

9 Build a Desirable Urban Form

9.1 Introduction

Urban form refers to the physical layout and design of the city. Urban design is the art of shaping the interaction between people and places through the arrangement, appearance and functions of cities. It addresses the natural and built environments and influences the processes that lead to successful cities. Or, more succinctly, how do buildings fit together to make quality spaces?

The focus of this chapter is on the achievement of a sustainable urban form for Mississauga, based on

the urban system and city structure, with high quality urban design and a strong sense of place that is culturally vibrant, attractive, livable and functional, and protects or enhances natural and built heritage features. It is organized on the basis of Intensification Areas where growth will be directed and other areas where limited growth will occur.

Mississauga envisions that growth will be directed to Intensification Areas comprised of the Downtown, Major Nodes, Community Nodes, Corporate Centres, **Intensification Corridors** and **Major Transit Station Areas**. Established residential Neighbourhoods, the Natural Areas



Figure 9-1: Mississauga will direct growth to Intensification Areas while protecting existing neighbourhoods. This concept plan illustrates how the Hurontario/Dundas area can be redeveloped to achieve a vibrant, pedestrian-friendly destination that is rich in character.

System and valuable cultural heritage resources will be protected and strengthened with infill and redevelopment, compatible with the existing or planned character. Employment Areas, Special Purpose Areas – University of Toronto Mississauga and the Airport - and Corridors will also receive growth compatible with their planned vision.

Appropriate infill in both Intensification Areas and Non-Intensification Areas will help to revitalize existing communities by replacing aged buildings, developing vacant or underutilized lots and by adding to the variety of building forms and tenures. It is important that infill “fits” within the existing urban context and minimizes undue impacts on adjacent properties. Redevelopment projects include a range of scales, from small residential developments to large scale projects, such as redeveloping strip malls. Redevelopment must also be sensitive to the existing urban context and minimize undue impacts on adjacent properties.

An appropriate urban form will guide development, infill and redevelopment in a manner that protects, enhances and restores the green system and cultural heritage features, while sensitively integrating these features into the city pattern.

Mississauga will achieve an attractive, comfortable and functional public realm as an integral component of its urban form. The public realm is composed of public lands with a focus on streets and boulevards and edges of private properties as they are visible from, and as they interface with the public streets. Policies regarding the public realm address matters such as the arrangement of streets and blocks, civic buildings, landmarks, gateways, views, public art and open spaces.

A desirable urban form frames and supports all movement systems in the City. It addresses the interdependent relationship among built form and various modes of movement, including accessibility. As greater emphasis is placed on transit and **active transportation**, urban form needs to support these various modes while still having regard for the importance of vehicular and goods movement to the economic functioning of the city.

Site development is the layout and design of all features on a property including buildings, structures, parking, driveways, landscaping and utilities. Site development policies are directed at the creation of buildings and spaces which not only satisfy the needs of its own users and those who will live and work in the area, but also the needs of future generations. Sites will be developed to:

- respect the experience, identity and character of the surrounding context;
- ensure the sustainability of natural systems and urban living;
- protect the quality of life of residents, employees and visitors;
- ensure the connectivity and integration of surrounding uses; and
- require properties to develop in a manner that contributes to the overall vision for the city.

9.1.1 Mississauga will develop an urban form based on the urban system and the hierarchy identified in the city structure as shown on Schedule 1: Urban System.

9.1.2 Within Intensification Areas an urban form that promotes a diverse mix of uses and supports transit and **active transportation** modes will be required. See Appendix H: Transit Oriented Development.

9.1.3 Infill and redevelopment within Neighbourhoods will respect the existing and planned character.

9.1.4 Development within Employment Areas and Special Purpose Areas will promote good urban design that respects the function of the area.

9.1.5 Development on Corridors will be consistent with existing or planned character, seek opportunities to enhance the Corridor and provide appropriate transitions to neighbouring uses.

9.1.6 The urban form of the city will ensure that the Green System is protected, enhanced and

contributes to a high quality urban environment and quality of life.

9.1.7 Mississauga will promote a built environment that protects and conserves heritage resources.

9.1.8 Mississauga will transform the public realm to create a strong sense of place and civic pride.

9.1.9 Urban form will support the creation of an efficient multi-modal transportation system that encourages a greater utilization of transit and **active transportation** modes.

9.1.10 The city vision will be supported by site development that:

- a. respects the urban hierarchy;
- b. utilizes best sustainable practices;
- c. demonstrates context sensitivity, including the public realm;
- d. promotes universal accessibility and public safety; and
- e. employs design excellence.

9.1.11 A distinct character for each community will be created or enhanced through the road pattern, building massing and height, **streetscape** elements, preservation and incorporation of heritage resources and prominent placement of institutions and open spaces.

9.1.12 An urban form will be developed to take advantage of the Lake Ontario waterfront through connections, views and access.

9.1.13 Development will have positive, restorative, ecological benefits on a site through the practice of sustainable building and site design.

9.1.14 Mississauga may undertake or require studies that develop additional policies, guidelines and design control tools that may contain more specific urban form requirements.

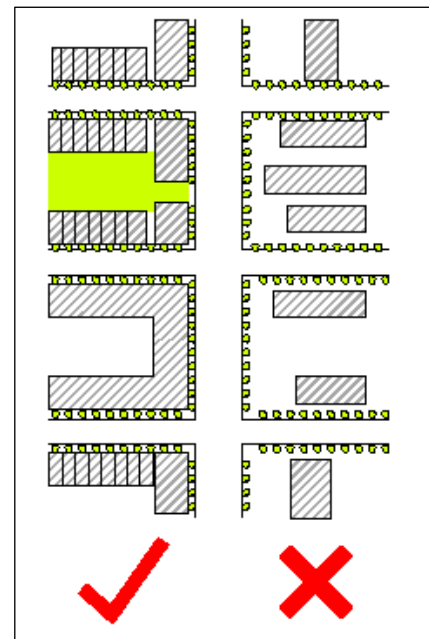


Figure 9-2: Building frontages will frame streets and provide a contiguous built form.



Figure 9-3: New development will frame adjacent streets by locating buildings parallel to the street with consistent front yard setbacks. Development on a corner should address both adjacent street frontages to give prominence to the corner.

9.2 City Pattern

City pattern provides the visual framework of the city. The city pattern that defines Mississauga includes:

- Intensification Areas;
- Non-Intensification Areas;
- Green System; and
- Cultural Heritage.

The city pattern is a reflection of policies and land use decisions that direct growth. It is the major driver of the city's image – it creates order, scale, a sense of place, purpose and identity.

Mississauga will develop a city pattern that is more sustainable and supports complete communities by directing growth to Intensification Areas and managing growth in other areas. It is intended to create a pattern marked by a greater mixture of land uses in a more compact form of development that supports, and is integrated with a multi-modal transportation system.

City pattern does not establish land use, but rather it directs the form in which permitted development

should be undertaken. Urban form requirements will vary in accordance with the envisioned city pattern.

The following policies for the city pattern will implement the city structure as shown on Schedule 1b: Urban System: City Structure and Schedule 1c: Urban System: Corridors, while protecting the Green System as shown on Schedule 1a: Urban System: Green System, and cultural heritage resources.

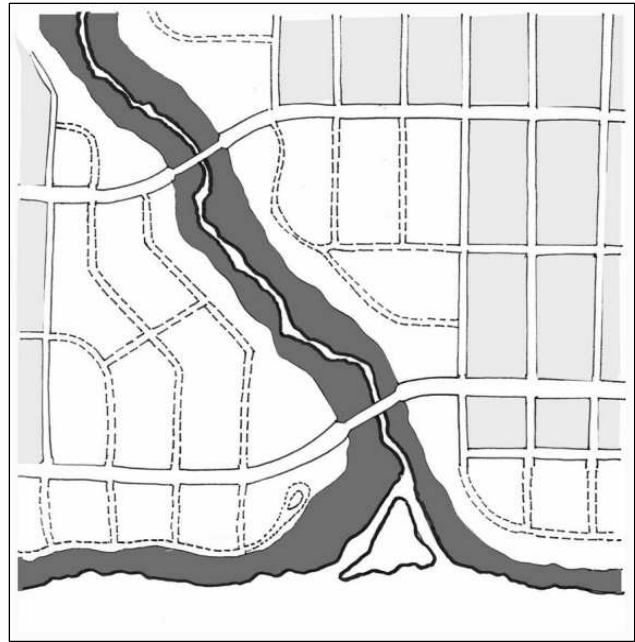


Figure 9-5: A sustainable city pattern will support complete communities.



Figure 9-4: The city pattern will respect the urban hierarchy with the Downtown containing the greatest heights, densities and mix of uses.



Figure 9-6: Over time, Eglinton Avenue and Hurontario Street will intensify with a built form that frames the streets and provides a quality public realm, ensuring a vibrant pedestrian environment.

9.2.1 Intensification Areas

Intensification Areas are the principal location for future growth and consist of:

- Downtown;
- Major Nodes;
- Community Nodes;
- Corporate Centres;
- ***Intensification Corridors***; and
- ***Major Transit Station Areas***.

Intensification Areas are a major building block of the city pattern and, as such, will be expected to exhibit high standards of urban design that will

result in vibrant and memorable urban places. They are intended to create order and a sense of place, with a scale that varies with their intended purpose and role in the urban hierarchy.

In order to achieve the vision for Intensification Areas as vibrant, mixed use areas, serviced by multi-modal transportation, the physical form, relationship among buildings and spaces and the quality of the built environment will be critical in making these areas successful.

9.2.1.1 Development will create distinctive places and locales.

9.2.1.2 Design excellence will create a vibrant Downtown complemented by communities that retain their own identity and contribute to an overall strong city identity.





Figure 9-7: A compact, urban built form with a mix of uses will be incorporated in Cooksville and other Intensification Areas.

9.2.1.3 Built form should provide for the creation of a sense of place through, among other matters, distinctive architecture, streetscaping, public art and cultural heritage recognition.

9.2.1.4 Mississauga will encourage a high quality, compact and urban built form to reduce the impact of extensive parking areas, enhance pedestrian circulation, complement adjacent uses, and distinguish the significance of the Intensification Areas from surrounding areas.

9.2.1.5 Small land parcels should be assembled to create efficient development parcels.

9.2.1.6 Mississauga will encourage the consolidation of access points and shared parking, service areas and driveway entrances.

9.2.1.7 Development proponents may be required to provide concept plans that show how a site will be developed with surrounding lands.

9.2.1.8 Zoning by-law amendments for new drive-through facilities in Intensification Areas will not be approved where they will interfere with the intended function and form of these character areas. Such applications may be considered in circumstances where the location, design and function of the drive-through facility:

- a. maintains the intent of the Plan;
- b. does not interfere with the continuity and character of the **streetscape**;
- c. provides for pedestrian movement into and through the site; and

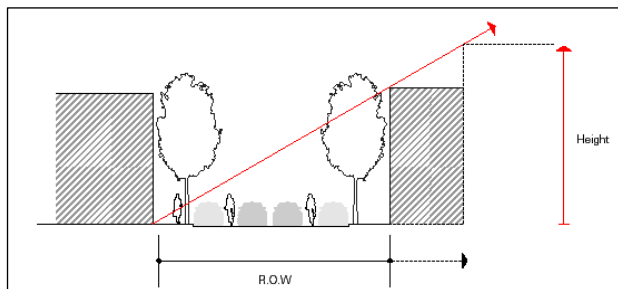


Figure 9-8: On wider streets, taller buildings may be required to provide appropriate street enclosure.

d. conforms to the “Drive-Through Stacking Lanes Reference Notes”.

The application will address, among other matters, the nature of surrounding uses, the specific location of the site within the Character Area, and opportunities for the integration of the drive-through facility with other uses within the development.

9.2.1.9 The preferred location of **tall buildings** will be in proximity to existing and planned **Major Transit Station Areas**.

9.2.1.10 Where the right-of-way width exceeds 20 m, a greater building height may be required to achieve appropriate street enclosure in relation to the right-of-way width.

9.2.1.11 Appropriate height and built form transitions will be required between sites and their surrounding areas.

9.2.1.12 **Tall buildings** will be sited and designed to enhance an area’s skyline.

9.2.1.13 **Tall buildings** will be sited to preserve, reinforce and define view corridors.

9.2.1.14 **Tall buildings** will be appropriately spaced to provide privacy and permit light and sky views.

9.2.1.15 In appropriate locations, **tall buildings** will be required to incorporate podiums to mitigate wind impacts on the pedestrian environment and maximize sunlight on the public realm.

9.2.1.16 **Tall buildings** will address pedestrian scale through building articulation, massing and materials.

9.2.1.17 **Tall buildings** will minimize adverse microclimatic impacts on the public realm and private amenity areas.

9.2.1.18 Principal streets should have continuous building frontages that provide continuity of built form from one property to the next with minimal gaps between buildings.

9.2.1.19 Existing large blocks will be reconfigured to incorporate a fine-grained block structure with public roads and on-street parking to support at-grade uses.

9.2.1.20 The public realm and the development interface with the public realm will be held to the highest design standards.

9.2.1.21 Mississauga will develop identifiable civic buildings, structures, and spaces as community and city focal points.

9.2.1.22 Development will contribute to pedestrian-oriented **streetscapes** and have an urban built form that is attractive, compact and transit-supportive.

9.2.1.23 Development will be designed to support and incorporate pedestrian and cycling connections.

9.2.1.24 Active uses will be required on principal streets with direct access to the public sidewalk.

9.2.1.25 Development will face the street.

9.2.1.26 Buildings should have active facades characterized by features such as lobbies, entrances and display windows. Blank building walls will not be permitted facing principal street frontages and intersections.

9.2.1.27 For non-residential uses, at-grade windows will be required facing major streets and must be transparent.

9.2.1.28 Development will create a sense of gateway to the Intensification Area with prominent built form and landscaping.

9.2.1.29 Built form will relate to and be integrated with the streetline, with minimal building setbacks where spatial enclosure and street-related activity is desired.

9.2.1.30 Development will have a compatible bulk, massing and scale of built form to provide an integrated **streetscape**.

9.2.1.31 Development will provide open space, including squares and plazas appropriate to the size, location and type of the development.

9.2.1.32 Buildings should be positioned along the edge of the public streets and public open spaces, to define their edges and create a relationship with the public sidewalk.

9.2.1.33 Buildings should be oriented to, and positioned along the street edge, with clearly defined primary entry points that directly access the public sidewalk, pedestrian connections and transit facilities.

9.2.1.34 Open spaces will be designed to promote social interaction.

9.2.1.35 Development will utilize **streetscape** design to provide visual connections to open space, providing enhanced sidewalk and trail connections near open spaces.

9.2.1.36 Buildings and **streetscapes** will be situated and designed so as to encourage pedestrian circulation.

9.2.1.37 **Streetscape** improvements including trees, pedestrian-scale lighting, special paving and street furniture in sidewalks, boulevards, open spaces and walkways, will be coordinated and well designed.

9.2.1.38 Developments should minimize the use of surface parking in favour of underground or aboveground structured parking. All surface parking should be screened from the street and be designed to ensure for natural surveillance from public areas. Aboveground structured parking should be lined with residential, commercial or office uses.

9.2.1.39 Parking lots and structures should not be located adjacent to major streets.

9.2.1.40 Signage will be integrated with the scale and character of built form and will follow **universal design principles**.

9.2.2 Non-Intensification Areas

Non-intensification areas will experience limited growth and change; consequently, intensive growth will not be directed to them. Non-Intensification Areas consist of:

- Neighbourhoods;
- Employment Areas;
- Special Purpose Areas; and
- Corridors.

Non-Intensification areas will have lower densities, lower building heights and more homogeneous land uses than Intensification Areas.

Neighbourhoods are stable areas where limited growth is anticipated. Development in Neighbourhoods will be required to be context sensitive and respect the existing or planned character and scale of development.

Employment Areas will continue to develop for a mixture of employment uses, including land extensive uses many of which will have a one to two storey urban form.

Where increases in density and a variety of land uses are considered in Neighbourhoods and Employment Areas, they will be directed to Corridors. Appropriate transitions to adjoining areas that respect variations in scale, massing and land uses will be required.

Special Purpose Areas – the University of Toronto Mississauga and the Airport - will be developed in a

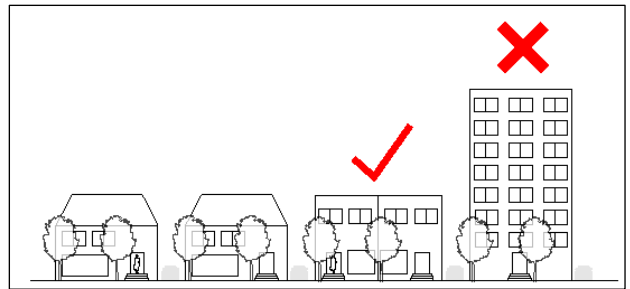


Figure 9-10: New development in neighbourhoods does not need to mirror existing development, but will be required to respect and be compatible with the surrounding area.

manner that reflects the unique role these areas play within the city and the region. While these areas will undergo limited urban development in the traditional sense, master plans for these areas will guide development that responds to their particular functions and development needs.

9.2.2.1 Heights in excess of four storeys will be required to demonstrate that an appropriate transition in height and built form that respects the surrounding context will be achieved.

9.2.2.2 Drive-through facilities will be permitted in non-intensification areas, provided that the proposed development does not interfere with the intended function and form of these Character Areas. Such applications will only be considered for approval where the location, design and function of the drive-through facility:

- a. maintains the intent of the Plan;
- b. does not interfere with the continuity and character of the **streetscape**;



Figure 9-9: Development in Non-Intensification Areas will be sensitive to the existing or planned character of the neighbourhood and the natural environment.

- c. provides for pedestrian movement into and through the site; and
- d. conforms to the “Drive-Through Stacking Lanes Reference Notes.”

The application will address, among other matters, the nature of surrounding uses, the specific location of the site within the character area, and opportunities for the integration of the drive-through facility with other uses within the development.

9.2.2.3 **Tall buildings** will generally not be permitted.

9.2.2.4 While new development need not mirror existing development, new development in Neighbourhoods will:

- a. respect existing lotting patterns;
- b. respect the continuity of front, rear and side yard setbacks;
- c. respect the scale and character of the surrounding area;
- d. minimize overshadowing and overlook on adjacent neighbours;
- e. incorporate **stormwater best management practices**;
- f. preserve mature high quality trees and ensure replacement of the tree canopy; and
- g. be designed to respect the existing scale, massing, character and grades of the surrounding area.

9.2.2.5 Employment Areas adjacent to residential areas, sensitive land uses and major roads will be required to meet higher standards of design and to mitigate adverse impacts on adjacent uses.

9.2.2.6 The City will work with landowners of Special Purpose Areas to encourage:

- a. the preservation and enhancement of the Natural Areas System;
- b. design for safety;

- c. design excellence;
- d. sustainable development; and
- e. the achievement of the overall intent, goals, objectives and policies of this Plan.

9.2.2.7 Development on Corridors will be encouraged to:

- a. assemble small land parcels to create efficient development parcels;
- b. face the street, except where predominate development patterns dictate otherwise;
- c. not locate parking between the building and the street;
- d. site buildings to frame the street and where non-residential uses are proposed to create a continuous street wall;
- e. provide entrances and transparent windows facing the street for non-residential uses;
- f. support transit and **active transportation** modes;
- g. consolidate access points and encourage shared parking, service areas and driveway entrances; and
- h. provide concept plans that show how the site can be developed with surrounding lands.

9.2.3 Green System



Figure 9-11: Kariya Park in Downtown Mississauga provides a reprieve from the built environment and is an essential component of the urban structure.

The Green System provides vital relief from the built environment. It helps satisfy human needs for rest, quiet and escape from the built environment. It is generally characterized by vegetated open areas ranging from manicured spaces and playing fields to expansive natural areas. Where buildings are sited, they tend to occupy a small proportion of the site and be small in scale except for public buildings, such as community centres and schools.

Urban form has a role to play in protecting the environment by being sensitive to natural areas in site design, utilizing sustainable design practices and supporting active modes of transportation.

9.2.3.1 Development will be sensitive to the site and ensure that Natural Areas Systems are protected, enhanced and restored.

9.2.3.2 All development will utilize sustainable design practices.

9.2.3.3 Mississauga will coordinate the design, function and location of parks with adjacent land uses.

9.2.3.4 Open space areas will be high quality, usable and physically and visually linked to streets, parks and pedestrian routes.

9.2.4 Cultural Heritage Resources

Cultural heritage resources are valued and should be preserved for future generations. Heritage properties, districts and landscapes create a unique sense of place and local identity. In addition to their historic associations, cultural heritage resources are landmarks and focal points that contribute to the overall city image.

9.2.4.1 Opportunities to conserve and incorporate cultural heritage resources into community design and development should be undertaken in a manner that enhances the heritage resources and makes them focal points for the community.

9.2.4.2 Development and open spaces adjacent to significant cultural heritage resources will:

- a. contribute to the conservation of the heritage attributes of the resource and the heritage character of the area;
- b. emphasize the visual prominence of cultural heritage resources; and
- c. provide a proper transition with regard to the setting, scale, massing and character to cultural heritage resources.



Figure 9-12: W.R.P. Parker had this country estate designed by the well known Canadian architect, Shy Mathers in 1918. The house was a social centre hosting such politicians as Mackenzie King at the time he was Prime Minister of Canada. In 1956 the property was sold to Hyl and Grace Chappell who lived here until the late 1980s.

9.2.4.3 *Streetscape* components such as signage, furniture and lighting, within areas with cultural heritage resources should be sympathetic to the character of the heritage area.



Figure 9-13: The Streetsville United Church, a heritage landmark, is preserved for the enjoyment of citizens today and future generations.



Figure 9-14: The Middle Road Bridge, located at the eastern end of Sherway Drive at the Etobicoke Creek, was built in 1909 and was the first concrete bow bridge of its kind in Canada.

9.3 Public Realm



Figure 9-15: Generous public sidewalks and open spaces will provide opportunities to enrich the pedestrian experience.

The public realm consists of streets and boulevards, public open spaces, squares and civic buildings and is an integral component of the urban form of the city. The arrangement of streets and blocks within the public realm provides a foundation for the city's built environment, which in turn influences the shape and layout of the public realm.



Figure 9-16: In the Downtown, public boulevards will be designed to incorporate street trees, on-street parking, pedestrian scale lighting, bicycle storage facilities and coordinated street furniture to enrich the urban experience.

The creation of landmarks, routes and gateways within the public realm contributes to the unique experience, legibility, sense of orientation and views and vistas. Public art, open space and landmark buildings in the public realm enriches the urban experience.

9.3.1 Streets and Blocks

Streets are public spaces that connect buildings, structures, parks, communities, natural resources and other significant public amenities. Blocks are the spaces between streets where buildings, structures and other elements, including parks and open spaces, are located. A **streetscape** is the image created by the buildings, sidewalks, signage, street trees, landscaping, street furnishings, open spaces, and other elements along streets.

9.3.1.1 Street patterns, development blocks and public open spaces together should create distinctive communities.

9.3.1.2 Mississauga will ensure that urban form, street patterns and public open space systems are coherent, orderly and legible.

9.3.1.3 Major roads and their **streetscapes** should be designed to create spaces that are integral parts of the adjacent communities, thus serving to link communities.

9.3.1.4 Development will be designed to:

- respect the natural heritage features, such as forests, ridges, valleys, hills, lakes, rivers, streams and creeks;
- respect cultural heritage features such as designated buildings, landmarks and districts;
- accentuate the significant identity of each Character Area, its open spaces, landmarks and cultural heritage resources;
- achieve a street network that connects to adjacent streets and neighbourhoods at regular intervals, wherever possible;

- e. meet **universal design principles**;
 - f. address new development and open spaces;
 - g. be pedestrian-oriented and scaled and support transit use;
 - h. be attractive, safe and walkable;
 - i. accommodate a multi-modal transportation system; and
 - j. allow common rear laneways or parallel service streets to provide direct access for lots fronting arterial roads and major collector roads, when appropriate.
- a. developing a fine-grained system of roads;
 - b. using short streets and small blocks as much as possible, to encourage pedestrian movement;
 - c. avoiding street closures; and
 - d. minimizing culs-de-sac and dead-end streets.

9.3.1.6 Where culs-de-sac and dead-end streets exist, accessible paths that provide shortcuts for walking and cycling and vehicular access should be created, where possible.

9.3.1.5 The improvement of existing streets and the design of new streets should enhance connectivity by:



Figure 9-17: A fine grain system of streets, incorporating small blocks will encourage pedestrian access and movement within Intensification Areas.



Figure 9-18: Development will incorporate street patterns of existing communities and built-up areas, with a particular block structure and characteristic street pattern.

9.3.1.7 **Streetscapes** will be designed to create a sense of identity through the treatment of architectural features, forms, massing, scale, site layout, orientation, landscaping, lighting and signage.

9.3.1.8 The design of developments at intersections and along major streets should be of a highly attractive urban quality, recognizing that streets are important civic spaces and linkages.

9.3.1.9 Development and elements within the public realm will be designed to provide continuity of the **streetscape** and minimize visual clutter.

9.3.1.10 Consideration will be given to the location of utilities on private property and the public right-of-way. Utilities will be grouped or located underground where possible to minimize visual impact. The City encourages utility providers to consider innovative methods of containing utility services.

9.3.1.11 Reverse frontage lots will not be permitted, except for infill development where a street pattern has already been established.

9.3.2 Civic Buildings and Spaces

Civic buildings and spaces are an important component of the public realm. These elements have the opportunity to become landmark buildings and spaces and should set the standard for development within the city. Civic buildings and spaces may also act as a catalyst for further development on surrounding lands.

9.3.2.1 Civic buildings and spaces will:

- a. be built to a high standard of design excellence;
- b. incorporate sustainable site development and buildings practices;
- c. strive to achieve a minimum standard of LEED Silver or custom green development standards; and
- d. be sited for prominence, visibility and universal accessibility.



Figure 9-19: Public views of the Mississauga Civic Centre, an important landmark, must be protected as it contributes to the identity of local government, the Downtown and the city as a whole.

9.3.2.2 **Universal design principles** will be applied in the development of, or renovation to City facilities including civic buildings, open space recreation uses, transit and pedestrian facilities.

9.3.3 Gateways, Routes, Landmarks and Views

Gateways, routes and landmarks are important building blocks of the city and contribute to city pattern and urban experience. Some sites within the city are uniquely located, given their topography, views or gateway condition. The design and function of these sites have the opportunity and responsibility to contribute to an area's character. Public buildings and structures with a prominent role and function should stand out from their context to support their role as landmarks.

Public views of important natural or man-made features along streets and **scenic routes** need to be protected since they add value to the built form and contribute to neighbourhood identity. When opportunities arise, new development must maintain, and in some cases, enhance those views and vistas to prominent features.

9.3.3.1 An appropriate gateway treatment will be created at city boundaries, major Provincial highway interchanges and at entry points to Intensification Areas through high quality development, massing of

buildings, open spaces, landscaping and **streetscape**.

9.3.3.2 **Tall buildings** have a greater presence on the skyline and are required to have the highest quality architecture.

9.3.3.3 Sites with prominence, high visibility and access should be considered as a priority for civic buildings and community infrastructure.

9.3.3.4 Buildings that serve the community such as places of religious assembly, colleges and hospitals, should be designed to be the focus of the community, highly visible, universally accessible and

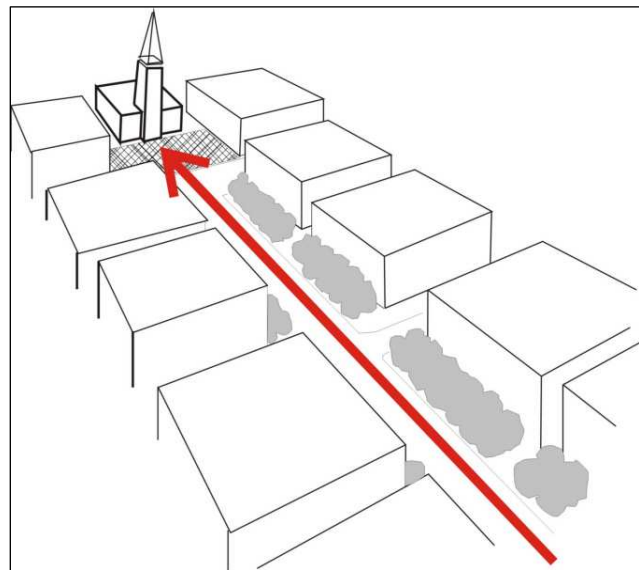


Figure 9-21: Development will preserve, promote and enhance public views to significant landmarks and natural features.



Figure 9-20: Views to Lake Ontario add value, provide a sense of orientation and preserve Port Credit's identity as a waterfront community.

attractive and serve as landmarks for future generations.

9.3.3.5 Special attention will be given to major intersections to create a sense of enclosure and identity, as well as heightened architectural interest.

9.3.3.6 Developments on major corners, prominent sites or that terminate a view will be held to a higher design standard.

9.3.3.7 New streets may be introduced to create prominent view corridors.

9.3.3.8 Views of significant natural and man-made features should be created, maintained and enhanced where appropriate.

9.3.3.9 Development will preserve, promote and enhance public views to the Lake Ontario waterfront.

9.3.3.10 Special care will be taken with development along **scenic routes** to preserve and complement the scenic historical character of the street.

9.3.3.11 Lands abutting the Mississauga Road right-of-way between the St. Lawrence and Hudson Railway and Lakeshore Road West (frontage, flankage and rear yards) which is a designated **scenic route**, will be subject to the following:

- a. direct frontage lots with direct access or flankage lots with buildings that have front doors facing Mississauga Road will be encouraged;
- b. service road and reverse frontage lot development will be discouraged;
- c. existing residential lot frontages will be retained;
- d. building massing, design and setback should be consistent with buildings on surrounding lots;
- e. projecting garages will be discouraged;
- f. tree preservation, enhancement and replacement on private lands will be required;
- g. alternative on site turn-arounds, such as hammerhead driveways, will be encouraged to reduce reverse movements and the number of driveway entrances. Circular driveways will be evaluated on an individual basis;
- h. preservation of existing landscape features (retaining walls, fences, hedgerows) will be encouraged; and
- i. the location of utilities should minimize the impact on existing vegetation.



Figure 9-22: Landmark buildings such as hospitals and places of religious assembly serve as focal points for communities as illustrated by the Credit Valley Hospital (Carlo Fidani Cancer Centre and the Richard and Annette Bloch Cancer Survivor Park) and Saviour of the World Chinese Church.

9.3.4 Public Art

Public art and culture enhances the quality of life for residents and visitors by contributing to the identity and unique character of the city and its various destinations. Incorporating public art into the experience of the city has the power to create a compelling, enriched environment and a place people will want to live in and return to.

Public art can range from the architecture of buildings to the design of elements within the public realm such as light features and seating. It may include memorials, sculptures, water features, murals, lighting or individual art installations; it may be integrated with building and landscape design; and art may also include functional elements such as street furniture and utility boxes.

Public art can serve as a focus in a public square or open space, or simply provide visual relief in high density areas. All gateway locations and public view terminus sites are candidates for public art.

Public art should be considered at a variety of scales and in diverse contexts. This includes larger installations at visually strategic locations such as the terminus of street corridors, at gateways, on prominent corners or in public open spaces. It also includes smaller or more unexpected installations such as along sidewalks, in interior courtyards, in associations with buildings (entrances, lobbies) and in alternative public spaces such as parking lots and garages.

9.3.4.1 Mississauga will prepare a Public Art Master Plan.

9.3.4.2 Mississauga will encourage public art on public and private lands.

9.3.4.3 Public art will be incorporated into the public realm, particularly in appropriate locations to serve as landmarks and as gateway features.

9.3.4.4 Public art will be incorporated into public works, whenever feasible.



Figure 9-23: The Crown Fountain in Chicago, Millennium Park, is a significant public art piece that enhances the quality of life for residents and visitors and provides an interactive, dynamic experience.

9.3.4.5 Development proponents are encouraged to incorporate public art into their developments. Intensification Areas will be priority locations for the installation of public art.

9.3.4.6 Public art is encouraged throughout the city, particularly in Intensification Areas and along the Lake Ontario waterfront.

9.3.4.7 Public art should have a prominent presence throughout the city and contribute to a high quality urban design. Public art should:

- a. be encouraged as an integral component of public works, land development and open space planning;
- b. include pieces that serve as orienting devices for moving about and wayfinding or as focal points in public open spaces;
- c. contribute to the animation of public spaces through its design, which may include pieces that are used as street furniture, play areas and/or other interactive uses; and
- d. correspond to the visual prominence of the site on which it is located.

9.3.5 Open Spaces and Amenity Areas

Open spaces include both public and private space as well as on site amenities and are one of the most significant contributors to an area’s character and quality of life. It is important that they not only be well designed and beautiful, but also that they be well connected and integrated with adjacent uses and other open spaces. The provision of open space

is an essential component of residential and non-residential development.

9.3.5.1 Mississauga will promote public open space design that is fully integrated with the urban design and built form of the community.

9.3.5.2 Open space will contribute to community aesthetics and enhance the Green System.

9.3.5.3 Natural features, parks and open spaces will contribute to a desirable urban form by:

- a. assisting with the protection, enhancement, restoration and expansion of the Natural Areas System, identified in Schedule 3: Natural System;
- b. connecting to the city’s system of trails and pathways;
- c. connecting to other natural areas, woodlands, wetlands parks, and open spaces, including streets, schools, cemeteries and civic spaces;
- d. ensuring that all new parks and Open Spaces address the street, providing clear visibility, access and safety;



Figure 9-24: In Port Credit, the Wave Park is the principal focus of the square with at-grade retail uses located at the edges to secure a vibrant, animated open space.

- e. ensuring that adjacent uses, buildings and structures front onto them, with direct access, and encouraging natural surveillance; and
- f. appropriately sizing parks and open spaces to meet the needs of a community and ensuring they are able to accommodate social events and individual needs, inclusive of recreation, playgrounds, sports and community gardens, where possible.

9.3.5.4 Open spaces will be designed as places where people can socialize, recreate and appreciate the environment.

9.3.5.5 Private open space and/or amenity areas will be required for all development.

9.3.5.6 Residential developments of significant size, except for freehold developments, will be required to provide common outdoor on site amenity areas that are suitable for the intended users.

9.3.5.7 Residential developments will provide at-grade amenity areas that are located and designed for physical comfort and safety. In Intensification Areas, alternatives to at-grade amenities may be considered.

9.3.5.8 Landscaped, outdoor on site amenity areas will be encouraged for employment uses.

9.4 Movement

A guiding principle of this Plan is to connect people with places through coordinated urban design, land use and transportation planning. Development should ensure the ease of movement between the built form and transit facilities and **active transportation** routes.

While vehicular and goods movement will continue to be an essential element of the transportation system, a priority for Mississauga is to increase the appeal of transit and **active transportation** modes for people of all ages and abilities. Mississauga is committed to accessibility through barrier free universal design. The design and relationships of development and of open spaces adjacent to streets, has a significant role to play in fulfilling these objectives.



Figure 9-25: A transit and pedestrian supportive urban form with active building facades and animated public realm is anticipated for Dundas Street, along with other Intensification Areas and Corridors in Mississauga.

9.4.1 Transit and Active Transportation

Urban form is fundamental to fostering transit and **active transportation** choices. Site and building design will improve connections and accessibility for transit users and promote pedestrian and cycling transportation modes. Mississauga will consider the convenience, comfort and safety of pedestrians and cyclists through urban design.



Figure 9-26: Bicycle parking is an essential urban amenity that nurtures transit usage and active transportation choices. (Research in Motion, Airport Corporate Centre)

Mississauga will ensure that pedestrian, cycling, transit and vehicular systems achieve a high standard of urban design and are an integral component of the city's visual image.

9.4.1.1 The design of all development will foster the improvement of connections and accessibility for transit users and promote **active transportation** modes.

9.4.1.2 A transit and **active transportation** supportive urban form will be required in Intensification Areas and in appropriate locations along Corridors and encouraged throughout the rest of the city.

9.4.1.3 Development will support transit and **active transportation** by:

- a. locating buildings at the street edge, where appropriate;
- b. requiring front doors that open to the public street;

- c. ensuring active/animated building facades and high quality architecture;
- d. ensuring buildings respect the scale of the street;
- e. ensuring appropriate massing for the context;
- f. providing pedestrian safety and comfort; and
- g. providing bicycle destination amenities such as bicycle parking, shower facilities and clothing lockers, where appropriate.

9.4.1.4 Development will provide for pedestrian safety through visibility, lighting, natural surveillance and minimizing vehicular conflicts.

9.4.1.5 The design of transit facilities will consider the convenience, comfort and safety of pedestrians and cyclists.

9.4.2 Vehicular and Goods Movement

Although a priority for Mississauga is to increase the appeal of transit and **active transportation**, urban form must also consider the needs of vehicular and goods movement, especially in areas where it forms the dominant mode of transportation. Building and site design in employment areas must carefully consider goods movement and the potential for conflict with transit and **active transportation** modes.

9.4.2.1 Urban form will balance the needs of vehicular and goods movement with transit and **active transportation** modes.

9.4.2.2 In areas where vehicular and goods movement is the primary mode of transportation, regard for the needs and safety of transit users, pedestrians and cyclists will be required.

9.4.2.3 Where buildings and structures are separated from roadways by parking lots, efforts to upgrade pedestrian access to buildings through landscaping, site design and the development of street related frontages is encouraged.



Figure 9-27: Mississauga’s Accessibility Advisory Committee was established in 2003. Its role is to promote and facilitate a barrier free Mississauga for citizens of all abilities.

9.4.3 Accessibility

As Mississauga’s population ages, the need for access will increase. Physical access to open spaces and buildings should be provided throughout the city. Further, the owners of existing buildings will be encouraged to retrofit them to be universally accessible.

9.4.3.1 Mississauga is committed to the creation of an accessible city. The design of the physical and built environment will have regard for **universal design principles**.

9.4.3.2 All development will be consistent with the Mississauga Accessibility Design Handbook.

9.5 Site Development and Buildings

A significant part of the urban experience takes place as people move from one building to another. Focusing on the relationship between buildings and the spaces that surround them is critical to quality urban form.

The quality and character of different communities and areas will be conserved, in part, by establishing a proper transition between them.



Figure 9-28: Architecturally expressed entrance features and defined landscaping provide a welcoming gesture and denote the sense of principal access to the building. (Biovail Pharmaceutical Corporation, Meadowvale Business Park)

In the planning and design of sites for development, consideration should be given to the existing site conditions, surrounding context, the public realm and proposed uses. Protecting and enhancing the **natural features, areas and linkages and their ecological functions** in the city, will contribute to sustainable site development.

Buildings through their location and massing, help define the use and character of streets and open spaces with a memorable sense of place and history. The orientation and placement of a building on a property creates a relationship with the adjacent context and helps define the quality and character of the public realm.

Good urban form results in a pedestrian friendly, safe, inviting and aesthetically appealing urban environment. Matters such as landscaping, parking, servicing and signage need to be appropriately addressed.

9.5.1 Context

Context addresses how developments demonstrate compatibility and integration with surrounding land uses and vegetation by ensuring that an effective transition in built form is provided between areas of different development densities and scale, and the protection of natural features.

9.5.1.1 Buildings and site design will be compatible with site conditions, the surrounding context and surrounding landscape of the existing or planned character of the area.

9.5.1.2 Developments should be compatible and provide appropriate transition to existing and planned development by having regard for the following elements:

- a. Natural Areas System;
- b. natural hazards (flooding and erosion);
- c. natural and cultural heritage features;
- d. street and block patterns;
- e. the size and configuration of properties along a street, including lot frontages and areas;
- f. continuity and enhancement of **streetscapes**;
- g. the size and distribution of building mass and height;
- h. front, side and rear yards;
- i. the orientation of buildings, structures and landscapes on a property;
- j. views, sunlight and wind conditions;
- k. the local vernacular and architectural character as represented by the rhythm, textures and building materials;

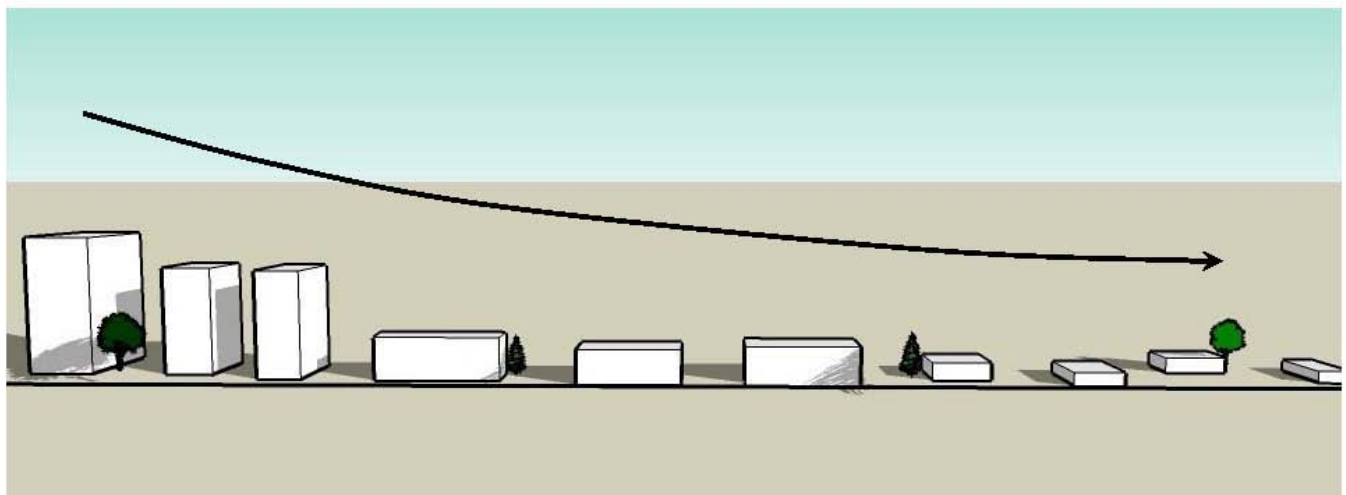


Figure 9-29: An appropriate transition of built form will be required to the existing and planned context.

l. privacy and overlook; and

m. the function and use of buildings, structures and landscapes.

9.5.1.3 Site designs and buildings will create a sense of enclosure along the street edge with heights appropriate to the surrounding context.

9.5.1.4 Buildings, in conjunction with site design and landscaping, will create appropriate visual and functional relationships between individual buildings, groups of buildings and open spaces.

9.5.1.5 Developments will provide a transition in building height and form between Intensification Areas and adjacent Neighbourhoods with lower density and heights.

9.5.1.6 Existing vegetation patterns and preservation and/or enhancement of the Urban Forest will be addressed in all new development.

9.5.1.7 Developments adjacent to public parkland will complement the open space and minimize negative impacts.

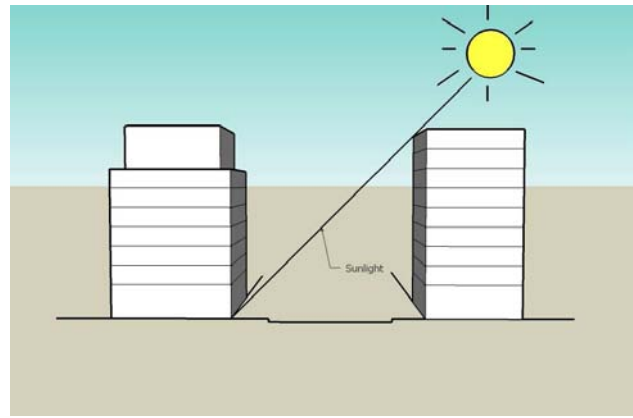


Figure 9-31: The height and massing of buildings should not obstruct sunlight from reaching the public sidewalk.

9.5.1.8 Proposed development should encourage public open space connections that link public parks and **community facilities** through the use of walkways, bikeways and bridges.

9.5.1.9 Development proposals will demonstrate compatibility and integration with surrounding land uses and the public realm by ensuring that adequate privacy, sunlight and sky views are maintained and that micro-climatic conditions are mitigated.

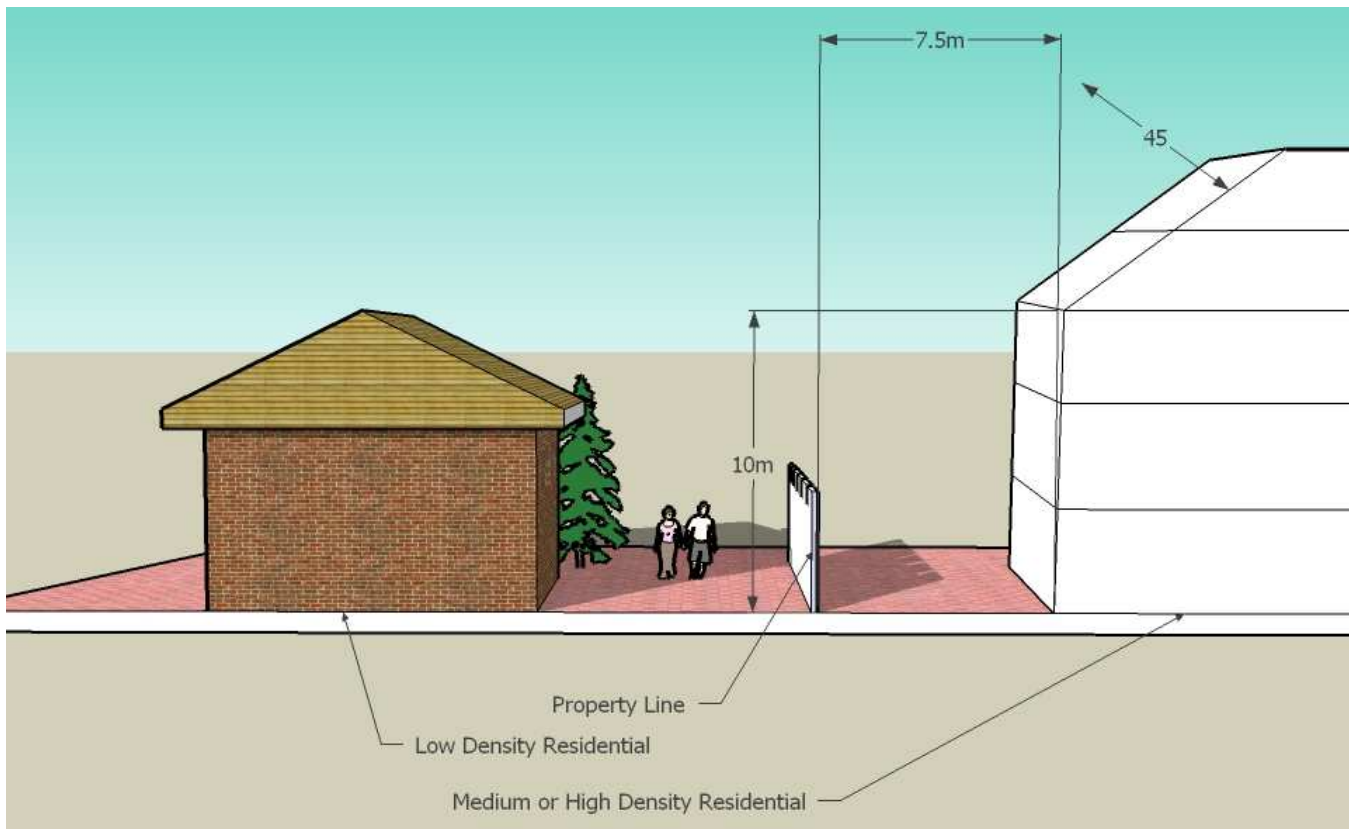


Figure 9-30: Development will respect the existing context and provide an appropriate transition in built form to low rise residential areas.

9.5.1.10 Where employment and commercial uses are adjacent to noise sensitive uses, noise mitigation should be provided at the source of the noise to ensure compatibility and acceptable noise levels.

9.5.1.11 New residential development abutting major roads should be designed with a built form that mitigates traffic noise and ensures the attractiveness of the thoroughfare.

9.5.1.12 Noise will be mitigated through appropriate built form and site design. Mitigation techniques such as fencing and berms will be discouraged.

9.5.1.13 Buildings with exposure to Provincial Highways or public streets in areas of site plan control will be subject to a higher standard of design, to achieve upgraded building elevations and landscaping, including principal doors and window fenestration.

9.5.1.14 Sites that have exposure to parks or double exposure to both Provincial Highways and public streets will be required to be designed with upgraded building elevations and landscaping facing all parks, public highways and public streets.

9.5.1.15 Development in proximity to landmark buildings or sites, to the Natural Areas System or cultural heritage resources, should be designed to:

- a. respect the prominence, character, setting and connectivity of these buildings, sites and resources; and
- b. ensure an effective transition in built form through appropriate height, massing, character, architectural design, siting, setbacks, parking, amenity and open spaces.

9.5.2 Site Development

The arrangement of elements on a site, as well as their massing and design, should contribute to achieving the City's vision and the intended character for the area. The development of a property may include one or more buildings or structures, services and utilities, parking areas and driveways and landscaping. Site design which incorporates **stormwater best management practices** will assist in achieving sustainable development objectives.

9.5.2.1 High quality, diverse and innovative design will be promoted in a form that reinforces and enhances the local character, respects its immediate context and creates a quality living or working environment.



Figure 9-32: Building facades should be parallel to the street edge with an appropriate architectural expression addressing the Highway 401 frontage. (Airport Corporate Centre)

9.5.2.2 Developments will be sited and massed to contribute to a safe and comfortable environment for pedestrians by:

- a. providing walkways that are connected to the public sidewalk, are well lit, attractive and safe;
- b. fronting walkways and sidewalks with doors and windows and having visible active uses inside;
- c. avoiding blank walls facing pedestrian areas; and
- d. providing opportunities for weather protection, including awnings and trees.

9.5.2.3 Development proponents will be required to ensure that pedestrian circulation and connections are accessible, comfortable, safe and integrated into the overall system of trails and walkways.

9.5.2.4 Where direct vehicular access to development is not permitted from major roads, buildings should be designed with front doors of individual units oriented towards the major road with vehicular access provided from a side street, service road or rear laneways.

9.5.2.5 Development proponents may be required to upgrade the public boulevard and contribute to the quality and character of streets and open spaces by providing:

- a. street trees and landscaping, and relocating utilities, if required;
- b. lighting;



Figure 9-33: Permeable paving is used to enhance tree preservation efforts and to promote stormwater infiltration at Dominican University, in River Forest, Illinois.



Figure 9-34: Bioretention features, such as **stormwater best management practices**, are encouraged to be incorporated in site development.



Figure 9-35: Generous landscape islands help to minimize the urban heat island effect.

- c. weather protection elements;
- d. screening of parking areas;
- e. bicycle parking;
- f. public art; and
- g. street furniture.

9.5.2.6 Development proponents will be required to demonstrate the successful application of **universal design principles** and compliance with legislated standards.

9.5.2.7 Site development should respect and maintain the existing grades on site.

9.5.2.8 Site designs that conserve energy will be encouraged. Energy conservation will be addressed at the development application stage and during the preparation of building and site designs. Buildings should be designed, oriented, constructed and landscaped to minimize interior heat loss and to capture and retain solar heat energy in the winter and to minimize solar heat penetration in the summer.

9.5.2.9 Site designs will be encouraged to minimize the consumption of water.

9.5.2.10 Site development will be encouraged to meet a minimum standard of LEED Silver or custom green development standards.

9.5.2.11 Site development will be required to:

- a. incorporate **stormwater best management practices**;
- b. provide enhanced **streetscape**;
- c. provide landscaping that complements the public realm;
- d. include the use of native non-invasive plant material;
- e. protect and enhance habitat;
- f. preserve significant trees on public and private lands;
- g. Incorporate techniques to minimize urban heat island effects such as providing planting and appropriate surface treatment; and
- h. provide landscaping that beautifies the site and complements the building form.

9.5.2.12 Heating, venting and air conditioning equipment and mechanical/utility functions will be



Figure 9-36: The Hazel McCallion Academic Learning Centre at the University of Toronto Mississauga demonstrates the importance of high quality architecture and the use of sustainable building materials to conserve energy. This building achieved a LEED Silver designation from the Canadian Green Building Council.

located away from the public realm and not be visible from public view.

9.5.2.13 External lighting for site development should:

- a. be energy efficient;
- b. utilize dark skylight fixtures; and
- c. not infringe on adjacent properties.



Figure 9-37: A safe and accessible pedestrian environment is created when doors front onto public sidewalks. (Port Credit)

9.5.3 Buildings

Buildings are often the most noticeable aspect of site development and therefore, the quality of their design and the materials selected is fundamental to good urban form. The articulation of a building is often what gives it a human scale and a sense of quality through attention to detail. The entrance of a building is often the most recognizable and used part of the façade and should be prominent, recognizable and accessible.

All buildings should be designed to incorporate sustainable technologies. Where **tall buildings** occur, they are prominent features of the urban form and should be designed to the highest of standards.

9.5.3.1 Buildings will be designed to create a sense of identity through the site layout, massing, forms, orientation, scale, architectural features, landscaping and signage.

9.5.3.2 Buildings must clearly address the street with principal doors and fenestrations facing the street in order to:

- a. ensure main building entrances and at grade uses are located and designed to be prominent, face the public realm and be clearly visible and directly accessible from the public sidewalk;
- b. provide strong pedestrian connections and landscape treatments that link the buildings to the street; and
- c. ensure public safety.

9.5.3.3 Building facades should be articulated to include changes in materials, or material treatments, as well as the indication of transition between floors and interior spaces to provide visual interest and relief.

9.5.3.4 Principal building entrances should be covered with a canopy, awning, recess or similar device to provide visual prominence and pedestrian weather protection.

9.5.3.5 Front building façades should be parallel to the street. Consideration may be given to allow for periodic indentation for visual relief and features such as urban plazas.



Figure 9-38: Green roofs are an effective stormwater best management practice and contribute to the reduction of the urban heat island effect.

9.5.3.6 Street facing façades should have the highest design quality. Materials used for the front façade should be carried around the building where any façades are exposed to the public view at the side or rear.

9.5.3.7 Buildings will be pedestrian-oriented through the design and composition of their façades, including their scale, proportion, continuity, rhythms, texture, detailing and materials.

9.5.3.8 Buildings should avoid blank street wall conditions. Blank walls resulting from phased development, will require upgraded architectural treatment.

9.5.3.9 **Tall buildings** will minimize undue physical and visual negative impact relating to:

- a. micro-climatic conditions, including sun, shadow and wind;
- b. noise;
- c. views;
- d. skyview; and
- e. adjacent cultural heritage resources, open spaces, the public realm, community infrastructure and residences.

9.5.3.10 The lower portion of **tall building** developments will include a built form that achieves street frontage and at-grade relationships to support a pedestrian-oriented environment.

9.5.3.11 Building materials should be chosen for their functional and aesthetic quality, sustainability and ease of maintenance.

9.5.3.12 The choice of building materials should minimize the risk for bird collisions.

9.5.3.13 Where appropriate, development should be designed to incorporate measures that minimize urban heat island effects.

9.5.3.14 Buildings should be designed to conserve energy and incorporate sustainable materials.

9.5.3.15 Buildings should be designed to minimize the consumption of water and to utilize **stormwater best management practices**.

9.5.3.16 Buildings should coordinate and integrate vehicular and servicing access to minimize their visual prominence.

9.5.3.17 Mechanical equipment, vents and metering devices will be integrated into the building design and will not be visible from the public realm.

9.5.3.18 Roof-top mechanicals and appurtenances will be integrated into building design and will not be visible from the public realm and residential developments.

9.5.3.19 It will be the responsibility of proponents of development applications to comply with Airport height restrictions.



Figure 9-39: Attractive and comfortable public spaces enhance the pedestrian experience. (Streetsville)

9.5.4 Relationship to Public Realm

The public realm is an integral part of any site development. The relationship between buildings, site layout and elements within the public realm has



Figure 9-40: The public realm in an urban environment constitutes an array of publicly accessible spaces which create a memorable sense of place. Wide public sidewalks with street trees, special pavement, animation and buildings framing the street contribute to a desirable public realm.

a great impact on the urban form and the experience of those who live, work and play in the city.

9.5.4.1 Development proposals should enhance public streets and the open space system by creating a desirable street edge condition.

9.5.4.2 An attractive and comfortable public realm will be created through the use of landscaping, the screening of unattractive views, protection from the elements, as well as the buffering of parking, loading and storage areas.

9.5.4.3 The sharing and reduction of access points/driveways will be encouraged to promote pedestrian safety and provide the opportunity for a continuous **streetscape**.

9.5.4.4 Along Corridors where an urban character is appropriate, buildings should be located close to and aligned with the street to enclose the street.

9.5.4.5 Built form will relate to the width of the street right-of-way.

9.5.4.6 Outdoor storage should not be located adjacent to, or be visible from city boundaries, the public realm or residential lands by incorporating the use of appropriate setbacks, screening, landscaping and buffering.

9.5.4.7 Display areas are to be an integral part of the overall site design and evaluated based on their visual impact on the **streetscape**.

9.5.5 Parking, Servicing and Loading

The design of parking, servicing and loading areas is a key component in the development of sites. These areas serve a functional need, but should be designed in a manner that screens less desirable aspects and provides high quality treatment of exposed areas while addressing safe and efficient movement of pedestrians and vehicles. Parking surfaces are a contributor to the urban heat island effect and, as such, should be designed to mitigate the heat effects.

9.5.5.1 Parking should be located underground, internal to the building or to the rear of buildings.

9.5.5.2 Above grade parking structures should be screened in such a manner that vehicles are not visible from public view and have appropriate directional signage to the structure.

9.5.5.3 Where surface parking is permitted, the following will apply. Parking should:



Figure 9-41: Service and loading areas should be discreet, located on site, recessed into the building and not be a dominant element of the **streetscape**.

- a. not be located between the building and the street;
- b. incorporate **stormwater best management practices**, such as, permeable paving, bio-retention areas and tree clusters;
- c. provide safe and legible raised walkways, with curb ramps, within parking areas to buildings and streets;
- d. incorporate **universal design principles**;
- e. be configured to permit future development;
- f. have appropriate landscape treatment including trees and lighting, throughout parking lots;
- g. provide appropriate landscape treatment to provide shading of parking areas; and
- h. provide landscape buffering at the street edge.

9.5.5.4 Shared parking between developments will be encouraged, where appropriate.

9.5.5.5 Secure bicycle parking will be provided in developments.

9.5.5.6 Site plans will demonstrate the ability for shared servicing access between adjacent developments.

9.5.5.7 Service, loading and garbage storage areas should be internal to the building or located at the rear of the building and screened from the public realm.

9.5.6 Safety



Figure 9-42: The Mississauga **Crime Prevention Through Environmental Design** Committee was established in 1994 to provide an interdisciplinary approach to reduce opportunities for crime in the built environment.

Crime Prevention Through Environmental Design (CPTED) concepts and principles have the objective of promoting safe living and working environments. Following CPTED principles, the public and private environment will be maintained at a level that enhances the public perception of safety and buildings, landscaping and site layout and will be designed to enhance personal safety.

9.5.6.1 Site layout, buildings and landscaping will be designed to promote natural surveillance and personal safety.

9.5.6.2 Active building frontages should be designed to face public spaces including entries and windows to ensure natural surveillance opportunities.

9.5.6.3 Development should clearly define areas of access and egress to avoid the creation of entrapment areas.

9.5.6.4 Development should incorporate lighting to ensure all designated areas of circulation, entrance, and connections are appropriately illuminated.

9.5.7 Signage

Signage is a significant element of the city's identity and character. Signage is both public and private. Signs include street names, interpretative and commemorative plaques, advertising and identification of uses.

9.5.7.1 Signage should:

- a. orient people as they move through the city;
- b. identify businesses and services;
- c. promote and enhance an area's character;
- d. identify significant sites, community uses, destinations and landmarks;
- e. recognize cultural heritage resources; and
- f. follow ***universal design principles***.



Figure 9-43: Signage will be designed to provide identity, orientation for pedestrians and have a compatible relationship with built form and the street.

9.5.7.2 Building and site designs will integrate signage and have regard for the character of the building, landscape and context. Signage should identify and inform as well as complement and enliven the ***streetscape***. Signage must be designed to minimize visual clutter.

9.5.7.3 Except for wayfinding and commemorative plaques, only fascia signs will be permitted within Intensification Areas.