven years, after which time, all the operating cost savings will go directly to the residents and condo owners.

With a green loan program that would allow developers to implement energy conservation measures at no cost premium, Mississauga would be better able to encourage multi-unit residential developers to build green.

Recommendations:

- 25. Conduct research on existing green loan programs:** Contact administrators of existing green loan programs to gather more detail and answer questions specific to Mississauga's development process.
- 26. Assess funding opportunities:** Based on the discussions with existing programs, assess the municipal finances required to administer the program. Confirm whether Mississauga has the resources for this type of incentive program.
- 27. Define eligibility criteria and application process:** Decide which energy conservation measures would be eligible under such a program. These could be based on optional measures within the Green Development Standard or existing third party standard thresholds (such as LEED®). Establish a methodology for application, submittal, and verification.

2.4. Pilot Projects

Pilot projects present an opportunity for the City to showcase examples of the successful implementation of green development in Mississauga. Pilot projects can be used to motivate other developers to pursue green strategies. They can also be used to test and refine elements of the GDS before being released to the wider development community.

Recommendations:

- 28. Select suitable sites:** Identify pilot projects at varying scale, size, and scope, i.e. small lot (residential), large site (multiple lots), large district (multiple ownership including City holding). Opportunities for major multiple ownership districts within Mississauga include the Imperial Oil Lands, the Hurontario Higher Order Transit Corridor, and the Downtown Core District. The ideal site for pilot projects is one that is currently owned by the City but which will be sold for private development. This allows the City to impose requirements beyond typical Site Plan Control as requirements of the sales/development agreement. An example of this concept being implemented in another municipality is Waterfront Toronto's West Don Lands development.
- 29. Incorporate exemplary performance of innovative technologies:** Include innovative technologies and/or demonstrate integrated green building design. The pilot projects should demonstrate exemplary performance and emphasize where Mississauga can be a leader.

- 30. Provide marketing:** Publicize and clearly communicate the development, completion, and success of the pilot projects through signage, plaques, and websites. Topics to feature include: description of the overall project and how it fits into the context of the GDS; description of specific green technologies; explanation of the environmental, social, and financial benefits; details of expected and actual system performance; relationship to other regional initiatives.

3. ENSURING ONGOING SUCCESS

To be truly successful, the GDS must be treated as an ongoing initiative that constantly evolves and improves. To achieve this, several measures and processes need to be implemented. Providing resources to the development industry and general public through knowledgeable municipal staff, education centres, and websites will provide the knowledge capacity necessary to ensure ongoing success. Keeping the GDS current and up-to-date will ensure that it remains relevant to Mississauga's priorities and goals.

It is critical that the GDS not be an isolated document or conflict with existing municipal policies (i.e. initiatives, documents, or by-laws). Successful implementation will require that it align with all existing municipal policies related to development. In addition, all new municipal policies developed in the future should take into consideration their relationship to the GDS. For every regulatory decision made, it should be asked how it aligns with the Strategy. As the Strategy evolves, elements should be incorporated into the Official Plan to make alignment with other initiatives streamlined and intuitive.

Recommendations:

- 31. Provide adequate staff training:** Train municipal planning and development staff so that they are knowledgeable about current green development practices and the elements of the GDS. Staff should be able to assist and provide consistent advice to developers. Training for Councillors should also be considered to help them answer questions from constituents and developers.
- 32. Create an education center:** Develop a "Center for Excellence" that provides support and advice to building professionals and outreach to the general public. The Centre should be centrally located, such as a small area within Mississauga's Civic Centre. Provide access to relevant green development publications, LEED® Reference Guides, City documents, and application material for incentives. If not open full-time, the center should have regularly scheduled office hours. The center could be run by existing municipal staff and/or volunteers. If an internal green development task force is established, maintaining this center should be one of their main responsibilities.

- 33. Provide online resources:** Create online resources that complement the education center and staff training. An online forum space where the public could interact with municipal staff could complement the center for excellence; however, websites are often easily left unmaintained and should only be developed if a clear protocol for review and updates is developed. Online toolkits and guidelines could be tailored towards specific green development practices. Online material should include references to existing resources; for example, the Credit Valley Conservation's (CVC) Strategic Online Sustainability Toolkit already contains material such as Stormwater Management – Low Impact Development toolkit and an interactive map profiling the regions various green technologies and projects. It could also provide a comparison of Mississauga's sustainability targets and their relation to LEED® to help developers seeking both Site Plan Approval and LEED® certification.
- 34. Plan future revisions:** Plan a clear schedule and documentation process for future revisions to the GDS. Set clear performance targets to identify where elements of the Strategy are working well or need revisions.
- 35. Coordinate effort with existing policies:** Ensure that the GDS aligns with existing policies related to development. Avoid recreating requirements and resources to minimize potential for conflict and duplication of effort.
- 36. Consider interaction with new policies:** Take into consideration how any new policy would affect, or be affected by, the GDS. Incorporate green development goals determined through pilot projects into the Official Plan for ease of implementation throughout other City documents.
- 37. Expand scope of the Strategy to neighbourhood and community scale:** As part of the next steps, the Strategy should consider green development at a scale larger than individual buildings. Considerations should be given to how community planning plays a role in green development. LEED® for Neighbourhood Development (LEED®-ND) could be used to inform community-scale green development strategies. Keeping in line with Mississauga's drivers, examples of strategies at the community-scale include: water body and habitat conservation, walkable streets, mixed-use neighbourhood centers, transit facilities, transportation demand management, block orientation for solar access, and district heating and cooling. This next tier of the Green Development Strategy would better address Plan of Subdivision applications, or development at a block level such as "big box" plazas.

4. TIMELINE

The following table provides a sample one to five year plan to implement the recommendations (with corresponding recommendation number given in parentheses) identified above. The investment put into the first two years should focus on setting a solid foundation for the Strategy. A timeline for regular revisions to the Strategy elements will be key to reaping the rewards of the initial investment and will make the Strategy more successful over its lifetime.

Ideally by year five, most elements will be incorporated into Mississauga's planning process such that the Strategy, and its continuous improvements, will be seen as business as usual. This will put Mississauga in place to be recognized as a municipal leader in green development.

	Years				
	1	2	3	4	5+
Define role and select champion and task force (1, 3)					
Implement interim Green Development Standard (4)					
Determine measures to achieve each driver (5, 6, 7, 8)					
Determine existing City targets/requirements for each measure (6)					
Identify gaps in existing by-laws, policies, etc. and revise where feasible (6)					
Define targets and how they will be communicated (5, 6, 7, 8)					
Develop resources to provide to public (Centre of Excellence, websites) (32, 33)					
Determine suitable sites and technologies to use for pilot projects (28, 29)					
Determine feasible incentives (11, 14, 17, 20, 25)					
Set eligibility criteria and pricing for feasible incentives (11, 12, 14, 15, 17, 20, 21, 27)					
Develop guidelines for feasible incentives (13, 22)					
Provide training to staff (31)					
Communicate available incentive programs to the public (23)					
Provide support to developers interested in incentives (24)					
Construct pilot projects and report on lessons learned to revise Strategy (28, 29, 30)					
Provide awards and recognition to development community (10)					
Review and revise Strategy elements to ensure they remain relevant (34)					
Expand scope of the Strategy to neighbourhood and community scale (37)					

APPENDIX A BROAD PRECEDENT REVIEW

October 14, 2009





City of Mississauga
Green Development Strategy - Phase 1 Preliminary Literature Review

Item	Standard Name / Jurisdiction (Bold text indicates most relevant for further analysis)	Region	Region Type	Responsibility for administration	Drivers					Initiative Type	Implementation	Owner	Building Type							Overview of Guidelines	Implementation	Potential Success Factors	Applicability to Mississauga	Web Links			
					Air Quality	Urban Heat Island	Stormwater runoff	Water Conservation	Waste Diversion				Green Space	Other	Public	Private	Commercial	Single Family	MURB						Institutional	All Buildings (Except Single Family)	Planning/Community-based
1	City of Vancouver Sustainability Strategy	North America	Municipal	Existing Departments	X	X	X	X	X	X	Food security	M				X				X	X	Both	Several programs have been implemented as part of the City's broader sustainability strategy. Initiatives include: - A Green Building Strategy for all commercial, institutional, mixed-use, and high density residential buildings. Actions in process include efforts for rainwater management, heat island mitigation, ecology, passive design, GHG reduction, transport management, and waste diversion. - A Green Homes Program - An EcoDensity Charter that requires new rezoning to meet LEED™ Silver or equivalent. Other City initiatives for waste, transportation, and green space are also included.	On July 22, 2008, City Council adopted changes to By-law and zoning guidelines that set an environmental performance for buildings over 3 stories or greater than 600 square meters. The City is adopting ASHRAE 90.1 2004 as new Energy Utilization By-law and decreasing overall building energy use requirements by 12-15% beyond ASHRAE 90.1 2001 to meet NRCan's Commercial Building Incentive Program requirements. The Green Homes Program in 2008 amended the building by-law for one family homes to improve construction, energy, and water performance. The EcoDensity Charter includes a rezoning policy for green buildings to achieve LEED™ Silver or equivalent.	Regulatory enforcement through zoning and by-law changes.	Unlike Mississauga, Vancouver has the authority to require buildings to perform above code minimum levels. However, it is a Canadian city with a similar population to Mississauga and a unique reputation for encouraging green building and increased density which we think will be valuable to Mississauga.	http://vancouver.ca/sustainability/building_green.htm http://www.vancouver-ecodensity.ca/
2	Toronto Green Development Standard	North America	Municipal	Existing department (City Planning)	X	X	X	X	X	X	GHG's	V M,I (proposed)		X					X		New	The Toronto Green Development Standard sets a series of targets, principles, and practices to guide development of City-owned and private sector facilities. The TGDS meets or exceeds the Ontario Building Code and is based on a comparative analysis of LEED™, Green Globes, and Energy Star. The Standard is based on principles that are measureable, performance oriented, focused on the design and construction of the built form (not on building operations or workplace programs that could also influence environmental performance), and user-friendly.	The Green Development Standard includes a separate checklist of practices and processes for low-rise residential, low-rise non-residential, and mid to high rise residential, commercial, and institutional. A new version (Toronto Green Standard) is due for final release in September, 2009, has a two-tier approach: Tier 1 are items within site plan review control + energy performance, and Tier 2 are not within site plan control but a 20% decrease off development charges are available for complying.	The first version had simple requirement descriptions and no documentation requirements; requirements were open to interpretation. It was developed as a voluntary tool but was turned into a mandatory requirement by other public entities. There was minimal support available from the City. The new version will be connected to the planning process and have more staff resources allocated.	Similar regulatory tools available. Some developers likely work within Toronto and Mississauga and therefore will be familiar with Toronto's program.	http://www.toronto.ca/planning/greendevlopment.htm http://www.toronto.ca/planning/consultantsreport.htm	
3	Town of Caledon Green Development Program	North America	Municipal	Existing department (Town of Caledon)	X	X	X	X	X	X	Energy/water security	V		X					X		New	The Town of Caledon's voluntary Green Development Program provides financial incentives for commercial and industrial buildings that are built to LEED™ standards and/or incorporate green technologies. The Town's Environmental Action Report also identifies other initiatives related to energy, air quality, and planning.	The program provides development charge discounts as a percentage of the non-residential development charge. These discounts range from 20% for LEED™ Certified buildings to 27.5% for LEED™ Platinum buildings. Green technologies, including solar hot water systems, transpired solar collectors, solar photovoltaic systems, permeable pavement, and stormwater cisterns, are discounted at 5%.	Monetary incentives, requirements based on existing standard to support successful implementation.	Similar regulatory environment.	http://www.town.caledon.on.ca/greendevlopment/ http://www.town.caledon.on.ca/content/townhall/departments/planningdevelopment/EnvironmentalAction_Report_2007.pdf	
4	City of Kelowna - Kelowna 2030 Official Community Plan	North America	Municipal	Existing department (City of Kelowna)	X	X	X	X	X	X	Food systems (urban agriculture)	M (proposed)		X					X	X	Both	The Kelowna 2030 Official Community Plan states that it will guide land use, development, transportation and infrastructure decisions for the next twenty years to ensure residents' desired future state is achieved.	The Plan is still in draft form and in the public consultation phase. Detailed objectives and policies needed to implement the initiative are included in the draft plan.	The Plan can form a strong backbone for future strategies to implement the Plan's policies.	Minimal; different regulatory environment. Document was developed with similar intentions as the Mississauga Plan rather than a Green Development Strategy.	http://www.kelowna2030.ca http://www.kelowna2030.ca/spaw2/uploads/files/OCPlan%20Draft%20Final%20-%20Web%20Version.pdf	
5	Coquitlam Green Development Guide	North America	Municipal	Existing department	X	X	X	X	X	X		V		X					X	X	New	The Green Development Guide provides an explanation of green development topics, and highlights green development practices which apply to development conditions within Coquitlam. The Green Development Guide discusses five key topics: - Green Building (including renewable energy) - Green Infrastructure (stormwater management and district energy) - Natural Infrastructure (open space networks, naturescaping) - Sustainable Transportation (street design, transit-oriented development) - Sustainable Neighbourhoods (design principles, rating systems)	The Green Development Guide is intended to be an information and reference tool used by the development community and their consultants, City Council, and staff in the preparation, review, and consideration of development applications.	Includes a green building primer section, case studies, photos, etc. to create a comprehensive resource.	Case studies and layout of Guide may be considered for Mississauga's Standard.	http://www.coquitlam.ca/Business/Developing+Coquitlam/Green+Development+Guide.htm	
6	City of Calgary - Sustainable Building Policy	North America	Municipal	Existing Department	X	X	X	X	X	X		M	X						X		Both	The Sustainable Building Policy mandates that new City-owned facilities must meet the LEED™-NC Gold standard, depending on size. Major renovations of City-owned facilities must meet LEED™-CI Silver or LEED™-NC Silver. New affordable housing must meet or exceed BuiltGreen Silver. Minor renovations or small buildings are excluded from LEED™ requirements but must follow the relevant sustainable building practices.	The City maintains a Sustainable Building Team, consisting of representatives of Business Units involved in environmental sustainable building practices, to provide input into reviewing and updating the Sustainable Building Policy, helping provide technical expertise on specific sustainable building issues and coordinating sustainable building knowledge and LEED™ (or other assigned rating system) training. The Team is also responsible for assisting project managers to understand and apply The Policy. A Community Green Fund created in 2006 provided \$15k for 5 environmental projects; fund increased to \$20k in 2007.	Based on existing standards to support successful implementation.	A similar Sustainable Building Team could be established to manage green development projects.	http://www.calgary.ca/docgallery/bu/cityclerks/council_policies/amcw005.pdf	
7	Montreal's Strategic Sustainable Development Plan	North America	Municipal	Existing department (Environment Canada)	X	X	X	X	X	X	Encourage industries, business, and institutions to adopt sustainable development practices	V		X					X		Both	The "Montreal Urban Indicators System Project" gives an excellent set of indicators Montreal is using to measure sustainability. The Strategic Plan identifies key action areas for sustainable development including: - reducing the heat emitted by one building or group of municipal buildings when replacing or renovating buildings - adopt and implement the master plan for waste management for metropolitan Montreal - commit to implementing measures to reduce, reuse, recover and reclaim waste generated in all municipal buildings - carry out at least 30 energy efficiency projects and 3 renewable energy projects by 2009 - carry out at least one energy efficient building project	By late 2006, nearly 70 organizations had committed themselves to achieving actions in the 2005-2006 Start-up Phase. In early 2007, a new challenge was issued to all partner organizations asking them to carry out at least five actions, including one feature action, from the 26 actions in the 2007-2009 Phase. Information dissemination and awareness-raising play a crucial role in the implementation of the Plan. During the development process for the Plan, partners recognized the need for environmental monitoring. The first report on environmental indicators for the 1999-2003 period was issued in November 2005. Reports will be produced every two years.	While the indicators are good there is little information provided regarding sustainable action plans or initiatives.	Appears to be one of the best strategies for measuring impacts on the environment and for using competition to encourage participation in the program.	http://ecoplan.mcgill.ca/?q=en/node/102 http://ville.montreal.qc.ca/pls/portal/docs/page/dev_durable_fr/media/documents/2007-2009_Phase_Abridged_En.pdf ville.montreal.qc.ca/developpementdurable	
8	Kitchener Local Environmental Action Fund	North America	Municipal	Existing department	X						Education	FI		X					X	X	Both	The Local Environmental Action Fund (LEAF) provides \$5 million in funding for projects that promote a sustainable Kitchener through the reduction of greenhouse gases. Projects and programs funded by LEAF must meet specific eligibility criteria that meet citizen's environmental priorities.	LEAF is intended to operate as a catalyst to leverage participation and investment by all stakeholders in the community to improve the environment. Funding ends in March 2009.	Funding provided to eligible developments. Applicants must describe how the proposed project meets the City's environmental goals; no quantitative targets are set.	Could investigate similar funding sources and strategies.	http://www.kitchener.ca/leaf	
9	Town of East Gwillimbury - Thinking Green Initiatives	North America	Municipal	Existing department	X	X	X	X	X	X		V		X	X				X		New	In 2006 East Gwillimbury Council passed a resolution adopting a Municipal policy directing all new Town facilities and new industrial, commercial, institutional and high-rise residential buildings within the municipality to be built to LEED™ Silver, with 17 specific credits being mandatory. This policy was modified in October 2007, when Council adopted a scaled approach to LEED™ certification based on building size. After January 2010, all major renovation projects will also have to achieve LEED™ Silver. Also in 2006 East Gwillimbury Council passed a resolution to adopt a municipal policy directing all new residential developments requiring either Site Plan or Subdivision approval to construct to ENERGY STAR qualification	The Town of East Gwillimbury is the first Canadian municipality to mandate LEED™ requirements for the private sector.	This approach requires full council buy-in as it pushes the realm of what is commonly understood to be within a municipality's jurisdiction.	Similar regulatory environment.	http://www.eastgwillimbury.ca/Environment/Thinking_Green_Initiatives/LEED™.htm	
10	City of Victoria - Green Principles for City Planning	North America	Municipal	Existing department (Planning and Development)	X	X	X					V, M		X			X	X			New	Victoria's Green Principles for City Planning include policies for public and private development. The Civic Green Building Policy requires all new construction of civic facilities over 500m2 to be LEED™ Silver with a goal of LEED™ Gold. The City is currently exploring a policy for private development.	A Green Building Policy for private development is being investigated.	Recommendations to mandate LEED™ Silver has been met with hesitation by stakeholders, as they perceive that it would be a barrier to development due to administrative costs.	Investigation is too early to identify applicability.	http://www.victoria.ca/cityhall/plnsrv_green_bldngs.shtml	
11	Metro Vancouver BuildSmart Program	North America	Municipal	Existing Department	X	X	X	X	X	X	All (but focuses on Demolition, Land Clearing and Construction (DLC) Waste Management)	V		X					X		New	BuildSmart is a program developed and administered by Metro Vancouver to encourage the use of green building strategies and technologies.	A Demolition, Land Clearing and Construction (DLC) Waste Management Toolkit, a reference guide for contractors, design professionals and building owners, has been developed to help them maximize the amount of construction and demolition waste diverted from disposal through salvage, reuse and recycling. Green building training workshops are provided	No mandate or incentives to promote program adoption across the city.	Some content may be useful for Mississauga's strategy.	http://www.metrovancouver.org/buildsmart http://www.metrovancouver.org/about/publications/Publications/dlctoolkit08web1.pdf - DLC Management Toolkit	
12	Ottawa Green Building Policy	North America	Municipal	Existing department (City of Ottawa)		X	X				Public transportation	M	X						X		New	All new municipal buildings greater than 500m2 (5,400 sq.ft.) must be LEED™ Certified. All newly constructed buildings will incorporate energy efficient features into the building design to meet the standard required by CBIP. Historic structures shall be exempt from the requirements of this policy. However, wherever practical, best efforts should be made to incorporate as many of the green building requirements and credits from the LEED™ Green Building Rating System as possible, without compromising the historical integrity of the structure.	Departmental Managers will be responsible to ensure that project budgets contain the 5% investment funding required to support the delivery of LEED™ – Canada 'Certified' building projects. Design and Construction Division, Real Property and Asset Management Branch: Project managers implementing individual projects will be responsible for delivering LEED™ – Canada 'Certified' projects. Supply Services Division, Finance Branch will be responsible for ensuring that all RFP and tender documents identify the requirement to deliver LEED™ – Canada 'Certified' projects.	By limiting requirements to City buildings, City has control however environmental benefit of green development is not enforced in private sector.	Mississauga's strategy should go beyond municipal buildings.	http://www.ottawa.ca/city_hall/policies/green_building/index_en.html	

Item	Standard Name / Jurisdiction (Bold text indicates most relevant for further analysis)	Region	Region Type	Responsibility for administration	Air Quality	Urban Heat Island	Stormwater runoff	Water Quality	Waste Diversion	Green Space	Other	Initiative Type	Public	Private	Both	Commercial	Single Family	MURB	Institutional	All Buildings Except Single Family	New / Existing/ Both	Overview of Guidelines	Implementation	Potential Success Factors	Applicability to Mississauga	Web Links	
13	Pickering Sustainable Neighbourhood Plan	North America	Municipal	Existing department (City of Pickering)	X	X	X	X	X	X	Transportation, food production, emergency preparedness	V, M			X					X	X	New	Sustainable City Project includes programs for - Benchmarking Sustainability - Sustainable Neighbourhood Plan Guidelines 1. Benchmarking Sustainability Framework - Responsible development (LEED, Green Globes, Energy Star, sustainable neighbourhoods, transportation) - Responsible consumption (GHG, energy, water) 2. Sustainable Neighbourhood Plan - developed a "scorecard" to measure sustainability - flexible plan, but based on LEED ND - Neighbourhood Guidelines encompass: environmental protection, development location, land use, development density and built form, resource efficiency, phasing, monitoring, etc.	The plan identifies a feasible, affordable and multi-stakeholder approach to sustainable neighbourhood design that will be applied to a conceptual development area. Sustainability principles, guidelines and strategies developed for the conceptual neighbourhood will also serve as a template for future development, for both greenfield and infill development, throughout the City of Pickering.	The plan encourages green development at the building, community, and neighbourhood scale. Benchmarking and monitoring success is an important aspect of the plan.	Mississauga's strategy could target and monitor success at the building, community, and neighbourhood level.	http://www.sustainablepickering.com/SNP/
14	City of Scottsdale Green Building Program (Arizona)	North America	Municipal	Existing Department	X	X	X	X	X	X	Increase renewable energy capacity	V, M , FI			X	X				X		Both	All new occupied city buildings of any size to achieve LEED™ Gold and to strive for the highest level of certification whenever project resources and conditions permit. In addition, all future renovations and non-occupied city buildings will be designed, contracted, and built to include as many principles of both the LEED™ program and the City's Green Building Program as feasible. The program also includes checklists for residential construction. The Rating Checklist includes 28 mandatory requirements and 135 total options, for a maximum possible point total of 270. Two rating levels: Entry (50 - 100 points) and Advanced (100 - 200) The City's Green Building Program is overseen by a Green Building Advisory Committee. Program incentives include: - Fast track plan review service, including development process and technical assistance - Green Building Permit and Inspections – Once plans are approved under the green building rating checklist, a green building permit is issued and green building inspections are provided to ensure the project complies with the green building provisions as approved on the plans. - Job site signs - City green building construction job site signs are available for builders to help distinguish their projects from others. - Directory of participating designers and builders - Participating architects, designers and builders are listed and published in promotional materials - Homeowner's manual which includes the green Certificate of Occupancy, signed copy of Green Certificate of Completion, list of green features, product literature and manufacturer's manuals. - Promotional package for builders/developers - Educational programs such as the annual Green Building Expo and a monthly green building and solar lecture series.	The program involves incentives, technical assistance, marketing support, and clear process to support successful implementation. Vague performance requirements - "whenever project resources and conditions permit", "as many principles of ... LEED™... as possible" - may lead to subjective applications and reviews.	Some implementation strategies could be considered.	http://www.scottsdaleaz.gov/greenbuilding.asp	
15	Massachusetts Green Building and Infrastructure Program	North America	Regional	Existing department (Massachusetts Technology Collaborative's Renewable Energy Trust)	X						Increase renewable energy capacity	V, FI			X	X				X		Both	The Green Buildings and Infrastructure Program provides financial and technical support for including renewable energy technologies in the broader process of green building development. The Program includes four distinct initiatives: - Green Affordable Housing - Green Schools - Large On-site Renewables - Small Renewables (Studies completed for MTC on the costs and benefits of green schools show that incremental costs of green schools in Massachusetts range from 1.5% to 2.5% and can provide benefits of up to 8 times the incremental cost over a 20-year lifecycle period.)	The Program supports individual projects and will use the results to increase knowledge of green building and renewable energy benefits and practices among building professionals and the public. MTC's Renewable Energy Trust is offering \$15 million in grants to fund clean energy technologies and green building design and planning assistance at schools that meet new guidelines for energy efficiency. The pilot phase of the Green Schools Initiative led to the new state regulations that require all new school or major renovation projects approved for a grant from the MSBA after July 1, 2007 to adopt numerous green design measures. MTC and the Mass. Department of Education are collaborating to supplement existing state codes and expand the use of clean energy technologies and other advances in school buildings on both statewide and site-specific bases. Under the Mass. Collaborative for High-Performance Schools, a best-practices manual is being created to help influence future school design and construction.	Promoting overall public awareness and providing technical support are likely to support successful implementation.	Some implementation strategies could be considered.	http://www.masstech.org/renewableenergy/green-buildings.htm
16	San Francisco Green Building Program	North America	Municipal	Existing Department (Department of the Environment)	X		X	X	X			M, FI			X					X		Both	The Green Building Program requires new large commercial buildings (>5000 square feet), residential high rises (over 75 feet), and renovations larger than 25,000 square feet comply with LEED™ standards. Other new residential construction would have to comply with the GreenPoint Rated standard. All municipal projects (new construction and major renovations over 5,000 square feet) are required to achieve LEED™ Silver certification. The San Francisco Municipal Green Building Compliance Guide provides an overview of the City's green building requirements and is intended as a resource for CCSF professionals working on the planning, design, construction, operation, and demolition of City buildings. Other initiatives include the SF Green Building Design Toolkit and SF GreenPRINT, the Green Project Reporting and Information Tool.	The Green Building Program is to be phased in over a number of years, starting in 2008, with the strictest part of the code being implemented in 2012. Projects which commit to LEED™ Gold certification are eligible for priority in permit processing. San Francisco's Rainwater Harvesting Rules allows homeowners to legally disconnect their downspouts and use rainwater for non-potable purposes both inside and outdoors. Effective November 2008, Chapter 13C of the San Francisco Building Code requires new buildings constructed in the city to meet green building standards, which were developed by the Green Building Task Force. Several other municipal green building legislation can be found on the website.	Integrating with code requirements combined with incentives supports successful implementation.	Some implementation strategies could be considered.	http://www.sfgov.org/site/dbi_index.asp?id=89703 http://www.sfgov.org/site/dbi_index.asp?id=89703
17	San Jose Green Building Policy	North America	Municipal	Existing Department (Environmental Services)	X	X	X	X	X	X		M (public); V (private)			X					X		Both	The updated Green Building Policy requires all new municipal buildings over 10,000 square feet to be constructed to achieve LEED™ Silver level certification at a minimum, with a goal of reaching LEED™ Gold or Platinum certification. The policy also states that the City shall provide leadership and guidance to encourage the application of green building practices in private sector planning, design, construction, management, renovation, operations, and demolition of buildings by promoting the voluntary application of the San José Green Building Policy goals. All new projects 10,000 square feet or over shall be required to do a cost benefit analysis to determine the highest practical level of certification along with the appropriate budget. Staff shall be dedicated to facilitate the processing of green building permits and plan review; serve as a resource for training and education on incorporating green building principles into private development projects; and maximize outreach opportunities with developers on the benefits of sustainable building and the certification process.	The Policy states: An Executive Steering Committee (ESC) shall be created and comprised of Senior City and Agency staff and include the directors of departments that construct, manage, maintain or occupy City and Agency facilities subject to this policy. The committee shall meet regularly to review the program and budget proposals and serve as a conflict resolution body to resolve issues as necessary to ensure the successful implementation of this policy. The ESC shall prepare and submit an annual Green Building Report to the City Council. The Density Bonus Incentive which provides greater heights and/or greater floor area for commercial and residential buildings achieving a LEED™ Silver rating or higher. The Federal Tax Deductions - Energy Policy Act of 2005 (EPACT2005) for new commercial buildings or reconstructed buildings that achieve a 50% reduction in energy use to qualify for a range of tax deductions up to \$1.80 per square foot. Partial deductions are also available for lighting, HVAC and building envelope improvements. Education and outreach is also a major implementation strategy, with public forums, workshops, and conferences.	Private development is not mandated or incented to conform with the Policy. Green Building Policies are prescriptive rather than quantitative which can lead to subjective reviews.	Mississauga's strategy should focus on quantitative evaluation with processes in place to mandate/incent private development rather than limit strategy to the public sector.	http://www.sanjoseca.gov/esd/natural-energy-resources/gb-policy.htm
18	City of Seattle's Green Building Program (CITY Green Building)	North America	Municipal	Issue-dedicated Office (Office of Sustainability and the Environment)	X	X	X	X	X	X	Sustainable forests	M for public; V for private; FI			X					X		Both	Sustainable Building Policy is short. Applies to new and renovated City projects with over 5,000 square feet of occupied space, must achieve a LEED™ silver rating. Direction to use Built Green for home renovations and residential green buildings. The program offers a wide range of technical, financial, and educational support for commercial, multifamily and residential green buildings. The website and annual report contains extensive information on the program. Adopted in January 2007, the Seattle Green Factor program is intended to increase the amount and quality of urban landscaping in new development in commercial zones while providing flexibility for developers and designers to efficiently use their properties.	City Green Building provides technical assistance and project coaching at three different levels to DPD permit applicants, developers, owners, and their project teams. The Density Bonus Incentive which provides greater heights and/or greater floor area for commercial and residential buildings achieving a LEED™ Silver rating or higher. The Federal Tax Deductions - Energy Policy Act of 2005 (EPACT2005) for new commercial buildings or reconstructed buildings that achieve a 50% reduction in energy use to qualify for a range of tax deductions up to \$1.80 per square foot. Partial deductions are also available for lighting, HVAC and building envelope improvements. Education and outreach is also a major implementation strategy, with public forums, workshops, and conferences.	Technical support, monetary incentives, and education support a successful implementation. Technical assistance must be of high quality and readily available; this puts pressure on City staff time.	Implementation strategies could be used in Mississauga.	http://www.seattle.gov/dpd/GreenBuilding/ http://www.seattle.gov/environment/building.htm http://www.seattle.gov/dpd/static/2007_CGB_AnnualReport_Final_LatestReleased_DPDP_021831.pdf
19	Portland Green Buildings Policy	North America	Municipal	Issue-dedicated Office (Office for Sustainable Development)	X	X	X	X	X	X		M for public; V for private; FI; FP			X					X		Both	The Policy is short but it applies to new construction & major renovation of all city facilities must meet LEED™ certification. G/Rated is their Green Building program which provides significant amount of information to implement green building for private sector. Commercial, high-rise and institutional buildings to achieve LEED™ Certified, but encouraged to go as high as possible. Portland LEED™ supplement developed. New/renovated green homes guidelines developed. Also includes guidelines for affordable housing projects. Portland Development Commission commercial projects to achieve LEED™ Silver. A proposed High Performance Green Building Policy is applicable to new commercial, MURB, and single-family buildings and existing commercial buildings.	The proposed High Performance Green Building Policy provides incentives and technical assistance for projects that incorporate advanced green building measures. The policy includes a "feebate" system for new commercial and multifamily buildings, with the fee/rebate issued depending on the level of energy performance improvement and LEED™ certification level attained. All new buildings built to code are assessed a fee, projects built to LEED™ Silver have the fee waived and the owner obtains access to financing options, and projects built to LEED™ Gold are given a financial reward. In-depth information regarding the financial structure of the feebate program can be found on the program website.	Financial incentives offered could lead to increased uptake.	Portland's Green Building Policy is one of the most extensive in the US by including a wide range of voluntary guidelines and incentive programs for all building types and construction activities. Individual components and methods of how Portland spurred green development could be adapted to Mississauga's requirements.	http://www.portlandonline.com/osd/index.cfm?c=41481 http://portlandonline.com/osd/gbpolicy
20	Alameda County Green Building Program	North America	Regional	Public Agency (Stop Waste)					X						X					X		Both	The program serves three target markets: Alameda County Waste Management Authority's seventeen member agencies; design and building industry professionals; and residents of Alameda County. Provides separate design guidelines and checklist for single family homes and multi-family. Directive for public buildings and commercial buildings is to follow LEED™.	The Green Building Program offers a full range of educational opportunities to increase general awareness of green building and provide ongoing professional development including workshops, seminars, and training for project managers, planners, building inspectors, architects, and contractors. The green building program also partners with local organizations such as National Association of Remodelling Industry, and Northern California Chapter of the USGBC. Policy development includes adoption and implementation of a Construction & Demolition Recycling Ordinance and Civic Green Building Ordinance.	Based on existing standards to support successful implementation.	Strong waste management policies and ongoing professional development to industry professionals could be used for Mississauga Standard.	http://www.stopwaste.org/home/index.asp?page=Z http://www.stopwaste.org/docs/2004_program_description_9-04.pdf

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Item	Standard Name / Jurisdiction (Bold text indicates most relevant for further analysis)	Region	Region Type	Responsibility for administration (Dept. of Environmental Services)	Drivers					Initiative Type Voluntary - V Mandatory - M Financial Incentive - FI Financial Penalty - FP	Implementation		Owner		Building Type							New / Existing/ Both	Overview of Guidelines	Implementation	Potential Success Factors	Applicability to Mississauga	Web Links
					Air Quality	Urban Heat Island	Stormwater Runoff	Water Conservation	Waste Diversion	Green Space					Public Buildings	Both	Commercial	Single Family	MURB	Institutional	All Buildings (Except Single Family)						
21	Arlington County, VA Green Building Program	North America	Municipal	existing department (Dept. of Environmental Services)	X	X	X	X	X		V			X							X	Both	Arlington County encourages private developers to evaluate the environmental impacts of all site plan projects. Requirements for site plan projects include: - LEED™ AP as part of design team - submission of a LEED™ Scorecard - Construction Waste Management Plan - Energy Star appliances for MURBs	The County established a Green Building Fund. The contribution is calculated at \$0.03 per square foot. (This is based on the fees assessed by the USGBC for registration and evaluation of a formal LEED™ application.) The Green Building Fund is used to provide education and outreach to developers and the community on green building issues. If a project achieves 26 or more points and the developer receives LEED™ certification from the USGBC, the Fund contribution is refunded. The county's Green Building Incentive Program allows a private developer to apply for additional density if the project achieves any level of LEED™-NC certification. The program applies to all types of building projects (office, high rise residential, etc.). The density bonus ranges from a minimum of .15 FAR for a LEED™ Certified project to a maximum of .35 FAR for a platinum project.	Financial incentives based on existing standards to support successful implementation.	Green building fund and additional density allowance could be implementation strategy for Mississauga	http://www.arlingtonva.us/departments/environmentalservices/epo/environmentalservicesepogreenbuildings.aspx
22	Austin Green Building Program	North America	Municipal	Existing Department (Austin Energy)	X	X	X	X	X		M (for new City buildings), V		X	X						X		Both	Guidelines include mandatory and optional items, many of which are based on LEED™. Developers submit a checklist and supporting documentation for review and are awarded a rating. There are Municipal Guidelines for civic buildings and a seven step guide for residential buildings. Also, a Sustainability Sourcebook provides information on regulatory issues for Austin. Provides case studies. Links to rebate programs for residential, commercial and MURBS. In 2000, the City Council passed a resolution requiring all municipal buildings to meet LEED™ Silver rating	The Austin Green Building Program provides a wide range of services to developers, builders and homeowners including training, technical support, and help with access to rebates. Publications include Sustainable Building Sourcebook, Green Building Program Newsletter, Green Home Buyers Checklist, and Municipal Building Guidelines all intended to educate builders and owners of green building opportunities. Some areas are mandated to comply with Program based on zoning. There are Municipal Guidelines for civic buildings and a seven step guide for residential buildings. Also, a Sustainability Sourcebook provides information on regulatory issues, climate etc for Austin. Provides case studies. Links to rebate programs for residential, commercial and MURBS. The Austin Green Map provides highlights and describes the green building projects across the city. (http://www.austineenergy.com/Energy%20Efficiency/Programs/Green%20Building/Resources/Map/index.htm)	Application, review, and approvals process is directly tied to the development process. Guidebooks include measurable targets, documentation requirements, and referenced standards.	Implementation strategies could be used in Mississauga.	http://www.austineenergy.com/Energy%20Efficiency/Programs/Green%20Building/Resources/Map/index.htm
23	The Chicago Standard	North America	Municipal	Existing department	X	X	X	X	X	All	V		X							X		Both	The Chicago Standard is a new set of construction standards for public buildings developed to guide the design, construction and renovation of municipal facilities and is derived from the LEED™ rating system. It is a list of LEED™ credits from various LEED™ documents for projects to target. Chicago's Dept. of the Environment also has initiatives in addition to the Chicago Standard, including those related to air quality, green roofs, urban heat islands, waste management, and brownfields.	City buildings are targeting minimum LEED™ certified for new construction.	By limiting requirements to City buildings, City has control; environmental benefit of green development is not enforced in private sector.	Mississauga should push strategy beyond municipal buildings.	http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/BIHSGAgenda_1.pdf http://egov.cityofchicago.org/webportal/COCWebPortal/COC_ATTACH/ChicagoStandard.pdf http://egov.cityofchicago.org/environment
24	Chicago Green Homes Program	North America	Municipal	Existing department	X	X	X	X	X	Homeowner education	V		X		X	X						Both	The purpose of the Chicago Green Homes Program is to encourage residential builders, developers and homeowners to use technologies, products and practices that will: * Provide greater energy efficiency * Provide healthier indoor air * Reduce water usage * Preserve natural resources * Improve durability and reduce maintenance * Reduce waste and pollution	For most projects, certification under the Chicago Green Homes Program is a multi-step process. Projects initially enrol in the program – typically during the design phase. There are four checklists for different project types; single-family or multi-family, and renovation or new construction.	Checklist has simple requirements with no documentation requirements and vague implementation strategies.	Checklists could help in the development of green standard for residential and MURB buildings	http://egov.cityofchicago.org/environment (Click on 'Chicago Green Homes')
25	City of New York High Performance Building Guidelines	North America	Municipal	Issue-dedicated Office (Office of Sustainable Design, Dept. Design & Construction)	X	X	X	X	X		M, FI		X							X		Both	Initiative includes • Guidelines that are mandatory for all public buildings and recommended for private buildings. • MillionTreesNYC program, aimed at planting one million trees in public and private spaces;	Local Law 86 mandates projects funded in full or partially with city funds must meet varying levels of LEED™ certification based on project size. A Green Schools Guide has been created to assist the school board in meeting Local Law 86.	By limiting requirements to City buildings, City has control; however environmental benefit of green development is not enforced in private sector.	The website contains in-depth information regarding green building guidelines, specs and examples that could be of great use in the development of the Mississauga standard.	http://www.nyc.gov/html/psds/html/standards/standards.shtml
26	Florida Green Building Coalition	North America	Regional	Non-profit (Florida Green Building Coalition)	X	X	X	X	X	Disaster mitigation	V		X	X						X	X	Both	The Florida Green Building Coalition provides 4 certification programs: - Green Home Standard - Green Development Standard - Green High Rise Standard - Green Local Government Standard for Green Cities & Counties - Green Commercial Buildings Standard For each listed green feature incorporated into the development, points are awarded. Developments that acquire a minimum number of points qualify to receive the green development designation and will be able to take full advantage of the designation's incentives. Designation involves a green building rater for technical support and compliance reviews.	Different municipalities offer different incentives for meeting the Guidelines. These include expedited reviews, reduced permitting fees, and reduced service impact fees.	Provides a consistent standard for entire state to use; however, some areas may have different priorities.	Generally not applicable due to location and scale of program. Green Development Standard document presentation could be reviewed for use in Mississauga.	http://www.floridagreenbuilding.org/db/ http://www.floridagreenbuilding.org/db/standards/docs/GreenDevComplete_v5.pdf
27	Los Angeles Sustainable Design Implementation Program	North America	Municipal	Existing department (City of LA Bureau of Engineering)	X	X	X	X	X	Residential Rehab, Deconstruction, Brownfield redevelopment	V, M (for City buildings)		X							X		Both	The City Council created the Sustainable Design Task Force in 1995 to incorporate environmentally sensitive design features into the City's new construction and remodelling projects. Since July 2003, all Department of Public Works new design and construction building projects 7,500 square feet or larger, must meet LEED™ Certified. In April 2008 the Private Sector Green Building Plan was put into law. All projects greater than 50,000 sq ft or 50 units are to comply with LEED™ Certified standards.	For private construction, the City will work with builders to speed up approvals and to remove obstacles in the municipal code for elements of sustainable building design, such as green rooftops, cisterns and permeable pavement. If a builder commits to pursuing LEED™ Silver certification, the City will expedite processing through the Planning and Public Works Departments. The Mayor's initiative will require the City to train case managers as LEED™ accredited professionals and will create one-stop checklists of all available City incentives to guide developers through the green building process. A cross-departmental Sustainability Team was created to review and revise green building policies and specific projects. They will meet weekly so that the development community can enjoy ongoing interaction with City staff. The Mayor's Annual Award of Excellence in Sustainable Design & Construction was created to recognize exemplary efforts by individuals and companies in the private sector.	Expedited processing, checklists of available incentives, an internal Sustainability Team, and an annual award are all initiatives that could lead to increased success.	Implementation strategies could be used in Mississauga.	http://eng.lacity.org/projects/sdip/ http://eng.lacity.org/projects/sdip/docs/SustainableBuildingInitiativeActionPlanFinal043003.pdf
28	Montgomery County (Maryland) Environmental Sustainability Policy	North America	Regional	Existing department (Montgomery County, Department of Public Works and Transportation)	X				X		M		X							X		New	The County's Environmental Sustainability Policy covers areas such as renewable energy, green buildings, air quality, and waste management, applying to government practices. New public buildings must achieve LEED™ Silver and new private buildings achieve LEED™ Certified.	In 2008, Montgomery County Council implemented legislation requiring any newly constructed or extensively modified non-residential or multifamily residential building with at least 10,000 square feet of gross floor area to meet requirements.	By limiting requirements to City buildings, City has control; however environmental benefit of green development is not enforced in private sector.	Generally not applicable due to location and scale of program.	http://www.montgomerycountymd.gov/content/DPT/WT/dtr/sustainability/sustainability.asp
29	Anaheim Green Building Program	North America	Municipal	Anaheim Public Utilities	X	X	X	X	X		V, FI		X							X		New	Anaheim's Green Building Program doesn't set out specific guidelines but rather offers financial incentives for incorporating specific green technologies or building to specific green building rating systems (LEED™, Build it Green, California Green Build and Green Building Initiative Green Globes)	Anaheim's green building program offers incentives for residential and commercial buildings Residential: - Residential Energy Efficiency Program offers \$500-\$1,500 per unit for energy efficient appliances. - TreePower provides free shade trees that can reduce air conditioning costs and keep your home naturally cooler. - Toilet Rebate Program offers \$30 per high efficiency toilet installed. - Solar Energy Buydown offers \$4 per watt for residential PV systems. - Irrigation Controller Rebate provides \$60 per active valve for fully automated landscape watering controllers Commercial: - Incentives from \$15,000 for LEED™ Certified to \$30,000 for LEED™ Platinum - New Construction Incentives offers up to \$300 per kW saved for each measure and up to \$75,000 per facility. - Design Review Assistance provides up to \$10,000 to identify methods to exceed Title 24 Building Code. - TreePower offers free shade trees to help you save energy and beautify your project. - Irrigation Controller Rebate offers \$750 per irrigated acre for for fully automated landscape watering controllers - Solar Energy Buydown provides \$2.80 per watt for commercial PV systems. Economic Development Discount Rate Pasadena's Green Building Program includes three components: 1. Green building ordinance 2. Incentives, and 3. Outreach & education As an incentive to building green, the City offers LEED™ Accredited Professional experts to guide new projects through the green building review at no cost to the project applicant. After a building is completed, the City offers \$1,000 rebates for each affordable housing unit provided in a green building. A Green Building Development Guide is available and provides architects, developers, property owners and others developing property in Pasadena an understanding of the relationship between the city of Pasadena's Green Building Practices Ordinance and the LEED™ requirements.	Variety of incentives based on existing standards may support successful implementation.	Implementation strategies could be used in Mississauga.	http://www.anaheim.net/utilities/adv_svc_prog/green_power/Gmbuild.pdf
30	Pasadena Green Building Program	North America	Municipal	Existing department (Planning and Development)	X	X					M		X	X			X	X		X		New	Pasadena's green building program requires that new municipal buildings, municipal renovations of 15,000 square feet or more, and commercial buildings over 50,000 square feet must meet the intent of LEED™ Silver at a minimum, and all projects subject to the green building ordinance must achieve LEED™ credit 3.1 Water Efficiency (exceed the baseline water projection by 20%).	Pasadena's green building program includes three components: 1. Green building ordinance 2. Incentives, and 3. Outreach & education As an incentive to building green, the City offers LEED™ Accredited Professional experts to guide new projects through the green building review at no cost to the project applicant. After a building is completed, the City offers \$1,000 rebates for each affordable housing unit provided in a green building. A Green Building Development Guide is available and provides architects, developers, property owners and others developing property in Pasadena an understanding of the relationship between the city of Pasadena's Green Building Practices Ordinance and the LEED™ requirements.	Requirements built into municipal code and based on existing standard can lead to increased success. Providing teams a LEED™ consultant at no charge can significantly offset consultant fees, but may lead to liability issues.	Implementation strategies could be used in Mississauga.	http://www.ci.pasadena.ca.us/permitcenter/GreenCity/building/gbprogram.asp



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Item	Standard Name / Jurisdiction (Bold text indicates most relevant for further analysis)	Region	Region Type	Responsibility for administration	Drivers							Implementation	Owner	Building Type							Overview of Guidelines	Implementation	Potential Success Factors	Applicability to Mississauga	Web Links
					Air Quality	Urban Heat Island	Stormwater runoff	Water Quality	Waste	Green Space	Other			Initiative Type	Public Buildings	Private Buildings	Commercial	Single Family	MURB	Institutional					
31	Green Building Program (Frisco, Texas)	North America	Municipal	Existing department (City of Frisco, Texas)	X	X	X	X	X	X		V, M (for residential)		X		X		X		New	<p>The City of Frisco Planning & Development Services Department will host accredited education programs concerning Commercial Green Building Initiatives. Information was not available on how residential program is mandated.</p> <p>For commercial buildings a checklist that focuses around 4 key objectives is used: reduce energy consumption, reduce water consumption, protect ecosystems, and improve air quality. The Commercial program is still in the development stage.</p>		Commercial building requirements are minimal and have vague documentation requirements. Information on incentives and review process was not available online.	Not applicable due to lack of information.	http://www.ci.frisco.tx.us/departments/planningDevelopment/greenbuilding/Pages/default.aspx
32	Santa Monica Green Building Program	North America	Municipal	Existing department (City of Santa Monica)	X	X	X	X	X	X	Public health, education,	M, FI		X	X			X		Both	<p>The Guidelines include required and recommended practices that are intended to reduce life-cycle environmental impacts associated with the construction and operation of both commercial and municipal developments and major remodel projects. The Program requires that public buildings achieve LEED™ certification.</p>	<p>A City Ordinance was established in 2008 with requirements for energy efficiency, recycled-content materials, and other green building standards on new construction projects. It also establishes a priority plan check incentive for certain buildings that pursue LEED™ certification. Other implementation strategies include:</p> <ul style="list-style-type: none">- Educational initiatives (resource centre, seminars, green home tour, annual expo);- Creation of a Green Business Certification program;- Financial incentives and expedited permitting for buildings pursuing LEED™; and- Publication of a "Sustainable City Report Card" detailing the success or shortfalls of the city's sustainability initiatives.	<p>Targets and documentation requirements are descriptive yet quantitative to allow a variety of projects to successfully meet credits. Some credits should be more quantitative to reduce subjective applications and reviews.</p> <p>Process is not clearly related to the planning process.</p>	Implementation strategies could be used in Mississauga.	http://greenbuildings.santa-monica.org/index.html
33	King County (Washington) GreenTools Program	North America	Regional	Issue-dedicated Office (Green Building Team)	X	X	X	X	X	X		V, FI		X			X		Both	<p>All County-owned/funded new construction and major remodel and renovation projects are required to achieve the LEED™ Gold certification. All capital projects that are not eligible or are limited in their ability to achieve LEED™ certification (e.g., infrastructure projects) must incorporate cost-effective green building and sustainable development practices using a county-developed "scorecard" or checklist.</p> <p>In addition, a LEED™ Supplement for King County was also developed that highlights credit strategies from a King County context.</p>	<p>The King County Green Building and Sustainable Development Ordinance went into effect in July, 2008. A Green Building Team is to be established to provide education and guidance to county departments.</p> <p>The King County Green Building Grant Program and the LEED™ Grant Program awards \$20,000 to \$30,000 to projects that are 4- or 5-star Built Green™ certified or LEED™ Silver or above; in addition, projects must also meet the King County 2005 Surface Water Design Manual Standards, the King County Post-Construction Soil Standard, and divert at least 75 percent of construction and demolition debris.</p> <p>GreenTools provides technical assistance, grants and hands-on training to help users create green projects efficiently and effectively.</p>	<p>Financial incentives offered could lead to increased uptake.</p> <p>Providing details on how projects in King County can use local resources for LEED™ projects may increase the number of LEED™-certified buildings indirectly.</p>	Mississauga could consider providing municipal/regional/provincial resources to help developers document requirements.	http://www.metrokc.gov/dnrp/swd/greenbuilding/index.asp http://your.kingcounty.gov/solidwaste/greenbuilding/documents/GreenBuildingAnnualReport_07.pdf	
34	Commonwealth of Pennsylvania High-Performance Green Building Guidelines	North America	Regional	Existing departments (Departments of Environmental Protection and General Services)							all	V		X			X		New	<p>The Commonwealth of Pennsylvania High-Performance Green Building Guide is a document that discusses building systems, practices, and processes inherent in green building design. The guide is more of a textbook style document rather than a points-based rating system.</p>	<p>The Guidelines are intended to familiarize decision-makers and others involved in the design, construction and development communities and buildings with the concept of sustainability. It is formatted to present theory and practice, concepts and case studies with sufficient detail and checklists to present the subject without dictating solutions. It is not meant to be a prescriptive document.</p>	<p>This is a good starting point to present green strategies to the construction industry. May not lead to increased green development as there are no incentives, mandates, or frameworks associated with the Guidelines.</p>	Not applicable - Mississauga's strategy should be more implementation-oriented.	http://www.gggc.state.pa.us/gggc/cwp/view.asp?a=3&q=152561&gggcNav=-515&q=156978 http://www.gggc.state.pa.us/gggc/cwp/view.asp?a=515&q=156978	
35	Pittsburgh's Green Building Alliance	North America	Private	non-profit (Green Building Alliance)								V		X			X		Both	<p>The mission of the GBA is to Educate, Research & Create Resources, Develop Public Policy, Improve Public Relations all with respect to Green Building in Pittsburgh. To date the program has resulted in educational programs such as workshops, summits and educational forums.</p>	<p>The City of Pittsburgh formed a Green Government Task Force late in 2006. A Green Building Fund was created to assist building owners and developers with the implementation of green building practices. It is available to qualified developers who plan to integrate green design into either new construction or rehabilitation projects. The Fund provides a source of flexible financing with:</p> <ul style="list-style-type: none">- Loan amounts from \$200,000 to \$400,000- Subordinate collateral positions- Fixed market-rate financing for the term of the loan- Extended repayment terms when necessary- Potential support for soft costs associated with the LEED™ rating system	<p>Organized financial incentive and education program to promote green development.</p>	Although organized by a not-for-profit, funding strategies can be explored for Mississauga.	http://www.gbapgh.org/WhatWeDo_Education.asp	
36	Minnesota Sustainable Design Guide & Building Guidelines	North America	Regional	University of Minnesota	X	X	X	X	X	X		V, M (public projects)	X		X		X		New	<p>The State of Minnesota Sustainable Building Guidelines (MSBG) build on previous local and national efforts. The guidelines are designed to be clear, simple and easily monitored with explicit documentation that will record progress. They are designed to be compatible with national guidelines such as LEED™ while maintaining regional values, priorities and requirements.</p> <p>The guidelines are organized into 5 topic categories: Performance Management, Site and Water, Energy and Atmosphere, Indoor Environmental Quality, Materials and Waste.</p>	<p>Version 1.1 of The State of Minnesota Sustainable Building Guidelines was released in July 2004 and tested on several pilot projects. Version 2.0 reflects improvements based on lessons learned from the pilot projects; it has been changed to Version 2.1 following a public review period.</p> <p>The Minnesota Legislature required the Departments of Administration and Commerce, with the assistance of other agencies to develop sustainable building design guidelines for all new state buildings funded by bond money after January 1, 2009.</p>	<p>Clear documentation requirements and pilot testing may support program success.</p> <p>The guidelines are compatible with LEED™ but maintain regional values, priorities, and requirements.</p>	Implementation strategies could be used in Mississauga.	http://www.msbg.umn.edu/	
37	City of Boulder - Green Points Building Program	North America	Municipal	Existing department (Community Planning Department)		X	X	X	X			M		X		X	X		Both	<p>The Green Points Program applies to all new residential construction, additions and remodels larger than 500 square feet. This program requires applicants to earn "points" by selecting green building measures. Detailed document that outlines credit requirements with photos and diagrams.</p>	<p>This program is required to receive a building permit. City council has adopted ordinances and amended the building code that require increased energy efficiency in new commercial construction and residential remodels and additions. It has been included in building code since 1996 for residential new construction and renovation projects as part of the permit application process.</p> <p>Minimum points are required for permit applications based on square footage.</p>	<p>Included in planning process and presented with clear descriptions and illustrations to improve understanding.</p>	Implementation strategies could be used in Mississauga.	http://www.bouldercolorado.gov/index.php?option=com_content&task=view&id=208&Itemid=489	
38	Built Green Colorado (Metro Denver)	North America	Municipal	non-profit (Built Green Colorado)	X	X	X	X	X	X		V		X		X	X		Both	<p>A comprehensive checklist that requires builders to meet sustainability requirements.</p>	<p>Built Green is a voluntary industry-driven program of the Home Builders Association of Metro Denver offered to builders across the state.</p>	<p>While voluntary, the program provides marketing for product manufacturers and builders on their website.</p>	Mississauga could adopt a similar website listing of builders that have met the Strategy.	www.builtgreen.org	
39	BuiltGreen, Bellevue, WA (Seattle Area)	North America	Municipal	Non-profit Home Builders Association (Master Builders Association of King and Snohomish Counties)	X	X	X	X	X	X	Education	V		X		X	X	X	Both	<p>This program is centered around a comprehensive checklist with weighted items organized into 5 environmental impact categories: Site and Water, Energy Efficiency, Health and Indoor Air Quality, Material Efficiency and Promotion of Environmentally Friendly O&M. There are four checklists that are intended to be used for New Home Construction, Home Remodelling, Multifamily Dwellings and Communities.</p>	<p>In order to become a member of the program, one has to attend a 1.5 day "Built Green University" training seminar. This training is required for all builder and energy rater members, and developed specifically for the use of those members to align with the Built Green Checklist.</p>	<p>While voluntary, the program provides marketing for builders on their website.</p>	Mississauga could adopt a similar website listing of builders that have met the Strategy.	www.builtgreen.net	
40	RecycleWorks - Green Building (San Mateo County, California))	North America	Regional	Existing department (San Mateo County)	X	X	X	X	X			V		X			X		Both	<p>Initiative includes:</p> <ul style="list-style-type: none">• A set of voluntary guidelines (the Green Building Guideline);• Educational initiatives;• Sustainable civic buildings; LEED™ has been used as a standard for some new buildings;• Determined the carbon footprint of the city;• Drafted a Climate Action Plan for approval by council that combines the results of the greenhouse gas inventory and a Sustainable Initiatives Plan from 2007; and <p>Also, the central committee produces annual reports on success of the program both in terms of rate of adoption and environment impact. Unique reporting (annual reports for last 8 years) describing state of county in categories of social, economic and environment.</p>	<p>The County has developed a Green Business Program to encourage local small businesses to adopt green practices. The San Mateo County Sustainable Building Checklist is promoted to applicants seeking building permits</p>	<p>No clear incentives or mandate available. There is no documentation or review process; strictly an information portal on various green building strategies.</p> <p>Guideline includes helpful illustrations.</p>	Similar population (~700,000). Its relationship to San Francisco is similar to Mississauga's to Toronto; the county's built-up areas are mostly suburban.	http://www.recycleworks.org/greenbuilding/Overviewoftheprogram http://www.recycleworks.org/pdf/G8-guide-2-23.pdf - Sustainable Design Guide http://www.sustainable.sanmateo.org/AnnualSustainabilityReports	
41	Battery Park City Authority - Environmental Guidelines	North America	Regional	Existing Department	X	X	X	X	X	X	Education	M		X			X	X	New	<p>Guidelines closely relate to LEED™. Residential Buildings guidelines designed to achieve LEED™ NC Gold; goal to achieve LEED™ EB every 5 years post-occupancy. BPCA will achieve LEED™ CI Gold for community space in base of building. Commercial/institutional designed to achieve LEED™ Gold.</p>	<p>These guidelines do not represent a complete resource, but rather a framework of concepts that may be interpreted and refined by the individual design teams to achieve the desired result.</p>	<p>No specific documentation requirements, but the document includes information on how the strategies relate back to LEED™.</p>	Not applicable - Mississauga's strategy should be more implementation-oriented.	http://www.batteryparkcity.org/page/page23.html	
42	Build San Antonio Green	North America	Municipal	Existing department (Metropolitan Partnership for Energy)		X	X	X				V, FI		X		X	X		Both	<p>The program utilizes a voluntary checklist system to create awareness and interest among builders and homeowners in resource-efficient building methods, materials, and technologies.</p>	<p>Various incentives for water/energy efficiency and solar energy are available.</p>	<p>Financial incentives to support implementation.</p>	Not applicable.	http://buildsagreen.org/	
43	Vermont Builds Greener Program	North America	Regional	Vermont Energy Investment Corporation								V		X		X		New	<p>The Vermont Builds Greener Program certifies residential buildings that are constructed to sustainable criteria. The criteria, or Scorecard, is a multi-page list of approaches, including the basic requirements with the available points that determine a building's score. A minimum number of points (100) must be achieved in order to receive the basic level of certification.</p> <p>VBG Handbook is an accompanying guide that details exactly what is required to obtain points for each approach, provides supplemental details and explanations, and lists information on materials and product resources. This guide is under development.</p>	<p>Homes are awarded a certification indicating how many points were achieved. Spot-check reviews are done by the Building for Social Responsibility Group.</p>	<p>Requirements are simple and do not include documentation requirements. This makes it difficult to adapt to non-standard scenarios as the intent of the requirements may not be clear.</p>	Not applicable - Mississauga's strategy should be more implementation-oriented.	http://www.bsr-vt.org/vbg/index.html http://www.bsr-vt.org/vbg/VBG_Scorecard.pdf		

City of Mississauga
Green Development Strategy - Phase 1 Preliminary Literature Review

Item	Standard Name / Jurisdiction (Bold text indicates most relevant for further analysis)	Region	Region Type	Responsibility for administration	Drivers							Initiative Type	Implementation				Owner	Building Type							Overview of Guidelines	Implementation	Potential Success Factors	Applicability to Mississauga	Web Links
					Air Quality	Urban Heat Island	Stormwater runoff	Water Quality	Waste Diversion	Green Space	Other		Public Buildings	Private Buildings	Commercial	Single Family		MURB	Institutional	All Buildings (Except Single Family) Planning/Community-based	New / Existing/ Both								
44	Melbourne Docklands Ecological Sustainable Development Guide	Australia	Municipal District	VicUrban (Victoria development agency)	X		X	X	X	X		Long-term value, alternative transportation, education	M				X				X	X	New	All commercial development in Docklands is required to meet minimum performance standards according to the Melbourne Docklands Ecologically Sustainable Development Guide (ESD). The ESD Guide was the first operational Green Building Rating tool in Australia and was a key reference tool in the development of Australia's Green Star program by the Green Building Council of Australia.	Certificate and awards are presented to developments that meet minimum criteria set forth in the guide's performance indicators.	Quantitative criteria are outlined, however, no documentation requirements are provided. Documentation provides more structure and less room for interpretation.	Mississauga could consider awards to promote strategy implementation.	http://www.docklands.com.au/cs/Satellite?c=VPages&cid=1182927645003&pagename=VicUrban%2FLayout&site=Docklands	
45	Oslo Strategy for Sustainable Development and Urban Ecology Program	European Union	Municipal	Existing department (City of Oslo)	X	X	X		X		Transportation, urban ecology	V			X				X	X	Both	Oslo's Urban Ecology Program identifies priority areas of action, partial goals, strategies and measures that are set out as the basis for elaborating, updating, and implementing all municipal plans and programs. In 2007 the City proposed an action plan to improve energy efficiency and replace fossil energy with renewables for buildings. The actions include: * All municipal oil-based heating to be phased out by 2011 * Stimulate energy efficiency in the state and private sectors * All use of fossil energy in Oslo to be phased out by 2020 * Encourage building of low energy and passive houses * Ensure connection of all buildings over 1000 m2 to the district heating system unless availability of more environmentally friendly alternatives can be demonstrated In 2008, a new standard for energy use was introduced for school buildings in Oslo: A maximum of 105 kWh/m2 applies to all new school buildings and a maximum of 120 kWh/m2 applies to total renovation projects. National building regulations which were revised in 2007 specify energy use of maximum 135 kWh/m2 for schools and 165 kWh/m2 for new office buildings.	In 1998, Oslo City Government presented a report to the City Council on the Oslo environment with an Urban Ecology Programme. This programme has served as the guideline for the City Government's work on the environment and its Local Agenda 21. By 2030, GHG emissions are targeted to be reduced by 50 % compared to 1990. The main tool for implementing energy efficiency measures in both the public and private sectors in Oslo is the city's Energy Efficiency Fund. In the period 1997-2007 the fund has granted an average of approx. \$5 million CAD annually to a variety of initiatives and projects leading to average new energy savings of approx. 55 GWh per year.	Specific energy intensity standards for different building types provide measurable targets.	Mississauga could establish specific energy intensity standards and/or set targets for renewable energy use.	http://www.byradsavdeling-for-miljo-og-samferdsel.oslo.kommune.no/miljo/english/			
46	Bristol, UK - Green Capital Project	European Union	Municipal	Existing department (Environment and Planning)	X	X	X	X	X			V		X					X		Both	Promoting sustainable building design and construction is an important part of the Bristol Green Capital project. The city council promotes sustainable building by: * working with developers applying for planning permission to make designs more sustainable * setting high standards for city building projects * providing advice and information to professionals and the general public	City council publications include Sustainable Building Design and Construction (checklists, BMPs for energy, waste, water, materials - Applicants for large developments are asked to submit a sustainability statement setting out how they have addressed these issues. The guidance is also a resource for anyone interested in building sustainably, with extensive advice and sources of further information for each topic.) Another publication is the Sustainable Urban Drainage Pack to encourage and showcase green roofs. Another document is the "Sustainable Development and Construction – Advice for small builders and householders." This is for home owners or builders working on small scale projects, including extensions and loft conversions.	Publications to help developers and home owners implement best management practices can encourage green development.	Publications, checklists, and guidelines outlining BMPs could be implemented	http://www.bristol.gov.uk/ccm/content/Environment/Planning/sustainability/sust-build-design-construction.en			
47	Liverpool, UK - Sustainable Development Plan	European Union	Municipal	Existing department (City council)			X	X			Staff training, transportation, renewable energy	V		X					X		Both	In December 2001, the Council approved a Sustainable Development Plan (SDP). This document, Building Sustainable Ways of Working was revised and reissued in early 2006. The key environmental actions for 2006-2009 put in order of priority are: * assess the feasibility of formal internal environmental management systems; * waste minimisation; * waste recycling (internal and external); * sustainable procurement (including Sustainable Procurement Guide and Sustainable Construction); * Green Transport Plan; * energy and water conservation; * increased use of renewable energy * internal staff training and awareness.	The Council and its partners propose to achieve the various sustainability targets through an action planning approach applied across the city to: * Publicize sustainable development targets and achievements to all sections of the community; * Ensure suppliers and partners observe sustainability standards, and * Monitor and train city staff	Training city staff in matters of sustainable development can encourage and support the sustainability plan.	In addition to developing a green development standard, Mississauga could encourage suppliers and business partners to adopt sustainable practices.	http://www.liverpool.gov.uk/Environment/Sustainable_development/index.asp			
48	Glasgow, UK - Environmental Strategy and Action Plan	European Union	Municipal	Existing department (Sustainable Development Group Development and Regeneration Services)							transportation	V, M		X					X	X	Both	Glasgow City Council signed the Aalborg Commitments in 2005. These are a set of ten sustainable development commitments which help prioritize the changes that must be made to become a more sustainable city. These commitments cover a wide variety of sustainability issues including the use of resources, health, transport, planning, social equity and justice. All major Council construction projects with a value of > £500,000 will be required to use a minimum of 10% recycled content by value. Sustainability statements will be required as part of the Committee reporting process for construction projects.	One of the focus areas is Sustainable Construction. In June 2006, the Council approved a corporate policy on sustainable construction. Initially this policy will apply where the Council has an interest as landowner, client, developer or partner. A City-wide policy, which will be implemented through the planning system, will be brought forward through the development of the next City Plan.	Following the Aalborg Commitments allows the city to follow existing accepted standards for sustainable development.	Sustainability reporting could be required for all construction projects.	http://www.glasgow.gov.uk/en/Business/Environment/Sustainabledevelopment/			
49	South East England - Regional Sustainability Checklist for Developments	European Union	Regional	Non-profit	X	X	X	X	X	X		V			X				X	X	Both	The sustainability checklist for new developments is designed to complement the Ecohomes/BREEAM rating system and the Code for Sustainable Homes. The checklist can be used to assess the sustainability potential of a development and is intended for decision makers in the public and private sector. The Checklist includes questions and criteria organised under eight categories. Relevant integrated regional framework indicators are provided for each category.	The Checklist is an easy-to-use online tool.	The checklist is basic and therefore difficult to identify what a successful project looks like. Based on existing standards for more successful implementation.	Not applicable - Mississauga's strategy should be more implementation-oriented.	http://southeast.sustainability-checklist.co.uk			
50	The Charter of European Cities & Towns Towards Sustainability - The Aalborg Charter	European Union	Federal	Existing department (The City of Aalborg Technical Department)	X	X	X	X	X	X		V		X					X	X	Both	The Aalborg Charter is based on Agenda 21 and outlines 10 goals for a sustainable community. Over 200 countries have signed on to the charter and as a result are required to submit a plan (within 12 months of signing on) describing how they will meet the 10 commitments outlined in the charter. Several tools and guidelines related to planning, design, social equity, transportation, health, etc. are offered by the Sustainable Cities and Towns Campaign.	A Sustainability Kit provides tools to help local governments implement the Aalborg Charter. The Planning and Design Guide tool is a source of ideas, measures and good practice examples to help local and regional governments to develop and implement action plans for sustainable energy. It highlights the need to include energy aspects into day-to-day activities of local and regional governments.	Online "one-stop-shop" for green development resources for improved program uptake.	Mississauga can use similar tools to promote the Green Development Strategy.	http://sustainable-cities.eu/ http://www.aalborgplus10.dk/media/finaldraftaalborgcommitments.pdf http://www.aalborgplus10.dk			
51	London Borough of Ealing	European Union	Municipal	Existing Departments	X	X	X	X	X	X	Transportation, education	M		X					X		Both	The Borough's Sustainability Checklist includes performance measures for: o Land Use and Location o Transport o Energy o Waste o Community Development o Biodiversity/Open Environment o Built Environment o Pollution o Human Activity	All major developments must complete the checklist; the score is considered in the approval process. London's Energy Saving Trust advice centre, a free information service on energy savings and sustainability, is promoted to residents	Simple checklist may lead to ambiguous interpretations during application and review process.	Not applicable - Mississauga's strategy should be more implementation-oriented.	http://www.ealing.gov.uk/ealing3/export/sites/ealingweb/services/environment/planning/planning_page/sustainable_planning/docs/01sustainability.pdf			
52	City of Helsinki	European Union	Municipal	Existing department (City of Helsinki Environmental Center)	X		X	X	X	X	Transportation, biodiversity	V, FP, FI		X					X		Both	Helsinki's local action plan defines these 5 overall goals: 1 The reduction of greenhouse gas emissions 2 The protection and fostering of biodiversity 3 To increase citizen interaction and participation 4 To develop means to measure and evaluate sustainable development 5 The implementation of suburban renewal according to the principles of sustainable development	Helsinki Local Agenda 21 process finds its roots in Finland's national Agenda 21 action plan, which was approved by Council in 2002.	The preparation of the action plan was a long-term participatory process, which involved every department of the city administration as well as citizens, neighbourhood associations, NGOs, professional associations, educational institutions, enterprises and commercial institutions, governmental organisations, religious institutions etc.	This program is in many ways different to North America in that sustainable development is developed into law and everyday life not just policies focused on Green Building.	http://www.hel2.fi/YMK/raportti07/downloads/Helsinki_EnvReport_2007.pdf http://www.hel.fi/wps/portal/Ymparistokeskus_en/Arkkikel7WICM_GLOBAL_CONTEXT=ymlk/en/Environmental+Programmes/The+City+of+Helsinki_s+Sustainability+Action+Plan http://www.hel.fi/wps/wcm/connect/961a6a804a17221891a3f93d8d1d4668/heko_2007net.pdf?MOD=AJPERES&CACHEID=961a6a804a17221891a3f93d8d1d4668			

APPENDIX B DETAILED PRECEDENT REVIEW

October 14, 2009



City of Mississauga – Green Development Strategy

Appendix B – Detailed Precedent Review

1.0 TORONTO, ON

1.1 Overview

Toronto's green development strategy includes a green development standard, by-laws for green roofs and renewable energy, design guidelines, and incentive programs. The Toronto Green Development Standard is currently mandatory for City-owned facilities and voluntary for private buildings, and is applicable to all new building types. The City also offers incentives for developers to incorporate green roofs or renewable energy systems or to design buildings with better energy performance than the minimum Ontario Building Code requirements. A by-law amendment to encourage the use of renewable energy technologies has been implemented; a by-law to mandate green roofs for certain building types is currently under development.

1.2 Green Development Strategy

1.2.1 Green Development Standard

The first version of the Standard was called the Toronto Green Development Standard (TGDS). It was developed in 2006 as a set of voluntary targets, principles, and practices to guide the development of new construction of City-owned facilities and to encourage sustainable development within the private sector. It was developed based on a review of City guidelines and targets, existing third-party green building rating systems (LEED®, Energy Star, and Green Globes), and experience of other green development standards from other cities around the world.

A cost-benefit study was conducted prior to developing the Standard to present the costs versus savings of implementing green development. The study provides an in-depth look at trends in green development across the region and identifies green technologies that are readily available to make green development achievable. The key findings of the report indicate:

“that the benefits derived from green development overwhelmingly outweigh the costs associated with building better. The marginal premium invested in measures to address the bio-regional drivers aimed at more sustainable forms of urban development can significantly improve the environmental, social and economic future, not only for Toronto, but the entire Greater Golden Horseshoe Region.



The TGDS is split into two different guidelines:

1. Mid- to high-rise residential, commercial, industrial, and institutional development
2. Low-rise residential

The principles guiding the TGDS are:

- Measurable
- Performance-based
- Focused on the design and construction of development
- User friendly
- Set high to significantly improve environmental performance but still allow for competition among developers

The Standard is a checklist that identifies development features that affect Toronto's environmental drivers and relates them to existing City standards, by-laws, targets, or guidelines. Some elements are minimum requirements, while others are identified as enhancements.

The key drivers of the TGS are:

- Air quality
- GHG Emissions/Energy Efficiency
- Water quality, quantity and efficiency
- Ecology
- Solid Waste

The Standard's voluntary approach has allowed the development community, the City and its Agencies, Boards, Commissions, and Corporations to become accustomed to the expectation that new development in Toronto needs to meet a higher level of environmental performance. The TGDS took an important first step to begin to change behaviour and expectations of the development community and City staff.¹

The TGDS is currently being updated and revised as the Toronto Green Standard (TGS). The TGS will be used to implement the broader environmental objectives by adopting and incorporating performance targets from policy and guideline documents such as the Climate Change, Clean Air and Sustainable Energy Action Plan, the Wet Weather Flow Management Master Plan, Target 70 Waste Diversion Plan, Toronto's water efficiency and energy efficiency programs, the Eco-Roof Incentive Program and the Green Roof By-law (under development), natural heritage studies, shade policy, tree canopy targets, and Bird-Friendly Development Guidelines, among others. The TGS will be released along with

¹ <http://www.toronto.ca/legdocs/mmis/2008/pg/bgrd/backgroundfile-16862.pdf>

changes to the Site Plan Control Process to include drawing mark-up requirements and a review process. The City is still developing the specific implementation aspects of the standard (i.e. documentation requirements).

The revised Standard is being developed to incorporate a new two-tiered structure that emphasizes the priority performance measures that can be secured through the planning process in Tier 1, and those that raise the bar on green development in Tier 2. The City met with developers to discuss the potential credits and targets. Their feedback was incorporated in the draft TGS currently posted on the website.

Tier 1 identifies the minimum performance measures that all private development must demonstrate during the Site Plan application process (a legal review identified this as the best process to implement in-house validation). The measures include exterior sustainable design, landscaping, site-level features (such as automobile, cycling and pedestrian infrastructure, and energy efficiency (25% better performance than the MNECB or Energuide 80 for low-rise development). While energy performance is beyond the City's control during site plan approvals, the City of Toronto Act is being used as a means to include energy requirements in the GDS.

Tier 2 requirements are voluntary as they go beyond Site Plan Control. The targets are encouraged through development charge rebates. Tier 2 identifies enhanced sustainable performance measures that encompass whole building performance such as energy efficiency (40% better performance than MNECB or Energuide 85 for low-rise development). The voluntary, enhanced, Tier 2 standard will be encouraged for all new buildings through the use of incentives such as the proposed Development Charge Refund. Project teams submit an application checklist with drawings and other suggested documentation. The Standard currently does not have a substantial compliance verification process.

The standard is targeted for release by September 2009.

1.2.2 Other City Initiatives

Green Roof By-law

The City is currently developing a proposed green roof by-law that would require green roofs on certain types of new buildings and establish a standard for green roof design and construction. The by-law would not replace or alter any existing Code requirements or define a singular code compliant green roof design

Renewable Energy By-law

In March 2008, a zoning bylaw amendment was passed by City Council that permits the use of renewable energy (solar thermal and photovoltaics, wind



turbines, geo-energy systems) and co-generation devices on every property and permits the distribution of the energy produced by those devices.

Design Guidelines for “Greening” Surface Parking Lots

The draft Design Guidelines for “Greening” Surface Parking Lots deals with common urban design and environmental challenges found within and around surface parking lots. These guidelines provide specific strategies and measures that can be applied to help meet the policies of the city’s Official Plan and environmental performance targets of the TGDS, such as:

- planting trees;
- providing good quality soil and generous landscaped areas;
- enhancing pedestrian and cycling infrastructure;
- managing stormwater on-site;
- reducing the urban heat island effect; and
- using sustainable materials and technologies.²

1.2.3 Incentives

The City recognizes the importance that monetary incentives play in helping to implement higher expectations in development and to help cover the premium or perceived financial barriers to new technologies and practices. The City has provided some financial incentive programs that target specific objectives or technology implementation such as: Green Roof Pilot Incentive Program, Eco-Roof Program, and the Better Buildings Partnership New Construction Incentive Program.

Sustainable Energy Funds

Toronto’s Sustainable Energy Funds, encompassing the \$42 million Toronto Energy Conservation Fund and the \$20 million Toronto Green Energy Fund, were created as part of the city’s Sustainable Energy Action Plan. The funds provide low-interest financing for buildings in the municipal, academic, social services, and health care sector to help overcome the barrier created by high upfront costs for energy efficiency measures and renewable energy projects. The zero-interest loans range from \$50,000 to \$1 million per project. Renewable energy systems considered include: solar PV, solar pool heating, solar domestic hot water, wind turbines, and geothermal systems.

Eco-Roof Incentive Program

Toronto’s Eco-Roof Incentive Program is designed to promote the use of green and cool roofs on Toronto’s new and existing commercial, industrial and institutional buildings. It is based on the success of its green roof pilot program in 2006 and 2007. Incentives are provided to projects through an application and

² http://www.toronto.ca/planning/urbdesign/pdf/greening_parking_lots_dg_update_16nov07.pdf



selection process, whereby priority is given to those projects located in the City's designated "employment districts".

The incentive program provides:

- \$50/m² of green roof (up to \$100,000) for projects on existing buildings;
- \$2 - \$5/m² of cool roof (up to \$50,000) for projects on existing buildings; and
- \$50/m² of green roof (up to \$100,000) for projects on new buildings with a GFA > 2,000 m².

Better Buildings Partnership New Construction Incentive Program

The Better Buildings Partnership New Construction Incentive Program (BBP-NC) aims to have new commercial, industrial, and multi-unit residential buildings designed and built to be more energy efficient than the minimum Ontario Building Code requirements by providing design assistance and energy efficiency incentives.

For energy simulations of new buildings, BBP-NC will pay the engineering firm performing the energy modelling \$2,000 + \$0.20m² gross floor area, up to \$7,000. For the energy efficiency incentive, BBP-NC will pay \$350 per peak kW reduction or \$0.04 per annual kWh reduction the new building is modelled to save, compared to the basic requirements of the Ontario Building Code.

1.3 Green Technologies

The TGDS covers many green technologies as a means to meeting the many green development criteria in the checklist. Further to the TGDS, the City has implemented incentives, guidelines, and by-laws focused on increasing the capacity of green and cool roofs, renewable energy systems (solar PV, solar thermal, wind turbines, geothermal), and stormwater management.

1.4 Education and Outreach

The City has a website featuring links to the Toronto Green Standard and all related documents including staff reports, related initiatives, and background consultant reports. There is a seminar scheduled in April, 2009 for the CaGBC Toronto Chapter to showcase the Toronto Green Standard and other City green building programs. It is anticipated that the new Toronto Green Standard will feature more education and outreach than the original Standard.

1.5 Effectiveness

The original release of the Toronto Green Development Standard was intended as a voluntary guideline for private development; however, it was adopted by several project



teams as mandatory requirements. The implementation process was unclear and there were insufficient City resources to effectively provide technical support. The experience with the TGDS was used to improve the system and create a more rigorous strategy with the Toronto Green Standard. The effectiveness of this strategy can be evaluated after it has been released.

1.5.1 Success Tracking

Toronto's GHG emission reduction targets, based on a 1990 level baseline (Climate Change, Clean Air, and Sustainable Energy Action Plan) are:

- 6% by 2012 (Kyoto target)
- 30% by 2020
- 80% by 2050

For urban forestry, the city hopes to double the tree canopy from 17% to 34% by 2050.

The City plans to monitor, evaluate, and report its progress on reducing GHG emissions by requesting energy utility companies in Toronto to provide data in a manner that respects customer confidentiality requirements.

1.5.2 Success Achieved

The TGDS experienced uptake beyond the City's expectations since it was never developed as a mandatory standard but was adopted as one by many developments. In 2007, 60% of development applications indicated they would meet the TGDS; this value increased to 90% in 2008. During application review, however, not all developments met the minimum requirements. The two-tiered structure of the TGS will provide additional measures of success and can be evaluated after it is released and implemented.

1.5.3 Success Factors and Barriers

Before finalizing the TGDS, City Planning staff conducted a survey with Toronto-area developers to learn about their experiences and concerns with respect to green development.³ This allowed the City to understand what developers were already doing with respect to green development and what issues they faced when trying to implement various environmental practices. Several suggestions were made as to how the Toronto Standard should take shape.

³ http://www.toronto.ca/planning/pdf/gds_discussionpaper_3.pdf

- **Flexibility:** Stakeholders stressed that the standard should be flexible by not focusing too strongly on specific types of technology, but rather on overall performance. Requirements should also vary based on building use.
- **User Friendliness:** Stakeholders wanted the standard to be clear and concise and should include targets that are widely achievable. The Standard should also align with City policies, by-laws, and regulations.
- **Marketplace Competitiveness:** The Standard should allow for competitiveness among green developers by setting it at a level that is high enough for development industry improvement, but still allows for “green competition” between developers.
- **Inclusiveness:** It was noted that a Toronto Standard should also apply to existing buildings, neighbourhoods, and individual sites.

1.6 Applicability/Lessons Learned

A particular difference between Mississauga and Toronto’s regulatory environment is the City of Toronto Act. Toronto’s interprets the special powers it has under the City of Toronto Act as giving it authority to require higher than OBC standards for energy conservation. Other Ontario municipalities, including Mississauga, do not have these powers.

Mississauga and Toronto share the value of measurable targets and key drivers including ecology, energy efficiency and water resources.

The stakeholder input described in the Success Factors and Barriers section regarding flexibility and competitiveness are likely to be applicable to the Mississauga market as well because of its proximity.

Toronto’s Green Development Standard is relatively new and is working through inevitable growing pains. However there are two elements that Mississauga may wish to consider in their own implementation.

- **The extensive overlap with existing standards:** The Toronto Green Development Standard and the newer Toronto Green Standard both mirror the LEED® rating system significantly, but not identically. This creates the potential for extra tracking and documentation effort for projects that must comply with the TGS, but also are pursuing LEED® for market reasons.
- **Need for a implementation and compliance support:** One of the growing pains the TGDS has demonstrated is a gap in the support for developers who are required to follow the standard. Limited to no support is available to developers to clarify requirements and interpretations, where required. Furthermore, a compliance mechanism has not been developed to verify that the requirements are being implemented where required.



2.0 VANCOUVER, BC

2.1 Overview

The City of Vancouver has implemented, or is planning, several policies and initiatives for green building and development, across all building types (public and private, new and existing). In addition to green building, other initiatives are related to neighbourhood energy planning, food, waste, and transportation. Vancouver also provides educational and outreach opportunities to developers and the general public.

2.2 Green Development Strategies

2.2.1 Green Building Strategy

Vancouver has implemented a Green Building Strategy (GBS) for all commercial, institutional, mixed-use, and high-density residential buildings. The GBS is being implemented in phases and was expected to be completed in Fall 2008 (direct contact with the City for an update was attempted but unsuccessful). Some actions have already been implemented; others have been adopted and are to be implemented at a later date, while other actions are still in progress.⁴

Rainwater Management (complete)

- Require drains in parking garages to connect to sanitary sewers instead of stormwater drains to reduce overflows of combined rainwater and sewage into surrounding water bodies during periods of heavy rain.
- Solve issues related to green roofs specific to Vancouver's climate with the Homeowner Protection Office.

In-Building Water Conservation (complete)

- Adopt low flush toilets in non-residential buildings.
- Review and analyze cost impacts, benefits, and regulatory barriers to requiring dual flush toilets and Energy Star laundry machines and dishwashers.

Transportation Demand Management (complete)

- Provide additional relaxations for minimum parking requirements to support alternative travel modes.
- Review the feasibility of unbundling parking requirements.
- Update requirements for secure bicycle parking and other end-of-trip facilities.
- Expand transportation demand management requirements for new developments.

⁴ http://vancouver.ca/sustainability/building_green.htm



Energy Efficiency (adopted)

- Improve enforcement of Energy Utilization By-law requirements
- Adopt ASHRAE 90.1 2004 as new Energy Utilization By-law.
- Decrease overall building energy use requirements by 12-15% beyond ASHRAE 90.1 2001 to meet Natural Resources Canada Commercial Building Incentive Program requirements.

Rainwater Management (in progress)

- Conduct analysis with recommendations and timeline for a city-wide storm water management plan for development.
- Develop on-site storm water management requirements for surface parking lots to reduce runoff and improve water quality, including oil separation and infiltration facilities.

Heat Island Effect Mitigation (in progress)

- Develop voluntary guidelines for green roofs and high albedo Energy Star cool roof that maximize rainwater management, energy efficiency, habitat and aesthetics.

Landscape and Ecology (in progress)

- Develop guidelines for voluntary urban agricultural installations to contribute to support a sustainable food system.
- Develop voluntary guidelines for native and low-water use landscaping to reduce use of drinking water for irrigation, particularly during drought periods.

Water Conservation (in progress)

- Permit waterless urinals as accepted plumbing fixture based on ANSI standards.
- Develop requirements for low flow irrigations systems that will decrease water use by 50%.

Energy Efficiency and GHG Reduction (in progress)

- Develop energy use targets by building type as an alternative energy compliance path.

Passive Design (in progress)

- Evaluate passive design floor space ratio exclusions that were used in SEFC Olympic Village; access desirability and feasibility of extending exclusions more broadly; access compatibility of current design guidelines and regulations with passive design features. Promote solar design, natural ventilation and daylighting through site and building design to enhance indoor occupant comfort and increased energy efficiency.



Waste Diversion (in progress)

- Develop mandatory Construction Waste Management Plans for all construction projects to be monitored through the building permit process.
- Develop recycling targets by analyzing existing building types and Metro Vancouver bans, recycling infrastructure and robustness of markets.
- Develop zoning guidelines and amendments for the Solid Waste By-law for improved in-building waste reduction facilities (waste, recyclables, organics) to support banned materials such as organic waste.

Transport Demand Management (in progress)

- Develop requirements for accommodating charging of electric vehicles.

2.2.2 EcoDensity Charter

Vancouver's EcoDensity Charter, adopted in June 2008, commits the city to make environmental sustainability a primary goal in all city planning decisions. Some policies have already been implemented, while others are still in development. In order to reduce barriers in achieving the goals of the Charter, some City policies, bylaws, incentives, and zoning will be, or have been, altered. Two actions have been implemented to date:⁵

Rezoning Policy for Green Buildings

Applications for new rezoning will need to be LEED® Silver at a minimum, with further mandatory requirements for specific LEED® credits:

- Energy performance - minimum of three points for Optimize Energy Performance credit;
- Water efficiency - minimum of one point from the Water Efficiency credits; and,
- Stormwater management - minimum of one point for the Stormwater Management credits (Rate & Quantity, Quality).

Buildings that are not eligible for LEED® certification due to the form of development are to achieve BuiltGreen BC Gold with a score of Energuide 80. Buildings that are ineligible for LEED® or BuiltGreen, the City will negotiate an equivalent green standard, emphasizing approaches that use green design practices to reduce energy before applying green energy technologies.

It is expected that City staff will consult with the development industry to determine recommendations for raising the green building requirements to LEED® Gold and BuiltGreen BC Platinum on January 1, 2010. Over time, the City intends to increase standards for all buildings requiring rezoning or not.

⁵ <http://www.vancouver-ecodensity.ca/webupload/File/actions-FINAL.pdf>



Rezoning Policy for Greener Larger Sites

For all rezonings that involve land approximately two acres or more, the policy requires that:

- A business case analysis by a qualified green energy consultant to explore the viability of campus or district energy systems. If the business case is viable, a system will be required.
- Overall site design shall consider and incorporate where appropriate orientation approaches that reduce energy needs, facilitate passive energy solutions, incorporate urban agricultural opportunities, and replicate natural systems.
- A Sustainable Transportation Demand Management Strategy be included that considers and prioritizes sustainable transportation modes such as walking, cycling, public transit, and facilitates the incorporation of low carbon vehicles (i.e. electric vehicles)
- A sustainable rainwater management plan that utilizes sustainable strategies that allow for infiltration, retention, treatment and utilization of rainwater where applicable and appropriate on site.
- A solid waste diversion strategy that provides space, infrastructure and a plan to divert organics and recyclables from the waste stream and minimizes vehicle trips required for collection where possible

2.2.3 Southeast False Creek

The Southeast False Creek (SEFC) development is a model sustainable community built on undeveloped waterfront land near downtown Vancouver incorporating high-performance buildings and infrastructure, easy transit access, and a strategic energy reduction plan.

The green building strategy for SEFC requires that all buildings be built to LEED® Gold, with a goal of LEED® Platinum for the community centre.

The SEFC's energy plan includes the Neighbourhood Energy Utility (NEU), a district energy system providing space heating and domestic hot water to all buildings in the development area. The first phase of development will use technology that recovers heat from the municipal sewer system, the first of its kind in North America, and only one of four in the world. The system also takes heat from roof-top solar energy systems from at least three buildings. Natural gas will be used as backup and to provide supplemental heat on the coldest days. The Energy Centre is under construction and is expected to be fully operational in October 2009.



To meet these green development requirements, baselines were specified:

Energy

- All buildings are required to connect to and use the SEFC Neighbourhood Energy Utility district energy system for space heating and domestic hot water, as required by the Energy Utility Systems By-Law.
- All appliances, except laundry dryer, in the residential units that are eligible under the Natural Resources Canada EnergyStar program must be Energy Star labeled.
- Lighting is to follow ASHRAE 90.1-2001 including user metering, smart controls, and occupancy sensors for public spaces.
- No natural gas fireplaces are permitted.

Parking

- Co-op vehicles and spaces are required as part of the City Parking by-law.

Landscape and Water

- Dual Flush toilets that meet or use less than 6.0/3.0 litres per flush are required.
- Low-flow faucets and showerheads to meet or use less than the Vancouver Building By-law.
- Specify drought resistant and/or native indigenous planting species.
- Green roofs on 50 percent of all roof surfaces are encouraged but not required.
- Rain water not managed by green roofs or on-site infiltration and irrigation strategies are to be transmitted to off-site rain water management systems.
- Landscape space designed for urban agriculture for building occupants is encourage.

Waste Management

- Composting for on-site gardens and/or landscaping.
- Provision for three streams of waste collection.
- Management of construction and demolition waste, ensuring that a minimum of 75 percent diversion of landfill through the construction process.

2.2.4 Green Technologies

Under the city's Green Building Strategy, EcoDensity Charter, and SEFC development, green technologies have been focused around water and energy issues. Technologies implemented or mentioned in the green development strategies include:

- green and high-albedo roofs
- low-flow fixtures and appliances



- Energy Star rated appliances
- solar energy systems
- electric vehicles
- district energy systems
- efficient lighting systems

2.3 Education & Outreach

Vancouver provides education and outreach to developers and the general public through websites and developer toolkits. In addition, the City has a learning centre that provides in-depth assistance and educational opportunities related to sustainable building practices.

One Day

Vancouver's official community engagement component of its Climate Change Action Plan is called One Day. Its website providing tools and resources to help Vancouver residents achieve GHG emission reductions by taking action at home, work, school, and on the road. It also provides a calendar of events and ways for residents to connect. One Day also provides building design and construction professionals with resources to help meet the City's Green Building Strategy.

BuiltSmart Program

The BuildSmart Program, administered through Metro Vancouver, encourages the use of green building strategies and technologies in five main areas: design strategies, construction, operations and maintenance, retrofit and tenant improvements, renovations, and demolition and deconstruction. Resources through this program include a Demolition, Land Clearing & Construction Waste Management Toolkit and a directory of local recycling services (haulers, contractors, depots, etc.).

Light House Sustainable Building Centre

The Light House Sustainable Building Centre is a non-profit organization and supporting partner of EcoDensity. It provides a learning centre and website that offers resources for industry professionals, building owners, government representatives, and homeowners to learn about green building practices, policies, products, projects, and service providers. In addition, Light House provides technical assistance, training and education opportunities, and conducts research related to green buildings.

2.4 Effectiveness

2.4.1 Success Tracking

Vancouver's green development strategies are components of the city's overall climate protection strategy and are a means to achieving their GHG reduction



targets. Using the 1990 level of GHG emissions as a baseline (unless otherwise noted), the city is targeting the following GHG reductions:

- 6% by 2012;
- 33% by 2020 (compared to 2007 baseline);
- 80% by 2050; and,
- All new construction to be GHG-neutral by 2030.

The green building strategy for SEFC development requires that all buildings be built to LEED® Gold, with a goal of LEED® Platinum for the community centre. In order to gauge and track project success, several indicators and targets were specified for the development:

Energy

- Indicator: total annual building energy consumption (GJ/m² GFA)
- Target: 0.79 GJ/m² average for commercial and institutional buildings; 0.31 GJ/m² for multifamily residential buildings.

Water

- Indicator: water consumption (residential) (L/capita/day)
- Target: 190 L/cap/day

Stormwater

- Indicator: Effective impervious area (EIA) as a percentage of total site area. EIA is the percentage of drainage area directly connected to a storm drainage system.
- Target: 40 percent EIA

Solid Waste and Recycling

- Indicator: Municipal Solid Waste disposed off-site (kg/capita/year)
- Target: 200 kg/capita/year assuming 90% residential floor space and 10% commercial floor space

Urban Agriculture

- Indicator: Area of community demonstration garden, farmers market and percentage of buildings with green roofs
- Target: 26,000 ft² for community gardens, farmers market included in official development plan by-law, green roof area TBD

Transportation

- Indicator: Percentage of non-auto trips by residents
- Target: 60% of all daily trips by non-auto modes of transportation

Green Buildings

- Indicator: LEED® points
- Target: LEED® Silver for non-municipal buildings, LEED® GOLD for civic buildings



2.4.2 Successes Achieved

The Green Building Strategy is being implemented in phases. Some actions have already been implemented; others have been adopted and are to be implemented at a later date, while other actions are still in progress. As detailed in the previous green development strategy section, the actions that have been completed include those related to rainwater management, in-building water conservation, and transportation demand management. Actions for improving energy efficiency, such as updating the energy utilization by-law, have been adopted but not yet fully implemented.

It was found that a number of City bylaws and regulations hinder the use of the green building design practices needed to meet the Green Building Strategy goals. Therefore, recommendations for amendments to the Zoning and Development Bylaw that would remove these barriers have been adopted by City Council⁶. These amendments are:

- Relaxing building heights to allow for renewable energy technologies, such as solar panels, on roofs, and to provide access to green roofs.
- Relaxing side yard and overhang requirements for fixed passive solar shading outside.
- Allowing thicker walls that will have better insulation standards.

2.4.3 Success Factors & Barriers

As described in the previous section, certain city bylaws impeded some green building technologies and practices to be adopted. These bylaws had to be amended by City Council in order to allow for these green building methods to be implemented.

It was determined that one of the challenges of the EcoDensity Charter was that it focuses on density and land-use patterns on a planning-scale, as opposed to green buildings at a building-scale. Changing land-use patterns was found to be more difficult. It has been noted that many people in the public critiqued the EcoDensity charter for being implemented too quickly. They also critiqued that the charter may override their community plans. Implementing the EcoDensity Charter was found to be more difficult in the city surroundings, not the downtown, due to community resistance. It has also been noted that although it was difficult to engage the public during charter development, websites, videos, and fairs proved to be successful for public outreach.⁷

⁶ <http://vancouver.ca/ctyclerk/cclerk/20081028/documents/tt1memo.pdf>

⁷ Personal communications with Neal Lamontagne, Vancouver EcoDensity. April 9, 2009.



2.5 Applicability/ Lessons Learned

A particular difference between Mississauga and Vancouver's regulatory environment is a charter that allows Vancouver to develop a building code that is more strict than the Provincial Building Code. Mississauga does not have these powers.

Like Mississauga, development within the City of Vancouver is largely infill of previously developed areas. At the building site level, this has allowed Vancouver to set higher requirements for transportation demand management and stormwater treatment than may have been viable had development largely been greenfield.

Additionally, Vancouver shares with Mississauga key values of water resource protection and protection/ restoration of natural heritage. At the building level, these have primarily been addressed by:

- mandating minimum water efficiency and stormwater requirements beyond LEED® prerequisites;
- setting specific targets for site perviousness;
- developing voluntary guidelines for highly water-efficient landscaping practices; and
- developing voluntary guidelines for urban agriculture.

Natural heritage protection has not been specifically addressed at the building site level.

Professional engagement in green building practices is greater in this region than in Mississauga. This is where the first Canadian chapter of the USGBC was formed, in 1999 prior to the incorporation of the CaGBC in 2002. Green building expertise continues to be more concentrated in this region compared to the rest of Canada, evident by greater representation on the CaGBC and the higher number of LEED® certified buildings. For this reason, it is likely that Mississauga will require more outreach and education than has been provided by this case study in order to promote similar success.

3.0 CALEDON, ON

3.1 Overview

The Town of Caledon's green development strategy is primarily centered on their green development program. This program, a component of the Environmental Progress Action Plan, is a voluntary initiative that encourages new private construction, through financial incentives, to adopt specific green technologies into their design or be designed to LEED® standards.



3.2 Green Development Strategies

The Town of Caledon's voluntary Green Development Program, implemented in June, 2008, provides financial incentives for commercial and industrial buildings that are built to LEED® standards and/or incorporate green technologies. The financial incentive is delivered as a development charge discount, enacted through a by-law amendment. The program is currently in the pilot phase, and will be re-evaluated in June 2009.

A project that incorporates one of the five identified green technologies into a project will obtain a 5% discount of the non-residential development charge; for LEED® certified buildings, the discount varies from 20% to 27.5% depending on the level of certification (Figure 1). The Town has set a cap on total funding for the year at \$250,000 – anything beyond this amount must be approved by Town Council.

Documentation supporting compliance with specific performance measures for the green technologies must be provided in order to obtain the green technology discount. The documentation must show that:

- **Solar hot water system** provides at least 25% of the total amount of energy required for full operation of the building, including all equipment and machinery;
- **Transpired solar collectors** provide at least 10% of the total amount of energy required for full operation of such building, including all equipment and machinery;
- **Solar photovoltaic system** provides at least 5% of the total amount of energy required for full operation of such building, including all equipment and machinery;
- **Permeable pavement** is used for all of the employee and visitor parking spaces for the building; or
- **Storm water cistern** provides 100% of the water required to irrigate the lot on which the building is located.



DEVELOPMENT CHARGE DISCOUNT APPLICABLE TO NEW COMMERCIAL & INDUSTRIAL BUILDINGS IN CALEDON*		
TACTIC	INCLUSIONS	DISCOUNT AS A PERCENTAGE OF NON-RESIDENTIAL DEVELOPMENT CHARGE
Green Technologies**	Solar hot water system	5% for any inclusion or any combination of inclusions
	Transpired solar collectors	
	Solar photovoltaic system	
	Permeable pavement	
	Storm water cistern	
LEED® Certified	Certified and registered with the <i>Canada Green Building Council</i> as meeting the applicable LEED® Canada 1.0 Rating System (or its successor)	20%
LEED® Silver		22.5%
LEED® Gold		25%
LEED® Platinum		27.5%
*discount applies to Town of Caledon development charges only. **for fact sheets visit www.caledon.ca/greendevlopment .		

Figure 1 – Financial incentives of the Green Development Program

After a green development application is verified, the discounted development charges are paid and a letter of credit is provided in the amount of the discount. The developer then has two years after building construction to demonstrate proof of LEED® certification and/or green technology compliance, at which time the letter of credit is released.

The Town has provided an example showing how the development discount would work: for a 100,000 square foot LEED® Silver building that has a base cost of \$7,000,000 with a \$630,000 premium for LEED® (9%), development charges would amount to \$176,000. The development charge discount of 22.5% would amount to \$39,600 in savings.

3.3 Green Technologies

Green technologies are an important aspect of the Green Development Program. Although various green technologies could be employed as a strategy in attaining LEED® points, the program also explicitly rewards the use of specific technologies, including:

- Solar hot water systems
- Transpired solar collectors
- Solar photovoltaics
- Permeable pavement
- Stormwater cisterns

3.4 Education & Outreach

In 2005, the Town established an Environment Committee to provide an inter-departmental perspective and assist in the implementation of the Environmental Progress Action Plan. A separate Green Development Committee was also developed to help with development and implementation of the program.

The program's website offers fact sheets for the different green technologies considered in the program. The fact sheets provide an overview of the technology, advantages, estimated savings, and links to government incentives, related case studies, and suppliers.

3.5 Effectiveness

3.5.1 Success Tracking

At the end of the green development program's pilot phase, the Environmental Committee will review and evaluate the program and report their findings and provide a series of recommendations to Town Council.

Although there were certain business and companies that were expected to make use of the program, the Town did not set any targets for program uptake.

3.5.2 Success Achieved

To date, the Town has approved one program participant seeking LEED® certification, although they receive frequent inquiries.

3.5.3 Success Factors and Barriers

In the program's development stages, the Town held consultation meetings with developers, builders, and consultants to provide an overview of green development and to receive feedback. It was determined from this session that developers did not want fast-tracked approvals as the incentive for building green. Instead, they expressed interest in direct financial incentives. This session helped the Town determine what type of program would work.⁸

The Town indicated that establishing a staff committee with cross-departmental representation was an important step in implementing the program. Retaining a consultant to assist with determining what approach was best for the municipality was also seen as important.

⁸ Personal communications with Sara Peckford, Environmental Progress Officer, Town of Caledon. April 14, 2009



One of the biggest challenges faced in developing the program was determining what levels of incentives to provide. This was found to be difficult due to the different contexts that green building and technology involve on a project to project basis. In addition, at the time of program development there was found to be a lack of cost-benefit analyses of LEED® buildings in a Canadian context.

Other challenges included determining the actual discount value that should be awarded, deciding which green technologies to include, and creating a process that isn't too burdensome.

The Town has been actively advocating for the Region of Peel to match their discounts. Although this has not yet been adopted, the Region of Peel is open to the idea and expressed interest in it. If it were to match the Town's discounts, it is expected that there would be more uptake.

3.6 Applicability / Lessons Learned

Caledon has much in common with Mississauga, being within the Region of Peel and sharing a regulatory environment as well as a comparable market sophistication with respect to green building design.

Their approach has been to incent green development in the private sector by rewarding LEED® or specific green technologies with development charge discounts. This was chosen over other incentives such as permit fast-tracking, because of feedback from developers that monetary incentives were more valuable to them.

Should Mississauga also pursue an incentive program, Caledon's research in determining their values may assist Mississauga in their own analysis.

4.0 MONTREAL, QC

4.1 Overview

Montreal's First Strategic Plan for Sustainable Development is a voluntary program that encourages industries, businesses, and institutions to partner with the city and adopt sustainable development practices. The Plan identifies priority areas related to sustainable development and provides a list of actions that are to be adopted by the city and its partners.

4.2 Green Development Strategy

Montreal adopted the First Strategic Plan for Sustainable Development in 2005 after many organizations, during the Montreal Summit in June 2002, showed interest in sustainable development. These organizations committed themselves to work in



collaboration with the city and promised to carry out specific actions. The content of the Plan was implemented over a five-year period (2005-2009) and reflects the communication between the City and its partners.

In developing the 2007-2009 Phase of the Plan, workshops were held with partner organizations to determine the orientations and actions that would make up the Plan. This resulted in identifying 10 orientations, four of which are identified as priority areas:

1. Improve air quality and reduce greenhouse gas emissions
2. Ensure the quality of life in residential environments
3. Practice responsible resource management
4. Encourage industries, businesses and institutions to adopt good sustainable development practices

The 10 orientations include 36 actions – 22 of which involve the city and its partners and 14 of which are the sole responsibility of the municipal administration. Each of these priority areas are divided into actions that need to be contributed by the municipality and those that need to be contributed by business partners.

Actions include purchasing energy-efficient vehicles, encouraging alternative transportation, reducing parking spots in the city center, promoting alternative fuels with proven environmental benefits, encouraging businesses to conduct an annual GHG emissions inventory, reducing urban heat islands, and improving stormwater quality.

4.3 Green Technologies

Montreal's Plan does not focus on or give precedence to any particular green technology or practice. Rather, the participating organizations decide how best to meet the goals of the action items in the priority areas.

4.4 Education and Outreach

Information dissemination and awareness-raising are an important aspect of the Plan. An exchange network offers partners the opportunity to promote their initiatives and share their experiences.

The Plan's website offers helpful information to implement the Plan. It offers useful tips for integrating sustainable development principles into the home, work and transportation, and allows Montreal organizations in all fields to make a commitment to implementing one or more of the actions suggested in the Plan.



4.5 Effectiveness

4.5.1 Success tracking

During the development process for the Plan, partners recognized the need for environmental monitoring. Indicators will be used to monitor and evaluate the progress of the various actions and the state of the City's environment. Every two years an update will be developed and submitted to municipal council. The indicators are divided into the four priority areas; some of them include:

- Number of days with poor air quality
- Area of parks in Montreal
- Area of on-land protected spaces on the island of Montreal
- Volume of waste generated, recovered, and eliminated
- Number of industries, business, and institutions that have environmental certification or a voluntary environmental program

4.5.2 Success Achieved

By late 2006, nearly 70 organizations had committed themselves to achieving actions in the 2005-2006 Start-up Phase. In early 2007, a new challenge was issued to all partner organizations asking them to carry out at least five actions, including one priority action, from the 36 actions in the 2007-2009 Phase. Today, over 150 organizations are partners in the Plan. These organizations range from institutions (McGill University, Concordia University, Université de Montreal, UQAM, ÉTS) to large corporations (Bell Canada, Gaz Metro, Hydro-Quebec, Merck Frosst, SNC-Lavalin), to small environmental organizations (Équiterre, Comité Écologique du Grand Montreal, Vélo Québec), amongst others.

4.5.3 Success Factors and Barriers

Success in the Plan is closely related to the education and outreach to the partners. During the 2005-2006 Start-Up Phase, the exchange network resulted in a number of information-sharing tools, including:

- nine issues of the Domino newsletter;
- online fact sheets for each of the actions that could be implemented by partners;
- four luncheon talks on themes addressed in the Strategic Plan;
- express memos with reminders of events in Montreal and elsewhere having to do with sustainable development;
- a virtual forum.

4.6 Applicability / Lessons Learned

Montreal's strategy is based on getting buy-in from a large number of organizations to raise the bar on their collective environmental performance. This collaboration is one way to achieve results from a large group of participants without relying on regulation. This approach would be applicable in Mississauga, considering the relationships and leverage that Mississauga has in the GTA and golden horseshoe area.

5.0 PORTLAND, OR

5.1 Overview

Portland, Oregon has historically been at the forefront in North America in addressing climate change by demonstrating environmental innovation and implementing practical solutions through policies, programs, and incentives.

Portland has combined strong municipal leadership (LEED® Gold), with comprehensive developmental support, from feebates, to tax incentives to education. For green building and development, the City has implemented mandatory and voluntary green building policies across all building types (public and private, new and existing), offers incentives for various green building technologies and practices, and provides comprehensive educational tools and resources for developers, building professionals, and the general public. Portland's green building strategies are continuously reviewed, updated, and refined to increase uptake of green building practices and make the City a leader in green development. Overall, the City's new Bureau of Planning and Sustainability (a merger between the Bureau of Planning and the Office of Sustainable Development) offers a wide range of initiatives for:

- climate protection;
- waste prevention and recycling;
- sustainable food;
- energy efficiency and renewable energy;
- economic development;
- sustainable City operations; and,
- green building.

5.2 Green Development Strategies

5.2.1 Portland Green Building Policy

In 2000, the Office of Sustainable Development (OSD) launched a program offering green building technical assistance, education and financial incentives to the development community and general public. In 2001, Portland was one of the first municipalities in the US to adopt a green building policy for public



facilities. Updated in 2005, the policy now requires that all new City-owned facilities attain LEED® Gold certification in addition to meeting more stringent requirements, including:

- 75% of all construction and demolition waste is recycled;
- 30% beyond City of Portland's Stormwater Management Manual baseline;
- 30% water savings beyond the Energy Policy Act of 1992 baseline code requirements; and,
- 30% energy savings beyond Chapter 13 of the Oregon Structural Specialty

Similarly, the Portland Development Commission (PDC) adopted a green building policy in 2001 (updated in 2005) that requires LEED® Silver certification for any new commercial construction project that receives funding from the PDC.

The Green Building program is funded through residential and commercial solid waste fees, grants and contracts. Sponsorships and tuition pay for additional programs and events.

5.2.2 Proposed High Performance Green Building Policy

Portland is continuously reviewing their green building policies and initiatives and updating them as necessary. This enhances the City's environmental and economic sustainability based on local conditions and keeps the City at the forefront of green development.

Recognizing the many benefits of the City's green building policy and based on feedback from and consultation with local green building professionals, in 2007 City Council requested that the OSD develop an even more aggressive green building policy. A proposed High Performance Green Building Policy was subsequently developed and is to be implemented in 2009. The main update to the policy is its "feebate" incentive system that would present developers with three options:

1. **Reward** – A one-time reward payment from the City for projects that achieve a high performance green building standard and significantly improve energy performance beyond the minimum Oregon code requirements. The payment is to be issued to the building owner by the City upon receipt of third-party verification (i.e. USGBC rating certificate). The amount of the reward depends on the level of environmental performance attained and building size.
2. **Waiver** – For projects that build to a green building standard and improve energy performance beyond minimum Oregon code. To qualify, project developers must document registration for the green building standard (i.e. LEED® registration number and scorecard) when applying for a building



permit followed by a submission of third-party verification within one year after receiving a Certificate of Occupancy from the Bureau of Development Services.

3. Fee – A one-time fee to mitigate GHG emissions and other environmental impacts will be issued to projects that are built to minimum Oregon code. The fee is based on building size. Fees will be used for feebate rewards, technical assistance, project recognition, and education programs.

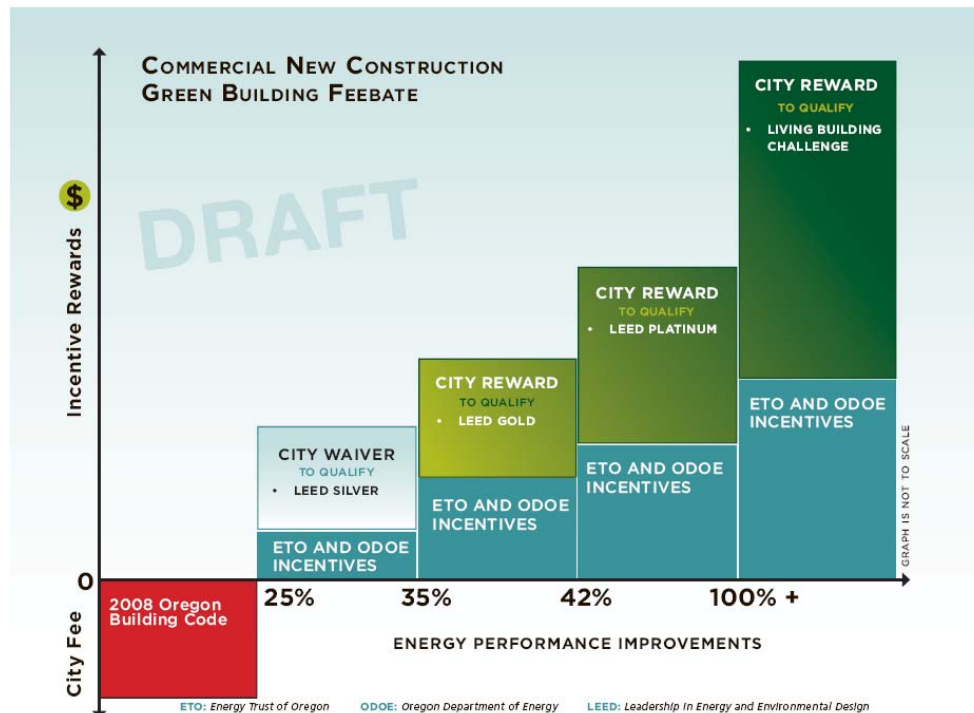


Figure 2 - Structure of the proposed commercial new construction green building feebate (City of Portland Proposed High Performance Green Building Policy, 2008)

Feebate Option	Green Building Standards ¹	Minimum Requirements	Feebate ²
Reward ³	Living Building Challenge	Net-zero energy and water documentation (1 year)	\$2.58 – \$5.15 per sf
	LEED New Construction 2.2 Or, for projects <50,000 square feet, Earth Advantage ⁴	Platinum certification, PLUS: EAc1 + EAc2: 10 points WEc1 + WEc3: 4 points	\$1.03 – \$2.06 per sf
	LEED New Construction 2.2 Or, for projects <50,000 square feet, Earth Advantage ⁴	Gold certification, PLUS: EAc1 + EAc2: 8 points WEc1 + WEc3: 3 points	\$0.51 – \$1.03 per sf
Waiver	LEED New Construction 2.2 Or, for projects <50,000 square feet, Earth Advantage ⁴	Silver certification, PLUS: EAc1 + EAc2: 5 points WEc1 + WEc3: 2 points	Not Applicable
Fee	None		(-) \$0.51 – \$1.03 per sf

Table 1 - Proposed multifamily residential new construction green building standards and feebate specifications

Feebate Option	Green Building Standards ⁵	Minimum Requirements	Feebate ⁶
Reward	Living Building Challenge	Net-zero energy and water documentation (1 year)	\$8.65 – \$17.30 per sf
	LEED New Construction 2.2 Core and Shell 2.0 Schools Retail	Platinum certification, PLUS: EAc1 + EAc2 : 10 points WEc1 + WEc3: 4 points	\$3.46 – \$6.92 per sf
	LEED New Construction 2.2 Core and Shell 2.0 Schools Retail	Gold certification, PLUS: EAc1 + EAc2: 8 points WEc1 + WEc3: 3 points	\$1.73 – \$3.46 per sf
Waiver	LEED New Construction 2.2 Core and Shell 2.0 Schools Retail	Silver certification, PLUS: EAc1 + EAc2: 5 points WEc1 + WEc3: 2 points	Not Applicable
Fee	None		(-) \$1.73 – \$3.46 per sf

Table 2 - Proposed commercial new construction green building standards and feebate specifications



5.2.3 Other City Initiatives

Green Investment Fund

The City's Green Investment Fund is a competitive grant program that supports innovative green buildings for public and private projects. A total of \$425,000 is available for 2009. The intent of the Fund is to support early building and site-related activities that identify means to implement comprehensive green building projects. Between 2005 and 2007, the GIF has invested over \$1.5 million in green building practices.

Ecoroof Incentive Program

The Bureau of Environmental Services offers an incentive of \$5 of per square foot of ecoroof (green roof) to owners of residential and commercial buildings. Installation costs of ecoroofs in the Portland area range from \$5 to \$20.⁹ The main environmental driver for the Ecoroof Grant is stormwater management, as opposed to urban heat island effect, appropriate to Portland's climate. Applications to the program are reviewed by a committee twice per year.

Proposed Climate Action Plan

In response to the Intergovernmental Panel on Climate Change's most recent climate change report, Portland and Multnomah County have developed a new Climate Action Plan that will target an 80 percent reduction in GHG emissions by 2050. The City and County have worked with public agencies, technical experts, and stakeholders to develop this plan which is expected to be released to the public in the Spring of 2009. The plan calls for action in the following areas: energy, buildings, land use, transportation, consumption, solid waste, and food, among others.

5.3 Green Technologies

Since Portland's green building policies are largely related to the LEED® rating system, which deals with many aspects of building design, it is inherent that the buildings that achieve success apply many green practices and technologies. However, it can be seen from the presence of the Ecoroof Incentive Program and the new proposed High Performance Green Building Policy that water conservation and management and energy efficiency are high priorities. In addition, the Green Investment Fund invests in innovative approaches to waste reduction, water conservation, on-site stormwater management and reuse, energy conservation and on-site renewable energy generation. Projects funded through the Green Investment Fund have included such innovative green technologies such as:

- PV-integrated glazing
- Roof-mounted PV panels

⁹ www.portlandonline.com/bes/ecoroofgrants



- Pervious pavers
- Roof-mounted wind turbines
- Integrated solar thermal heat pump system

5.4 Education & Outreach

Portland offers educational and outreach opportunities related to green development to developers, building professionals, and the general public through a wide range of initiatives such as websites, guidebooks, seminars, a resource centre, and award ceremonies.

G/Rated Program

G/Rated is Portland's comprehensive green building program operated under the Office of Sustainable Development (OSD). The program provides capacity for outreach, technical assistance, policy, research and staff training. The program acts as a central resource for professionals in the development industry to gain information regarding Portland's green building initiatives, research and support. It offers an initial consultation and direction on green building issues with respect to indoor air quality, energy and water efficient systems

Staff also coordinate the activities of all City agencies to develop, implement, and enforce the actions as described in the City of Portland Green Building Policy.

Green Building Hotline and Resource Center

Portland's Green Development Resource Center offers a Green Building Hotline that provides support to residents, contractors, businesses, schools, building professionals, and non-profit organizations by providing comprehensive green building resources, tools, and guidelines. The hotline is available by phone and online. The resources include:

Tools and information include residential construction checklists, recycling toolkits, listing of local businesses, networking opportunities

Annual BEST Awards

The annual BEST Awards, presented to Portland area companies demonstrating excellence in business practices that promote economic growth and environmental benefits. The awards are intended to inspire the business community to showcase innovation and show their commitment to sustainability. The award categories are:

- BEST Practices for Sustainability for Very Small, Small, Medium and Large companies
- Sustainable Products or Services
- Green Building - New Construction/Major Renovation and Tenant Improvement
- Sustainable Food Systems



5.5 Effectiveness

Since implementing their GHG emissions reduction plan in 1993 and initial green building policy in 2000, Portland has achieved success on many levels. This can be attributed to setting aggressive targets, consulting with building professionals and developers, providing educational opportunities, and continuously reviewing and updating existing policies and initiatives.

5.5.1 Success Tracking

In November 2007, City Council responded to the UN's Intergovernmental Panel on Climate Change's most recent report by directing staff to develop an ambitious new climate protection strategy that adopts a goal of reducing emissions of carbon dioxide by 80 percent by 2050.

For the proposed High Performance Green Building Policy, it is planned that the Office of Sustainable Development (now the Bureau of Planning and Sustainability) will review data on trends in building construction and green building certification and report annually on the percent of projects and square footage that achieved the performance levels of the green building policy. Similarly, the City will report on compliance with the existing buildings requirement. The full policy will be reviewed after three years, when building codes are being updated, to evaluate its effect and any propose and recommended changes.¹⁰

5.5.2 Successes Achieved

Some of the highlights of Portland's green development efforts over the years include:

- Becoming the first city in the US to adopt a plan to reduce GHG emissions (1993);
- GHG emissions in 2007 remaining at the same level as 1990, despite a population growth of 18 percent;
- Between 2000 and 2006, about 22 percent of all new commercial building square footage received LEED® certification;
- About 12 percent of single-family homes built in 2006 were certified by Earth Advantage as meeting the Energy Star Northwest standard;
- The addition of two major light rail lines and the Portland Streetcar and 75 percent growth in public transit use since 1990;
- A recycling rate of 63 percent, among the highest in the US;
- The construction of nearly 40 high-performance green buildings by 2005;

¹⁰ <http://www.portlandonline.com/osd/index.cfm?c=45879&a=220984>



- The establishment of the Energy Trust of Oregon and consistent funding for energy efficiency and renewable energy programs;
- The planting of over 750,000 trees and shrubs since 1996; and,
- The weatherization of 10,000 multifamily units and over 800 homes in two years.^{11, 12, 13}

5.5.3 Success Factors & Barriers

The City issued a report in 2007 describing the challenges that local leading green building professionals encountered when employing green building strategies.¹⁴ The green building professionals also provided recommendations as to how the City could facilitate and support green building development in the city.

Challenges

It was stated that common challenges encountered when developing a green building include costs, regulatory barriers, established policies and procedures, and project financing. More specifically, the challenges included:

- Higher costs frequently attributed to the first costs of energy efficient products or the additional premium on green products.
- Certified wood and solar energy being perceived as cost prohibitive for many projects.
- Perceived increased expense of LEED® certification which is cost prohibitive for smaller-scaled projects.
- Added costs of Code appeals.
- Implementation of innovative or unconventional practices due to inconsistency with the established building and zoning codes.
- Perception that the City's building and zoning codes are not flexible enough to allow products or processes that are unique to green buildings.
- Inconsistency of City policy and procedure at different bureaus which can inhibit the development of green, as well as conventional, buildings.

Although currently regarded as a leader in green building, it was indicated that the City will need to show strong leadership and implement aggressive policies to maintain its position as a leader. Compared to other municipalities, green building in Portland relies more heavily on private-sector action rather than public policy.

¹¹ <http://www.portlandonline.com/osd/index.cfm?c=45879&a=220984>

¹² <http://www.portlandonline.com/osd/index.cfm?c=41896>

¹³ <http://www.portlandonline.com/osd/index.cfm?c=41901&a=112118>

¹⁴ <http://www.portlandonline.com/osd/index.cfm?c=48817&a=170933>



Recommendations

Several recommendations were made as to how the City could specifically facilitate and support green building, including: financial incentives, regulatory systems that facilitate green building and building regional economic development alliances. Other recommendations included:

- Applying green building practices at a larger scale, such as neighborhood or urban renewal areas, since many energy and development solutions are not feasible for individual buildings but may become feasible at larger scales.
- Maintaining Oregon's Business Energy Tax Credit (BETC) which is widely regarded as a highly effective financial incentive for energy conservation and accelerated adoption of LEED® certified green buildings.
- The need for the City to promote the already well-established economic cluster of local companies that provide products and services related to the green building industry.

Furthermore, it was believed that the City has the opportunity to remove barriers to green building implementation by supporting:

- taxes and regulations that encourage what is valued and penalize what is not valued;
- incentives and regulations that support strong local and regional economic development;
- alliances between companies that offer products and services within the green building industry;
- regulatory systems that facilitate and speed up green development projects;
- advanced energy conservation standards, building commissioning and recommissioning;
- ASHRAE's Proposed Standard 189, Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings;
- organizations that assist homeowners and small businesses to efficiently utilize existing and future incentives.

5.6 Applicability / Lessons Learned

There are two themes in Portland's approach, which may be most instructive to carry over to Mississauga.

The first is the need to address real or perceived costs obstacles to green building development. Portland identified this as a main obstacle in the City's 2007 Report. They are also proposing that their proposed High Performance Green Building Standard have cost incentives as a key element.

Secondly, is the need to facilitate the green building development process such that they are no slower than, or preferably accelerated, compared to conventional applications. This was also a recommendation of their 2007 report. It can be



addressed on several fronts, including for example, education and outreach, on-staff facilitators, and a clear and user-friendly compliance process.

These stakeholder concerns are likely to apply to Mississauga as well. The extent of this can be evaluated within the planned stakeholder discussions.

In a regulatory context, the feebate approach proposed in Portland's High Performance Green Buildings Strategy is a viable option for Mississauga. Monetary incentives such as Portland's EcoRoof Incentive and Green Technology Investment fund are also viable.

Similarly to Vancouver, professional engagement in green building practices is greater in this region than in Mississauga. Green building expertise is strongly represented here, evident by greater representation on the USGBC and the higher number of LEED® certified buildings. For this reason, it is likely that Mississauga will require more outreach and education than has been provided by this case study in order to promote similar success.

6.0 CHICAGO, IL

6.1 Overview

Chicago has a long history of green leadership with current Mayor Richard M. Daley. Chicago has had an emphasis on storm water management, notably green roofs, and is currently focusing on greenhouse gas reductions.

We understand the City of Mississauga is specifically interested in Chicago's green development achievements, particularly in the area of storm water management.

The City of Chicago first began its sustainable development efforts with the creation of the Department of the Environment in 1992. Through the Department of the Environment and the Department of Buildings, Chicago has implemented various programs related to green development, including those for green buildings, green roofs, urban heat island mitigation, stormwater management, waste management, and energy. The city's green building initiatives are voluntary and applicable to new and existing public and private buildings and development.

6.2 Green Development Strategies

6.2.1 Green Building Permit Process

Chicago's Green Building Permit Process is an expedited process that reduces permitting time and waives consultant review fees. This has encouraged hundreds of green projects in the city, totaling more than 2 million square feet.



There are currently more than 250 buildings working toward LEED® certification.

Chicago's expedited permitting program for projects that incorporate innovative green building strategies is not formalized through ordinance or regulation; rather, the Department of Buildings (DOB) has developed formal, detailed guidelines for the program¹⁵.

Projects accepted into the Green Permit Program can receive permits in less than 30 business days or in as little as 15 business days. The number of green building elements included in the project plans and project complexity determines the length of the permit process. Incorporating more green building elements into the design shortens the timeline to obtain a permit. Applicants that demonstrate an extraordinary level of green strategy implementation may have consultant code review fees waived. Applicants are guided through the expedited permit process by a dedicated team of experts in green building design.

For commercial buildings to be accepted into the program, they must earn LEED® certification, with different incentives for different levels of certification. In addition, many projects must integrate certain green technologies and strategies selected from a list of specific measures, or "Menu Items," that enhance sustainability, affordability, and economic development.

PROJECT TYPE	BENEFIT TIER I	BENEFIT TIER II	BENEFIT TIER III
	<i>Expedited permit¹ (goal <30 days)</i>	<i>Consultant review fee paid up to \$25,000 Expedited permit¹ (goal <30 days)</i>	<i>Consultant review fee 100% waived Expedited permit¹ (goal <30 days)</i>
INSTITUTIONAL Hospitals	LEED Certified ² + 2 Menu Items	LEED Silver ² + 2 Menu Items	LEED Platinum ² or LEED Gold + 2 Menu Items
Community Centers and Schools	LEED Certified ² + 1 Menu Item	LEED Silver ² + 1 Menu Item	LEED Platinum ² or LEED Gold ² + 2 Menu Items
INDUSTRIAL	Not applicable	LEED Certified ² + EnergyStar Roof + 1 Menu Item	LEED Gold ² or LEED Silver + 2 Menu Items
COMMERCIAL Retail over 10,000 square feet (footprint)	LEED Certified ² + EnergyStar Roof + 2 Menu Items	LEED Silver ² + 25% Green Roof + 2 Menu Items	LEED Gold ² + 50% Green Roof + 2 Menu Items
Retail under 10,000 square feet (footprint)	LEED Certified ² + 1 Menu Item	LEED Silver ² + 1 Menu Item	LEED ² Platinum or LEED Gold + 2 Menu Items
Office over 80 feet tall	LEED Certified ² + 50% Green Roof + 2 Menu Items	LEED Silver ² + 75% Green Roof + 2 Menu Items	LEED Platinum ² or LEED Gold + 75% Green Roof + 2 Menu Items
Office under 80 feet tall	LEED Certified ² + 2 Menu Items	LEED Silver ² + 2 Menu Items	LEED Platinum ² or LEED Gold + 3 Menu Items

¹⁵ http://www.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/GreenPermitBrochure_1.pdf



The Menu Items include measures such as:

- exceptional energy performance: for LEED® projects, obtain four points for EAc1, Optimize Energy Performance
- green roofs
- on-site renewable energy: amounting to at least 1 % of total annual energy use
- transit-oriented development design: locate buildings near public transit and with minimal parking
- exceptional water management: exceeded requirements of the Chicago Stormwater ordinance
- natural ventilation: provide a natural or hybrid ventilation system serving 50% of regularly occupied areas
- exceptional bike parking: exceed LEED® requirements

6.2.2 The Chicago Standard

In 2004, The City of Chicago adopted The Chicago Standard, a green building strategy to guide the design, construction, renovation, operation and maintenance of municipal facilities. The Chicago Standard is based on 46 selected points from the LEED® Rating System which have been deemed reasonable and appropriate for Chicago. The Standard was implemented as a way to build a base of building professionals experienced in green building design. Although originally developed to guide development of municipal facilities, the Standard can be used towards any commercial construction or renovation project.

6.2.3 Other City Initiatives

Construction and Demolition Recycling Ordinance

In 2006, Chicago passed the Construction and Demolition Recycling Ordinance which requires all major demolition and construction projects to recycle a minimum of 50 percent of their waste beginning in 2007. Since then, 397,359 tons of generated debris were recycled, which amounts to an 87 percent weighted recycling average per project.

Green and Cool Roofs

The City has established a Green Roof Improvement Fund for buildings in the “Loop” (the downtown core) as well as a Green Roof Grant Program to help fund small and large green roof installations. The Green Roof Grant Program offers residential and small commercial building owners up to \$5,000 for green roof projects.

The City’s Cool Roofs Grant Program provides up to \$6,000 to help residents and small business owners install a cool roof.



Urban Heat Island Mitigation

The Green Urban Design policy framework addresses urban heat island effect and includes codes for urban forestry. During the last 15 years, Chicago has planted more than 500,000 trees and achieved a City-wide tree count of 4.1 millions trees. The City plans to plant approximately 1 million new trees by 2020.

Green Alleys

Chicago's Green Alley Guidebook provides information and best management practices to reduce the urban heat island effect, stormwater runoff, and light pollution in alleyways. BMPs include high-albedo and permeable pavement and dark sky compliant light fixtures. More than 40 green alleys have been completed and the City has made green alley design a part of standard practice.

Stormwater Management

The City of Chicago has implemented a Stormwater Management Ordinance that requires developments of a certain size and density to control the rate and quantity of stormwater leaving the site. Specifically, the Ordinance requires a development to capture the first ½ inch of rain on-site.

The Guide to Stormwater Best Management Practices provides guidance to developers and residents on ways to reduce the quantity of stormwater draining into the municipal sewer system and local waterways. The BMPs promote the reduction of impervious surface area and the use of landscape and soils to naturally move, store, and filter stormwater runoff. The guide includes a summary of green roofs, cisterns, permeable paving, natural landscaping, filter strips, bioswales, and detention basins, and their associated costs and effectiveness.

Chicago's Water Agenda (2003) outlines a strategy for conserving and protecting the city's water resources. Strategies include examining the potential for installing grey water systems to irrigate landscaping or for building reuse, planting native and drought-tolerant species, developing a plan to charge for water based on usage. Other strategies for stormwater management include green roofs, permeable pavement, and downspout disconnections.

Climate Action Plan

Chicago's new Climate Action Plan, released in 2008, has an aggressive target of 80% greenhouse gas emissions reduction from 1990 levels by 2050, with an interim target of 25% reduction by 2020. The plan focuses on five main strategies:

- Energy efficient buildings;
- Clean and renewable energy sources;
- Improved transportation options
- Reduced waste and industrial pollution



- Adaptation

These five strategies are broken into 35 actions for mitigating GHG emissions. While a majority of the actions are related to retrofits, upgrades, and renovations, the following lists the actions related to green development:

- **Energy Efficiency Code:** The City of Chicago will update and simplify its Energy Conservation Code in order to align it with the international standards as well as facilitate adherence to its regulations.
- **Renewable Energy:** The City plans to increase renewable energy capacity, adding to the already existing six wind farms in Illinois and two megawatts of solar generating capacity in the city.

6.3 Green Technologies

The technologies and measures implemented as part of Chicago's green development strategies have primarily been focused on stormwater management, urban heat island mitigation, and renewable energy. The technologies and measures implemented for stormwater management and urban heat island mitigation are closely linked. These include permeable pavement, green roofs, and tree cover. Solar photovoltaic and thermal systems are also featured throughout the city especially in City facilities where they provide over 70 percent of hot water needs in 20 buildings; in total, the city also has two megawatts of solar generating capacity.

6.4 Education & Outreach

Chicago Center for Green Technology

The Chicago Center for Green Technology (CCGT) serves as the most comprehensive green building educational resource in the US Midwest. The Center promotes sustainable homes, workplaces, and communities through educational programming and training, research and demonstration and by acting as a resource network.

The CCGT offers free seminars for the public 2-3 times per week. Their Green Building Resource Center includes knowledgeable staff, a sample library of green building and design materials, free public access to the BuildingGreen magazine and website, reference books, LEED® reference material, and newsletters and industry journals.

The Center's building and campus itself is also an educational tool as it incorporates various green technologies:

- Energy
 - Roof-mounted solar PV system (28.8 kW)
 - Building-integrated PV window awning system (10.8 kW)
 - PV system covering the parking lot (32.4 kW)
 - Greenhouse with Trombe Wall passive solar air heating system



- Stormwater Management
 - Green roof
 - 12,000 gallon cistern used for landscape irrigation
 - Bioswales and artificial wetland
- Site
 - Landscaping with native plants
- Materials
 - 40% of CCGT's building materials are made from recycled materials

In response to Chicago's increasing demand for educational resources of green technology, the CCGT has developed a Green Tech University program that provides free seminars and an opportunity to expand professional networks. Certificates are available from Green Tech U in subjects such as architecture, building and construction management, and engineering.

6.5 Effectiveness

6.5.1 Success Tracking

As detailed in Chicago's Climate Action Plan the city is targeting an 80% reduction in GHG emissions from 1990 levels by 2050, with an interim target of 25% reduction by 2020.

6.5.2 Success Achieved

Chicago's Green Permit program has encouraged hundreds of green projects in the city, totaling more than 2 million square feet. There are currently more than 250 buildings working toward LEED® certification. According to City officials, 19 permits were processed through the Green Permit program in 2005, 71 in 2006, and 144 in 2007. This includes a considerable number of large residential projects (affordable housing projects, condominiums, apartment buildings), as well as commercial projects.¹⁶

In 2005, Chicago was the only city in the world to have 4 LEED® Platinum buildings.

As of 2008, 400 green roof projects in various stages of development totaling nearly four million square feet are in development. The City plans to increase the number of green roof projects to 6,000 by 2020.

During the last 15 years, Chicago has planted more than 500,000 trees and achieved a City-wide tree count of 4.1 millions trees.

¹⁶ Municipal Green Building Policies: Strategies for Transforming Building Practices in the Private Sector. Washington, DC: Environmental Law Institute, 2008.



6.5.3 Success Factors and Barriers

It has been reported that the success of Chicago's program is due largely to the provision of comprehensive permit coordination services to participating projects. Program participants are particularly drawn to the availability of a Green Permit program staff member who is not only knowledgeable about the City's permitting system and requirements and available to help navigate this system but also someone who is knowledgeable about green buildings in general. This is an important benefit in addition to the reduced permitting time and potential fee reduction.¹⁷

6.6 Applicability / Lessons Learned

By beginning with aggressive measures within the City's jurisdiction, specifically with its green roof initiatives, and by greening its own buildings, Chicago developed a reputation for green success which provided momentum to an increasingly comprehensive approach. Their innovative focus on green alleyways may similarly develop into a compelling hallmark of their green commitment.

Although it has set relatively high (yet voluntary) achievement standards Chicago has attempted to remove obstacles by providing developer support that includes permit acceleration, fee incentives and technical support.

7.0 AUSTIN, TX

7.1 Overview

Austin's green building program is one of the largest and the first comprehensive program in the US to encourage sustainable building techniques for residential, multi-family, commercial, and municipal buildings. The Austin Energy Green Building program was developed and is managed by the municipally-owned electric utility, Austin Energy, and originally intended as a voluntary program.

Several educational and outreach opportunities exist through seminars, an online sourcebook of sustainable design principles, and a directory of local green building professionals.

¹⁷ Municipal Green Building Policies: Strategies for Transforming Building Practices in the Private Sector. Washington, DC: Environmental Law Institute, 2008.



7.2 Green Development Strategies

7.2.1 Austin Energy Green Building Program

Austin's green building initiatives date back to 1985 when the Energy Star energy conservation program was created by Austin City Council. City council passed a resolution to implement sustainable building techniques in City facilities in 1993, and in 1995 their Commercial Green Building Program began. In 2000, City Council passed a resolution mandating that all municipal buildings gain LEED® Silver certification. The commercial building rating tool was revised in 2005.

The Austin Energy Green Building Program uses green building rating systems and checklists for residential, multi-family, and commercial buildings. Each rating system offers five different rating levels, from one to five stars. There is also a special two-star rating system for Planned Unit Development (PUD) projects. For each rating level projects must include certain pre-requisites (basic requirements) in addition to a specific number of points from a list of optional criteria. Four- and five-star projects have additional pre-requisites. Overall, the commercial building rating system is divided into eight categories: Basic Requirements, Team, Site, Water, Energy, Indoor Environmental Quality, Materials and Resources, Education, and Innovation.

Although primarily a voluntary program for commercial buildings, buildings in certain areas of Austin require a rating. All projects in the Central Business District and Downtown Mixed Use zones must achieve at least a one-star rating. Other zones requiring a rating include the Traditional Neighbourhood district, the University Neighbourhood Overlay district, the airport redevelopment zone, as well as several PUD districts.

Documentation and Compliance

Austin's program is notable for its involvement in all aspects of the project, from the planning stage through construction and commissioning. The program's staff assist project teams in incorporating green building practices and techniques and to ensure that these measures are documented correctly throughout the process.

Before a developer submits site plan documents to the city's planning department, they must obtain a Letter of Intent from the green building program which affirms that the developer is aware of the green building requirements as related to the project. Before submitting a building permit application, a developer must submit a checklist, plans and specifications documenting that the project meets minimum criteria of the rating system. A Certificate of Initial Compliance is then issued. Officials have noted that projects that work closely



with the program during the site plan process have not experienced delays during the green building review.¹⁸

Green building program staff work closely with projects throughout construction. An extensive database system is maintained to track each project. The checklists specify the type of documentation that must be submitted as verification for certain pre-requisite and optional points. Before the city adopted its latest Energy Code, the program required submission of certain testing results depending on the type of project and level of green building rating pursued. All commercial building projects require submission of calculations for water use, construction waste recycling and energy efficiency in addition to a commissioning report. The program typically conducts two to three site inspections per project, separate from the city's regular inspections.

Enforcement

For the projects that are required to obtain a green building rating, their final Certification of Occupancy cannot be obtained until they have complied with the green building criteria. If a project does not achieve the minimum rating, the city may issue penalties

Incentives

Building owners are able to take advantage of several incentives from Austin Energy for incorporating energy conservation measures.

- Rebates are available for solar photovoltaic systems at \$3.75 per watt.
- Solar water heaters are eligible for rebates between \$1,500 and \$2,000 along with a 30% tax credit of \$750 to \$1000.
- Thermal Energy Storage systems used to reduce peak electricity demand can receive up to \$100,000 in rebates.

7.3 Green Technologies

Richard Morgan, of Austin Energy, notes that technology incentives are playing a decreasing role as codes and standards advance. For example, while it used to be cost effective to incent efficient lighting and reflective roofing in new construction, current new building standards now mandate many of the strategies and these incentive no longer make sense.

¹⁸ Municipal Green Building Policies: Strategies for Transforming Building Practices in the Private Sector. Washington, DC: Environmental Law Institute, 2008.



7.4 Education and Outreach

The program provides free consulting and educational services for building professionals through seminars, an online professionals directory, newsletter, and a sustainable building sourcebook.

Since the program is run through the municipal electric utility, the cost of providing extensive green building services through 20 funded staff positions is offset by the reductions in capacity demand on the city's power plants.

The program's Sustainable Building Sourcebook is an online guide that contains information relevant to the Austin area, such as regulatory issues, climate, installation guidelines, and sources of assistance. It also contains relevant information related to green building practices and strategies. Chapters include: Community, Energy, Health & Safety, Materials, Water, and Green Building Design Tools. Although designed to educate all readers, the Sourcebook is directed specifically to those in the building industry. Rather than presenting in-depth details about specific green building measures, the Sourcebook offers general building guidelines that reflect Austin's unique conditions.

Free seminars are provided to all building professionals and Austin Energy and City of Austin personnel. Fieldtrips are also provided. A bimonthly electronic newsletter that highlights green building within the community is also offered.

The program's website contains a searchable directory of green building professionals. Austin's Green Map is an interactive Google Maps-based website that highlights the City's green buildings certified under Green Building Program and LEED®. A description of specific green technologies and level of Green Building Program and LEED® rating is given for each building.

7.5 Effectiveness

7.5.1 Success Tracking

The green building program maintains a database that tracks the progress of each project and indicates whether a project has failed to submit required documentation for a particular measure. This way, the program can follow up with a notice to the project.

The success of Austin Energy's investment into internal resources is strongly defended by Richard Morgan, Program Manager of Austin Energy's Green Buildings program for the last 10 years. The utility reviews their avoided costs for capacity increases every year. This provides one side of their business case argument for their green program investments. The Green Buildings program has



a relatively small budget of \$1.7M for their 20 staff. By comparing the green building performance (particularly in their case with respect to energy use) of buildings that have received Austin Energy's support to those which have not, they are very confident that this investment in internal resources is worthwhile.

7.5.2 Success Achieved

According to city officials, as of 2007 there were 19 commercial projects and 8 multi-family projects containing 1,267 units completed under the program.¹⁹ About half of these projects were required to obtain a rating, while the remainder were voluntary. Program officials have noted that since the program is part of the city's electric utility and also receives funding from the municipal water utility, evaluating its results is a central part of the program. Commercial projects are required to model or calculate actual energy use, water use, and construction waste recycling. Therefore, the program is able to determine savings achieved through the program.

7.5.3 Success Factors and Barriers

According to Richard Morgan, Program Manager of Austin Energy's Green Buildings program for the last 10 years, there are three particularly key components to the programs success.

One is their collaborative approach with industry and developers. This in particular has led to achievements that would otherwise not have been possible, such as changes to codes and development of the **Climate Protection Plan**. Furthermore, the intensive support provided to developers and design teams described in the "Education and Outreach" section, has resulted in substantial project success.

Another is clearly their strong investment in internal resources. The collaboration described above has required substantial internal time and resource commitment. Austin Energy has taken an active role in all applicable industry associations and contributed significantly by providing comprehensive analysis and well-researched positions on initiatives they support. Some of their successes have required extended negotiation periods - one recent ordinance change about energy use in homes was in discussion for a year.

Furthermore, internal resources are required to support the very successful education process described in the earlier section of this report.

¹⁹ Municipal Green Building Policies: Strategies for Transforming Building Practices in the Private Sector. Washington, DC: Environmental Law Institute, 2008.



A third component of their success is marketing. Morgan notes that a key to uptake has been successful long-term marketing, particular to the public, to increase awareness of the direct green buildings benefits to their lives.

With respect to barriers, Morgan notes that professional expertise is still lacking in the green development community, particularly with respect to energy modelling and commissioning. This is one reason why it continues to be necessary to support this expertise in house and provide it to design teams. This is interesting considering the relatively developed state of Austin's market compared to Mississauga's.

7.6 Applicability / Lessons Learned

Since Austin's program is administered by the public electricity utility, they have a much clearer financial incentive to motivate energy and peak saving measures than in a municipal context. However, this does illustrate that a business case can be made for a wide range of strategies. In particular, Richard Morgan, Program Manager of Austin Energy's Green Buildings program for the last 10 years, described that their business case for their exemplary investment into internal resources is likely more solid than their business case for technology incentives.

It was interesting to note that despite the relatively developed state of Austin's market compared to Mississauga's, Austin still feels there is a large gap in professional knowledge, particularly with respect to energy simulation and commissioning. This is a reason why their internal resources continue to be so critical to their Green Program success.

8.0 SCOTTSDALE, AZ

8.1 Overview

Scottsdale's voluntary Green Building Program is administered through checklists that encourage a whole-systems approach to green buildings through appropriate design and building techniques. Projects are rated in six environmental impact areas: Site Use, Energy, Indoor Air Quality, Building Materials, Solid Waste, and Water. Different checklists are available for residential, multi-family residential, and commercial buildings and tenant improvements.

To encourage uptake of the program, incentives such as priority plan reviews and job site signs are offered. Educational opportunities through seminars, workshops, and directories of green building professionals are also offered.



8.2 Green Development Strategy

8.2.1 Green Building Program

The City of Scottsdale's green building program for residential buildings began in 1998 to encourage green building techniques with the goal of achieving short- and long-term energy, water, and resource savings. In 2005, Scottsdale became the first US city to mandate LEED® Gold certification for all new municipal buildings. In addition, all future renovations and non-occupied city buildings must be designed, contracted, and built to include as many principles of both the LEED® program and the City's Green Building Program as feasible. Building on the success of the residential green building program and City LEED® policy, the city also developed a voluntary green building checklist for commercial and multi-family residential buildings and tenant improvements.

The rating checklists include mandatory items along with over 100 other options. Two rating levels are achievable, Entry and Advanced, depending on the number of points attained

Priority Plan Review

All qualified green buildings receive expedited and priority plan review. Depending on the building's degree of complexity, qualified green buildings can expect to receive building permits in two-thirds the time of regular building projects. Development process and technical assistance is provided as part of the plan review and approval process.

Green Building Permit and Inspections

Once plans are approved under the green building rating checklist, a green building permit is issued. Green building inspections are then provided in conjunction with the regular city inspections to ensure the project complies with the green building provisions as approved on the plans. Upon completion of the building, a Green Certificate of Occupancy is issued that becomes a permanent record of the city.

Job Site Signs

City green building construction job site signs are available for builders to help distinguish their projects from others. This serves as a way to inform the general public of the builder's green building credentials.



8.3 Green Technologies

The use of passive and active solar energy and water conservation systems are particularly emphasized in the green building program. The program makes reference to several state incentives, tax credits, and rebates available for implementation of related technologies.

8.4 Education and Outreach

Scottsdale has established a Green Building Advisory Committee that helps to support and develop a pro-active campaign for green building in the city. The volunteer committee is responsible for providing guidance to improve program criteria, promotion, education and special events.

Scottsdale considers the program to be consumer-driven; therefore, the city is engaged in an ongoing effort to educate the public and building industry by providing:

- Development process assistance
- Construction job site signs
- Directory and recognition of participating buildings and designers
- Certification
- Lectures (green building and solar), workshops, and special events

Every builder and designer who enters a project into the green building program is expected to attend at least two green building related lectures, workshops, or seminars.

The city's 2007 Green Building Expo attracted over 10,000 attendees, 120 exhibitors, 24 educational seminars, and a Sustainable Film Festival.

8.5 Effectiveness

8.5.1 Success Tracking

Success of the green building program is primarily tracked through the number of green permits that have been issued to residential and commercial buildings. The city tracks the number of projects that builders have completed through the program, along with their average green building rating. The number of solar hot water and photovoltaic permits are also tracked.

8.5.2 Success Achieved

Scottsdale's program was originally established for residential buildings only. Since then, it has grown to include commercial and multi-family buildings and tenant improvements. The program has also expanded to municipal buildings - in



2005, Scottsdale became the first US city to mandate that all city buildings must attain LEED® Gold certification.

By 2007, over 1450 green permits had been issued for residential and commercial buildings. In 2006, over 34% of all the permits that were issued were green permits – the highest percentage of any year.

8.5.3 Success Factors and Barriers

The success of the entire program can be attributed to the early adoption of green building techniques for residential buildings. There has been substantial participation in the incentive program among residential builders, as the priority plan review was seen as a major benefit.

Although the city has high-level management support for administering the program, it has been noted that the priority plan review may have to be phased out if the program becomes too successful. For example, when the program achieves a participation of 40-50% of new residential projects, the city will not be able to handle such high volumes without disrupting the regular permitting process.²⁰

8.6 Applicability/ Lessons Learned

Scottsdale's approach of strong municipal leadership with optional but comprehensively supported private green development is an approach Mississauga could consider as a strong "carrot" rather than "stick" strategy. This may be appropriate if Mississauga feels more time is required to develop in-house expertise to support strict compliance renews or mandated development requirements.

²⁰ Municipal Green Building Policies: Strategies for Transforming Building Practices in the Private Sector. Washington, DC: Environmental Law Institute, 2008.



APPENDIX C REGULATORY ENVIRONMENT

October 14, 2009



City of Mississauga – Green Development Strategy

Appendix C – Regulatory Environment

1.0 REGULATORY ENVIRONMENT

1.1 The Planning Act—General Provisions

Planning in Ontario is governed by the Planning Act, which was recently updated through Bill 51. One key purpose of the Act is: “to promote sustainable economic development in a healthy natural environment.” Local municipalities must consider provincial issues when implementing the Planning Act, such as: “a) the protection of ecological systems, including natural areas, features and functions; c) the conservation and management of natural resources; e) the supply, efficient use and conservation of energy and water; f) the adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems; g) the minimization of waste.”

In addition, the Act states that municipal planning decisions “a) shall be consistent with policy statements... that are in effect at the time of the decision ...; and b) shall conform with provincial plans that are in effect...”

1.2 The Provincial Policy Statement (2005)

The 2005 Provincial Policy Statement contains a number of policies which direct municipal councils towards achieving sustainable development. For example, in Section 1.1.1 c) the Provincial Policy Statement states that healthy, liveable and safe communities are sustained by “avoiding development patterns which may cause environmental or public health or safety concerns”. In general, the policies promote intensification and regeneration with a mix of densities and land uses and transportation systems that “minimize negative impacts to air quality and climate change, and promote energy efficiency”. Specific policies call for water conservation and efficient use of water resources, energy efficient transportation services, minimizing the length and number of vehicle trips, supporting the development of public transit, promoting the reduction, reuse and recycling of waste and promoting design and orientation which maximize the use of alternative or renewable energy.

1.3 The Official Plan

Section 16 (10) of the Planning Act outlines the framework for municipal official plans. It states that official plans shall contain: “a) goals, objectives and policies established to primarily manage and direct physical change and effects on the social, economic and natural environment of the municipality or part of it...”. Section 16 (2) states that an official plan may contain: “a description of the measures and procedures proposed to attain the objectives of the plan”. These “goals, objectives and policies” as well as

“measures and procedures” cover a broad territory including matters pertaining to sustainable development practices.

With respect to green development, Section 2.7 of the Mississauga Official Plan outlines the City’s Environmental Goals and objectives focusing on protecting natural systems, preventing and reducing pollution and conserving and reusing natural resources. The objectives cover a wide range of subjects including promoting “the conservation and re-use of energy, water, and other natural resources and encourage waste reduction, re-use of materials and recycling, to reduce waste” and encouraging “energy conservation and reducing air pollution and greenhouse gas emissions through site and community design, which supports alternative forms of transportation such as, transit, cycling, and walking”.

Section 3.15 of the Mississauga Plan further outlines a set of Environmental Policies. These primarily relate to protection and enhancement of natural features, mineral extraction, protection from natural hazards, contaminated lands, storm water management, energy conservation, pollution prevention and reduction, land use compatibility, and waste disposal.

Sections 5.3.1.6 and 5.3.1.7 of the Mississauga Official Plan state that in order to provide consistent, efficient, and predictable application of environmental planning principles, all development applications will have regard for a wide range of identified environmental objectives, and that “Mississauga will co-ordinate environmental performance criteria with the programs, policies, and legislation of appropriate Provincial Government agencies, Conservation Authorities, and the Region”.

These policies will help Mississauga take advantage of provisions in the Planning Act (described in the following sections) to mandate certain green development requirements. The regulatory avenues available for specific requirements will be presented in subsequent phases of this study as the metrics and targets are developed.

1.4 Community Improvement Plans (Section 28 of the Planning Act)

Section 28 of the Planning Act contains regulations and policy development tools to create Community Improvement Areas within municipalities. The tools available to help municipalities implement community improvements in partnership with the private sector include:

- “tax equivalent grants”;
- reductions or elimination of application and/or permit fees; and
- incentives and loans.

Subsection 28 (7.1) of the Act defines eligible costs towards which grants or loans may be applied. These include development, redevelopment, construction and reconstruction of lands and buildings for rehabilitation purposes or for the provision of energy efficient uses, buildings, structures, works, improvements or facilities.

Municipalities must include policies in their Official Plans regarding Community Improvement and designate Community Improvement Areas to take advantage of the provisions in this Section.

Many municipalities have used these and other provincially available grant programs to provide incentives for brownfield site redevelopment. Others have introduced incentives for environmentally sustainable development that reduce or eliminate the tax increase for a ten year period that would otherwise be generated by an improvement to a property. This incentive would come out of municipal tax dollars. It is available for improvements made in a designated 'community improvement area'.

The Mississauga Plan identifies Community Improvement Areas along Hurontario St, Dundas St. E, and Lakeshore Rd. E.

1.5 Zoning Bylaw (Section 34 of the Planning Act)

Possibly the most relevant document at the block level, Section 34 of the Planning Act, outlines how zoning bylaws can be used as a tool to implement the provisions of Official Plans. In general, the provisions pertain to regulating land use such as:

- where buildings are erected, located or used;
- natural features and areas;
- "regulating the type of construction and the height, bulk, location size, floor area, spacing, character and use of buildings or structures to be erected or located within the municipality"; and
- loading, parking, land area, height and density.

It is very difficult to use zoning powers on their own to achieve sustainable development practices. In Ontario, the internal aspects of building construction are regulated by the Ontario Building Code. In general, a Zoning Bylaw cannot exceed the provisions of the Building Code to achieve sustainable development.

An exception to this general rule may be Subsection 34 (16) which was added as part of the amendments introduced through Bill 51 in 2006. It permits municipalities to pass zoning bylaws with prescribed conditions on the use, erection or location of buildings or structures. To take advantage of this section, municipalities must include policies in their official plans regarding zoning with conditions. It may be possible to use this section to require compliance with green development standards as a condition of development, however, it is not clear whether the Province will limit the use of this section to certain prescribed conditions, rather than leaving the option of defining the conditions to municipalities.

Bonus Provisions (Section 37 of the Planning Act)

Section 37 of the Planning Act allows the municipality to authorize increased height and density over that which was otherwise permitted under Section 34 in return for the provision of “such facilities, services or matters as are set out in the bylaw”. This section of the Planning Act is often referred to as the “bonusing section” and could potentially be used as an incentive to achieve sustainable development practices in return for additional density and height. As with other sections of the Planning Act, municipalities must include policies in their official plans to guide the use of these bonusing provisions.

Mississauga does have policies in its Official Plan regarding bonusing to achieve certain objectives (see Section 5.3.3.2 of the official Plan). These policies, however, do not include green development, other than the protection of natural areas.

1.6 Site Plan Control (Section 41 of the Planning Act)

Section 41 of the Planning Act outlines procedures for site plan control. Under this section, municipalities can review plans and drawings for buildings located in areas identified in their official plans as designated areas of site plan control. This area may cover the entire municipality. Municipalities can use these drawings to review massing and conceptual design, relationship to adjacent buildings, location of interior walkways, stairwells, elevators, and exterior design. They can also review sustainable design elements on adjoining highways under a municipality’s jurisdiction including landscaping, paving materials, street furniture, recycling containers, and bicycle parking.

This section gives municipalities powers that extend beyond the regulations contained in zoning bylaws, pertaining to siting and appearance of buildings, areas accessible to the public and site design including access, loading, lighting easements for municipal services, walkways, walls fences etc. Sustainability objectives related to site design (as opposed to building design) can be achieved through the use of this section. The section specifies that energy conservation guidelines will be established to assist in the evaluation of site plans.

Mississauga has designated the entire City as an area subject to site plan control, and therefore can review all site plan applications based on the City’s sustainability guidelines.

Parks Dedication (Section 42 of the Planning Act)

Section 42 of the Planning Act allows a municipal council to require land or cash in lieu of the value of the land for the purposes of parks dedication as a condition of development or redevelopment of land. Mississauga has included policies in its Official Plan that reflect these provisions in the Planning Act.

A new subsection, 42 (6.2), was added as a result of the amendments introduced with Bill 51. It allows a municipality, subject to certain conditions, to reduce the amount of any payment required for parks purposes if a part of the land that is proposed for redevelopment meets sustainability criteria set out in the official plan. This provision is intended to address situations where it may not be possible to convey land for parks purposes. It may be particularly suited to sites where high density development is contemplated and a lesser amount of parkland may be considered acceptable in return for meeting green development objectives. The use of this incentive may be worth considering as one of a number of tools to achieve green development in Mississauga.

1.7 Plans of Subdivision (Section 50 of the Planning Act)

Section 50 of the Planning Act outlines procedures for preparing, approving and registering plans of subdivision. Plans of subdivision include road layouts, lots, buildings, watercourses, wetlands, woodlots, and municipal services, provided the official plan includes policies regarding these matters. This section gives considerable authority for municipalities to include a broad range of provisions, including requirements related to sustainability objectives in subdivision agreements. Where lands are subject to plans of subdivision, municipalities have used this section to achieve a broad range of sustainability objectives. Mississauga outlines its policies for site plan approval in section 5.3.5 of its official plan. This study will generally be limited to the Site Plan level.

1.8 Development Permits (Section 70.2 of the Planning Act)

This section of the Planning Act allows the Province to pass regulations that would enable a municipality to replace land use controls (such as zoning bylaws, zoning with conditions, bonus provisions, site plan control, and parks conveyance) with a development permit system that could include any or all of these procedures in one approval package. The section requires land owners to enter into agreements with the municipality, which may be registered on title, as a condition of obtaining a development permit. Section 5.3.4 of the Mississauga Official Plan states that “consideration will be given to the enactment of a development permit system as authorized by the Planning Act”.

To date, only one municipality in Ontario, Muskoka, has adopted a development permit system in accordance with this section of the Act. This is likely due to the amount of effort required to successfully implement it. It may be worthwhile for Mississauga to discuss with the Province to determine whether a “Made in Mississauga” development permit system makes sense.

APPENDIX D MISSISSAUGA'S APPLICATION FOR SITE PLAN APPROVAL

October 14, 2009





The personal information on this form is collected under the authority of Section 41 of the Planning Act RSO 1990, c.P.13, as amended and will be used for the Site Plan Approval process only. For the purposes of public access to information, limited amount of information may be displayed on the City’s website. Questions about the collection of personal information should be directed to the Manager, Development Services, Planning and Building Department, 300 City Centre Drive, Mississauga, Ontario, L5B 3C1, Telephone (905) 896-5511.

For information regarding fees and charges related to development applications, please refer to the Typical Development Approval Cost Guideline booklet available from the Planning and Building Department.

Notice to All Applicants

1.

This application package consists of the following:

Page
- a.

Site Plan Process Flow Chart.....

2
- b.

Site Plan Approval application form to be completed by the applicant.....

3
- c.

Site Plan Application Checklist completed by the Counter Planner at the time of submission of application.....

4-6
- d.

Environmental Site Screening Questionnaire and Declaration to be signed by the owner

7
- e.

Conservation Authority Fee Collection form.....

8
- f.

Tree Injury or Destruction Questionnaire and Declaration form

9
- g.

Development Application Review Committee (D.A.R.C.) Requirements for Site Plan Applications.....

10
- h.

Fee Calculation Sheet.....

11
2.

Restrictions on title, if applicable, are to be provided by the applicant.
3.

Please type or print clearly all information.
4.

Application package and supporting documentation are to be submitted to the Planning and Building Department on the 11th Floor, City Hall, 300 City Centre Drive, Mississauga, Ontario L5B 3C1.
5.

If this Application is signed by an applicant other than the owner, or by an agent, written authorization of the owner must accompany this application.
6.

Attach the required number of plans as identified in the Development Application Review Committee (DARC) meeting.
7.

All drawings, including floor plans and building elevations, are to be folded to 21.5 cm by 28 cm (8 ½” x 11”).
Rolled plans will not be accepted.
8.

A Municipal Address is required prior to Site Plan submission. Please contact the Transportation and Works Department, Support Services, (905-615-3200 ext. 3215) for a municipal address if you do not have one.
9.

All site plan applications which propose the use of a private sewage system (or relocation or extension to an existing system) must provide the information identified on page 6 of this application as part of the submission.
10.

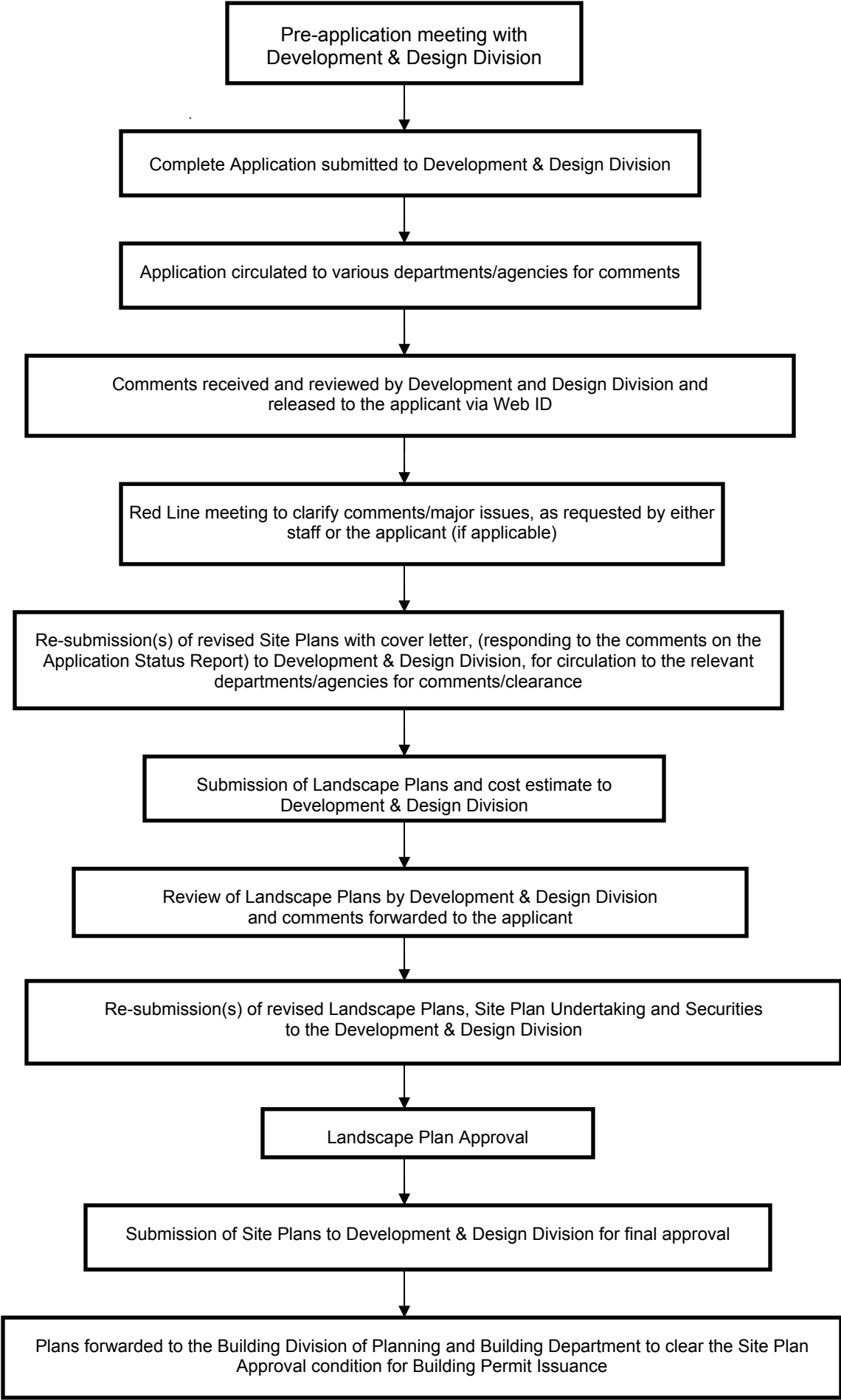
Please be advised that should there be no activity on a file over a period of three months from the date of the last activity by either the City or the applicant, the file will be closed by the Planning and Building Department without further notification to the applicant and/or owner. A new application and fee will be required to re-open the file.
- If you are aware that the site plan application will be held in abeyance for three months or more and you wish that the file remain open, you must submit in writing the reasons for this request upon which time the Planning and Building Department will make a determination on the disposition of the application.
11.

It is an offence under the Building Code Act to commence construction without a building permit. The City of Mississauga vigorously prosecutes contraventions of the Building Code Act. Any owner, contractor and subcontractor who contravenes the Building Code Act may be charged with an offence and prosecuted by the City. Repeat offenders may have a Prohibition Order imposed against them.

I hereby declare that I have read and understand the requirements of this application.

(applicant/owner’s initials:) _____ (date:) _____

SITE PLAN PROCESS FLOW CHART
Under the Planning Act, R.S.O. 1990 c.P. 13, as amended





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FOR OFFICE USE ONLY		
File No.	Ward	Reason for Site Plan Approval: <input type="checkbox"/> Site Plan Control By-law <input type="checkbox"/> C of A/L.D.C. Circulation Type: <input type="checkbox"/> Std. <input type="checkbox"/> Minor <input type="checkbox"/> Revision <input type="checkbox"/> Infill
Cross Reference File No(s).		
Property Address:		
Project Proposal:		
How would you like to receive Application Status Reports? (Choose only one) <input type="checkbox"/> E-City <input type="checkbox"/> Mail/Fax		

1. AGENT/APPLICANT AND OWNER INFORMATION

Name	Mailing address and E-Mail Address	Phone, Fax # and Cellular #
Agent/Applicant:		
Registered Owner:		

2. SITE INFORMATION

- a. Street Address: _____
- b. Legal Description of Site (i.e. lot and concession number/registered plan number/reference plan number):

- c. General Location of Site: _____
- d. Dimensions of Site: Gross Site Area _____ ha Site Frontage _____ m Site Depth _____ m

3. PLANNING INFORMATION

Planning District: _____

Existing Official Plan Designation: _____ Proposed Official Plan Designation (if applicable): _____

Existing Zoning: _____ Proposed Zoning (if applicable): _____

4. DETAILED DESCRIPTION OF PROPOSAL: _____

- | | |
|--|--|
| a) Number of Units _____ | e) Total Gross Floor Area (gfa) _____ |
| b) Number of Storeys _____ | f) Proposed Tenure: _____ |
| c) Existing Gross Floor Area (gfa) _____ | g) List the environmentally friendly or green site and building design features being proposed:
_____ |
| d) Proposed Gross Floor Area (gfa) _____ | |
- (add a separate attachment if required)

5. DECLARATION

I hereby declare that the statements made by me in this application are to the best of my belief and knowledge a true and complete representation of the purpose and intent of this application.

Signed and sealed at _____

this _____ day of _____ in the year _____.

Owner or authorized agent _____ Owner or authorized Agent’s Name: _____
(please print)

Drawing Submissions

Circulation	Site Plans*	Elevations	Floor Plans	Received
Standard/Major Revision	24	10	3	<input type="checkbox"/>
Infill Housing	14**	6	3	<input type="checkbox"/>
Minor	4	2	1	<input type="checkbox"/>

*All drawing numbers are approximate, exact amount to be determined at pre-application meeting with Co-ordinator. (See page 10).

** If septic systems are proposed, one (1) additional site plan and one (1) copy of soils analysis is required.

FOR OFFICE USE ONLY
Site Plan Circulation

Standard/Major Revision Circulation List

	SP	Elevation	Floor	
Building	1	1	1	<input type="checkbox"/>
Fire	1	1	-	<input type="checkbox"/>
Trans & Works	5	1	1	<input type="checkbox"/>
Region of Peel	3	-	-	<input type="checkbox"/>
Enersource Hydro Mississauga	1	1	-	<input type="checkbox"/>
Geomatics	1	-	-	<input type="checkbox"/>
LA/LAT	1	1	-	<input type="checkbox"/>
UD	1	1	1	<input type="checkbox"/>
Bell Canada	1	1	-	<input type="checkbox"/>

Low Rise Multi-Residential (for information only)

Enbridge Consumers Gas	1	1	-
Rogers Cable TV	1	1	-

Other as required (Site Plan only)

☐ Ward Councillor: _____

☐ C.V.C./C.H./T.R.C.A. (2 SP, 2 Grading, 1 Elevation)

☐ G.T.A.A. (1 SP, 1 Elevation)

☐ Ministry of Transportation (3 SP)

☐ Applicable Residents Association _____

☐ Traffic Safety Council

☐ Canada Post

☐ Mississauga CPTED

Infill/Minor Circulation List

	SP	Elevation	Floor	
Building	1	1	1	<input type="checkbox"/>
Fire*	1	1	-	<input type="checkbox"/>
Trans & Works	4	1	1	<input type="checkbox"/>
Region of Peel	3	-	-	<input type="checkbox"/>
Enersource Hydro Mississauga	1	1	-	<input type="checkbox"/>
Geomatics	1	-	-	<input type="checkbox"/>
LA/UD	1	1	1	<input type="checkbox"/>
LAT	1	1	-	<input type="checkbox"/>
Bell Canada	1	-	-	<input type="checkbox"/>

Residential with septic systems:

Plumbing**1☐

*All additions except for detached and semi-detached

Community Services:

☐ Forestry (Infill)

☐ Planning & Heritage

☐ Heritage Coordinator

Corporate Services:

☐ Facilities & Property Management

Circulation:

Date:

Year

Month

Day

Comments due by*:

Date:

Year

Month

Day

*All comments are to be provided on MAX.

Project Co-ordinator:

Extension:

Planner:

UD:

LA:



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Application Submission Checklist

The following is the checklist of the required information to be provided with the application, including information that is required on the site plan, building elevation and floor plan drawings. To ensure your application is complete, please ensure the following is included with your application:

General Requirements

- ☐ Completed/signed Application Form.
- ☐ Agent's Letter of Authorization. Note: only required if the application is signed by an applicant or agent other than the owner.
- ☐ Required application fee in accordance with the current Fee Schedule. Note: cheque, cash or credit card are accepted (card limited to a maximum amount of \$10,000.00). Cheques are to be made payable to the City of Mississauga.
- ☐ Required number of site plans, building elevations and floor plans in accordance with the Site Plan Circulation List (page 4 of the application form) or instructions from the pre-application meeting. (Page 10).
- ☐ Completed Environmental Site Screening Questionnaire and Declaration (to be signed by owner only).
- ☐ Completed Conservation Authority Fee Collection Form, If applicable.
- ☐ Completed Tree Injury or Destruction Questionnaire and Declaration.
- ☐ Completed Traffic Safety Council Site Plan Review Sub-Committee Form for all school site plan applications.
- ☐ All plans submitted with the application must be folded to 21.5 cm x 28 cm (8 1/2" x 11"). **Rolled plans will not be accepted.**
- ☐ Site plan at a legible scale, 1:200 suggested. All measurements must be in metric.
- ☐ Key Plan at a legible scale, with a north arrow.
- ☐ Applicant's and owner's name, address, telephone and fax numbers.
- ☐ Municipal address and legal description.
- ☐ Finished floor elevations of existing and proposed buildings.
- ☐ Underground garage roof slab elevations.
- ☐ Retaining walls (top and bottom of wall spot elevations, material).
- ☐ Building entrances, including spot elevations at entrances to indicate flush thresholds.

- ☐ Site Plan and Building Statistics:
- ☐ Zoning category.
- ☐ Lot and Plan Number, and municipal address.
- ☐ Lot area.
- ☐ Lot coverage – proposed and permitted.
- ☐ Gross Floor Area – proposed and permitted.
- ☐ Gross Leasable Area.
- ☐ Landscaped Area – proposed and required.
- ☐ Paved Area.
- ☐ Parking Spaces – proposed and required.
- ☐ Parking Spaces, for persons with disabilities – proposed and required.
- ☐ Loading Spaces – proposed and required.
- ☐ All bearings and dimensions of the property.
- ☐ Adjacent land uses, zoning, existing structures and setbacks.
- ☐ Adjacent street names.
- ☐ Adjacent bus bays, stops or shelters; above ground utilities; municipal sidewalks.
- ☐ Dimensions of all buildings and structures.
- ☐ The location of any existing structures, underground storage tanks, gas pumps, island canopies or signage and whether any encroachment agreements have been entered into with either the City or Region.
- ☐ Building setbacks to lot lines and rights-of-way (including underground parking structures and overhead canopies).
- ☐ Centre line setback of buildings from major roads as per Section 2.1.14 of Mississauga Zoning By-law 0225-2007.
- ☐ Existing/proposed easements and rights-of-way and restrictions registered on title.
- ☐ Location and dimension of parking spaces (including parking spaces for persons with disabilities), aisles, and loading spaces.
- ☐ All vehicular entrances (widths and radii) and the location of any existing centre medians and/or turning lanes external to the site.
- ☐ Dimensions of landscape and amenity areas.
- ☐ Existing and proposed grades around the perimeter of the site and critical points within the site, including the base of existing trees to be preserved.



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Application Submission Checklist

The following is the checklist of the required information to be provided with the application, including information that is required on the site plan, building elevation and floor plan drawings. To ensure your application is complete, please ensure the following is included with your application:

General Requirements - (continued)

- ☐ Existing natural features and vegetation.
- ☐ Type and location of all hard surface areas/walkways/ stairs/ramps.
- ☐ Garbage storage and handling areas.
- ☐ Legal information pertaining to road widenings, including reference plan numbers, instrument numbers, etc. and any widenings required by the City or the Region of Peel.
- ☐ Professional stamp (architect or engineer).
- ☐ The location of exclusive use areas or private amenity areas for new condominium townhouse developments .
- ☐ The location and turning radii for Fire and Emergency Service access route is to be clearly delineated.
- ☐ The location of Community Mailbox equipment for new condominium townhouse projects, detached condominium developments and proposed new industrial and commercial developments.
- ☐ A signed condominium declaration for multiple family residential developments.
- ☐ Other Site Plan Development Standards.

For applications on proposed private sewage systems:

- ☐ Type of sewage system, size and capacity.
- ☐ Setbacks from all property lines and water sources, including, but not limited to, wells, ponds, reservoirs, lakes, creeks and rivers.
- ☐ Spot and grading elevations around the perimeter of the system.
- ☐ Approximate location of trees, shrubs and other vegetation that may be impacted by the system.
- ☐ Gross Floor Area of the dwelling.
- ☐ Proposed number of bedrooms.
- ☐ Detailed list of the proposed plumbing fixtures for the purpose of load calculations. (*separate letter*)
- ☐ Three (3) copies of a Soils Analysis along with the results of percolation tests.

All other questions regarding private sewage systems are to be directed to the Building Division, Plumbing Inspection group at 905-896-5612.

For sites adjacent to Greenbelt lands:

- ☐ Top of bank location
- ☐ Stable slope line
- ☐ Limit of floodline

Building Elevations

Elevation drawings shall illustrate:

- ☐ Location of roof-top mechanical units and proposed screening.
- ☐ Building materials colours and glazed areas.
- ☐ Building dimensions.

Floor plans are for information purposes only, to determine the proposed use of spaces and the location of door and window openings.

Floor Plans shall illustrate:

- ☐ Proposed use of spaces.
- ☐ All building access points.
- ☐ Building dimensions.
- ☐ Any below grade or structured parking levels.
- ☐ Roof plan (which may be shown on the site plan).

Office Use Only

(File Number)_____
(Counter Planner’s Initials)_____
(Date)_____



The personal information on this form is collected under the authority the Planning Act RSO 1990, c.P.13, as amended and will be used for the purposes of evaluating your development application. For the purposes of public access to information, limited amount of information may be displayed on the City's website. Questions about the collection of personal information should be directed to the Manager, Development Services, Planning and Building Department, 300 City Centre Drive, Mississauga, Ontario, L5B 3C1, Telephone (905) 896-5511.

City File Number: _____

Municipal Address: _____

Legal Description: _____

NOTE: ALL QUESTIONS MUST BE ANSWERED, INCOMPLETE FORMS WILL NOT BE ACCEPTED.

1. What is the current use of the property? _____
2. What were the previous uses of the property? _____
3. Will lands be dedicated to the City as part of this application
(including road allowances, parks, greenbelts)? ☐ Yes ☐ No ☐ Uncertain
4. Is there reason to believe that the lands may be potentially contaminated based on
historical land use of this or an abutting site, such as but not limited to: electroplating,
the operation of electrical transformer stations, disposal of waste materials, chemical
storage, gasoline stations, automotive repair garages, and/or dry cleaning plants? ☐ Yes ☐ No ☐ Uncertain
5. Are there or were there any above ground storage tanks on the property? ☐ Yes ☐ No ☐ Uncertain
6. Are there or were there any underground storage tanks or other
buried waste on the property? ☐ Yes ☐ No ☐ Uncertain
7. For existing or previous buildings on the site, are there building materials
remaining which are potentially hazardous to health (e.g. asbestos, PCB's, lead paint)? ☐ Yes ☐ No ☐ Uncertain
8. Has fill ever been placed on this site? ☐ Yes ☐ No ☐ Uncertain
9. a). Has this property ever had a septic system? ☐ Yes ☐ No ☐ Uncertain
b) Does this property currently use a septic system? ☐ Yes ☐ No ☐ Uncertain
10. Does this property have or has it ever had a well? ☐ Yes ☐ No ☐ Uncertain
11. Has an Environmental Site Assessment (ESA) been prepared for this site,
or is an ESA currently being prepared for this site?
(If yes, please submit your Phase 1 ESA with your application) ☐ Yes ☐ No ☐ Uncertain
12. Has a Record of Site Condition (RSC) been completed for this Property? ☐ Yes ☐ No ☐ Uncertain

I, _____, of the _____ in the _____ am the owner. I
acknowledge that it is the owner's responsibility to ensure that the site is in compliance with all applicable acts and regulations. I further
acknowledge that the City of Mississauga and/or the Regional Municipality of Peel are not responsible for the identification and/or
remediation of contaminated sites and in any action/proceeding for environmental clean-up or damage. I undertake that I will not sue or
claim against the City of Mississauga and/or Regional Municipality of Peel. I hereby declare that the statements made by me in this
questionnaire are, to the best of my knowledge and belief, a true and complete representation of the physical conditions, and the present
and former uses, of the property.

*Owner's Signature: _____

*Declaration must be signed by the owner in all circumstances

Declared before me at _____
of _____
in the _____
on the _____ day of _____ 20____

Commissioner of Oath's signature: _____

Stamp: _____



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For Conservation Authority Use Only				
Received Date:	Year	Month	Day	
CFN				
Recipient				

Check ☒ relevant Conservation Authority

- ☐ The Toronto and Region Conservation Authority
5 Shoreham Drive, Downsview, Ontario M3N 1S4 416-661-6600 www.trca.on.ca \$

fee amount
- ☐ Credit Valley Conservation
1255 Old Derry Road West, Meadowvale, Ontario L5N 6R4 905-670-1615 www.creditvalleycons.com \$

fee amount
- ☐ Conservation Halton
2596 Britannia Road West, R.R. #2, Milton, Ontario L9T 2X6 905-336-1158
www.conservationhalton.on.ca \$

fee amount

Date: Year Month Day

City Application No.:			
Contact Information:			
Applicant/Agent:			
Name:			
Address:		City:	Postal Code:
Telephone No.:	Fax No.:	Cellular No.:	e-mail Address:
Legal Description:			
General Location:			

Please review the applicable Conservation Authority Fee Schedule (on their respective websites) and complete the applicable boxes. Attach the fee made payable to:

- or
- Toronto and Region Conservation Authority or TRCA
- or
- Credit Valley Conservation or CVC
- or
- Conservation Halton or CH

☐ Please check if receipt is required from the Conservation Authority

Note: Only one set of application fees (the highest fee) will apply when processing and reviewing consolidated application circulations. Additional fees may apply to applications which require extensive investigation (i.e. reports) by Conservation Authority staff. The applicant will be informed by the Conservation Authority if these additional fee requirements are applicable.

Tree Injury or Destruction
Questionnaire and Declaration
(For a Tree Permit or Tree Removal Permission)



City of Mississauga
Community Services Department
Forestry Division
3235 Mavis Road
MISSISSAUGA ON L5C 1T7
Tel: (905) 615-4100
Fax: (905) 615-3098

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1. Municipal address: _____

2. Ward # _____

3. Name of Registered Owner: _____

4. Are there existing trees on the property with a diameter greater than 15 cm (6 in.)? ☐ Yes ☐ No

5. Check all applicable statements.
You intend on injuring or destroying:

☐ No treesNo permit or permission

☐ All trees have a diameter of 15 cm (6 in.) or lessNo permit or permission

☐ Up to FOUR trees, with diameters greater than 15 cm (6 in.) within one calendar year.....No permit or permission

☐ Five or MORE trees with diameters greater than 15 cm (6 in.) within one calendar year.....Permit or permission required

Indicate how many trees are subject to injury or destruction: _____

6. If a Permit/Permission is required, have you applied for a permit to injure or destroy the trees? ☐ Yes ☐ No

(a) If YES, what is the status of the application? ☐ IN PROCESS ☐ APPROVED ☐ REFUSED

(b) What is the Permit/Permission number: # _____

7. Provide the file number for any other development applications currently under review for subject property:

☐ Not applicable

Official Plan/Rezoning: _____ Subdivision: _____

Building Permit: _____ Site Plan: _____

Pool Enclosure Permit: _____ Committee of Adjustment: _____

Land Division: _____ Erosion & Sediment Control Permit: _____

8. Declaration

I hereby declare that the statements made in this questionnaire and declaration are, to the best of my belief and knowledge, a true and complete representation of my intentions.

Signed at the City of Mississauga this _____ day of _____, 20 _____

Signature of Owner or authorized Agent _____

Please Print _____

Summary – Office Use Only (based on information provided above)

Date:	Year:	Month:	Day
-------	-------	--------	-----

Is a Permit/Permission required? ☐ Yes ☐ No

If yes, has an application for a Tree Permit/Permission been submitted? ☐ Yes ☐ No

Copy: Private Tree By-law Inspector, Forestry, 3235 Mavis Road
Manager, Development Construction, T&W, 3185 Mavis Road.
If building permit is required, and the site is an unregistered plan
and site plan approval is not required.

Development Application
Review Committee (DARC) Requirements
for Site Plan Applications

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Site Plan Application Requirements

Prior to making a site plan application, applicants are required to attend a pre-application meeting with the Development Application Review Committee (DARC), which is held on Wednesdays at 2:15 p.m. To book a pre-application meeting, contact Lisa Christie, DARC Chairperson at 905-615-3200 ext. 5542.

The following types of issues may be discussed at the meeting:

- the site plan approval process;
- relevant policies and recent directions of Council;
- application submission requirements;
- other types of approvals and/or fees which may be required i.e. Conservation Authority, Committee of Adjustment, etc.;
- potential areas of concern about the proposal.

At least seventeen business days prior to the meeting (Mondays by 4:00 p.m.), the following information must be provided to the DARC Chairperson of the Development Planning Services Centre either electronically or by hard copy.

- 1) A covering letter which includes the following information:
 - owner/applicant name;
 - brief description of the proposal;
 - current official plan and zoning information;
 - previous application number(s), if relevant and,
 - who will attend the meeting in support of the proposal.
- 2) Fifteen copies of a concept sketch/plan of the proposal, including:
 - building footprint/dimensions;
 - setbacks to all lot lines;
 - access/driveway location(s) and dimensions;
 - existing site conditions (any natural, heritage or man-made features, including significant vegetation);
 - proposed elevations (conceptual sketch and proposed heights);
 - proposed floor plans;
 - preliminary grading information;
 - easement information and restrictions, and;
 - parking and other relevant site statistics
- 3) Fifteen copies of a Map of the site showing adjacent street names, key plan, north arrow, municipal address, legal description.
- 4) Fifteen copies of a plan of survey (if available).
- 5) Images of the property and surrounding area.

NOTE: Additional information may be required during the processing of any development application.

Date of Meeting:_____

Planner: _____

Applicant Name:_____

Location of Site:_____

Ward #: _____

- ☐ Complete Application Form and fees (check website for up to date fee schedule)
- ☐ Urban Design Study
- ☐ Arborist Report (Tree Survey/Preservation Plan)
- ☐ Parking Use Study
- ☐ Sun/Shadow/Wind Study
- ☐ Environmental Impact Study
- ☐ Slope Stability Study/Top of Bank Survey
- ☐ Functional Storm Drainage Report
- ☐ Storm Water Management Study
- ☐ Site Remediation Studies (which may include Phase I Environmental Site Assessment, Phase II Environmental Site Assessment, Remedial Work Plan, Site Clean-up Report, Record of Site Condition)
- ☐ Acoustical Feasibility Study
- ☐ Vibration Analysis
- ☐ Air Quality Study
- ☐ Geotechnical Report
- ☐ Traffic Impact Study (may be scoped for gapping, signal operations and/or other relevant traffic issues)
- ☐ Traffic Safety Impact Study
- ☐ On-Street Parking Analysis
- ☐ Park Concept Plan
- ☐ Archaeological Assessment
- ☐ Heritage Impact Statement
- ☐ Above and below ground Utility Plans (City Lands)
- ☐ Condominium type
- ☐ Restrictions on Title (*easements*)

☐ Other Information:_____

☐ Grading Drawings _____

☐ Total Site Plan _____

☐ Total Elevations _____

Applications such as minor variance or part lot control may be required as the application proceeds through the approval process.

All opinions offered by staff are preliminary, and based on limited information available. Opinions are subject to change pending review of the formal site plan application



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FEE CALCULATION SHEET

NOTE: This calculation sheet is to be completed by the Counter Planner at the time of application submission.

Application File # _____

Associated File(s) # _____

of Units _____

Gross Floor Area _____ - 500 m² = _____ m²*

(Fee of \$1.95 per m² applies to area over 500 m²)

CITY FEE

Base Fee:

\$1,950.00

= \$ _____

(includes infill housing)

PLUS

Detached, semi-detached and townhouse dwellings: \$390.00 per unit:
(except for detached dwellings within areas in Wards 1 and 2, Doulton Drive, Gordon Woods and Meadowvale Village)

\$390.00 x _____ # of units = \$ _____

All other residential, commercial, industrial, office or institutional uses *(Maximum fee is \$39,000.00 for Industrial or Office uses)

\$1.95 x _____ m² * = \$ _____

OR

Fee for Minor Building Alterations or Site Revisions:

\$910.00

= \$ _____

TOTAL CITY FEE: = \$ _____

PLUS

Agency Fees (If applicable)

Conservation Authority Fee

\$ _____

= \$ _____

APPENDIX E STAKEHOLDER WORKSHOP SUMMARY

October 14, 2009



Green Development Strategy

Planning and Building Department
Development and Design

July 13, 2009

Direction to Consultants

What is needed in order to achieve 'green development' in the City?

- Emphasize that **Council must show commitment** and financial support
- Develop **implementable incentives** package
 - Reduce development charges and fees
 - Encourage public-private partnerships
 - Reward and punishment strategy
 - Identify opportunities and criteria for when to consider bonusing
 - Give development credit when implementing stimulus strategy
- Make **recommendations outside of scope** such as;
 - Align with T&W Storm-water Quality study
 - Aligning with any Transit 'master plan' in future
 - City parks and open spaces green initiatives to align in future directions
 - Clarify the acknowledgement of 'other' studies (no over-riding them)
 - The unavoidable impacts on adjacent public lands, further aligning may need to take place,
 - Financial commitment from the City
- **Stream line/fast tracking approvals**, but for City to achieve it ("ducks in a row")
 - Trained staff
 - Standards to onerous that highly skilled staff required as part of review
 - Budget/resources the reason (Toronto hired a consultant)
- Emphasize **Champion needed** to lead, whether it be political/community leader
 - Public education piece
 - Developing public awareness
- **Pilot projects and sites** needed to demonstrate and showcase merits of 'green development'
 - Sites of varying sizes (i.e., small lot (residential), large site (multiple lots), large district (multiple ownership including City holding - HHOT)
 - Signage, education plaques, etc.
- **Acknowledge and commemorate** 'green' initiatives
 - Awards to distinguish green from the others
- Clarify the pros and cons of **performance standards versus Bylaws** – when to use which
 - Flush out **'regulation versus incentives'** discussion

Green Development Strategy

Planning and Building Department
Development and Design

- **Reduce parking** standards to make public transit viable (when close to transit)
- **Support city staff** through;
 - Municipal employee training
 - Educating applicants and staff (separate from training)
 - Development 'Centre for Excellence'
 - Create 'Information Library' made easily available (i.e. City website)
 - Process to allow for the review and study completed initiatives
 - Consultants can help train people
- **Integrated planning and design**, particularly in context of neighbourhoods
- **'Made in Mississauga' strategy** should include
 - City objectives and how to meet them
 - Targets and measures
 - **Choices** in green standards in order to meet objectives
 - Using **LEED** to achieve instant benefits
 - Recognition of **LID** guidelines for some kind of crediting
 - Cost benefit analysis to determine savings in long-term
- Comprehensive **Transportation and transit strategy** (maybe see Bob Sasaki)
 - Active transportation
 - Auto share
 - Smart share
 - Parking Strategy
- Review **Toronto's two-tiered system** to determine the extent of Mississauga application

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APPENDIX F DRAFT PRELIMINARY GREEN DEVELOPMENT STANDARD

October 14, 2009



City Of Mississauga – Green Development Strategy
Appendix F - Draft Preliminary Green Development Standard

The Core Project Team developed a Draft Preliminary Green Development Standard as an interim step to developing the full Strategy (Standard, Incentives, Education, Training). This Draft is included within this Appendix.

Halsall Associates provides the following preliminary comments for consideration prior to implementation of the final document:

1. An effective Standard should include documentation requirements so applicants are aware of how the City intends to review compliance.
2. Include a “cover” outlining the compliance process (i.e. when to submit documentation, how long review will take, how review feedback will occur, how approvals will be issued).
3. Definitions should be provided (i.e. high quality soil, shade trees, GFA, etc.).
4. Avoid non-measurable targets (i.e. Requirement 1.1). Ambiguous requirements lead to confusion and various interpretations may not achieve the desired result.
5. Do not reproduce requirements that are mandated in existing documents (i.e. Storm Water, accessibility) to avoid conflicts and confusion. Where possible, strengthen existing zoning/by-laws/guidelines/policies rather than incorporating them in a Standard.



Stage One: GREEN DEVELOPMENT STANDARDS

(Please note that, notwithstanding the recommendations provided in the Phase 3, Green Development Strategy, the following standards may be implemented immediately as a part of the City's current mandate related to the review of development applications.)

1 Protect and Enhance Natural Areas

- 1.1 Preserve and enhance existing natural areas system and ensure that there are no negative impacts from adjacent developments. An Environmental Impact Study is required in or adjacent to natural areas. *(Natural Heritage) – Existing OP policy*
- 1.2 Ensure that at least 50% of vegetation species planted is native and non invasive. On lands in or adjacent to natural areas, all plantings must be native and non-invasive. *(Natural Heritage)*

Immediate Action: Consult with LAs in Pe&B and CMS prior to finalizing standard.

2 Provide Green Space

2.1 Trees in hard-scape:

For trees planted in groups of 2 or more in primarily hard surface areas such as parking lots and entry courts, provide a minimum of volume of 15 cubic metres of high quality soil per tree. A single tree planted in hard-scape requires a minimum volume of 30 cubic metres of soil. *(Urban Forest)*

2.2 Trees in soft-scape:

Provide trees planted in landscape areas with a minimum volume of 30 cubic metres of high quality soil. *(Urban Forest)*

- 2.3 Plant shade trees 6 m to 8m apart, adjacent to the property line along all street frontages, open space frontages and public walkways. *(Heat Island)*

- 2.4 In parking areas, provide landscape islands at the end of each row of parking to a minimum dimension of 4.5m in width times the length of the parking stall (single or double row). *(Heat Island)*

3 Efficient Urban Structure

- 3.1 Design clearly designated sidewalks, crosswalks, and walkways which are continuous, universally accessible, and barrier free. Connect buildings entries to off-site pedestrian paths, transit stops and parking areas (car/ bicycle). *(Transportation)*
- 3.2 Locate **air-exhaust** systems and **air-intake** grates away from pedestrian routes and amenity areas. *(Transportation)*

4 Greenhouse Gas Emissions

- 4.1 Design all parking areas so as not to exceed the minimum number and dimensional size required by the Zoning By-law. Additional spaces may be provided **only** for dedicated priority parking spaces for carpooling, and for publicly accessible spaces dedicated to car-sharing. All additional spaces must provide electrical outlets for plug-in electric vehicles. *(Automobile)*

- 4.2 Provide occupant bicycle parking at the following rates:

Residential:

For buildings located in the Downtown, Nodes and the Waterfront with more than 10 units, provide 0.5 bicycle parking spaces per unit. Locate at least 5% of residential bicycle occupant parking at grade. *(Cycling)*

Institutional/Office/Retail:

For buildings in the Downtown, Nodes, and the Waterfront, provide 0.1 bicycle parking spaces/100 m² of non-residential GFA. *(Cycling)*

- 4.3 Locate 50% of occupant bicycle parking in a secure weather-protected area. *(Cycling)*

Immediate Action Required: All parking/ bike standards need to be coordinated with various strategies such as the Cycling Strategy (standards are currently being re-written) and Parking Strategy. Further, in 2010 a comprehensive study will be undertaken to create car parking standards.

5 Stormwater Management

- 5.1 Maximize the natural infiltration and retention of rainwater using low impact development stormwater management techniques such as permeable pavement, grass channels, dry swales, rainwater harvesting, downspout disconnection, soak away pits, bio-retention, tree clusters, filter strips and green roofs. *(Stormwater Retention)*

APPENDIX G GREEN DEVELOPMENT FRAMEWORKS

October 14, 2009



City Of Mississauga – Green Development Strategy

Appendix G - Green Development Frameworks

1.0 GREEN DEVELOPMENT FRAMEWORKS

There are four broad approaches to developing a green development strategy:

- Use an existing standard or certification system previously developed by others;
- Modify an existing standard or certification system;
- Create a new, custom standard; or
- Incorporate requirements within other City documents and programs (i.e. Zoning By-Laws, Site Plan Application Requirements, and education).

Through our extensive research of other jurisdictions' approaches to Standards, we found that direct integration was not common. The first three approaches are stand-alone documents that would be used in addition to by-laws, policies, and procedures.

1.1 Existing Third Party Standards

Using an existing certification system for establishing a Green Development Strategy for Mississauga minimizes the duplication of effort, for both the City and developers. It enables developers to apply knowledge they have learned from other projects using the existing systems, rather than having to learn and use a framework that is only applicable in Mississauga. Using existing certification systems with external support systems (such as technical advice, reviews, and certification processes) reduces the municipal staff resources required to review applications. However, adopting an existing standard usually requires some level of compromise, since it is likely that no single standard perfectly reflects all of Mississauga's priorities and interests.

The third party standards most commonly used in this market are described in Appendix D. These include:

- LEED®
- Green Globes and BOMA BEST
- Living Building & Living Site and Infrastructure Challenges
- Energy Star
- Proposed ASHRAE/USGBC/IESNA Green Building Standard

1.2 Modifying Existing Standards

Each of the existing standards described above are structured to address a specific set of priorities with different degrees of flexibility. Municipalities have modified existing standards to respond to unique opportunities and constraints in a given community, and to address important principles and priorities not adequately addressed in the original standard. Modifying existing standards is an effective way to create "Made in Mississauga" Green Development Strategy while reaping the benefits of using existing



rating systems. This framework type requires additional effort to develop, deliver, and maintain the Strategy.

One approach for modifying an existing standard is to mandate specific credits/criteria from the standards. For example, East Gwillimbury mandates 20 existing LEED® credits and all prerequisites for buildings less than 600m². Non-residential projects between 600m² and 1,200m² must meet LEED® Certified, and non-residential development greater than 1,200m² and multi-unit residential buildings must meet LEED® Silver. The town has also developed a LEED® policy that requires a LEED® Accredited Professional be engaged on the project team and certify that the credit requirements have been met. Documentation is submitted to the Town throughout design and construction to confirm the project is on track.

The Town calculates LEED® securities based on \$5/sf up to a maximum of \$500,000 which are incorporated into the site plan agreement letter of credit. Half of the securities are released when proof of application for certification with the CaGBC is provided; the other half is released when the project achieves the appropriate level of LEED® certification.

The Chicago Standard also modifies the LEED®-NC rating system by identifying 26 mandatory credits for all of its municipal facilities. The proposed Mississauga Green Building Standard for public buildings will identify specific critical LEED®-NC credits.

Another option for modifying existing standards is to add credits unique to the municipality. As an example, Waterfront Toronto's Mandatory Green Building Requirements were created for the redevelopment of Toronto's southeast downtown industrial lands. Builders are required to achieve a minimum of LEED® Gold, including mandated energy performance and measurement and verification credits. Additional requirements include:

- Team experience
- Integrated design process
- District energy
- Green roofs
- Long-term flexibility
- Energy Star appliances
- Suite-level energy and water meters
- Three-streamwaste management

1.3 Create a New Certification System

When existing standards do not capture all the important drivers, or fit into their regulatory regime, municipalities have developed their own certification systems. These may be similar to existing standards, but can have different targets, more or fewer credits, and different documentation requirements. To be effective, it is critical that the municipality provide the support necessary to maintain and administer the standard. The Toronto Green Standard discussed previously is one local example of this framework strategy.



Another example is Pickering, where Guidelines were prepared for all new development at varying scales:

- the neighbourhood level
- for plans of subdivision
- site plans
- building permit level
- building permits

The Pickering Standard includes a combination of required and optional design criteria; required criteria must be met for City approval, and points are assigned for optional criteria. A minimum number of points are required before plans will be approved. Criteria targets are based on existing rating systems: LEED®, Green Globes, and Energy Star. Responsible consumption is measured based on greenhouse gas emissions, energy consumption, and water use. Compliance is demonstrated through applications, designs, and reports submitted to the City Planning and Development Department. The City then judges whether the design conforms to the criteria to approve the minimum requirements and assign points.

1.4 No Stand-Alone Standard

An alternative to defining a performance standard includes incorporating the City's drivers into existing processes and/or supporting market movement indirectly.

Sustainability goals can be mandated through the existing Site Plan approvals process and zoning by-laws. This may increase uptake as the requirements are seen as standard practice rather than onerous additions to the development application process. Vancouver has used this approach to mandate improved building performance. Mississauga could use this approach, but would be limited to elements within the Site Plan approvals process as mandating performance beyond the building code is beyond the City's legislative jurisdiction.

Another option is to allocate resources in promoting Mississauga's drivers through industry involvement, education, and marketing. Montreal, for example, has devoted resources to collaborate with industrial and commercial partners to create consensus-based and peer-motivated market changes. Similarly, the "Partners in Project Green – A Pearson Eco-Business Park Project," is being lead by the Toronto and Region Conservation Authority in conjunction with the Greater Toronto Airports Authority and local industry. The project goal is to create an "internationally recognized community known for its competitive, high performance and eco-friendly business climate." This approach could be used for new development through Mississauga, but requires an increased technical awareness to keep Mississauga at the forefront of sustainability benchmarking trends.

APPENDIX H EXISTING INCENTIVES AND PROGRAMS

October 14, 2009



City of Mississauga – Green Development Strategy
Appendix H – Existing Incentives & Programs

1.0 EXISTING GREEN PROGRAMS AND INITIATIVES

1.1 National Programs

Natural Resources Canada – ecoEnergy Retrofit Incentive for Buildings

The ecoEnergy Retrofit Incentive Program includes prescriptive and custom incentive applications. There are varying compliance paths based on residential, commercial, institutional and industrial facilities. For the custom incentive application, an assessment of energy consumption before and after implementing the retrofit project is required. Energy audits or energy assessments by certified NRCan-licensed energy advisors provide the energy savings which is translated in to an incentive payment. A building can earn \$10 per gigajoule of energy saved up to 25% (or \$50,000) of the project cost.

Natural Resources Canada – ecoEnergy for Renewable Heat

EcoEnergy for Renewable Heat offers an incentive to industrial, commercial and institutional purchasers of solar heating systems. The incentive is based on a rate per square metre of collector area multiplied by a collector-specific performance factor. The incentive rate is based on the type and area of solar collector and location of the project (urban and remote communities). Incentive rates range from \$30/m² to \$440/m².

Natural Resources Canada – ecoEnergy for Renewable Energy

EcoEnergy for Renewable Energy offers incentives for all renewable energy system installations based on the number of kilowatt hours (kWh) of electricity which will be produced over a 10 year period. These low-impact renewable projects will receive \$0.01/kWh over 10 years.

Federation of Canadian Municipalities - Green Municipal Fund

The Green Municipal Fund (GMF) is a program that supports Canadian municipal initiatives that benefit the environment, local economy, and quality of life by providing grants and below-market loans. GMF education and training resources help municipal governments share expertise and strengthen their ability to set targets and surpass goals. There are three main funding programs depending on activity:

a) Sustainable Community Plans

The GMF offers grants to municipalities that develop sustainable community plans such as neighbourhood plans, municipal greenhouse gas reduction plans, or brownfield action plans. Funding is available for up to 50% of the costs, up to a maximum of \$350,000.



b) Feasibility Studies and Field Tests

Projects that seek to improve the environmental effectiveness of municipal operations related to brownfields, energy, transportation, waste, or water through feasibility studies and field tests are eligible for funding for up to 50% of the costs to a maximum of \$350,000.

c) Capital Projects

Below-market loans, usually in combination with grants, are available for implementation of capital projects, covering up to 80% of costs to a maximum of \$4 million in loans with \$400,000 in grants. Applicable projects include brownfield remediation, retrofit and new municipal green buildings, transportation, waste diversion, and wastewater.

1.2 Provincial Programs**Ontario Ministry of Energy – Ontario Solar Thermal Heating Incentive**

This program is very similar to the ecoEnergy for Renewable Heat program by the federal government. It requires the project to be located in the Province of Ontario with the application filed through Natural Resources Canada.

Ontario Ministry of Revenue – Retail Sales Tax Exemption

Retail tax paid for qualifying renewable energy equipment is returned as a rebate after the equipment is purchased and installed. Eligible equipment includes solar, wind, micro-hydro electric or geothermal systems.

Ontario Power Authority – Feed-in Tariff Incentive Program

As part of Ontario's adopted Green Energy Act of 2009, the OPA is poised to establish a feed-in tariff incentive program that would make residential, community, and large-scale renewable energy projects easier to implement. The feed-in tariff program allows owners to connect their renewable energy systems to the electrical grid and sell back the power to the OPA at a higher rate than what it is purchased at. The following table illustrates the proposed pricing structure of the program:



Proposed Feed-In Tariff Prices for Renewable Energy Projects in Ontario		
Technology	Size	Incentive (¢/kWh)
Biomass		
	Any size	12.2
Biogas		
	≤ 5 MW	14.7
	> 5 MW	10.4
Waterpower		
	≤ 50 MW	12.9
Community based or Aboriginal	≤ 2 MW	13.4
Landfill gas		
	≤ 5 MW	11.1
	> 5 MW	10.3
Solar PV		
Rooftop	≤ 10 kW	80.2
	10 - 100 kW	71.3
	100 - 500 kW	63.5
	> 500 kW	53.9
Ground mounted	≤ 10 MW	44.3
Wind		
Onshore	Any size	13.5
Offshore	Any size	19
Community based or Aboriginal	≤ 10 MW	14.4

Ontario Power Authority – High Performance New Construction

The High Performance New Construction (HPNC) incentive program rewards new construction activities. This incentive is provided for prescriptive and custom applications. HPNC rewards a new construction project per kilowatt (kW) of energy demand reduced. Prescriptive projects determine the incentive value based on the culmination of electricity saved per piece of equipment. The incentive grants \$250/kW of savings or \$60/appliance with a \$1,000 minimum application. Custom applications require an energy model, which are fully funded up to \$10,000 as a part of the incentive. The results of the energy model will dictate the incentive value which is provided to both the building owner and design professionals. Custom application incentives range from \$250/kW to \$400/kW for the building owner and \$50/kW to \$100/kW for the 'design decision maker' or design professional.



Ontario Power Authority – Electricity Retrofit Incentive Program

The Electricity Retrofit Incentive Program provides both prescriptive and custom incentive applications. The prescriptive application applies a pre-defined rebate value per standard equipment retrofit. There is a minimum requirement of \$250 for an application to be processed. The custom application is based on the energy demand reduction resulting from a retrofit project. The incentive is based on the lesser of \$250/kW saved or 50% of the project cost (including all other incentive programs).

Ontario Power Authority – Multi-Family Energy Efficiency Program

The Multi-Family Energy Efficiency Program targets multi-unit residential buildings in an effort to reduce energy consumption. This program includes an energy audit, prescriptive project and custom project application. There is a \$35/unit incentive for energy audits which typically covers the cost of an energy audit in large buildings. The prescriptive applications provide incentives based on a prescribed list of energy retrofits. The custom application provides \$0.07/kWh saved in an energy efficiency retrofit project.

1.3 Regional Initiatives

The Region of Peel is currently updating its Official Plan, considering amendments that are necessary to bring the ROP into conformity with relevant legislation, plans, and policies including the Provincial Policy Statement (2005 PPS), the Greenbelt Plan (2005), and the Growth Plan for the Greater Golden Horseshoe (2006). Regional Official Plan Amendments (ROPA) 20 and 21 are proposed changes to the Plan's policies on sustainability, energy, natural heritage, agriculture, air quality, and integrated waste management. They are currently working their way through the statutory process and are not yet in force. A new amendment on transportation policies, ROPA 22, is the most recent and is currently the subject of public consultations. Others will come forward over the next several months but are less likely to pertain to sustainability issues.

The following summarizes the policies most pertinent to the MGDS. For more detail, refer to the specific excerpts from the Regional Official Plan (ROP) and ROPA documents in Appendix B. Relevant parts of the existing ROP are discussed first, followed by a discussion of the proposed changes most relevant to the MGDS.

The unaltered sections of the ROP address the following issues:

- **Watersheds and Subwatersheds:** Minimize development impacts.
- **Natural Hazards:** These include "... areas along the Lake Ontario Shoreline and ravines, valleys, rivers, streams and riverine Flood Plains that are susceptible to flooding, erosion and/or unstable slopes." The ROP defines policies limiting developments within the flood plains or erosion limits of shorelines and within the 100 year erosion limit of ravine, valley, and stream corridors.



- **Regional Structure:** The municipality should plan for land uses to be appropriately buffered and/or separated “to prevent adverse effects from odour, noise, and other contaminants.”
- **Urban Systems:** The ROP objectives and policies support a pedestrian-friendly and transit-supportive urban system, with urban nodes that incorporate a mix of residential and employment opportunities.

The proposed amendments to the ROP include the following issues:

- **“Overarching Theme”:** The “overarching theme,” sustainability, will clearly be stated in the ROP Introduction. “The environmental imperative is to protect, enhance and foster self-sustaining biodiversity while reducing and measuring the impact of development on the ecosystem based on a systems approach. Further, the imperative seeks to reduce Greenhouse Gas (GHG) emissions and other pollutants while promoting best practices in sustainable development including use of green development standards, energy efficient systems and living within the carrying capacity of Peel’s supporting ecosystems...”
- **Energy Resources:** The ROP will support smarter energy use based on three principles – efficiency, conservation, and diversity. It encourages cooperation between municipalities and local distribution companies to develop energy conservation incentives. It requires municipal official plans to include policies on efficient building design and landscape practices. It encourages small scale and renewable energy generation facilities.
- **Planning:** This amendment describes a policy to encourage municipalities to, “prepare green development standards, addressing land use and transportation issues, including stormwater management, energy efficiency and district heating as well as other renewable energy opportunities, innovation in the area of planning for green spaces and addressing issues related to the impacts of climate change.” It also encourages the municipalities to require a sustainability design brief in applications for development.
- **Air Quality:** Residential and sensitive land uses should be appropriately distanced from existing harmful emission sources.
- **Natural Environment:** Require environmental impact studies where development is adjacent to the Greenlands system.
- **Waste Management:** To contribute to the region’s overall waste reduction objectives, municipalities are encouraged to incent high reuse of construction and demolition waste.

Although many of these are qualitative, they are clearly aligned with many of Mississauga’s drivers. There are no anticipated conflicts between Mississauga’s drivers and the Region’s sustainability directives; however, the City should maintain regular

contact with the Region to ensure the GDS does not conflict with any future Regional programs.

Credit Valley Conservation and Toronto and Region Conservation Authority have developed a Low Impact Development Stormwater Management Manual to help developers, consultants, municipalities, and landowners understand and implement sustainable stormwater planning and practices. Low Impact Development strategies are presented with fact sheets, design templates, maintenance, and costs. The strategies identified in the Manual include rainwater harvesting, green roofs, downspout disconnection, bioretention, permeable pavement, among others. The Manual also provides sample monitoring techniques to measure the success of the stormwater management strategies. The Manual is currently under review and is expected to become

1.4 Municipal Initiatives

The City of Mississauga has numerous initiatives underway with respect to green development and sustainability in general. The following documents were reviewed during the background research phase of the study:

- Mississauga Storm water Quality Control Strategy Update
- Mississauga Growth Management Study
- Mississauga Official Plan Review (2008)
- Mississauga Strategic Plan (2008)
- Mississauga Environmental Advisory Committee policy
- Mississauga Green Building Standards for City-Owned Facilities
- Mississauga Green Development Workshop Summary (May, 2008)
- Mississauga Living Green website
- Credit Valley Credit River Water Management Strategy
- Mississauga Natural Area Survey
- Pearson Eco-Business Zone Plan
- City installations of sustainable technologies
- Our Future Mississauga - Community Engagement Outcomes
- Bus Rapid Transit Study
- Future Directions for Recreation and Parks (Master Plan & 2009 Master Plan Review)
- Mississauga Urban Design Strategy (Draft)
- Mississauga Environmental Master Plan Study
- Hurontario Higher Order Transit Study
- City of Mississauga Erosion and Sediment Control By-law No.394-93

These documents were used to determine the most relevant drivers for Mississauga and will be referred to as the MGDS implementation plan is developed. The following sections briefly outline the initiatives most relevant to the Green Development Strategy.



1.4.1 Mississauga Growth Management Study

The Mississauga Growth Management Study (GMS), October 2008, is a plan for managing growth to 2031. The report emphasizes that Mississauga's growth in the next 25 years will be based on redevelopment and intensification. It considers the Provincial Policy Statement (2005), conforms to the Growth Plans for the Greater Golden Horseshoe, and aligns with the draft Strategic Plan and draft Regional Transportation plan. The GMS is to be used to:

- identify where future growth should and should not be located;
- inform infrastructure, facilities and services investments; and
- provide a basis for the new official plan.

The report discusses metrics which benchmark Mississauga's current status and targets along with rationale for the following key strategic directives of the GMS:

- build complete communities;
- protect and enhance the environment;
- maintain a strong economy; and
- create an efficient urban structure.

The GMS also identifies Urban Growth Centre (UGC) locations and density targets, and similarly identifies and defines targets for "Major Nodes," "Community Nodes," "Intensification Corridors," "Urban corridors," and other spaces.

1.4.2 Mississauga Plan

Developed in 2003 and most recently updated in January, 2009, Mississauga's Official Plan provides a framework for all new development. There is a comprehensive review currently underway to update the Plan, and in June, 2009, it will be updated to conform to the Provincial initiatives.

The Plan identifies the City's goals and objectives relating to:

- "Identification, protection, and enhancement of the Natural Areas System;
- Promotion of design which creates an interesting built environment, and reflects the unique character of communities;
- Establishment of an urban form which is compact, efficient, comfortable, and supportive of transit;
- Continued application of sound financial practices."

The Plan calls for an ecosystem approach to development, which supports the Green Development Strategy initiative. The “ecosystem approach” is defined as:

“Planning and management which recognizes that economy, community, and environment are inextricably linked and equally important for the health of the City.”

The City’s goals and objectives are put into action through general and district-specific policies; the GDS will be implemented City-wide, and therefore will correspond with the general policies.

The Plan was instrumental in developing the recommended Drivers for Mississauga (see Drivers section in this report), and will be referenced as targets are set in future phases of this study. The Plan is further discussed in the Regulatory Environment section below.

1.4.3 Urban Design Strategy

This report has no official status, but forms the background for green initiatives in the urban design section of Mississauga’s new Official Plan. The Strategy outlines elements of new Urbanist design strategies that should be considered for Mississauga. The strategies include many that are addressed by LEED for Neighbourhood Development. Some strategies that are more relevant to the site-level scale of this study include:

- Link pedestrian connections on private land to existing public infrastructure.
- Main building entries and at-grade uses face public realm, are visible, and are directly accessible.
- Parking and access, service areas, and utilities are located at the rear of buildings.
- Design streets (pavement) to include permeable surfaces and promote streetscape with increased permeability and infiltration.

The document identifies conventional zoning as focusing on FSI, dwelling units/ha, setbacks, parking standards, etc.; it neglects integrated built forms. Form-based codes are discussed as a way to engage the community in the planning process. They are defined as focusing on the relationship between building facades and the public realm, and may be used to achieve high quality, predictable public realms for identified growth areas.

The Strategy suggests implementing a program to “promote, recognize, and honour” projects meeting high standards for architectural, landscape, and urban design. The Mississauga Urban Design Awards could be expanded to include a specific award for green development.

1.4.4 Municipal Green Building Standard

Mississauga is in the process of developing a Green Building standard for all public building new construction or major renovations. By starting with public buildings, the City can lead the way as a role model for the private sector. The Study is in the early phases, and is scheduled to be completed in the summer of 2009. The proposed Standard will identify specific critical LEED®-NC credits, with an emphasis on storm water management, water use reduction, and energy performance. It will likely address interior elements of buildings, which is outside the scope of this project.

1.4.5 Strategic Plan

Mississauga has developed a Strategic Pillars for Change program as part of its Strategic Plan – “Our Future Mississauga”. The Pillars are:

- Developing a transit-oriented city
- Ensuring youth, older adults, and new immigrants thrive
- Completing our neighbourhoods
- Cultivating creative and innovative businesses
- Living green

All Pillars relate to the ecosystem approach to development Mississauga is striving to achieve. On a site development level, the Transit-Oriented City and Living Green pillars are most applicable. The Living Green website provides residents access to information on strategies to improve the environment. The website is broken down into Land, Air, Water, and Energy. Some initiatives include:

Green Municipal Enabling Fund

In 2005, the City of Mississauga was approved for a Federation of Canadian Municipalities (FCM) Green Municipal Enabling Fund for a city-wide energy audit that is being initiated in 2006. An inventory of energy use and greenhouse gas (GHGs) emissions in corporate operations and the community was completed as a member of FCM and International Council for Local Environmental Initiatives’ (ICLEI) Partners for Climate Protection program. A Corporate Local Action Plan is being implemented to reduce GHGs as part of the City Clean Air Strategy.

Carpool Zone

Smart Commute Mississauga is a Transportation Management Association and a partnership between the City of Mississauga, the Region of Peel, and local employers in the City of Mississauga, with funding from Metrolinx. The program provides access to a corporate ride-matching program called Carpool Zone for public and private sector companies.



1.4.6 The Parking Strategy for Mississauga City Centre

This strategy was developed to:

- support good urban design and contribute to creating a walkable downtown by minimizing surface parking and encouraging higher density development through the use of parking garages that are well located and integrated with primary development (i.e. active uses at ground level of a parking structure);
- foster economic development by assisting the private sector in achieving the development vision of the City Centre through strategic public investment in the provision of municipal parking facilities and transportation alternatives; and
- help implement Transportation Demand Management by influencing commuter mode choice through parking supply management and pricing.

Metrics from this report which may inform the MGDS include:

- existing general parking philosophy, Official Plan policy zoning requirements for parking space, carpool, surface parking and bike storage and Transportation Demand Management policy;
- changes in parking philosophy (e.g. establishing and economic value for parking, establishing a direct link to TDM), proposed Official Plan policy, zoning by-law requirements (reducing parking minimums, establishing parking maximums, encouraging shared parking and off-site parking), payment-in-lieu amendments and transportation demand management recommendations (reduced corporate level transit pass rates for bulk purchases, a city supported auto sharing service, reduced cost car/van pool spaces in priority locations, designated parking for scooter, motorcycle and bicycle use, guaranteed ride home service);

There are also several existing initiatives to motivate new developments with respect to “greener” parking strategies:

Payment- in-Lieu Contributions from Developers

This planning tool recognizes that private developers encounter financial challenges in providing on site parking in garages to service their sites in City Centre and this discourages Class A office development. It is economically viable for Commercial projects in other areas of the City to provide surface parking. This gives other areas of the City a competitive advantage. The city is proposing to provide city-owned garages to serve new office developments in return for payment-in-lieu of parking contributions from developers. This document recognizes that the payment must be set appropriately to sufficiently motivate developers to give up control over the parking, but in return, the city will have the flexibility for more strategic parking decisions.



Discount Transit Pass Program

Provides a 15% price reduction from the city, if employers provide a 25% discount. Work is being done to provide a 50% transit pass reduction between the City and Smart Commute.

Directed Downtown Tax Reserve

The Municipal Act introduced by the province in 2001 has opened the door for consideration of tax incentive zones to promote Smart Growth initiatives; however, Mississauga is presently not applying this.

1.4.7 Hurontario Higher Order Transit Feasibility Study

The Hurontario Higher Order Transit (HHOT) Feasibility Study had three main objectives:

1. Examine how rapid transit could be introduced along Hurontario/Main Street between Port Credit and downtown Brampton;
2. Develop appropriate land use and urban design policies and initiatives to support rapid transit service; and
3. Identify potential social, economic, and environmental impacts or various rapid transit routes and technologies.

The ultimate outcomes of the HHOT project are to determine a preferred route and technology for rapid transit with supporting land use policies and urban design guidelines. The study is expected to be completed by the end of 2009.

1.4.8 Bus Rapid Transit

The Bus Rapid Transit (BRT) project is a high-efficiency east-west transit corridor and service to be constructed across Mississauga and is part of a 100km corridor connecting Oakville to Pickering.

The BRT system will span 18 kilometres, running along the Highway 403, Eastgate Parkway and Eglinton Avenue corridors between Winston Churchill Boulevard and Renforth Drive. It will complement and connect with local bus services and inter-regional transit and subway systems, linking high-density development and employment centres across Mississauga.

It is expected to be completed in 2012 and will provide an extensive express bus service for thousands of riders per day to travel to, from and through Mississauga and the GTA.

