City of Vaughan

REVIEW OF PARKING STANDARDS CONTAINED WITHIN THE CITY OF VAUGHAN'S COMPREHENSIVE ZONING BY-LAW:

The Draft Parking Standards Report is a draft document and has not been approved by Council to-date.

MARCH 2010

IBI GROUP

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D)

TABLE OF CONTENTS (CONT'D)

TABLE OF CONTENTS (CONT'D)

APPENDICES

LIST OF EXHIBITS

TABLE OF CONTENTS (CONT'D)

TABLE OF CONTENTS (CONT'D)

EXECUTIVE SUMMARY

ES.1 Study Approach

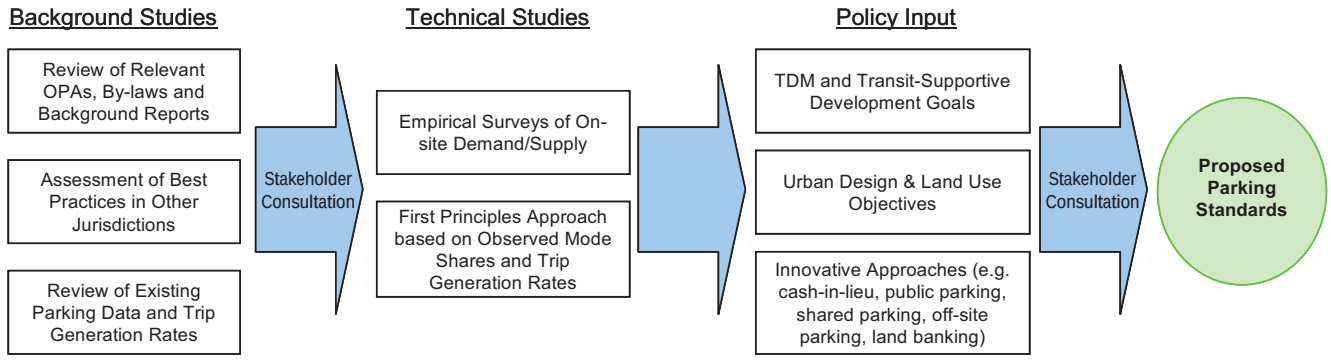
As the City of Vaughan continues to evolve into an increasingly urban environment with more pervasive and frequent public transportation, the City has recognized the need to review its parking standards. This report proposes new parking standards for the City of Vaughan regulating the supply and design of private, off-street parking. It also discusses options and provides recommendations regarding the development of public parking.

The "Parking Requirements" contained within By-law 1-88 demonstrate an auto-oriented approach which ensures that each destination can accommodate peak parking demand on site, thereby minimizing the potential for off-site impacts. The existing requirements have little consideration for the availability of alternative forms of transportation, urban context, or development forms. High minimum parking requirements contribute to an over supply of parking, inefficient use of land, and dispersed development patterns, which in turn strengthen automobile dependence and discourage alternative forms of transportation, such as transit and walking.

This study adopts a broader understanding of the role of parking standards. In addition to minimizing parking spill-over into sensitive areas, minimum and maximum parking requirements along with alternative approaches (e.g. shared parking) are viewed as key parking management tools to help promote more sustainable forms of development. This includes supporting more cost- and land-efficient forms of development, supporting the envisioned urban structure and public transit investments, encouraging transportation alternatives to the automobile, and mitigating the environmental impacts of parking facilities. The overall approach adopted in this study is that **parking zoning standards should be responsible, implementable, and promote more sustainable forms of development.**

While empirical parking supply and occupancy surveys are an important aspect of the study, multiple approaches for assessing and developing parking standards are adopted. A comprehensive approach involves assessing best practices, reviewing existing standards in Vaughan and other jurisdictions, conducting parking surveys, estimating parking demand directly from first principles, and considering policy objectives. The framework for determining new parking standards is illustrated in Exhibit ES-1.

Exhibit ES-1: Framework for Determining Parking Standards



ES.2 Highlights of the Proposed Parking Standards

Highlights of the proposed parking standards include:

- **"Responsible" parking requirements**: The existing parking requirements are quite high for many uses, sometimes higher than comparable jurisdictions in the GTA or across the country. Revised parking requirements have been developed to better reflect a responsible level of parking, balancing the need to require appropriate levels of parking without contributing to extensive oversupply and inefficient land use.
- **Reduced number of uses**: Currently, parking requirements are specified for over 60 uses, many of which have significant overlap or are not justified in having their own parking requirement (e.g., video store versus convenience store versus retail store). To simplify the standards and improve their accuracy, the proposed standards consolidate uses, where appropriate, particularly for retail, restaurant, and industrial/employment uses.
- **Sensitivity to urban context**: The existing parking standards generally follow a "one size fits all approach". However, due to differences in built form, transit service, and planning visions across the City (e.g., Vaughan Metropolitan Centre – OPA 500, Steeles Corridor – OPA 620, etc.), the same parking requirement will not be appropriate everywhere. The proposed standards specify alternative minimum and maximum (in certain cases) parking requirements for four different urban categories, reflecting alternative transportation conditions and planning visions for these areas.
- **Sensitivity to parking demand and existing supply**: In addition to urban classifications, adjustment factors are proposed to tailor parking requirements to local conditions. Examples include parking reductions for sites in close proximity to frequent transit service and mixed-use sites that can share parking among uses with offset peak demands. These adjustment factors will initially be implemented through guidelines with the intent that they later be formalized in the parking by-law once tested.
- **Cash-in-lieu and Public Parking**: With development of the Vaughan Metropolitan Centre and growth in local centres and intensification corridors, there is opportunity and need for Vaughan to take a greater role in parking management. Cash-in-lieu is recommended as one strategy to help raise funds for the development of public parking that also provides flexibility to developers to provide less parking on-site. It is recommended that collected funds need not be limited to constructing and operating public parking, but could also be spent on measures relating to improving parking efficiency (e.g., improved signage and access to existing lots) and reducing parking demand in the area (e.g., pedestrian improvements).
- **Improved parking design**: Recommendations are provided regarding parking space access and dimensions. This includes dimensions for typical automobile spaces, small car spaces to promote the uses of smaller, more fuel-efficient vehicles, and bicycle parking. Potential by-law requirements are also provided regarding many design aspects, such as landscaping, location and layout, and stormwater management. These requirements were subsequently used to develop a separate stand-alone document on "**Parking Design Guidelines**"
- **Bicycle parking**: To promote cycling as a more sustainable mode of travel, bicycle parking requirements are specified for office, retail, restaurant, multi-unit residential, and school uses, including requirements for short- and long-term spaces.
- **Accessible Parking**: Revised accessible parking supply and design requirements are not proposed at this time. Rather, the intent is that Vaughan will adopt revised

standards in line with the provisions under the Accessible Built Environment Standards being developed as part of the Accessibility for Ontarians with Disabilities Act.

ES.3 Public Parking

Recommendations are also provided regarding public parking. These recommendations are intended to be a starting point for the development of a Parking Management Business Plan. Such a plan would require additional analysis to determine capital and operation costs, and a supporting resolution from Council.

In general, collective parking can be provided by the City or by the private sector and is typically priced. Collective, priced parking is seen as an important element of the transportation strategy for the Vaughan Metropolitan Centre, in particular, and potentially at other high order transit hubs, as it promotes alterative modes of transportation and Transportation Demand Management (TDM), reduces parking demand and the land required for parking, and generates revenue to fund parking structures or potentially other community improvements.

Financing parking can be one of the most challenging parts of parking development. Based on a specific review of opportunities, cash-in-lieu is recommended as one approach to help raise funds for the development of public parking in the Vaughan Metropolitan Centre, Steeles Corridor (i.e., Jane St. to Keele St.), and local centres, particularly the Woodbridge Core and Kleinburg-Nashville. Other funding options such as user fees and tax increment financing also hold promise in particular areas, but require further investigation as part of more location-specific parking strategies.

If Vaughan plans to increase its role in parking management and the provision of public parking, it will need an appropriate organizational structure to guide and implement these activities. Five parking management types are considered. Creating a Parking Advisory Committee, similar to that created in the Town of Markham, consisting of Regional and Municipal Councillors is recommended as the preferred approach that can be put in place relatively quickly to ensure more strategic and coordinated planning and action regarding parking management. A Parking Manager position should be created to coordinate staff support for this committee from various City departments.

This governance structure is a demonstrated low cost and effective approach to initiate and grow priced public parking. In the future, there may be a need for a more consolidated parking management structure with the consolidated authority to collect revenue, acquire land, and develop and operate parking facilities, such as a parking authority. A parking authority is not warranted in the City of Vaughan in the short- to medium-term; however, the City should coordinate efforts with the Region if it moves to establish a parking authority, as recommended in York Region Transportation Master Plan.

Prompted by on-going development and growth in the Woodbridge Core, a specific review of opportunities and options to guarantee a sufficient number of parking spaces available for use by the public was conducted for this area. Based on in-person surveys of businesses in the Woodbridge Core, on- and off-street parking surveys, and consultation with key stakeholders, such as the Woodbridge Ratepayers Association, it was found that there was adequate parking availability at peak times; however, the most convenient spaces are highly utilized. Building off the proposed parking standards for the area, a number of strategies are recommended to improve parking efficiency and increase parking supply including improved signage, more regular enforcement, facilitating cooperation among local businesses, and creative use of cash-in-lieu funds, among other strategies.

ES.4 Next Steps and Implementation Considerations

Moving forward from these recommendations, proposed standards will need to be put forward to Council for approval. A zoning by-law amendment to implement these recommendations has been drafted and will be the primary implementing mechanism for the recommendations in this study. In addition, several supporting guidelines have been developed or are recommended including:

- Parking Design Guidelines (Separate Document);
- Guidelines on the application of adjustment factors (proposed to be developed based on suggestions in this report); and,
- Parking Management Business Plan (proposed to be developed based on suggestions in this report).

As with any zoning change, a number of implementation issues will need to be considered. It is recommended that the new parking standards will apply to all development, new and existing within the City. In general, proposed minimum parking standards are lower than existing standards so most existing developments will not have a deficit of parking if they are reassessed with the new standards. In some cases, existing development may have more parking than allowed by a maximum parking standard. In either case, existing development not in compliance with the parking standards will be considered “legal non-conforming”. It is recommended that no existing developments be required to get rid of parking if they supply spaces above the maximum standard. However, if such a site undergoes a major addition/reconstruction project and/or requests a zoning variance, this maximum parking standard should come into force.

Even though reduced minimums and parking maximums proposed in some areas are partially based on future transit improvements (e.g., subway, VIVA dedicated busway/light rapid transit), it is recommended that adoption of proposed parking standards occur as soon as possible, rather than being tied to these improvements. New development takes time and is difficult to change once it is in place. The development applications occurring now in the Steeles Corridor and Vaughan Metropolitan Centre needs to be built to reflect the future transit service soon to be provided by the subway.

Parking standards are one of the most powerful tools available to a municipality for influencing its off-street parking supply, particularly for new development. However, progressive parking standards are only one component in promoting more sustainable development in Vaughan. Particularly in areas where maximum parking limits are proposed and structured parking is desired, proper incentives will need to be in place to encourage the type of development desired. Examples of such incentives include good transit service, density bonuses, joint development of parking or public parking provision nearby, and a taxation structure that does not favour free surface parking over priced structured parking.

In summary, it is envisioned that the parking zoning by-laws will be “living” regulations that evolve as required to meet changing conditions, just as they have done in the past. The proposed standards and supporting recommendations regarding public parking are important tools for the City of Vaughan, as it continues to evolve into an increasingly urban environment with more pervasive and frequent public transportation.

ES.5 Proposed Parking Standards

For each use, proposed standards are subdivided by urban structure category, reflecting the intent of these standards to be sensitive to planning visions and current and future transportation conditions in each area. The proposed framework is summarized in Exhibit ES-2 (See Exhibit 3.4 in Main Report for a map of geographies). Unique minimum and maximum parking standards are proposed for many uses in High-Order Transit Hubs, Local Centres, and Primary Centres/Primary Intensification Areas, with city-wide minimum standards applying to all remaining areas.

Exhibit ES-3 and Exhibit ES-4 present a summary of the proposed minimum and maximum parking standards for non-residential and residential uses, respectively. Proposed adjustment factors are summarized in Exhibit 8-35. In addition to vehicle parking, the recommendations in this report also address bicycle parking, accessible parking, shared parking, and off-site parking in detail, as described in Section 5 "Other Parking Requirements and Provisions", and parking design, as described in Section 6 "Parking Design."

Exhibit ES-2: Proposed Approach to Parking Standards by Urban Context Category

Urban Context Category	Approach
High-Order Transit Hubs (Vaughan Metropolitan Centre, Steeles Corridor, Jane to Keele, Yonge Street)	• Lowest parking minimums recognizing high level of transit service and planned availability of on- and off-street collective parking • Responsible parking maximums designed to encourage transit use, promote compact development, and support establishment of on- and off-street collective, priced parking • High potential for public parking including on- and off-street facilities provided that parking maximums are enforced and City develops capacity to provide public parking
Local Centres (Woodbridge Core, Thornhill Heritage Conservation District, Maple Heritage Conservation District, Kleinburg-Nashville Heritage District, Vellore, Carrville, Concord)	• Low parking minimums recognizing small lots, mixed-use development form, desire to maintain high-quality public realm, and availability of on-street parking • Parking maximums on surface parking designed to discourage large surface parking lots, encourage transit use and structured parking, and support development of more on- and off-street collective parking • High potential for public parking in selected areas including on-street (in commercial/industrial areas) and off-street facilities provided that parking maximums are enforced and City develops capacity to provide public parking
Primary Centres/Primary Intensification Areas Regional Corridors: Yonge Street, Avenue 7, Jane Street Vaughan Metropolitan Centre west of 400	• Reduced parking minimums recognizing good level of transit service and desire for compact development • Parking maximums on surface parking designed to encourage transit use, discourage large surface parking lots and support establishment of on- and off-street collective, priced parking • Medium potential for public parking in selected areas including on- and off-street facilities building off of initiatives in the Vaughan Metropolitan Centre and Steeles Corridor
Base (Other Areas) (The rest of the City including Employment lands and Neighbourhoods)	• Basic parking minimums requiring a minimum responsible level of parking, but allowing for some flexibility to account for availability of travel choices and surrounding land use context. • No maximum parking limits recognizing that these areas are currently auto-dependent and not well served by transit.

Exhibit ES-3: Summary of Proposed Parking Standards – Non-Residential Uses

	Use Category	Description	Existing Standard (Minimum)	Proposed Standards (spaces / 100m² GFA)						
				Base (Other Areas)	High-Order Transit Hubs		Local Centres		Primary Centres/Primary Intensification Areas	
				Min	Min	Max	Min	Max (4)	Min	Max
Retail	Retail/Shopping Centre	<=5000m², eating establishments limited to 20% of GFA at this parking rate(1)	Varies from 2.0-6.0	3.5	2	4	3	4.5 surface parking	3	4.5 surface parking
	Retail/Shopping Centre	>5000m², eating establishments limited to 20% of GFA at this parking rate(1)	2.0-6.0	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking
	Supermarket	>1000 m²	6	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking
	Bank or Financial Institution (standalone on own lot)		6	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking
Eating Establishment	Eating Establishment		16-20	10	6	10	8	-	8	-
	Take-Out Eating Establishment		10	6	3	6	4	-	4	-
	Outdoor Patio		Equal to eating establishment	0	0	-	0	-	0	-
Office	General Office Building	Ancillary retail, personal services, and eating establishment limited to 15% of GFA at this parking rate(2)	3.5	3	1.5	2.5	2	3 surface parking	2	3 surface parking
	Medical Office Building		5/ practitioner	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking
Industrial	Industrial/Warehousing		1.5-2	1	-	-	-	-	-	-
	Mixed Industrial Building	Ancillary office, retail, personal services, and eating establishment limited to 15% of GFA at this parking rate(3)	1.5-2	1.5	-	-	-	-	-	-

(1) Eating establishment floor area above 20% of site GFA, should be assessed at the proposed eating establishment rate

(2) Retail, personal services, and eating establishment floor area above 15% of site GFA, should be assessed at the use-specific rate

(3) Office, retail, personal services, and eating establishment floor area above 15% of site GFA, should be assessed at the use-specific rate

(4) Maximum does not apply if parking is below grade

Exhibit ES-3: Summary of Proposed Parking Standards – Non-Residential Uses (cont.)

	Use Category	Existing Standard	Proposed Standards (units as specified)						
			Base (Other Areas)	High-Order Transit Hubs		Local Centres		Primary Centres/Primary Intensification Areas	
			Min	Min	Max	Min	Max	Min	Max
Places of Assembly and Related Uses	Hotel/Motel	1 per bedroom plus the requirements for any other use	0.9/bedroom(1)	0.75/bedroom(1)	-	0.85/bedroom(1)	-	0.85/bedroom(1)	-
	Banquet Halls, Dance Halls, Clubs and Convention Centres	11/100m^2 GFA	7/100m^2 GFA	3/100m^2 GFA	-	4.5/100m^2 GFA	-	4.5/100m^2 GFA	-
	Health or Fitness Club	11/100m^2 GFA	7/100m^2 GFA	5/100m^2 GFA	-	6/100m^2 GFA	-	6/100m^2 GFA	-
	Theatre, Auditorium, Public Hall, Arena, All Seasons Sports Facility, and Other Places of Assembly and Entertainment	11 / 100 m^2 GFA(2) and 0.33/ person in the maximum design capacity(3)	10/100m^2 GFA	5/100m^2 GFA	-	8/100m^2 GFA	-	8/100m^2 GFA	-
	Community Centre and Libraries	3.5/ 100 m^2 GFA(6) and 0.33/ person in the maximum design capacity(7)	2.0/100m^2 GFA	1.0/100m^2 GFA	-	1.5/100m^2 GFA	-	1.5/100m^2 GFA	-
	Museum, Art Gallery, Y.M.C.A., Y.W.C.A.	0.2/ person in the maximum design capacity	2.0/100m^2 GFA	1.0/100m^2 GFA	-	1.5/100m^2 GFA	-	1.5/100m^2 GFA	-
	Place of Amusement	0.17/ person in the maximum design capacity	2.0/100m^2 GFA	1.0/100m^2 GFA	-	1.5/100m^2 GFA	-	1.5/100m^2 GFA	-
	Bowling Alley	4 per lane	4 per lane	-	-	-	-	-	-
	Funeral Home	4/100m^2 with a 15 space minimum	4/100m^2 with a 15 space minimum	-	-	-	-	-	-

(1) Parking requirements for other uses (e.g., restaurant, convention centre) should be determined based on a shared parking calculation

Exhibit ES-4: Summary of Proposed Parking Standards – Non-Residential Uses (cont.)

	Use Category	Description	Existing Standard	Proposed Standards (units as specified)						
				Base (Other Areas)	High-Order Transit Hubs		Local Centres		Primary Centres/Primary Intensification Areas	
				Min	Min	Max	Min	Max	Min	Max
Institutional Uses	Place of Worship	Permanent Seating	11/ 100 m^2 GFA	23/ 100 m^2 GFA of worship area	9/ 100 m^2 GFA of worship area	18/ 100 m^2 GFA of worship area	15/ 100 m^2 GFA of worship area	23/ 100 m^2 GFA of worship area	18/ 100 m^2 GFA of worship area	29/ 100 m^2 GFA of worship area
		Variable Seating		34/ 100 m^2 GFA of worship area	13/ 100 m^2 GFA of worship area	26/ 100 m^2 GFA of worship area	22/ 100 m^2 GFA of worship area	34/ 100 m^2 GFA of worship area	26/ 100 m^2 GFA of worship area	43/ 100 m^2 GFA of worship area
	Hospital, Private and/or Public		0.75/bed in addition to 0.25/employee	No standard specified(2). Require studies be conducted for new hospitals and hospital expansion.	-	-	-	-	-	-
	Elementary and Secondary School	Parking	1.5 - 4(3)/Teaching Classroom	1.5 / classroom	1 / classroom	-	1.25 space / classroom	-	1.25 space / classroom	-
		Pick-Up/Drop-Off Spaces	0	3 spaces + 0.02/student	3 spaces + 0.015/ student		3 spaces + 0.015/ student		3 spaces + 0.015/ student	
	Post-Secondary Schools		Greater of 4/classroom or 6/100 m^s GFA	4/ classroom plus 1/ 6 seats in an auditorium or theatre	2.5/classroom plus 1/7 seats in an auditorium or theatre	-	3/classroom plus 1/7 seats in an auditorium or theatre	-	3/classroom plus 1/7 seats in an auditorium or theatre	-
	Day Nursery	Parking	1.5/Employee	1/Employee	0.75 / employee	-	0.85 / employee	-	0.85 / employee	-
		Pick-Up/Drop-Off Spaces	0	3 spaces + 0.1/ student	3 spaces + 0.05/ student		3 spaces + 0.05/ student		3 spaces + 0.05/ student	

(1) Required parking for auxiliary uses, such as residences, schools and day cares should be based on the specific requirements for these uses

(2) Due to the variation in hospital parking requirements, it is recommended not specify a standard for hospital land uses, as is practiced in the City of Toronto

(3) Secondary, Public, or Commercial School

Exhibit ES-4: Summary of Proposed Parking Standards – Residential Uses

Use Category	Description	Existing Standard (Minimum)	Proposed Standards (spaces per unit)						
			Base (Other Areas)	High-Order Transit Hubs		Local Centres		Primary Centres/Primary Intensification Areas	
			Min	Min	Max	Min	Max	Min	Max
Detached; Semi-Detached; Street Townhouse		2-3	2 per unit, with tandem parking permitted	1 per unit	-	1 per unit	-	1 per unit	-
Multiple Family Dwelling	Bachelor/1 Bedroom	1.75 (1.5 + 0.25 visitor/unit)	0.9	0.7	1	0.8	1.2	0.85	1.2
	2 Bedrooms		1.1	0.9	1.3	1	1.4	0.95	1.4
	3 Bedrooms		1.2	1	1.5	1.1	1.7	1.15	1.7
	Visitor		0.2	0.15	0.15	0.2	0.2	0.2	0.2
Residential - Senior Citizen's Dwelling - Independent	Bachelor/1 Bedroom	1 per unit	0.6	0.45	-	0.5	-	0.5	
	2 Bedrooms		0.8	0.6	-	0.7	-	0.7	
	3 + bedrooms		0.95	0.8	-	0.85	-	0.85	
Senior Citizens Dwelling - Supportive	Supportive: seniors-oriented multi-family housing with some services provided	1 per unit	0.5	0.4	-	0.45	-	0.45	
Senior Citizens Nursing Home	Nursing home: with full services provided	0.5 per bed	0.25/bed	0.2/bed	-	0.25/bed	-	0.25/bed	
Senior Citizens Visitor(1)	Applies to all SC dwelling types		0.2	0.15	-	0.2	-	0.2	
Home Occupation	Cottage Industry, Home Occupation, Private Tutor	1-2 in addition to res. requirements	1 in addition to residential requirements (can be tandem)						

(1) Applied per bed in the case of nursing homes.

1. INTRODUCTION

1.1 Background

Parking standards regulate the supply of off-street parking facilities and basic elements of its design. They are one of the most significant tools available to a municipality for influencing its off-street parking supply, particularly for new development. Off-street parking supply, in turn, has significant implications for transportation behaviour, urban design, and development patterns.

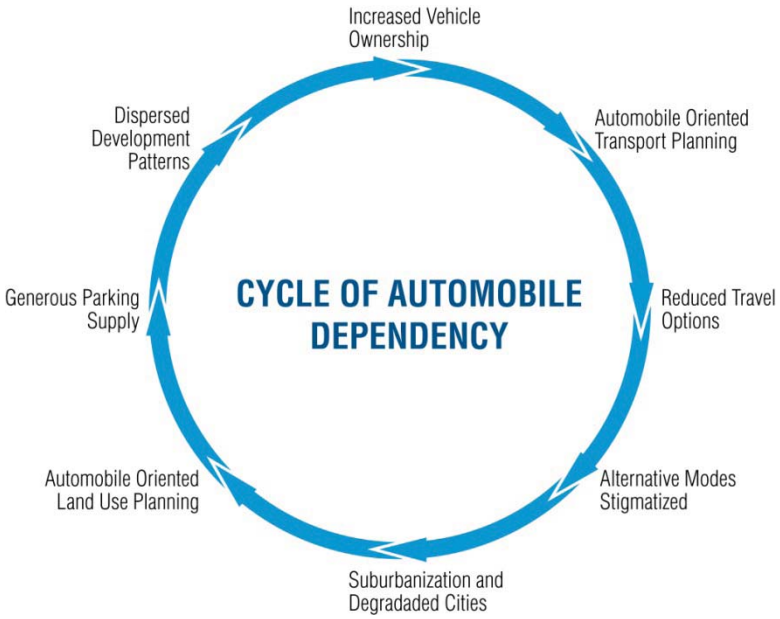
Parking zoning standards have traditionally been used by municipalities to specify parking requirements for new developments to ensure that ample off-street spaces are provided to meet anticipated parking demand. The City of Vaughan's existing parking standards reflect this practice. These standards have often been developed under the approach that more parking is better, thereby encouraging auto-oriented forms of development. However, with a growing desire to build higher-density, compact, and pedestrian-friendly development, support urban redevelopment, and encourage non-auto modes of transportation, it is recognized that robust parking standards will balance a variety of transportation and development objectives.

As the City of Vaughan continues to evolve into an increasingly urban environment with more pervasive and frequent public transportation, the City has recognized the need to review its parking standards. This primary goal of this study is to review the "Parking Requirements" contained within By-law 1-88 in order to provide recommendations that will better reflect Vaughan's transportation and land use realities and objectives. Options for the provision of public parking are also considered.

1.2 Objectives of Parking Standards

As noted, the "Parking Requirements' contained within By-law 1-88 demonstrates an auto-oriented approach which ensures that each destination can accommodate peak parking demand on site, thereby minimizing the potential for off-site impacts (also known as 'predict and provide'). This strategy typically discourages collective parking and leads to a large stock of private parking that is free of charge. As shown in Exhibit 1-1, high minimum parking requirements contributes to an over supply of parking and a cyclical pattern of automobile dependence.

Exhibit 1-1: Generous Parking Supply and the Cycle of Automobile Dependence



Source: Litman, T. (2006) Parking Management Best Practices. American Planning Association. Chicago, IL

This study adopts a much broader understanding of the role of parking standards. Minimum and maximum parking requirements along with supporting standards are viewed as key parking management tools to help promote more sustainable forms of development including:

- Supporting more efficient forms of development in terms of cost and land requirements;
- Supporting the envisioned urban structure and public transit investments;
- Encouraging transportation alternatives to the automobile and single-occupant vehicle (SOV) use, in particular;
- Mitigating the environmental impacts of parking facilities such as stormwater runoff and its contribution to the urban heat island effect; and
- Minimizing parking spill-over into sensitive areas.

In addition to these objectives, successful parking standards should be defendable and based on sound technical analysis, allow for quick understanding and easy application, and balance the needs and concerns of a diverse set of stakeholders such as City staff, developers, businesses, ratepayer groups, Transportation Demand Management (TDM) organizations, and the general public.

The overall approach adopted in this study is that **parking zoning standards should be responsible, implementable, and promote more sustainable forms of development.**

1.3 Policy Context

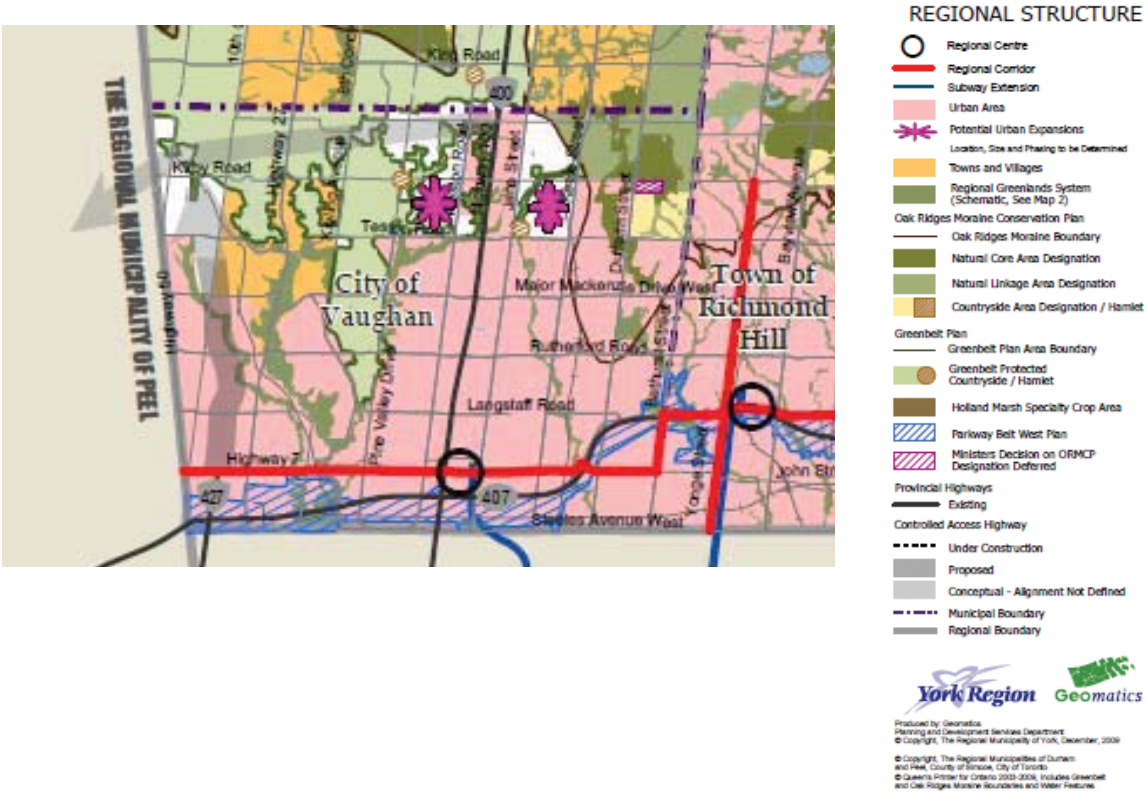
A key objective of parking standards is to support envisioned urban structure and public transit investments. As such, a review of the planning and policy documents in York Region and Vaughan has been conducted to understand local and regional land use and transportation plans as well as the parking policies and strategies proposed and implemented to date.

1.3.1 YORK REGION

REGIONAL OFFICIAL PLAN

On December 16, 2009, Council of the Regional Municipality of York adopted the York Region Official Plan - December 2009. This Plan iis organized around the themes of sustainable natural environment, economic vitality and healthy communities, . It is based on a regional structure consisting of regional centres, regional corridors, urban areas and towns and villages (Exhibit 1-2).

Exhibit 1-2: Regional Structure Map, York Region Official Plan



There are several policies in the new official plan that relate directly to parking as follows:

Under Cultural Heritage (Section 3.4):

Policy 9 – "To encourage access to core historic areas by walking, cycling and transit, and to ensure that the design of vehicular access and parking complements the historic built form".

Under Sustainable Cities, Sustainable Communities:

Policy 10 – "That secondary plans and zoning by-laws shall, in consultation with the Region and related agencies, incorporate parking management policies and standards that include:

a. reduced minimum and maximum parking requirements that reflect the walking distance to transit and complementary uses;

b. shared parking requirements, where possible, reflecting variances in parking demand between complementary uses on a time-of-day, weekday/weekend, and monthly basis;

c. on-street parking;

d. site design that orients the main building entrance(s) towards the street(s), that does not permit the placement of surface parking spaces between the main building entrance and the major street;

e. the design of surface parking to support redevelopment and retrofitting; and,

f. preferential locations for carpooling and car-sharing spaces and bicycle storage requirements."

Under Regional Centres (Section 5.4)

Policy 8 - "That secondary plans and zoning by-laws shall, in consultation with the Region and related agencies, incorporate parking management policies and standards that include:

a. reduced minimum and maximum parking requirements that reflect the walking distance to transit and complementary uses;

b. shared parking requirements where possible, reflecting variances in parking demand between complementary uses on a time-ofday, weekday/weekend, and monthly basis;

c. site design that orients the main building entrance(s) towards the street(s), and that does not permit the placement of surface parking spaces between the main building entrance and the major street;

d. an approach that anticipates and plans for the transition of surface parking to structured/underground parking as site *development* evolves; and,

e. preferential locations for carpooling and car-sharing spaces."

Policy 9 – "That all new buildings shall front the major street. Reverse lotting on the street, and/or surface parking between a building's main entrance and the street, are not permitted"

Policy 26 – " To work with local municipalities in the area of parking management, for the long term establishment of the following within the Regional Centres:

a. a system of municipal parking authorities to develop and/or operate shared public parking facilities;
b. cash-in-lieu-of-parking policies; and,
c. the planning for parking in structured or underground facilities in the final phasing of all site *development*."

The Regional Official Plan also includes requirements on trip reduction including "that new institutional, commercial and industrial development applications include a transit demand strategy that consider preferential carpool parking, bicycle facilities, employee transit passes, and alternative work arrangements."

YORK REGION TRANSPORTATION MASTER PLAN (NOVEMBER 2009)

The Transportation Master Plan for York Region makes a number of recommendations regarding parking management that relate to this study. Generally, it recommends that:

- A parking supply and pricing strategy should be developed to help regulate the supply of on- and off-street parking in designated Centres and Corridors. Area municipalities should support this strategy through changes to parking supply standards as it relates to land use and new developments.

- Municipal parking authorities with pricing strategies are encouraged to be established by area municipalities in order to support the parking supply and pricing strategy in designated Centres and Corridors put forth by York Region.

YORK REGION PEDESTRIAN AND CYCLING MASTER PLAN (APRIL 2008)

On April 24, 2008, York Regional Council endorsed the final Pedestrian and Cycling Master Plan (PCMP), a blueprint to develop walking and cycling infrastructure. The plan will also promote alternate forms of travel, such as combining walking and cycling with public transit, to help The Regional Municipality of York reach it's sustainable transportation objectives.

The York Pedestrian and Cycling Master Plan identifies a number of specific policies related to or impacted by parking including the need for trip end facilities (e.g. bicycle parking, showers) and the need to adopt site designs that promote sustainable transportation modes.

TRANSIT ORIENTED DEVELOPMENT GUIDELINES

The objective of York Region's Transit Oriented Development (TOD) Guidelines is to guide development in Regional Centres and Corridors in a manner that addresses the needs of transit users and ensures efficient transit service. The report provides vehicle parking design guidelines for providing sufficient parking while encouraging transit use:

- Design surface and structure parking facilities that incorporate safe and convenient connections between parking and building entrances;

- Consider existing surface parking lots as placeholders for future development;

- Reduce the prominence of surface parking;

- Adjust the quantity of parking to reflect the level of transit service;

- Integrate parking supply with Transportation Demand Management (TDM) programs;

- When possible, encourage on-street parking; and

- Promote shared parking arrangements among neighbourhood properties.

1.3.2 VAUGHAN

VAUGHAN PEDESTRIAN AND BICYCLE MASTER PLAN STUDY

The 20-year Vaughan Pedestrian and Bicycle Master Plan, released January 2007, provides a comprehensive network plan and set of supporting recommendations, including promotion and education strategies, and an implementation strategy to guide City staff.

The study includes several recommendations relating to bicycle parking. In particular, the study specifies that "trip-end" facilities such as benches, shelters and secure parking for bicycles should be provided at major employment, educational, commercial and other nodes that people frequent throughout the City. This would give people the option of using their bicycle or walking to a destination where they may have otherwise chosen to drive.

OFFICIAL PLAN AMENDMENTS

The City of Vaughan is in the process of developing new Official Plan. The project began in November 2007 and is expected to be completed by September 2010. Some of the emerging directions and draft maps were considered in developing the parking standards in this current study.

The City of Vaughan has many Official Plan Amendments (OPA's) which make reference to parking; however, there are three significant OPA's that expand on parking requirement amendments not yet established in the City's by-laws, which act as placeholders in anticipation of revisions to the City of Vaughan's parking standards:

Official Plan Amendment 500 (Vaughan Corporate Centre Secondary Plan Area, March, 1998)

In the Metropolitan Centre Node, the City of Vaughan may encourage increased lot coverage provisions, reduced parking standards, shared parking for mixed uses, on-street parking, cash-in-lieu parking and other incentives that contribute to the goals of the plan. The OPA also encourages a reduction in parking standards and the provision of maximum rather than minimum parking limits to manage traffic demand.

Official Plan Amendment 620 (Steeles Corridor, Jane to Keele)

Allows for transit supportive parking standards along this corridor through a zoning by-law amendment and suggests that reduced parking standards may be phased in over time as target densities are achieved. These transit supportive standards extend as far as demanding an "adequate supply" of secure bicycle parking "at the subway station, near bus stops, in urban squares, and in other high activity areas." OPA 620 also asserts that parking maximums will be established in the interest of encouraging transit use and discouraging parking oversupply. Furthermore, OPA 620 encourages shared parking for mixed-use developments and on-street parking being credited to on-site parking requirements.

Official Plan Amendment 651 (Carrville District Centre Plan)

Beyond several important urban design considerations, OPA 651 also encourages arterial on-street and lay-by parking to support street-related building entrances - Dufferin Street, Rutherford Road, the District Centre and Main Street are specifically targetted. The OPA calls for secure bike parking requirements near transit stations, public parking facilities on mixed-use developments, tying below grade parking to incentive packages, parking structures for high-density development, crediting on-street parking towards on-site parking requirements, and allowing on-street parking for all commercial developments fronting the street. The OPA also asserts that existing standards should be reduced and parking maximums introduced for the District Centre, which would apply to all

surface and structured parking. Carpool priority parking requirements are also recommended, along with similar priorities accorded to low and non-polluting motor vehicles such as electric cars.

Explicit links to transit supportive standards are identified, such as maximum parking standards, priority signalling, shared parking arrangements, and public-parking structures. In reference to Carrville, off-site parking is allowed and specific on-site maximums are included:

- For all retail commercial uses - a maximum of 4.25 spaces/100m^2 of Gross Floor Area (a reduction of 1.25 – 1.75 spaces/100m^2 from the minimums in By-Law 1-88).
- For all office uses - a maximum of 3 spaces/100m^2 of Gross Floor Area (a reduction of 0.5 spaces/100m^2 from the minimums in By-Law 1-88).
- For all condominium-based residential uses – a maximum of 1.75 spaces per unit, inclusive of visitor parking (0.25 spaces/unit over the minimum in By-Law 1-88).
- For all freehold residential uses – 2 spaces per unit are required (equal or 1 space/unit over the minimum in By-Law 1-88).

The City is directed to investigate the establishment of a public parking authority within the Carrville City Centre and cash-in-lieu mechanisms.

Kleinburg-Nashville Heritage Conservation District Study and Plan

A study was also completed in 2001, the Kleinburg-Nashville Heritage Conservation District Study and Plan, which concluded that Kleinburg's parking supply is already more than sufficient to meet peak parking demand and there is no need to add more parking to the core area. The need to add new parking is further reduced if a shared parking policy is achieved. The study went on to recommend that the City of Vaughan's zoning by-law be reviewed to see if parking standards for the Kleinburg-Nashville commercial core can be reduced. Furthermore, the study suggested that businesses in the Kleinburg-Nashville commercial core should develop strategies that maximize the utilization of existing parking.

CASH IN LIEU OF PARKING POLICY IN KLEINBURG

Cash in lieu of parking programs enable developers to pay a fee in lieu of providing parking spaces required under municipal zoning by-laws. The revenue is typically utilized to finance collective parking spaces to replace some or all of the private spaces that developers would have provided. The existing cash in lieu by-law in Kleinburg demonstrates the City's interest in developing more progressive parking policy and public parking. The by-law (159-2006) applies to properties designated as "Mainstreet Commercial"[1] and areas permitted for commercial uses.

1.4 Organization of Report

This report is structured into seven additional sections:

- Section 2 outlines various approaches to developing parking requirements through an examination of existing standards and principles, surveys, the influence of policy objectives, and other factors that need to be considered;
- Section 3 provides an overview of potential approaches to developing new parking standards for the City of Vaughan and describes the recommended hybrid approach;

[1] In accordance with the Official Plan Amendment 601 (Kleinburg – Nashville Community Plan)

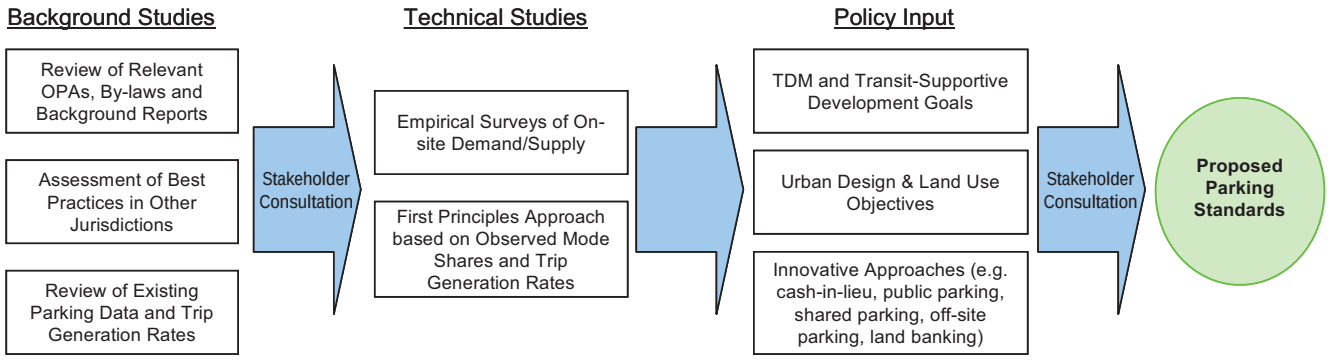
- Section 4 details the recommended new parking standards for residential, retail, restaurant, office, industrial, institutional, and other uses. Beyond proposing new standards, each sub-section includes a discussion of the parking issues involved with each land use, an overview of the existing requirements both in Vaughan and elsewhere, as well as the spot survey results;
- Section 5 proposes standards for bicycle and accessible parking as well as provisions for share and off-site parking;
- Section 6 details options and recommendations related to parking design;
- Section 7 provides a recommended approach for Vaughan to provide public parking; and
- Section 8 concludes with a summary of the study's key findings and proposed standards.

2. APPROACHES TO DEVELOPING PARKING REQUIREMENTS

There are a number of approaches to developing parking requirements. Once common approach is to review and borrow standards from other jurisdictions or from published sources (e.g., Institute of Transportation Engineers (ITE) *Parking Generation*, Urban Land Institute (ULI) *Shared Parking*, etc.). However, conducting parking surveys is preferred in order to clearly determine actual parking requirements for various uses. However, there are also limitations to parking surveys. For mixed use sites, it is difficult to accurately survey and apportion parking accumulation to specific land uses. Moreover, surveyed parking at one or several sites may not be representative of parking demand at another location given differences in site characteristics (e.g., surrounding density, transit service, etc.) and the popularity of the establishment.

Thus, while empirical parking supply and occupancy surveys are an important aspect of the study, multiple approaches for assessing and developing parking standards are adopted. A comprehensive approach involves assessing best practices, reviewing existing standards in Vaughan and other jurisdictions, conducting parking surveys, estimating parking demand directly from first principles, and considering policy objectives. The framework for determining new parking standards is shown in Exhibit 2-1.

Exhibit 2-1: Framework for Determining Parking Standards



2.1 Existing Standards

One approach is to develop new parking standards based on existing standards. Although it is often uncertain how existing standards were derived, it can be assumed that they were likely developed from careful analysis of local parking requirements for each type of use. In addition, regulatory and development parties are already familiar with these standards, which may make them resistant to significant change. This approach is particularly appropriate when there has been general satisfaction with the standards.

Existing or recommended standards from other jurisdictions or professional bodies are also useful to help develop parking standards. Appendix C presents a comparison between Vaughan parking standards and other jurisdictions and published sources. Canadian jurisdictions considered include Brampton, Markham, Mississauga, Toronto, Vancouver, Calgary, Winnipeg, Niagara Falls, London, Hamilton, Kingston, and Ottawa. Publications reviewed include *Parking Standards* from the American Planning Association (APA), *Shared Parking* 2nd Edition from the Urban Land Institute and International Council of Shopping Centres, and *Parking Generation* 3rd Edition from Institute of Transportation Engineers.

2.2 First Principles

The first principles approach involves estimating parking requirements based on key variables that affect parking occupancy. This approach is useful for exploring how parking requirements change with different land use and transportation characteristics, such as employee density, auto occupancy, and auto mode split. As such, this approach is useful in cases where minimum and/or maximum parking standards are set to help achieve specific modal split targets.

This approach, however, can only be used for land uses where it is relatively straightforward to estimate a parking ratio based on key variables. As an example, general office parking demand ratios can be estimated from employee density, auto mode split, and auto occupancy using the following equation:

General Office Parking Demand Ratio	=	**Employee Density**	X	**Auto Mode Split**	/	**Auto Occupancy**
(Spaces/100m^2)		(employees/100m^2)		(%)		(# occupants/vehicle)

Employee absenteeism and visitor parking demand also affects office parking demand, but these are generally assumed to cancel each other out. Calculations for sample scenarios are shown in Exhibit 2-2 representing a good transit service scenario and average Vaughan conditions. Based on 2006 data from the GTA Transportation Tomorrow Survey (TTS), 85% of daily trips in Vaughan are made by private vehicle.

Exhibit 2-2: First Principles Calculation of Office Parking Demand Ratio by Scenario

Scenario	Employee Density (# employees/100m^2)	Auto Mode Split (%)	Auto Occupancy (# occupants/veh)	Parking Demand Ratio (spaces/100m^2)
Good Transit	3.9	60%	1.2	2.0
Average Vaughan	3.9	85%	1.2	2.8

2.3 Empirical Surveys

Empirical parking surveys are a major component of this study. A spot survey approach was adopted to determine parking supply and peak parking occupancy at many sites across the City. Empirical surveys are necessary to enable an understanding of parking requirements for a given use. This includes the number of vehicles accumulating at a site, how this parking occupancy changes over time (e.g. by hour, day, and season), and the variation in parking occupancy across sites of similar uses.

Clearly, the approach for determining a standard using empirical data must be considered carefully to ensure that sufficient parking supply is provided without compromising goals regarding supporting more compact forms of development and encouraging non-auto modes of transportation.

2.3.1 SURVEY METHODOLOGY

The empirical survey is a critical component of this study designed to help answer key questions in developing office, retail and industrial parking standards, such as:

- How much parking is being supplied in relation to existing standards?
- How much of this parking is close to peak occupancy?
- Do specific uses (e.g. Large Retail, Medical Office) have unique parking demands or can they be grouped into the general retail or general office categories?

A spot survey approach was chosen whereby surveyors would visit a site, record existing parking supply, parking occupancy, and other site characteristics and then proceed to the next site. This approach allowed surveyors to quickly collect parking data on many office, retail, and industrial sites across the City.

The parking survey data collection involved three phases, which are discussed in detail in the following sections.

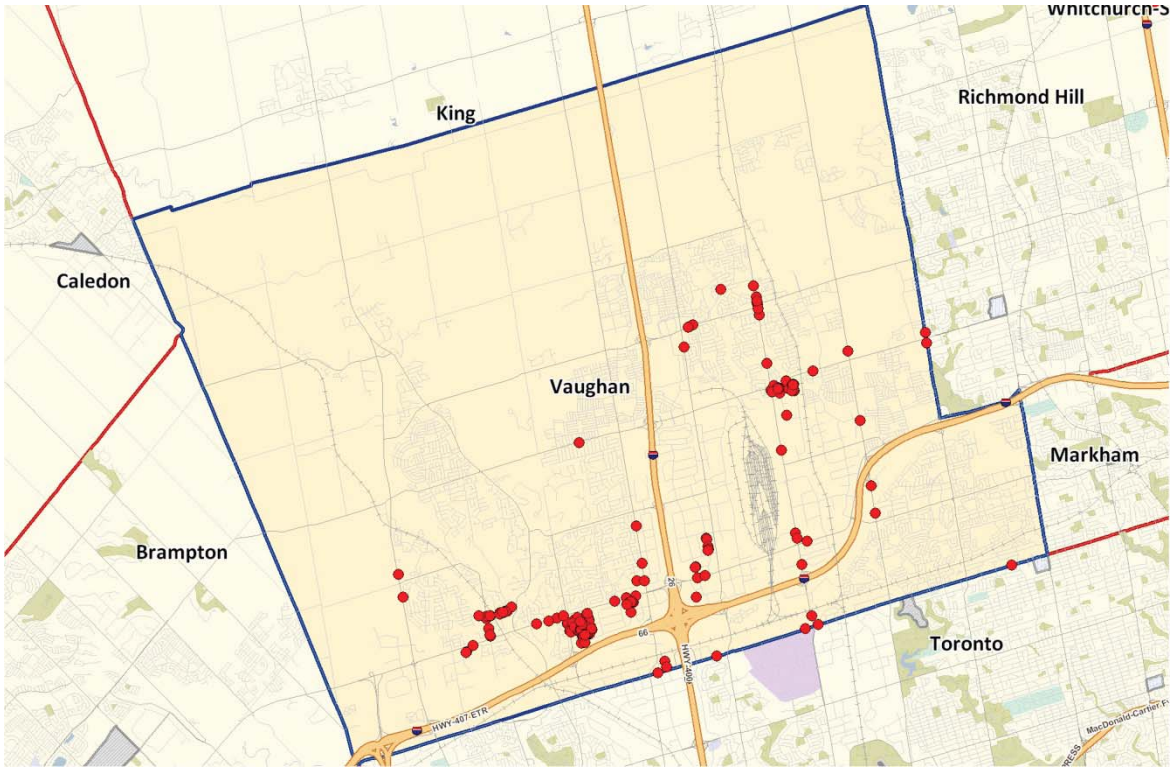
2.3.2 SPOT SURVEYS

Spot surveys were conducted by two surveyors on weekdays, between December and March 2008, with the bulk of surveys carried out in late December and early January. Surveyors visited sites at or near the expected time of peak parking demand for each land use. Upon visiting a site, surveyors would record a variety of information, including:

- Name of establishment(s);
- Date & time of visit;
- Parking supply;
- Parking occupancy;
- Supply of designated disabled spaces;
- Supply of bicycle parking;
- Free/pay parking;
- Digital photograph of the site; and
- Note other related characteristics (e.g., street parking, shared parking, etc.).

The sites selected for the spot surveys were based on areas of interest identified by the City. Within these areas of interest, specific sites were chosen by the surveyors which reflected typical land uses in Vaughan while aiming for broad geographical and land use coverage. This basic approach was taken due to the lack of detailed GIS data comprehensively describing the distribution of land uses across the city. Overall, 171 retail, office, and industrial sites were surveyed (Exhibit 2-3).

Exhibit 2-3: Survey Sites



Completed surveys were then reviewed and filtered. Data cleaning, adjustment of data, and survey limitations are discussed in Appendix B.

2.4 Policy-Based

In certain cases, policy goals can be the driving force behind parking standards for a given area. Parking standards can be set to achieve a certain auto mode split target or urban design objectives. This can be as simple as reducing parking requirements by a given proportion or setting maximum requirements in transit-supportive areas. Alternatively, using a first principles approach, specific auto mode split targets can be translated into the parking supply ratio to help achieve this goal.

For example, the North York Secondary Plan specifies that parking supply should be regulated to attain an auto driver modal split of no more than 33% in the p.m. peak hour. Using a first principles approach, it was determined that a parking minimum of 1 space per 100m^2 GFA and a parking maximum of 1.4 spaces per 100m^2 GFA would help to achieve this goal.

Of course, if a policy-based justification is used to develop lower minimum parking standards or maximum standards, good alternatives to the private vehicle should be in place or in development to ensure a successful outcome. In addition to the quality of non-auto modes, area-wide parking management strategies can also be very effective in making the best use of a limited parking supply[2].

In developing, city-wide parking standards for Vaughan, it is particularly important to consider policy-based objectives for heritage areas and urban areas including Centres and Corridors, as discussed further in Section 3.

[2] Litman, T. 2006. Parking Management Best Practices. American Planning Association. Chicago, IL.

3. STRUCTURE OF PROPOSED PARKING STANDARDS

3.1 Exploring the Options

This section assesses the possible approaches to developing the City of Vaughan's parking standards and identifies a preferred option.

Parking standards are often a blunt policy tool. As stated in a recent US Environmental Protection Agency (EPA) publication, "Generic parking standards have not kept up with the complexity of modern mixed-use development and redevelopment."[3], and this has so far been the case in most of Vaughan. Common mechanisms for encouraging more efficient parking supply and land development, such as shared parking or off-site parking provisions are not widely adopted in Vaughan. In addition, most parking standards in Vaughan do not provide any special consideration for transit-oriented development, infill development, affordable housing, or the size of residential units[4], all of which typically have unique parking needs. There are many options to improve the existing parking standards to encourage more sustainable development patterns and corresponding travel behaviour, thus reinforcing the City's quality of life goals. Four broad approaches are outlined below.

Generic Standards – In essence, maintain the parking standards as they exist today, but modify the current minimum parking supply requirements and fix irregularities and inconsistencies. The advantages of this approach are its simplicity to implement and potential acceptability given its similarity to the current standards. Assuming many of the existing inconsistencies are resolved, the standards would be relatively straightforward to enforce and would require few internal administrative changes. However, under this approach the parking standards would remain insensitive to many of the City's planning goals and local needs. For example, the Woodbridge Expansion Area would have the same standards as the Vaughan Metropolitan Centre, despite the vision for the former being low-density development and that of the latter being a compact urban centre with planned subway service. Furthermore, given the strong interest in generally reducing Vaughan's existing parking requirements, this option assumes that developers will choose to provide less parking given the choice.

Adjustment Factors – Under this framework, the structure of the parking standards would remain more or less intact, but various mechanisms for reducing the minimum requirements, and/or implementing maximum parking limits, based on site-specific conditions would be introduced. Thus, modifying factors must be developed with careful consideration of the factors influencing parking demand. Site-specific factors might include:

- Transit accessibility
- The availability of off-site parking, such as on-street or public parking
- Walkability/pedestrian-friendly environment
- Average household income
- The availability of car share vehicles

[3] US Environmental Protection Agency. (2006) Parking Spaces/Community Places – Finding the Balance Through Smart Growth Solutions. Washington, DC.
[4] The City of Vaughan By-law 1-88 requires 1.5 parking spaces per 'Residential – Apartment Dwelling' unit, regardless of unit size or number of bedrooms. In comparison, the City of Mississauga's parking requirements are based on the number of bedrooms and tenure of the apartment (e.g. 1.25 parking spaces for 1-bedroom condo units and 1.18 parking spaces for 1-bedroom rental units).

- Land use mixes – including live-work opportunities, opportunities for shared parking between uses

- Residential or employment densities

There are many examples of such adjustment factors aimed at tweaking parking requirements to better reflect true demand for parking and to balance parking with wider community goals:

- Los Angeles grants a reduction of 0.5 spaces per affordable housing unit, with further reductions if the units are within 1,500 feet of high-order transit;

- Portland, Oregon removes minimum parking requirements for sites located within 500 feet of a transit street with at least 20-minute peak hour service;

- For offices within 400m of a light-rail station, Pasadena, California, applies a maximum parking standard equivalent to 75% of the minimum standard in other areas;

- The office zoning in Montgomery County, Maryland allows a 15 % reduction to the minimum parking requirements if businesses participate in the "Share-A-Ride" program. Participation involves designating a transit co-coordinator and reserving at least 20% of parking for carpools. Other ways to qualify include subsidizing transit passes for employees[5].

- South San Francisco has enacted a citywide Transportation Demand Management (TDM) Ordinance, which allows reduced parking requirements for projects meeting TDM requirements. The ordinance applies to all non-residential developments that expect to generate 100 or more average daily trips, or to projects seeking a floor area ratio (FAR) bonus. Parking reductions are not fixed, but are subject to case-by-case review and depend on the number and extent of the TDM strategies implemented (e.g., parking for carpools and vanpools, transit subsidies, guaranteed ride home, parking charges for employee spaces, etc.).

The advantage of this approach is that it can provide detailed city-wide context sensitivity without having to develop unique parking standards for each of the City's neighbourhoods. This sensitivity, however, always involves tradeoffs with the system's complexity, where simpler systems are easier to understand, enforce, and predict.

The main limitation with this approach is that it will only be sensitive to existing conditions, which may diverge significantly from the City's planned vision and may also change quickly, resulting in significant amounts of non-conforming developments. Quickly changing requirements might also make it difficult for developers to predict the parking requirements for longer-term projects.

Spatial Taxonomy – Sub-regions within the city would be defined and grouped, with each group having its own parking requirements. For some land uses, there may be little variation across these identified regions, while others may vary dramatically. The six urban transects developed by Andrés Duany and Elizabeth Plater-Zyberk form an interesting variation on a traditional zone-based dissection of the city. These transects form a continuum, from rural to urban, that defines how the zones relate to one another and how they will evolve over time, thus offering a basis for organizing planning policy and, ultimately, the built environment (see Exhibit 3-1). Broadly, a zone-based approach allows the parking requirements to address the specific needs in particular areas of the city, which may stem from long term transportation and land use planning goals.

[5] Smith, T. (1983) Flexible Parking Requirements. American Planning Association. Planning Advisory Services Report #377. Chicago, IL.

In the case of Vaughan, so as to not introduce an entirely new urban stratification into the City's planning discourse, such parking zones would likely borrow heavily from regions of interest defined in the City of Vaughan and York Region's Official Plans. As the structure of the parking standards would change little, this approach would be relatively easy to enforce as it would only require the added step of determining the zone of a proposed development. Under such an approach, a by-law's sensitivity to local context is limited by the number and diversity of zones. Care must be taken in defining these zones as they are likely difficult to change once established.

Exhibit 3-1: An example of a spatial taxonomy zoning framework – Duany and Plater-Zyberk's Urban Transects from Smartcode v9.0 (2007)

SMARTCODE — **TABLE 14. SMARTCODE SUMMARY**

Municipality

Note: All requirements in this Table are subject to calibration for local context.

a. ALLOCATION OF ZONES per Community (applicable to Article 3 only)							(see Table 16)
CLD requires	no minimum	50%min	10 - 30%	20 - 40%	not permitted	not permitted	
TND requires	no minimum	no minimum	10 - 30%	30 - 60 %	10 - 30%	not permitted	
RCD requires	no minimum	no minimum	not permitted	10 - 30%	10 - 30%	40 - 80%	
b. BASE RESIDENTIAL DENSITY (see Section 3.4)							
By Right	not applicable	1 unit / 20 ac avg.	2 units / ac. gross	4 units / ac. gross	6 units / ac. gross	12 units / ac. gross	
By TDR	by Variance	by Variance	6 units / ac. gross	12 units / ac. gross	24 units / ac. gross	96 units / ac. gross	
Other Functions	by Variance	by Variance	10 - 20%min	20 - 30%min	30 - 50%min	50 - 70%min	
c. BLOCK SIZE							
Block Perimeter	no maximum	no maximum	3000 ft. max	2400 ft. max	2000 ft. max	2000 ft. max *	
d. THOROUGHFARES (see Table 3 and Table 4)						* 3000 ft. max with parking structures	
HW	permitted	permitted	permitted	not permitted	not permitted	not permitted	
BV	not permitted	not permitted	permitted	permitted	permitted	permitted	
AV	not permitted	not permitted	permitted	permitted	permitted	permitted	
CS	not permitted	not permitted	not permitted	not permitted	permitted	permitted	
DR	not permitted	not permitted	permitted	permitted	permitted	permitted	
ST	not permitted	not permitted	permitted	permitted	permitted	not permitted	
RD	permitted	permitted	permitted	not permitted	not permitted	not permitted	
Rear Lane	permitted	permitted	permitted	permitted	not permitted	not permitted	
Rear Alley	not permitted	not permitted	permitted	required	required	required	
Path	permitted	permitted	permitted	permitted	not permitted	not permitted	
Passage	not permitted	not permitted	permitted	permitted	permitted	permitted	
Bicycle Trail	permitted	permitted	permitted	not permitted *	not permitted	not permitted	
Bicycle Lane	permitted	permitted	permitted	permitted	not permitted	not permitted	
Bicycle Route	permitted	permitted	permitted	permitted	permitted	permitted	
e. CIVIC SPACES (see Table 13)						* permitted within Open Spaces	
Park	permitted	permitted	permitted	by Warrant	by Warrant	by Warrant	
Green	not permitted	not permitted	permitted	permitted	permitted	not permitted	
Square	not permitted	not permitted	not permitted	permitted	permitted	permitted	
Plaza	not permitted	not permitted	not permitted	not permitted	permitted	permitted	
Playground	permitted	permitted	permitted	permitted	permitted	permitted	
f. LOT OCCUPATION							
Lot Width	not applicable	by Warrant	72 ft. min 120 ft. max	18 ft. min 96 ft. max	18 ft. min 180 ft. max	18 ft. min 700 ft. max	
Lot Coverage	not applicable	by Warrant	60%max	70%max	80%max	90%max	
g. SETBACKS - PRINCIPAL BUILDING							
Front Setback (Principal)	not applicable	48 ft. min	24 ft. min	6 ft. min 18 ft. max	0 ft. min 12 ft. max	0 ft. min 12 ft. max	
Front Setback (Secondary)	not applicable	48 ft. min	12 ft. min	6 ft. min 18 ft. max	0 ft. min 12 ft. max	0 ft. min 12 ft. max	
Side Setback	not applicable	96 ft. min	12 ft. min	0 ft. min	0 ft. min 24 ft. max	0 ft. min 24 ft. max	
Rear Setback	not applicable	96 ft. min	12 ft. min	3 ft. min *	3 ft. min *	0 ft. min	
Frontage Buildout	not applicable	not applicable	40%min	60%min	80%min	80%min	
h. SETBACKS - OUTBUILDING							
Front Setback	not applicable	20 ft. min +bldg setback	20 ft. min +bldg setback	24 ft. min +bldg setback	40 ft. max from rear prop	not applicable	
Side Setback	not applicable	3 ft. or 6 ft.	3 ft. or 6 ft.	0 ft. min or 3 ft.	0 ft min	not applicable	

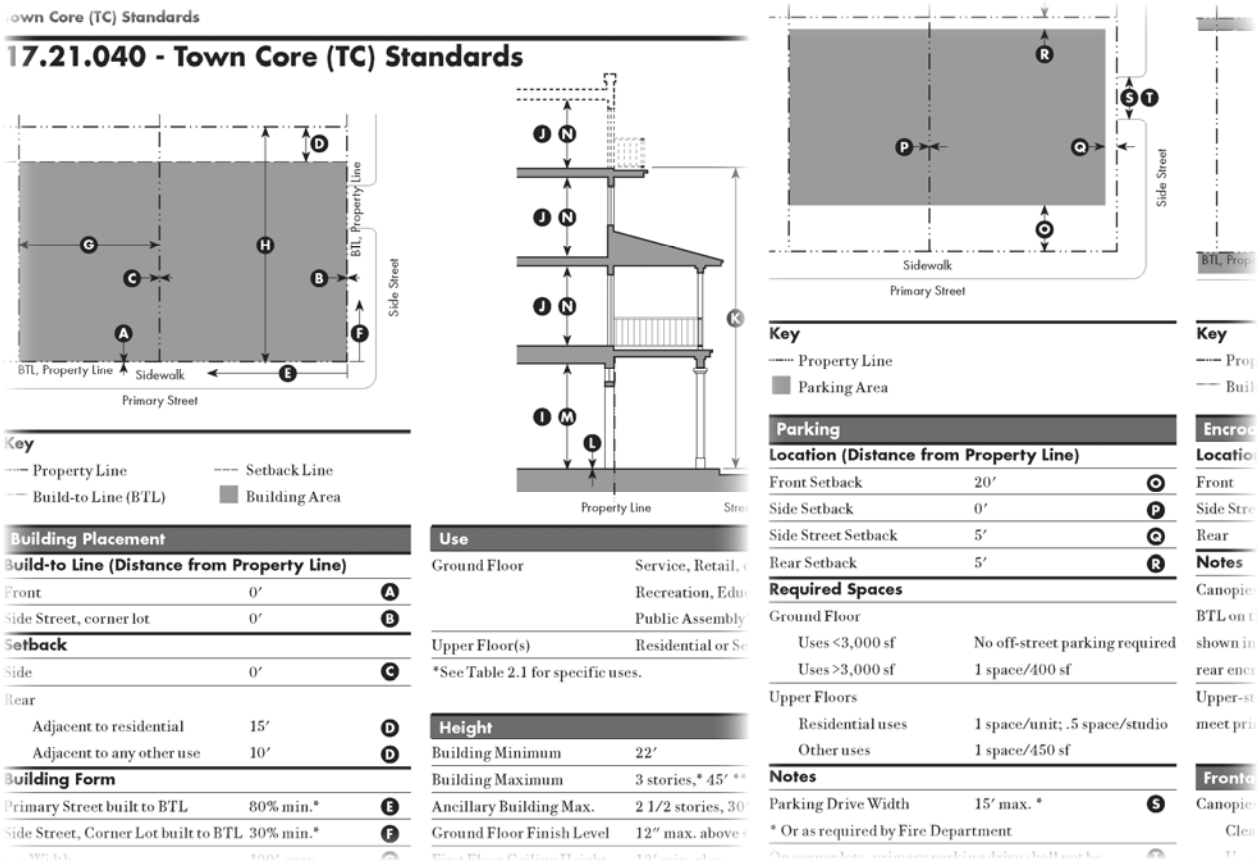
DISPOSITION

Form-Based – Form-based parking standards would be defined primarily in reference to the physical environment. Typically these parking requirements would fit within a form-based code that regulates the built environment and imposes few direct restrictions on land uses. Such schemes tend to focus on development scale, massing, architectural standards and street topology, as well as the relationships between buildings. By not focusing on the intricate details of land use segregation, this approach purports to better facilitate both spatial and temporal land use mixing.

As this approach is prescriptive in declaring what a city's built form should look like, as oppose to detailing what is not allowed, it can be effectively integrated with the city's planning visions and similarly, easy for developers to predict what would be required of their projects. Such codes also tend to be comprehensible to a broader audience since they directly reference the built form as opposed to using the more abstract traditional planning tools, such as floor area ratios. Form-based codes are thus easier to understand, enforce, and represent graphically.

In terms of parking requirements, the minimum and/or maximum standards might be specifically defined for various building envelope or street section characterizations, but across broad land-use categories (such as those used in the SmartCode: residential, lodging, office, retail, civic, and other[6]). Given the nature of form-based standards, parking requirements would also likely include details related to their design. It would be very challenging, however, to integrate a form-based approach to parking standards within a traditional zoning by-law, as presently exists within the City of Vaughan, and the resulting by-law would be quite complicated.

Exhibit 3-2: A sample of form-based codes for the Town Core area in the City of Grass Valley, California



[6] Duany, Sorlien, & Wright (2007) SmartCode Version 9.0.

Table 2.1: Town Core (TC) Zone Allowed Land Uses and Permit Requirements

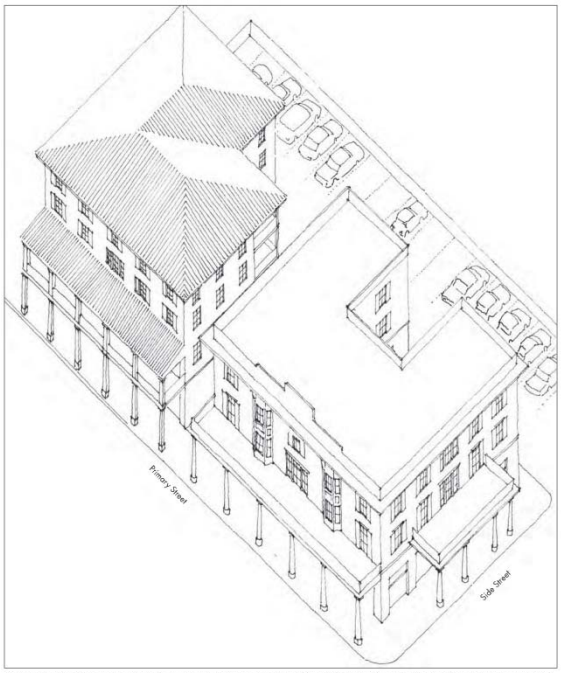
Land Use Type[1]	Permit Required	Specific Use Regulations
Recreation, Education & Public Assembly		
Commercial recreation facility: Indoor	MUP	
Health/fitness facility	MUP	
Library, museum	P	
Meeting facility, public or private	UP	
Park, playground	UP	
School, public or private	UP[2]	
Studio: art, dance, martial arts, music, etc.	P	
Theater, cinema, or performing arts	MUP	
Residential		
Home occupation	P	17.44.100
Live/work unit	P	17.44.130
Mixed use project residential component	P[2]	17.44.140
Retail		
Bar, tavern, night club	UP	
General retail, except with any of the following features:	P	
Alcoholic beverage sales	MUP	
Floor area over 10,000 sf	UP	
On-site production of items sold	MUP	
Operating between 9pm and 7am	UP	
Used merchandise	MUP	
Neighborhood market	P	
Restaurant, café, coffee shop	P	
Services: Business, Financial, Professional		
ATM	P	
Bank, financial services	P	
Business support service	P[2]	
Medical services: Clinic, urgent care	P[2]	
Medical services: Doctor office	P[2]	
Office: Business, service	P[2]	
Office: Processing	P[2]	
Office: Professional, administrative	P[2]	
Services: General		
Day care center: Child or adult	P[2]	17.44.060 17.44.110
Day care center: Large family	P	17.44.060
Day care center: Small family	P	
Lodging: Bed & breakfast inn (B&B)	P	
Lodging: Hotel	MUP	
Personal services	P	
Public safety facility	UP	
Transportation, Communications, Infrastructure		
Parking facility, public or commercial	UP	
Wireless telecommunications facility	UP	17.46

Key	
P	Permitted Use
MUP	Minor Use Permit Required
UP	Use Permit Required
NA	Use Not Allowed

End Notes

[1] A definition of each listed use type is in Article 10 (Glossary).

[2] Allowed only on second or upper floors, or behind ground floor use for that area on Mill Street between Neal and West Main Streets and on West Main Street from Church to South Auburn Streets.



Examples of buildings in the Town Core area. Buildings taller than three stories will be allowed only with approved use permit.

3.2 Selecting a Preferred Approach

There is not necessarily an ideal approach, and there are many possible hybrids. Before recommending a particular framework for the parking standards for the City of Vaughan, it is important to consider that some will be easier to enforce, while others might be more politically palatable. These and other tradeoffs are summarized in Exhibit 3-3.

Exhibit 3-3: The Benefits of Each Parking Standards Framework

	Generic Standards	Adjustment Factors	Spatial Taxonomy	Form-Based
Alignment with Long Term Transportation / Land Use / Urban Design Goals	★	★★	★★★	★★★
Sensitivity to Existing Transportation / Land Use / Urban Design Conditions	★	★★★	★★	★★
Ease of By-law Enforcement	★★★	★★	★★★	★★★
Predictability for Developers	★★	★★	★★	★★★
Ease of Integrating with Existing Zoning By-law	★★★	★★	★★	★

As the project's terms of reference clearly states, the City is committed to creating compact, walkable, and transit supportive neighbourhoods, and this sentiment was also echoed in staff workshops. As such, the option of recommending minor changes to the existing generic standards will not be pursued for its lack of sensitivity to varying parking needs. As well, the challenges of introducing form-based parking requirements into a zoning by-law which is not form-based are too great given the project's resource constraints and the likely overly complex zoning by-law that would result. As such, a hybrid approach of **Adjustment Factors and Spatial Taxonomy** is recommended. This approach would operate within the framework of defined urban contexts, while also incorporating important adjustment factors. The details of such standards would be more focused on differentiating environmental conditions through careful characterization of Vaughan's urban contexts and the sensitivities of adjustment factors for their corresponding parking requirements. There would be less emphasis on detailed stipulations for a large number of land uses. Where appropriate, this hybrid approach would also involve a consolidation of the land uses currently identified in Section 3.8 (Parking Standards) of By-law 1-88. If the new parking standards are to be relevant, it is vital that they be simple to understand and easy to enforce.

As discussed later, the application of adjustment factors is a new concept in Vaughan, and most other areas, and therefore requires careful consideration before being implemented with in the zoning by-law. There are issues that may result in that some of the proposed adjustment factors are subjective, and cannot be tied to a physical measure (e.g. availability of car-pool parking). Therefore, it was decided that the adjustment factors would be implemented as guidelines initially on a case by case basis, allowing staff to test their application prior to formally adopting the factors in the zoning by-law. Potential adjustment factors are discussed in Chapter 8.

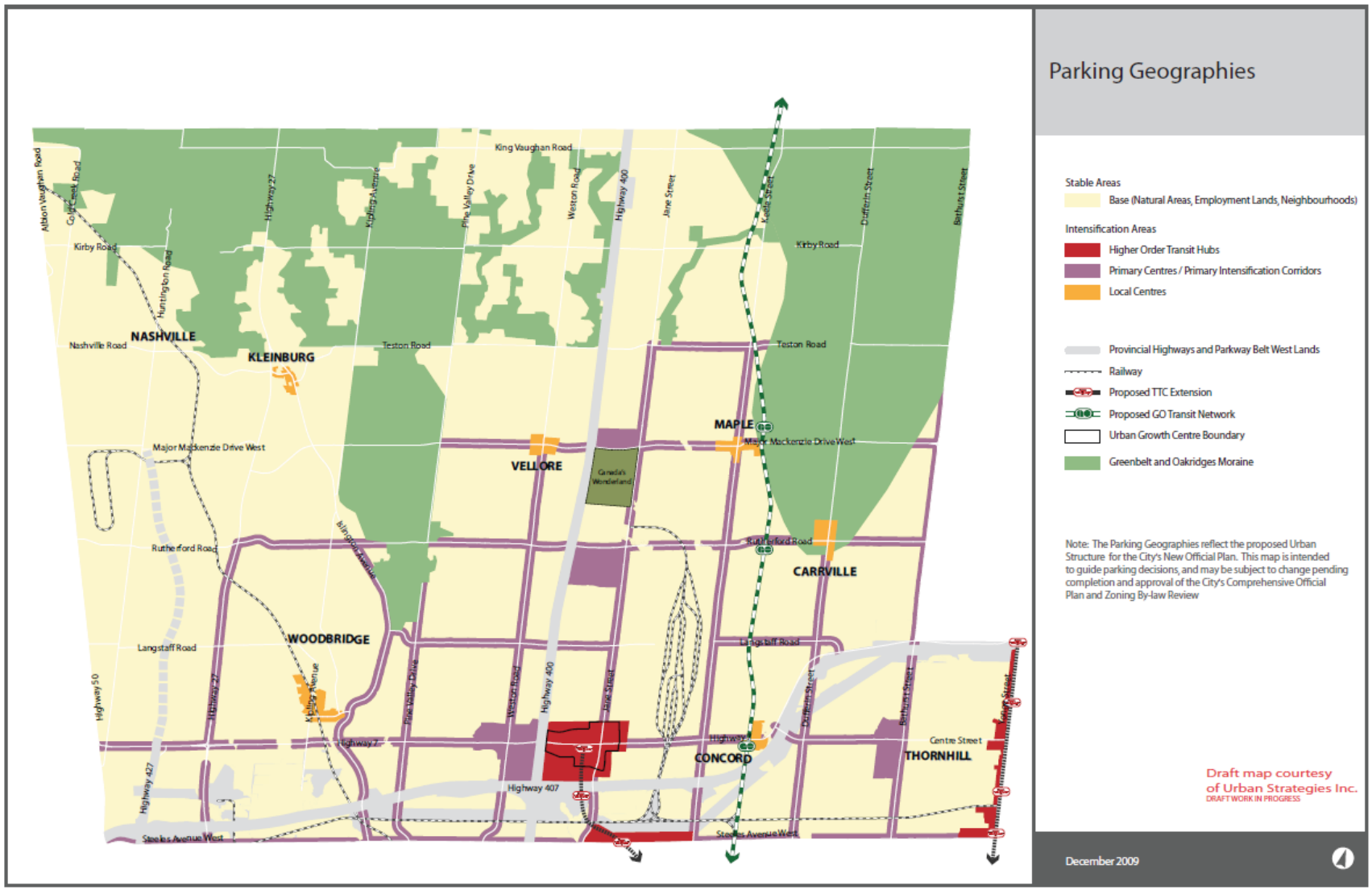
3.3 Defining Urban Structure Categories

Parking standards must balance a variety of objectives to ensure sufficient parking, while encouraging desirable forms of development that support transportation alternatives to the private automobile. However, the importance of each objective varies for different regions within the City of Vaughan. Thus, while a primary objective of parking standards at the city-wide level may be to ensure sufficient parking, shaping development and discouraging single occupant vehicle (SOV) use will be priorities for mixed-use growth areas. The Official Plan specifies that significant portions of future population growth in Vaughan will be steered to medium density developments along

major arterials, and to a lesser extent, primary roads, which are well served by transit. Although low density development will likely continue to dominate Vaughan's landscape for some time to come, the City recently began the process of revising its Official Plan and intensification policies will no doubt need to be strengthened even further as the City details how it will meet the provincial density targets detailed in the *Places to Grow* Growth Plan for the Greater Golden Horseshoe.

Exhibit 3-4 locates key planning geographies including higher order transit hubs, primary centres/primary intensification corridors, local centres, and the rest of the city.

Exhibit 3-4: Map of Vaughan's Planning Geographies



These categories are generally based on the proposed urban structure concept in the City's new Official Plan.

In order to determine which categories warrant unique parking standards, existing and planned transportation, parking, and land use characteristics were reviewed based on site observations, interviews with developers, review of planning documents, and consultation with City staff. Based on this review, four categories for geographical stratification of the new parking standards are identified. These categories are summarized below, describing the rationale behind each category.

3.3.1 HIGH-ORDER TRANSIT HUBS

- ***Vaughan Metropolitan Centre***
- ***Steeles Corridor, Jane to Keele***
- ***Yonge Street Corridor***

With recent commitments to extending the Spadina subway line as far as Vaughan Metropolitan Centre, some areas within Vaughan bear considerable potential for high-density nodal development. Beyond the Vaughan Metropolitan Centre itself, this also includes a hub near York University at Jane and Steeles, often simply referred to as the Steeles Corridor. The Steeles Corridor Secondary Plan (OPA 620) encourages compact pedestrian-friendly urban form, densification around the planned subway station, transit-supportive urban design, compact and linked mixed use, and streetscapes designed at pedestrian scale. Areas along the Yonge Street Corridor could also be added to this category, contingent on subway extension being announced for this area.

Given the compact land use vision for these areas, surface parking is discouraged for both hubs, and maximum parking requirements and significantly reduced minimums will be strongly encouraged. The Steeles Corridor Secondary Plan has already definitively stipulated that maximums will be introduced. Tighter parking requirements and priced parking, for which a market has already been established at York University, will also help to promote higher transit ridership than would otherwise be achieved. With these lower parking requirements, however, the City may want to also consider a cash-in-lieu policy provided that it is accompanied by the creation of a city-wide public parking administration with the capacity to strategically plan and invest the resulting funds (See Section 7.3). Generally, these types of considerations are relevant for rapid transit (i.e. subway, LRT or BRT) corridors.

A phased approach to changing the parking standards for these hubs in Vaughan is recommended since it will take time before subway service is established. Similarly, phasing is important as these hubs are expected to set a precedent for changes to the lower-scale centres. In particular, the focus will be on first establishing the Vaughan Metropolitan Centre.

3.3.2 LOCAL CENTRES

- ***Woodbridge Core***
- ***Thornhill Vaughan Heritage Conservation District***
- ***Maple Heritage Conservation District***
- ***Kleinburg-Nashville Heritage District***
- ***Carrville***
- ***Concord***
- ***Vellore***

Local centres encompass Vaughan's Heritage Districts and other local centres. Heritage District's in particular are an important connection to the City's past as several small rural communities. Lots in these areas tend to be smaller and, in contrast to elsewhere in Vaughan, they often front the streets. As such, these centres tend to be more supportive of pedestrian activity and comprise an urban form closer to the long-term sustainable vision for Vaughan's evolution. Vaughan's heritage districts represent the City's best examples of pedestrian-scale urban places, which, although primarily residential, already support a mix of land uses. Thus, it is felt that they represent critical places in the City's urban context, for both real and symbolic value, that deserve special consideration in all matters of urban planning, with a careful eye for preserving and amplifying their unique identities.

In terms of parking, there is less space available for parking, which effectively acts as a virtual limit on parking supply if parking structures are not financially feasible. It is thus felt that historic districts and local centres are good candidates for introducing parking maximums as soon as possible, but that this should be done in conjunction with a plan to provide improved transit service and increased public parking facilities. One such type of collective parking facilities might include priced on-street parking, which can work well to support more pedestrian accessible street-related retail – an important stated goal for these districts.

3.3.3 PRIMARY CENTRES AND PRIMARY INTENSIFICATION CORRIDORS

- ***Regional Corridors: Yonge Street, Avenue 7, Vaughan N/S Corridor (as defined in the York Region Official Plan)***
- ***Vaughan Metropolitan Centres West of Highway 400***

Beyond intensification and mixed use, the defining feature linking these areas is their level of transit service. Avenue 7, Yonge St, and the Centre St Corridor already have frequent VIVA service, and this is expected to improve significantly as development intensifies. As higher-order transit is planned for these corridors, transit adjustment factors for certain uses are good candidates to further lower the parking requirements in these areas.

For the two district centres, Carrville and Vellore, the City aims to create this environment out of open space and the challenge will be to encourage compact development without pushing it to other greenfield sites. A significant component of this incentive will likely come from commitments to public transit investment. Although the district centres have yet to see significant development, the vision is for development to concentrate around centrally-located transit facilities. Similarly, a long-term municipal commitment is required for the urban centres, and particularly the regional corridors, "to facilitate the anticipated and required shift in urban structure." (OPA 660) It is hoped that Avenue 7, for example, will evolve from currently "auto-dominated highways to human-scale 'mainstreet'" as reverse lotting will no longer be permitted, compact form will be encouraged, and high quality urban design will take centre stage.

Intense development in these areas will be carefully phased, following on the heels of development in the Vaughan Metropolitan Centre. It is thus felt that these regions require parking standards separate from the Vaughan Metropolitan Centre, recognizing their unique development phasing and the related intensification goals. Parking maximums for these areas would likely be recommended, based on reduced demand due to high-order transit provision. The precedent has already been set as retail, office and residential parking maximums are in place for Carrville.

3.3.4 BASE (OTHER AREAS)

- ***Local Corridors (as defined in the York Region Official Plan)***
- ***Employment Areas***

- ***Suburban Residential Areas***

Throughout Vaughan's rapid growth in recent decades, development patterns have been largely suburban. This is exemplified by elements such as the municipality's large block pattern, wide arterials with minimal obstructions, and segregated land uses. The City is well aware of the challenges to sustainable lifestyles posed by this urban form and hopes to reduce automobile dependence with generally improved transit service, pedestrian and cycling support, and intensified development. As such, it is felt that the parking standards for these largely suburban areas can largely be addressed through generally lower minimum requirements and adjustment factors sensitive to the mentioned changes in urban context that the City aims to achieve, such as level of transit service.

One potential unique land use that deserves special mention is employment areas. This would include areas such as the Highway 427 employment corridor (Vaughan Enterprise Zone). Consideration was given to developing a special category for employment areas; however, the same general principles would apply as for other areas. For example, parking maximums would not generally be applicable as most of the uses are large commercial/industrial building forms and urban design considerations are not as relevant. In addition, most of the unique characteristics of this area are captured in standards for individual uses (i.e. mixed use industrial building, industrial warehousing). It is noteworthy that after much discussion, in developing their new parking by-law City of Toronto staff decided against providing separate parking standards for employment areas, or setting maximums for these areas, and deemed the base ratios to be applicable. One of the reasons was that the City did not want to discourage new businesses from coming into employment areas.

3.4 Proposed Framework

Within the above structure, there are several possible strategies to tailor the parking requirements to best respond to the true parking demand and align with the planning visions for each urban context. Exhibit 3-5 summarizes the proposed parking standard strategies for each of the different urban context categories. Note that this is an overview of the proposed approach and each strategy may not apply to every land use within each Urban Context.

In addition to the disaggregation of parking standards by geographic category, it is also proposed that adjustment factors be applied as discussed further in Chapter 8.

Proposed standards are discussed in detail in Section 4.

Exhibit 3-5: Proposed Approach to Parking Standards By Urban Structure Category

Urban Context Category	Approach
High-Order Transit Hubs (Vaughan Metropolitan Centre, Steeles Corridor, Jane to Keele, Yonge Street)	• Lowest parking minimums recognizing high level of transit service and planned availability of on- and off-street collective parking • Responsible parking maximums designed to encourage transit use, promote compact development, and support establishment of on- and off-street collective, priced parking • High potential for public parking including on- and off-street facilities provided that parking maximums are enforced and City develops capacity to provide public parking
Local Centres (Woodbridge Core, Thornhill Heritage Conservation District, Maple Heritage Conservation District, Kleinburg-Nashville Heritage District, Vellore, Carrville, Concord)	• Low parking minimums recognizing small lots, mixed-use development form, desire to maintain high-quality public realm, and availability of on-street parking • Parking maximums on surface parking designed to discourage large surface parking lots, encourage transit use and structured parking, and support development of more on- and off-street collective parking • High potential for public parking in selected areas including on-street (in commercial/industrial areas) and off-street facilities provided that parking maximums are enforced and City develops capacity to provide public parking
Primary Centres/Primary Intensification Areas Regional Corridors: Yonge Street, Avenue 7, Jane Street Vaughan Metropolitan Centre west of 400	• Reduced parking minimums recognizing good level of transit service and desire for compact development • Parking maximums on surface parking designed to encourage transit use, discourage large surface parking lots and support establishment of on- and off-street collective, priced parking • Medium potential for public parking in selected areas including on- and off-street facilities building off of initiatives in the Vaughan Metropolitan Centre and Steeles Corridor
Base (Other Areas) (The rest of the City including Employment lands and Neighbourhoods)	• Basic parking minimums requiring a minimum responsible level of parking, but allowing for some flexibility to account for availability of travel choices and surrounding land use context. • No maximum parking limits recognizing that these areas are currently auto-dependent and not well served by transit.

For purposes of classification, these categories represent a hierarchy as follows:

1. High-Order Transit Hubs;
2. Local Centres;
3. Primary Centres/Primary Intensification Areas; and
4. Base (Other Areas).

Any area that falls into more than one category (e.g., Primary Intensification Area and High-Order Transit Hub) would be classified as the earlier level on the hierarchy (e.g., High-Order Transit Hub in this example.

Maximum Parking Requirements

Maximum parking requirements are a key component of the parking standards framework and merit further discussion.

The maximum parking standard is a policy-based parking management tool that is receiving increased attention. By limiting the amount of automobile parking in specific sub-regions or urban contexts, a municipality makes a statement that parking provision must be balanced with other land use and transportation objectives and that the automobile is not the only mode for travel to that area.

Parking maximums are intended to:

- Reduce the amount of space dedicated to parking and support transit and pedestrian-oriented development;
- Provide a strong incentive for transportation demand management[7];
- Curb practices among some industries towards parking oversupply, particularly in areas in close proximity to transit stations, where transit use may reduce parking demand;
- Potentially allow parking pricing to come into play with associated transportation demand management benefits (e.g. increased transit use) and create a market for collective parking, which could be provided by the City; and
- Allow the City to have input on how all parking is built, which enhances its ability to help create well-designed urban areas.

On this final point, the City can currently only regulate how parking on a site is built up to the minimum required supply. This has implications for the City's ability to set urban design standards to which parking is built. Instituting parking maximums in areas where good urban design is a City priority will allow the City to regulate all on-site parking.

Despite the benefits of parking maximums, strategies to reduce and limit parking must be implemented carefully. Parking maximums may be opposed by the development community and imposing parking maximums that are too restrictive may encourage development to go elsewhere or result in parking spill-over problems, particularly if there is poor transit accessibility.

The use of parking maximums is growing in Canadian municipalities. Traditionally, maximum parking standards have been designed to limit automobile volumes entering downtown or central business areas such as in Vancouver and Toronto. However, parking maximums are being used increasingly in suburban contexts to support intensification areas. In Vaughan, the Carville District Centre Plan specifies maximum parking limitations for retail commercial, office, and residential uses.

Elsewhere, a significant emergence of the use of parking maximums recently occurred in the UK, when the government planning policy on parking was reviewed and a new version issued in 2001. The revision included a nation-wide shift from the previous use of minimum parking standards to the use of maximum parking standards. Scotland has also instituted nation-wide parking maximums.

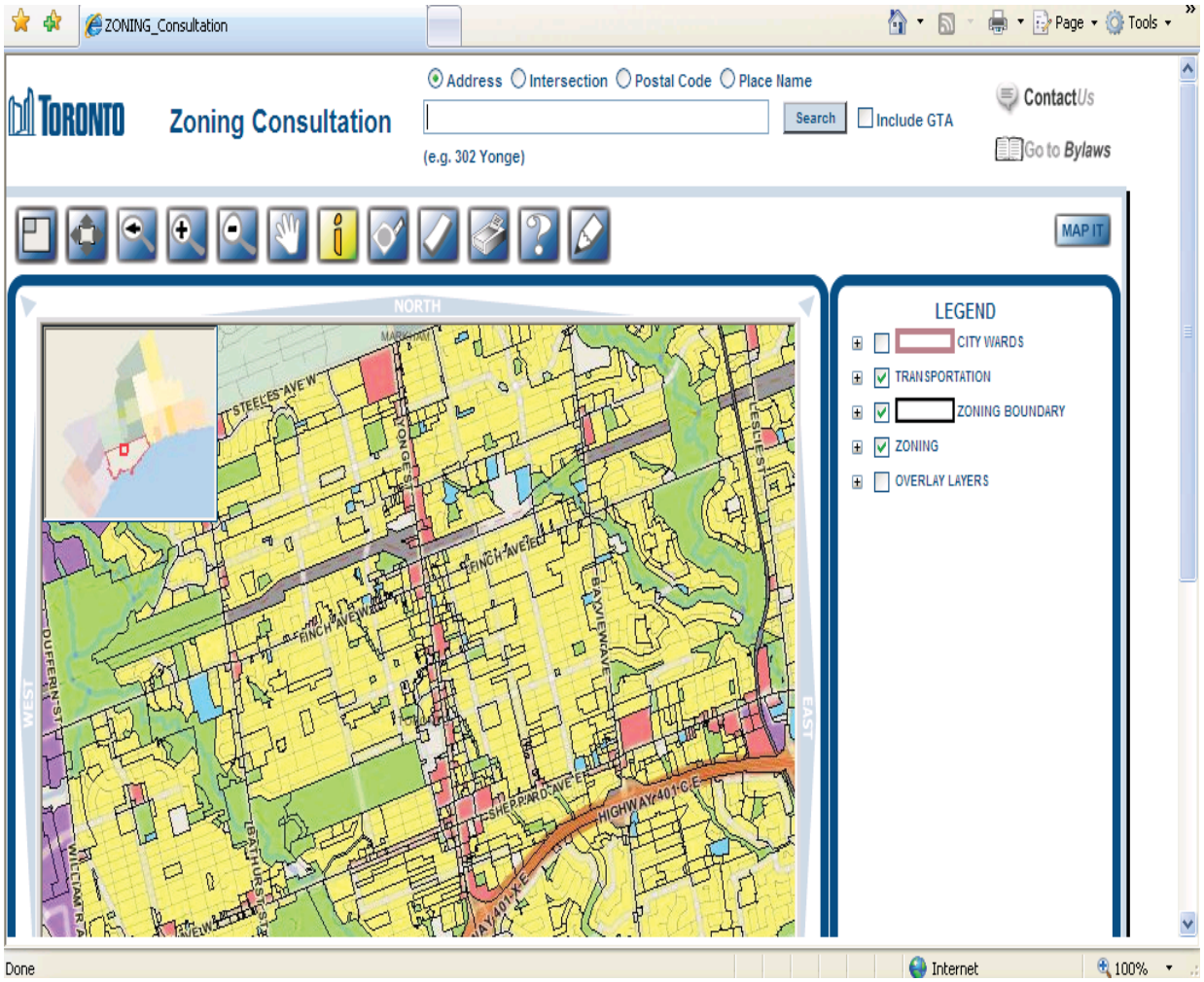
[7] The undersupply of parking for employees is a key incentive for employers to adopt and promote workplace transportation demand management. Ample, free parking at workplaces has been cited as one of the biggest barriers to TDM in Markham (Lorenzo Mele, SmartCommute Co-ordinator, Markham, personal communication).

3.4.1 APPLICATION OF STANDARDS BY GEOGRAPHIC AREA

The provision of separate standards by geographic area is more than warranted, but introduces some complexities in the application of parking standards, particularly in the short term until such time as precise zoning maps are prepared and adopted in the New Official Plan. In the interim, it is suggested the following boundaries be adopted:

- Higher Order Transit Hubs – define boundaries based on secondary plans
- Primary Centres and Primary Intensification corridors – Includes all properties abutting or with access to streets identified as intensification corridors and centres areas identified in preliminary mapping (purple areas on Exhibit 3-4)
- Local Centres – define boundaries based on corresponding Official Plan Amendments

Eventually, it is recommended that the City of Vaughan move towards an electronic mapping system for the zoning by-law, similar to that developed for Toronto. (see below)



4. PROPOSED PARKING REQUIREMENTS

Parking requirements for each use are discussed in terms of issues and considerations, existing requirements, requirements in other jurisdictions, parking demand, and proposed requirements. This discussion is organized by use including:

- Residential;
- Retail;
- Restaurant;
- Office;
- Industrial;
- Place of Worship;
- Place of Assembly, Place of Entertainment, and Related Uses; and
- Institutional.

4.1 Residential Uses

Residential parking demand is dependent on auto ownership among a site's residents as well as visitor activity. As such, residential parking standards are typically specified in terms of dwelling units or bedrooms. Since income is the most significant determinant of auto ownership, one would expect a family living in larger dwellings to have a higher income, more cars and need more parking spaces, while seniors, renters, and those living in smaller dwellings to have fewer vehicles and less of a need for parking.

It is also important to clarify the role of residential parking requirements. In general, there is little risk in reducing minimum residential parking requirements as availability of parking is a key decision in an individual's residential choice. Developers are well attuned to their potential customers' parking needs and will not reduce parking provision so much as to compromise the marketability of their development. Particularly in the case of apartments and condominiums where tenant parking is typically provided underground, minimizing excess parking can reduce the cost of development and make dwelling units more affordable. As such, the purpose of residential minimum parking requirements should be to ensure that a basic, responsible level of parking is provided without unduly increasing the costs of development.

Proposed parking requirements are discussed in terms of four dwelling categories:

- Detached, semi-detached, and street townhouse dwelling;
- Multi-unit dwelling;
- Senior citizens dwelling; and
- Home occupation or live-work dwelling.

4.1.1 DETACHED, SEMI-DETACHED, AND STREET TOWNHOUSE DWELLINGS

Issues and Considerations

- Residential parking requirements for single-unit, semi-detached, and townhouse dwellings are currently designed to include both residential and visitor parking requirements entirely on-site. This is because there are few areas that currently allow overnight on-street parking.

- Such dwellings typically provide 1 space in a garage and 1 space on the driveway at minimum so parking technically should not be a problem, if it were not for high auto ownership rates.

- On-street parking is generally not permitted in residential areas, except where there are mixed-use designations in areas of intensification where on-street and lay-by parking may be permitted.

Existing Requirements

- **Single family detached dwelling and semi-detached dwelling**: 3.0 parking spaces per dwelling unit for lots greater than 11.0 m frontage, and 2.0 parking spaces per dwelling unit for lots less than and equal to 11.0m frontage.

- **Street townhouse dwelling:** 2.0 parking spaces per dwelling unit.

The rationale for increasing the parking requirement for detached and semi-detached dwellings with greater frontage than 11 metres is unclear. It may be to account for higher income and auto ownership associated with larger houses and lots. The requirement of 3 spaces per unit is high, particularly for semi-detached dwellings. However, this reflects the reality that the average Vaughan household owns more than two vehicles[8].

It also appears that with a parking ratio of two spaces per single family and townhouse dwelling, standards are designed to accommodate visitor parking needs primarily on-site, as opposed to utilizing on-street parking. At the present time, there is a reluctance to permit on-street parking in stable residential areas. However, there may be opportunities to allow some use of on-street parking for visitor needs in mixed use areas, or where there is nearby publically accessible off-street parking.

Requirements in Other Municipalities

Standards for single family detached units, semi-detached units, and street townhouses across other jurisdictions typically range from 1.0 to 2.0 parking spaces per unit. Requirements vary based on location and type of dwelling. Appendix C provides a more detailed comparison of Vaughan's parking standards with other jurisdictions.

Recommendations

Single-detached, semi-detached, and street townhouse dwellings are similar in that residents park on site and visitors often park on the street. Many jurisdictions specify similar parking requirements for all three categories and this approach is proposed for Vaughan. **The proposed base standard for single family detached dwelling, semi-detached dwelling, and street townhouse dwellings is 2 spaces per unit, with tandem parking permitted.** This is reduced to 1 space per dwelling unit in higher order transit hubs and other intensification areas.

[8] 2006 Transportation Tomorrow Survey.

4.1.2 MULTIPLE FAMILY DWELLINGS

Issues and Considerations

- Typical market practice is to provide tenant parking underground and visitor parking at grade. This is partly because it is more difficult to control visitor parking and there is a desire to keep it separate from tenant underground parking;
- Auto ownership typically increases with increasing unit size and number of bedrooms because unit size is an indicator of household income;
- Rental units generally have lower auto ownership than condominium units;
- The availability and price of tenant parking can influence auto ownership;
- Visitor parking can be shared with customer parking for ground floor or nearby commercial uses; and
- Buildings with access to frequent transit service often have lower auto ownership.

Existing Requirements

Existing requirements are specified at 1.5 tenant spaces per unit and 0.25 visitor parking spaces per unit.

Requirements in Other Municipalities

- Standards for multiple family dwellings in the assessed Canadian municipalities vary by location, zones, number of bedrooms, and/or the presence of a private driveway. In general, the parking requirements range from 0.3 spaces per unit for a bachelor unit in downtown Toronto to 1.75 spaces per unit for a three-bedroom condominium unit in Mississauga.
- Mississauga is the only jurisdiction to specify lower parking requirements for rental vs. condominium apartments.
- Multi-unit residential parking requirements in many jurisdictions vary by location, by size of the development, or by the number of bedrooms. Vaughan standards show little such flexibility.
- Visitor parking requirements are on the high end of those observed in other jurisdictions, which typically range between 0.15 and 0.25 spaces per unit.

Parking Demand

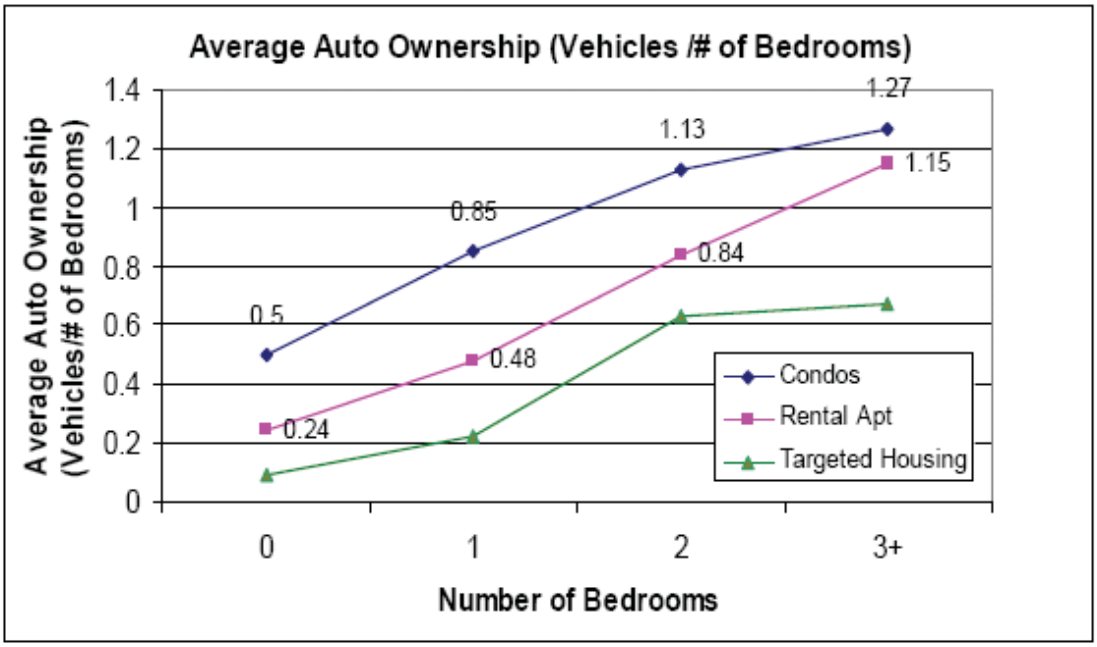
A number of difficulties were encountered by the IBI study team while conducting parking surveys of multi-unit residential dwellings. Approximately 20 buildings were contacted; however, in many cases, building managers could not be reached or did not give permission to have a parking survey conducted at their building. While several surveys were conducted, data on parking demand was primarily acquired from other sources including other parking studies and discussion with multi-unit residential developers.

An empirical survey of approximate 5,000 apartment units stratified by building type (rental apartment or condominium) was conducted in the City of Toronto[9]. This data shows that, in general,

[9] Cansult (2007) *Parking Standards Review – Phase Two Apartment Building/Multi-Unit Block Developments Component, New Zoning By-Law Project*, City of Toronto.

auto ownership varies with the number of bedrooms per unit and tenure (Exhibit 4-1). In addition, a small relationship was shown between auto ownership and proximity to high quality transit service. These results provide a strong basis for specifying multi-unit residential parking requirements by the number of bedrooms per unit. For Toronto multi-family residential buildings outside of areas well served by transit, average auto ownership ranged from about 1 to 1.2 autos per unit. This is likely comparable to many areas in Vaughan.

Exhibit 4-1: 2006 Toronto Residential Parking Survey Results



Source: Cansult (2007) *Parking Standards Review – Phase Two Apartment Building/Multi-Unit Block Developments Component, New Zoning By-Law Project*, City of Toronto.

Note: Targeted housing includes seniors buildings, social housing, and co-op apartments.

Several parking studies were also reviewed for condominium developments in Vaughan. In general, parking demand ranges from about 0.95 to 1.3 spaces per unit. In addition, a number of condominium projects have recently been built in Thornhill and along the Steeles Avenue corridor with parking supply rates of 1.0 to 1.3 spaces per unit and visitor parking rates of approximately 0.2 spaces per unit[10].

Recommendations

Proposed multi-unit residential parking standards are presented in Exhibit 4-2. Key elements of the proposed standards include:

- The proposed standards are specified by the size of the unit (i.e., the number of bedrooms) to make minimum requirements more reflective of actual demand and still easy to enforce. This approach reflects findings from the Toronto Parking Survey and reflects a general best practice approach to multi-unit residential parking standards. The practice has been successfully applied in several municipalities in Ontario for several years and is generally accepted by the development community.

[10] 7 and 15 North Park Drive; 1,2, and 8 Maison Parc Court; 91 Townsgate Drive; 7601 Bathurst Street

- The proposed minimum parking requirements are reduced substantially from existing requirements to reflect current planning goals and building practices in Vaughan. Similarly, the proposed visitor parking requirement is reduced to 0.2 spaces per unit. For high-order transit hubs the recommended visitor parking requirement is 0.15 spaces per unit, reflecting the high level of transit service in these areas and the expected reductions in visitors arriving by second vehicle. It is expected that these standards will substantially reduce the number of parking reduction requests received by the City without leading to significant parking shortages. Further reductions are allowed based on good transit access and unbundling of tenant parking from the price of a unit.

- Reflecting existing and/or proposed mix of residential and commercial/employment uses and improved transit service in High-Order Transit Hubs, Local Centres, and Primary Centres/Primary Intensification Areas, maximum and reduced minimum requirements are proposed in these areas. Maximum requirements indicate that lower auto ownership is preferred in these areas, but are not set so low as to discourage development. At current proposed levels, maximum standards provide a check against parking oversupply.

Exhibit 4-2: Proposed Multi-Unit Residential Parking Standards

Description	Existing Standard	Proposed Standards						
		Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
		Min	Min	Max	Min	Max	Min	Max
Bachelor/1 bedroom	1.75 per unit (1.5 tenant/ unit + 0.25 visitor/unit)	0.9	0.7	1	0.8	1.2	0.85	1.2
2 Bedrooms		1.1	0.9	1.3	1	1.4	0.95	1.4
3+ Bedrooms		1.2	1	1.5	1.1	1.7	1.15	1.7
Visitor		0.2	0.15	0.15	0.2	0.2	0.2	0.2

4.1.3 SENIOR CITIZENS DWELLINGS

Issues and Considerations

- There may be restrictions on the ability to distinguish parking standards by demographics (i.e. senior citizens).

- There will be increasing demand for dwellings geared towards seniors as the population ages.

- Seniors-oriented housing will generate a lower parking demand per unit due to the smaller family sizes and a lower vehicle ownership rate.

- There is a wide spectrum in types of seniors housing ranging from high-end condominium units with no specialized care to nursing homes with full care and common dining and recreation.

- Aside from transit access, affluence, and nearby services, other factors that might affect parking demand include the average age of residents, resident mobility, and whether a shuttle bus is provided to key destinations.

- Parking demand for employees increases with increasing level of care.

- Parking demand is often the highest at the time of construction when "younger seniors" move in and reduces over time as residents age and reduce auto ownership.

Existing Requirements

The existing by-law separates senior citizens dwellings into two categories:

- **Senior Citizens Dwelling**: This includes any apartment building occupied by persons 60 years old and over. The current requirement is 1.0 spaces per unit, which includes the visitor parking requirement.

- **Senior Citizens Nursing Home**: This includes any premises maintained and operated for two or more unrelated persons requiring nursing care. The current requirement is 0.5 parking spaces per bed, which includes the visitor parking requirement.

The Senior Citizens Dwelling category, in particular, is quite broad and includes in its definition all dwellings marketed to seniors short of institutional residences with private or shared rooms. As such, both staff and developers have noted that the current rate of 1 space per unit for Senior Citizen Dwellings is too high since many seniors living in such residences do not own a vehicle and the residences often provide shuttle services to help residents access shopping and other amenities.

One issue that was raised by staff is whether or not the term Senior Citizens Home can be used to define standards, as it would be discriminatory. Therefore, prior to finalizing the parking by-law, the appropriate definition for this use will need to be determined. The recommendations below would be applicable to any similar use definition. It is noteworthy that the new City of Toronto Draft Zoning by-law adopted the terms:

"Retirement Home"; and,

"Seniors Community House"

Requirements in Other Municipalities

Parking standards in other municipalities typically provide two or three categories under senior citizens dwelling including seniors-oriented housing (i.e., no specialized care), retirement homes (i.e., some support services), and nursing homes (i.e., full specialized care).

- For seniors-oriented housing, parking standards range from about 0.2 to 1 space per unit.

- For retirement homes, standards generally vary between 0.2 to 0.5 spaces per unit or bed[11]. Other municipalities have more comprehensive standards, such as Mississauga and Burlington. The latter also indicating standards per occupant and per employee, as well as for visitors.

[11] Marshall Macklin Monaghan for the City of Hamilton, *City-Wide and Downtown Parking and Loading Study*, October 2005, 11

- Parking standards for nursing homes are generally specified per bed and range from 0.2 to 0.33 spaces per bed. For instance, Mississauga and Burlington require 0.85 spaces per employee plus 0.25 spaces per bed[12].

Parking Demand

Seniors-oriented housing typically generates a lower parking demand per unit due to the smaller family sizes and a lower vehicle ownership rate. Studies from Toronto and California have shown that the average auto ownership for such dwellings is about 30% of the average for typical condominiums[13]. A detailed study of parking rates for seniors housing facilities in a Lower Mainland Community (British Columbia) also found substantially lower parking allocation by dwelling unit, with decreasing parking demand based on the level of care provided (Exhibit 4-3).

Exhibit 4-3: Guidelines for Parking Allocation for Senior Citizens Dwellings

Type	Spaces per Unit*			
	Resident	Employee	Visitor	Total
Independent: seniors-oriented multi-family housing with no services provided	0.3	0.05	0.2	0.55
Supportive: seniors-oriented multi-family housing with some services provided	0.15	0.15	0.2	0.50
Nursing home: with full services provided	--	0.25	0.2	0.45

* Parking demand specified per bed for Nursing Homes
Source: Zein, SR and Rao, K. (2008) Development of Parking Rates for Seniors Housing Facilities. CITE Annual Conference. Victoria, British Columbia.

Recommendations

Proposed senior citizens dwelling parking standards are presented in Exhibit 4-4. Key elements of the proposed standards include:

- Three categories are proposed for senior citizens dwellings including independent, supportive, and nursing home. This allows the lower parking demand at supportive residences to be incorporated into the parking standards.

- As for multi-unit residential developments, proposed standards for independent senior citizens dwellings are specified by the size of the unit (i.e., the number of bedrooms) to make minimum requirements more reflective of actual demand.

- The proposed minimum parking requirements for independent senior citizens dwellings are reduced from existing requirements to reflect current planning goals and building practices in Vaughan. Minimum requirements are set approximately 30 percent below proposed multi-unit requirements reflecting the commonly observed differences in auto ownership. Similarly, the proposed visitor parking requirement is reduced to 0.2 spaces per unit. For high-order transit hubs the recommended visitor parking requirement is 0.15 spaces per unit, reflecting the high level of transit service in these areas. Further reductions are allowed based on good transit access, shuttle service, and unbundling of tenant parking from the price of a unit.

[12] Marshall Macklin Monaghan for the City of Hamilton, *City-Wide and Downtown Parking and Loading Study*, October 2005, 12
[13] Cansult (2007) *Parking Standards Review – Phase Two Apartment Building/Multi-Unit Block Developments Component, New Zoning By-Law Project*, City of Toronto. and Rational Parking. Great Communities Collaborative. www.greatcommunities.org

- Reflecting existing and/or proposed mix of residential and commercial/service uses and improved transit service in High-Order Transit Hubs, Local Centres, and Primary Centres/Primary Intensification Areas, minimum requirements are reduced in these areas.

- No maximum parking limits are proposed. This reflects that some seniors may have difficulty using transit, walking, or cycling due to physical mobility constraints.

Exhibit 4-4: Proposed Senior Citizens Dwelling Parking Standards

Land Use	Description	Existing Standard	Proposed Standards						
			Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
			Min	Min	Max	Min	Max	Min	Max
Senior Citizens Dwelling - Independent	Bachelor/1 bedroom	1 per unit	0.6	0.45	--	0.5	--	0.5	--
	2 Bedrooms		0.8	0.6	--	0.7	--	0.7	--
	3+ Bedrooms		0.95	0.8	--	0.85	--	0.85	--
Senior Citizens Dwelling - Supportive		1 per unit	0.5	0.4	--	0.45	--	0.45	--
Senior Citizens Nursing Home		0.5/bed	0.25/bed	0.2/bed	--	0.25/bed	--	0.25/bed	--
Visitor*	Applies to all SC dwelling types		0.2	0.15	--	0.2	--	0.2	--

*Applied per bed in the case of nursing homes.

4.1.4 HOME OCCUPATION

Issues and Considerations

This category includes all cases where professional or commercial activity is conducted out of a primary residence, which is typically ancillary to the residential use. It also includes a discussion of live-work, although this category is not being recommended as a separate use requiring a parking standard within the zoning by-law.

There are many forms of potential home occupation housing arrangements. Key issues and considerations for these uses include:

- Parking demand is dependent on visitor/customer activity and additional employees.

- Customer/employee parking demand can sometimes be met by utilizing existing on-street parking, where permitted and where the associated traffic is not a nuisance to other residents (see below).

- In stable residential areas, traffic and parking demand created by home-based businesses may be a nuisance.

- Single people, couples, empty nesters, and occasionally children typically inhabit live/work projects in urban areas[14].

- Unless the work component of the unit is quite large, the number of employees tends to be small.

- With home occupation arrangements, residential parking may be shared with customer/employee parking. For instance, one or more of the residents in the household may work elsewhere which could result in some parking spaces being empty during the day.

Existing Requirements

There are currently several categories and standards for home-based businesses:

- **Cottage Industry**: 2.0 parking spaces in addition to residential requirements.

- **Home Occupation**: 2.0 parking spaces in addition to residential requirements.

- **Private Home Daycare, Private Home Tutoring**: 1.0 parking space in addition to residential requirements.

These existing parking requirements are not sensitive to the availability of on-street parking. In some cases, they may also require residents to pave over part of their front lawn to create additional parking, thus unfairly discouraging opportunities for home occupation arrangements. However, if tandem parking is allowed, many single-family dwellings would be able to meet these requirements without any modifications.

Requirements in Other Municipalities

There are a variety of options for dealing with home occupation parking requirements:

Parking spaces per unit versus per square feet of total work area

Most cities require 1-1.5 parking spaces per unit or specify requirements relative to the work area – for example 1 parking space for every 400-600 square feet of the total work area[15.] However, in some instances the latter approach has led to many vacant spaces, particularly if the project does not permit employees and walk-in trade.

Typical standards require 1 parking space for units less than 232m^2 [16]. Generally, the maximum number of spaces required is between 2-2.5 parking spaces per unit if employees and walk-in trade are permitted[17]. Alternatively, some standards require the applicable commercial parking requirement if the work space is beyond a certain size.

On-Street Parking

If there is abundant on-street parking on surrounding streets, this could be used to supplant some or all of the unit's off-street parking. If clients are anticipated or employees and walk-in trade are permitted, additional parking spaces should be provided (on street or off street)[18].

[14] Thomas Dolan Architecture, *10 Truths of Live/Work Planning Policy*
http://www.live-work.com/lwi/codes/truths.pdf
[15] http://www.live-work.com/lwi/codes/truths.pdf
[16] Equivalent to 2,500ft^2. American Planning Association, *Section 4.2 Model Live/Work Ordinance*
http://www.planning.org/smartgrowthcodes/pdf/section42.pdf
[17] http://www.live-work.com/lwi/codes/truths.pdf
[18] ibid.

Recommendations

Home-based businesses should generally be supported as they encourage mixed use, promote economic development, and generally reduce travel needs of residents.

The current parking requirements of 2 spaces for Home Occupation and Cottage Industry land uses, in addition to residential requirements, are high given that such uses may often generate little additional employee or customer parking. Furthermore, it is unlikely that private home daycares or tutoring would generate substantial parking demand other than for pick up and drop off. As such, it is proposed that these three categories be amalgamated into one use with the following parking requirements:

- **Home-based business**: 1 parking space in addition to residential requirements, which can be provided as a tandem parking space.

Though not proposed as part of the current by-law due to the fact that defining a "live-work" use definition requires more study given the larger implications, parking requirements that could be applied at a future date could be:

- **Live-work unit with work area < 200 m^2**: Greater of 1.5 spaces per unit or corresponding residential requirement (whichever is greater).

- **Live-work unit with work area > 200 m^2**: Sum of required parking for residential and commercial uses based on individual standards. Commercial parking requirement should be calculated based on the floor area dedicated to this use.

These standards assume that once the work area goes beyond a certain size, parking for the commercial use dominates over the residential function and generates higher parking demand. Further study is recommended for planning and zoning policy on live-work units.

4.2 Retail Uses

4.2.1 ISSUES AND CONSIDERATIONS

Retail parking serves customers as well as employees and other visitors, such as contractors and couriers. Key issues and consideration regarding retail parking in Vaughan include:

- Most parking for large format retail and shopping centres is designed using the 20th busiest hour in the year as the design hour (this time typically corresponds to the second or third busiest hour on the second Saturday before Christmas). Using this approach, typically over half of the available spaces are vacant during 40% of the year's operating hours. This reflects the tendency of retailers to supply significant amounts of excess parking for the majority of the year to ensure that customers rarely have trouble finding spaces;

- Reducing requirements provides more flexibility to developers to provide less parking if lower demand is expected, supporting more compact development and lower development costs;

- Large tenants often specify detailed parking demands in the terms of their lease (e.g. free parking, amount of parking, surface parking, etc.). This encourages developers to provide ample parking to ensure financial feasibility of the development.

- Retail customers are particularly more inclined to use a private vehicle when they are making multiple stops or when they are purchasing large or heavy items (e.g., electronics, large grocery shop, etc.);

- It is challenging to set retail parking standards on the basis of floor area as retail parking demand is also a function of the number of customers visiting the establishment, which can vary significantly between stores of the same physical size. This makes it difficult to accurately develop a first principles estimation of parking requirements for retail uses;

- The type of retail use affects parking demand. Some uses have lower parking requirements due to the smaller proportion of floor area dedicated to customers (e.g., home improvement store, dry cleaners), while others, such as grocery stores and shopping centres, have larger parking requirements reflecting higher customer densities and the propensity of these customers to use private vehicles; and

- The parking requirement for retail uses often increases with increasing GFA given the tendency to shop longer and lower turnover of the parking spaces at such establishments.

4.2.2 EXISTING REQUIREMENTS

Many uses are grouped under the retail category in the City of Vaughan parking zoning requirements. Existing retail standards are summarized in Exhibit 4-5.

Exhibit 4-5: Existing Vaughan Retail Parking Requirements

Retail Use	Minimum Parking Requirement (spaces / 100 m^2 GFA)	Additional Notes
Shopping Centre	6	
Supermarket	6	
Retail Warehousing	6	plus the requirements for the warehousing use
Brewers Retail & LCBO	6	
Automotive Retail Store	6	
Personal Service Shops, Laundromat	6	
Bank or Financial Institution	6	
Retail Store, Convenience	5.5	
Video Store	5.5	
Print Shop	3.5	
Automobile Service Station/ Autobody Repair Garage	4.5	Plus 1 space/motor vehicle kept for sale
Motor Vehicle Sales Establishments	3	
Car Brokerage	3	
Building Supply Outlet	2	

There is little variation in retail requirements and most retail uses are required to provide in the range of 5.5 to 6 spaces per 100m^2 GFA. This points to the opportunity to consolidate retail uses, particularly highly specific categories, such as video store and brewers retail & LCBO.

Shopping Centre Standard and Mixed Use Commercial Development

The shopping centre standard is of particular interest given that this requirement is currently applied to mixed-use developments in all commercial zones. As stated in the Comprehensive Zoning By-Law, "*when any combination of the above uses* (referring to all allowable uses in the zone) *is developed as a shopping centre, the parking requirements shall be subject to the shopping centre parking standard*". In the C1 Zone, the GFA of eating establishments is limited to 20% of the total development's GFA, while no such restriction is specified for other commercial zones.

The advantage of this approach is that it provides a simple method to deal with mixed use commercial developments (e.g. neighbourhood shopping plazas, big box retail plazas) that include retail, grocery, office, eating establishment, and personal service uses. It also limits parking issues when there is a change in use. The key disadvantage is that the parking requirement is less

sensitive to actual parking demand at a development, and may require an oversupply of parking when there is a high proportion of office uses or other lower demand uses. In addition, this approach may require limitations on the size of eating establishments and other uses that generate high parking demand.

4.2.3 REQUIREMENTS IN OTHER JURISDICTIONS

Findings from a jurisdictional review include:

- For *general retail*, parking requirements across Canadian jurisdictions are typically in the range of 3 to 5 spaces per 100m^2 GFA. Many cities such as Ottawa, Toronto, Vancouver, and Calgary specify substantially lower standards in their downtowns (e.g., 0 to 2 spaces per 100m^2 GFA). Standards often increase with increasing GFA of the establishment.

- Many jurisdictions specify *shopping centre* standards in the range of 3.9 to 7.5 spaces per 100m^2 GFA, which include a range of commercial uses.

- *Supermarket* standards range form 3.6 to 6.7 spaces per 100m^2 GFA, often somewhat exceeding general retail standards.

- *Bank* standards range widely from 0 to 6.67 per 100m^2 GFA. Winnipeg has also incorporated a queuing requirement of 5 vehicles for drive-in banks[19]. A 2005 parking study for Hamilton recommended a standard of 3.33 spaces per 100m^2 for banks with a drive-through and 6.5 spaces per 100m^2 for standalone banks without such facilities[20].

Exhibit 4-6 compares parking requirements for general retail, large grocery, shopping centre, and personal service shop in Vaughan with other GTA municipalities and published sources. Key observations include:

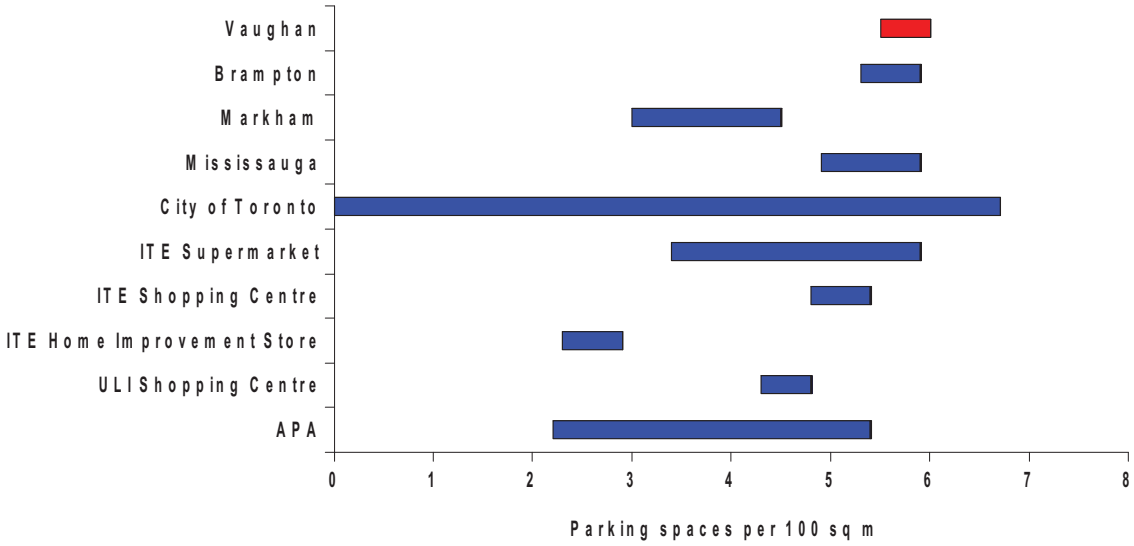
- The type of retail use affects parking demand. In terms of large format retail with large storage requirements (e.g. Home Improvement Stores), the ITE and ULI results appear to assert that there is considerable variation. Some uses have lower parking requirements due to the smaller proportion of floor area dedicated to customers, while others, such as grocery stores and shopping centres, have larger parking requirements reflecting higher customer densities and the propensity of these customers to use private vehicles.

- Vaughan's parking standards for most retail uses fall towards the upper limit of 5.5 to 6 parking spaces per 100m^2. They are similar to requirements in Brampton and Mississauga; however, they are at the upper end or higher than standards in all other surveyed jurisdictions as well as in the published sources.

- There is opportunity to tailor Vaughan's retail requirements to address the effects of storage requirements (e.g., Retail Warehousing), high customer densities (e.g., supermarket), and the nature of establishment (e.g., local vs. regional market base)[21].

[19] Marshall Macklin Monaghan for the City of Hamilton, *City-Wide and Downtown Parking and Loading Study*, October 2005, 23.
[20] ibid.
[21] The Urban Land Institute also suggests that parking demand rates increase with floor area. (Urban Land Institute and International Council of Shopping Centers. (2003) *Parking Requirements for Shopping Centers, 2nd Edition*. Washington, D.C.)

Exhibit 4-6: Comparison of Retail Minimum Parking Requirements



Notes: ITE demand, ULI, and APA values refer predominantly to single-use, suburban sites with little transit.
ITE Demand = Parking demand ratios (i.e., not recommended parking standards) from *Parking Generation*, 3rd Edition, Institute of Transportation Engineers, 2004.
ULI = Recommended parking standards from *Shared Parking 2nd Edition*, Urban Land Institute and the International Council of Shopping Centers, 2005.
APA = Surveyed parking standards from American cities in *Parking Standards*, American Planning Association, 2002.

4.2.4 PARKING DEMAND

As discussed earlier, retail surveys were conducted in late December, before Christmas, and are expected to reflect annual peak demands. Exhibit 4-7 presents city-wide average supply and average peak parking occupancy ratios for retail uses. The data shows that standalone large grocery establishments have the highest rate of parking supply and demand. Banks also have a slightly higher parking demand ratio than general retail. However, results for banks and large grocery establishments should be treated with caution given the low number of samples for standalone sites.

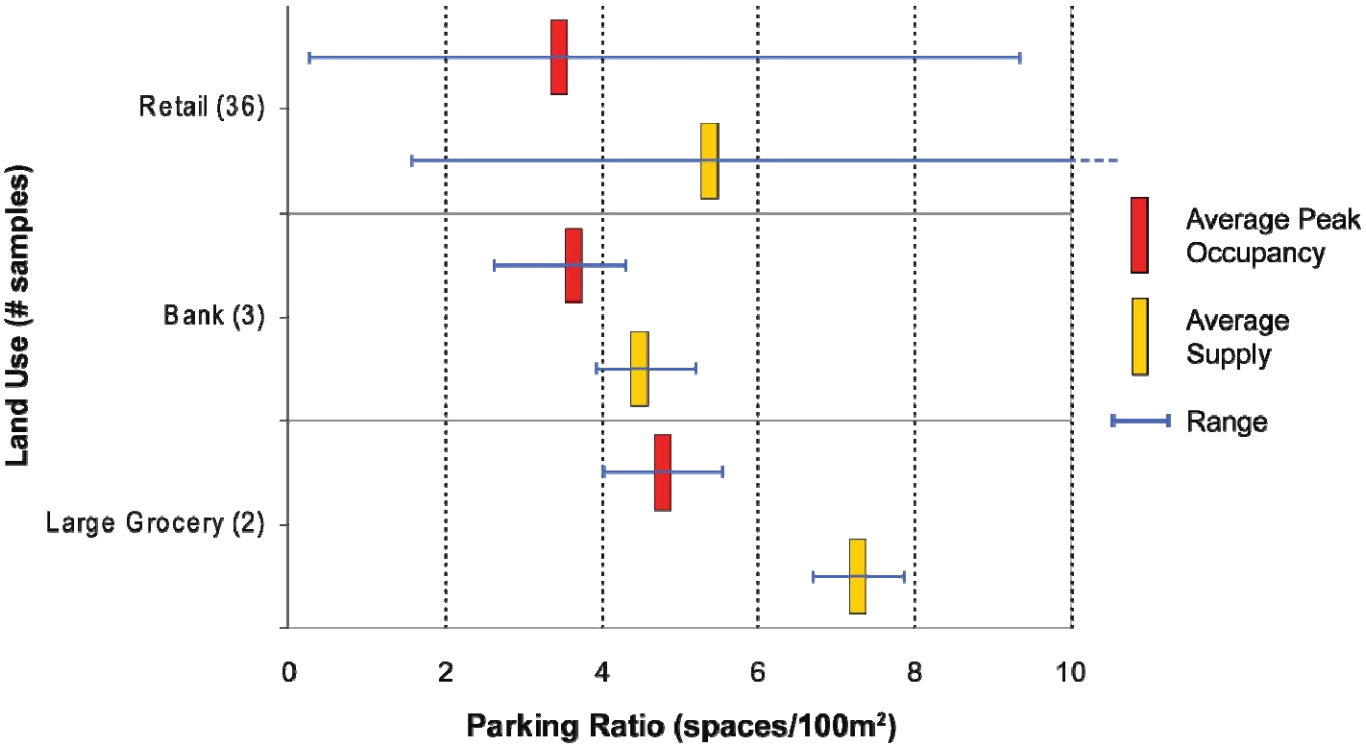
The majority of surveyed retail uses include multi-unit buildings (classified as shopping centres in the zoning by-law), reflecting the prevalence of this retail built form in Vaughan. There is wide variation in the general retail parking supply rate and peak parking occupancy rate reflecting the range of uses included within this category. The average supply rate for the general retail category is between 5 and 6 parking spaces per $100m^2$, which corresponds to current minimum parking requirements. However, the average peak occupancy rate is approximately 3.5 parking spaces per $100m^2$, significantly below the required supply.

Peak parking utilization (i.e., peak parking occupancy/parking supply) is a good indicator of whether a parking facility is appropriately sized. The Urban Land Institute reports that parking facilities operate at optimum efficiency at a parking utilization in the range of 85 to 95 percent occupancy[22]. Thus, 0.85 peak utilization is a conservative measure of an appropriately sized parking facility. Given this, a parking facility exhibiting a peak parking utilization below 0.70 (i.e., 30 percent of spaces are unused at the time of peak parking demand) is considered to provide excess capacity.

[22] ibid.

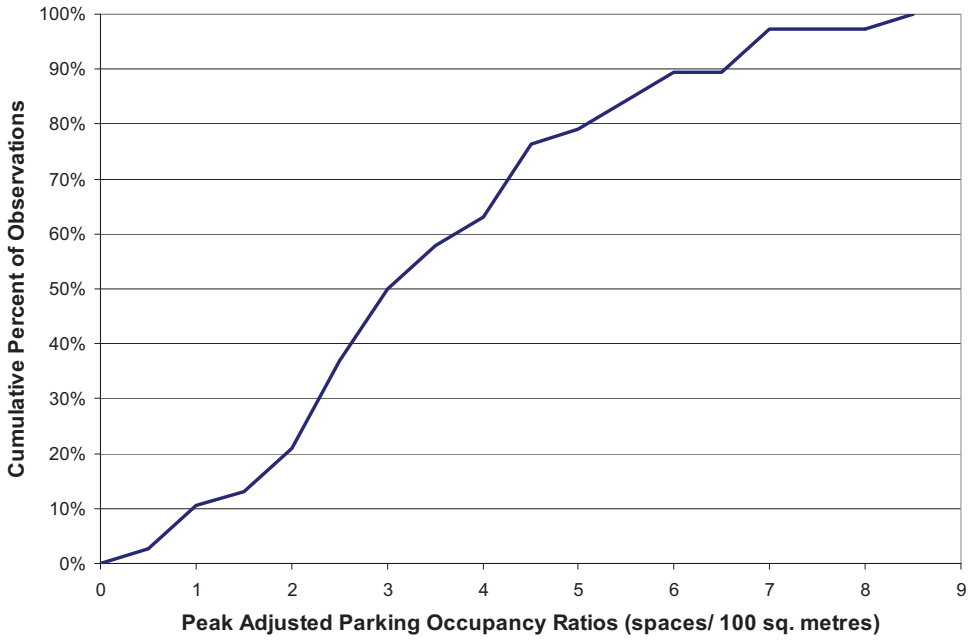
Almost 60 percent of all retail sites exhibit peak parking utilization below 70 percent, even at the annual peak. This is a strong indication that many general retail, large retail, large grocery, and personal service establishments provide substantial excess parking. As such, there is potential to reduce existing retail minimum requirements. In addition, given the tendency to over-supply parking for marketing purposes, parking maximums would be a useful regulatory tool in key areas.

Exhibit 4-7: Retail Parking Supply and Peak Occupancy



To assess the potential impact of alternative parking requirements, Exhibit 4-8 illustrates the proportion of surveyed sites with a peak parking occupancy at or below a certain rate. This graph shows, for example, that a parking supply rate of 3 spaces per 100 m^2 GFA would be sufficient to accommodate peak parking demand and just over half of surveyed retail sites. Alternatively, the parking requirement should be approximately 5.5 spaces per 100 m^2 to ensure that 85% of sites meet their annual peak demand (i.e., the 85^{th} percentile approach). However, in order to promote more sustainable and efficient forms of development, the traditional 85^{th} percentile approach is not considered appropriate for this study.

Exhibit 4-8: Cumulative Peak Parking Occupancy for General Retail



4.2.5 PROPOSED STRUCTURE OF STANDARDS

While Section 3 addresses the structure of proposed parking standards in terms of use of minimum and maximum standards and stratification by urban context, there are two main outstanding issues in terms of the structure of retail parking standards: grouping of retail categories and stratification by size of establishment. These will allow Vaughan's retail requirements to address the effects of storage requirements (e.g., Retail Warehousing), high customer densities (e.g., supermarket), and the nature of establishment (e.g., local vs. regional market base) on parking demand.

Grouping of Retail Categories

As shown in Exhibit 4-5, there are currently at least 15 retail categories in the parking requirements. To facilitate easier transitions between retail uses over time and make the standards easier to understand and enforce, it is recommended that a number of these uses be consolidated. Furthermore, there is little evidence to support distinguishing between the different retail uses currently identified in the parking standards. Based on the review of existing standards in Vaughan and other jurisdictions and analysis of parking demand in Vaughan and elsewhere, three retail use categories are proposed:

- **General Retail/Shopping Centre**: This category includes most existing retail categories. A detailed review of retail parking demands in Toronto found little variation in parking demand between retail stores, personal service shops, and shopping centres, when the size of establishment is taken into consideration[23]. As such, it makes sense to consolidate many retail uses. To properly account for mixing of uses, shopping centres will require further specifications in terms of allowable space dedicated to eating establishments, as discussed later.

[23] IBI Group. 2007. Review of the City of Toronto Zoning By-Law Parking Standards for Office, Retail, and Restaurant Uses. City of Toronto.

- **Supermarket**: Grocery stores, or supermarkets as they are defined in the existing zoning by-law, typically generate a high customer turnover and the need to carry grocery bags means customers are more likely to travel by private vehicle. As such, parking demand for supermarkets is expected to be higher than general retail and a unique standard is required.

- **Bank or financial institution**: Banks generate high customer demand as well as employee office-related demand. As such, parking demand for standalone banks is expected to be higher than general retail and a unique standard is required. A stand alone bank would be one which is not part of another development, or simply a banking machine. Some of these banks also have drive-thrus, which may influence parking demand, but likely not to the extent that a separate standard is required or possible to estimate.

Consistent with the current requirements, shopping centres will continue to include a range of commercial uses on the same site. Supermarkets and banks will receive the shopping centre standard if included as part of larger development.

Stratification by Size of Establishment

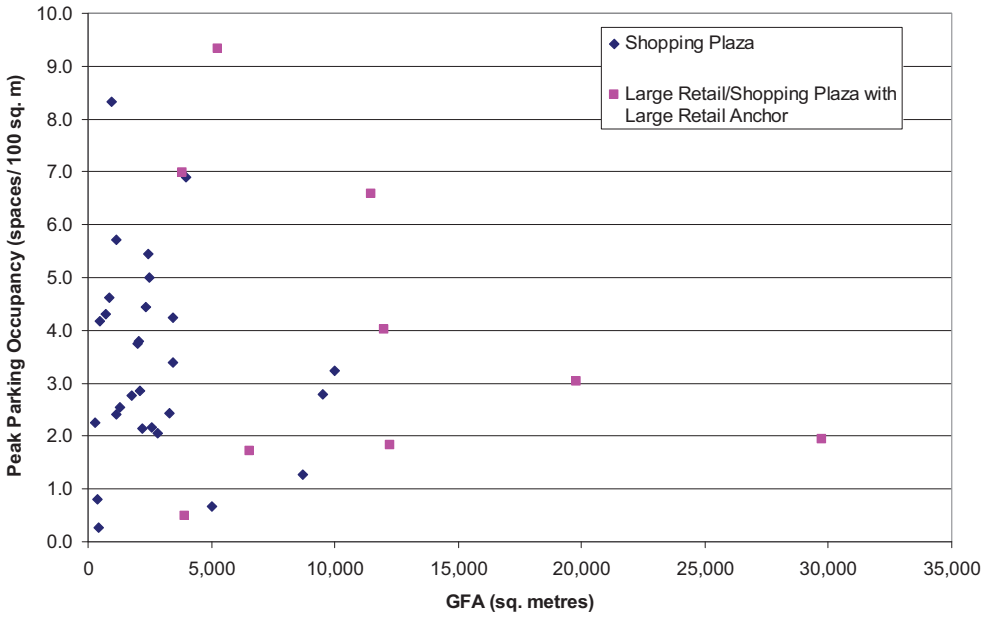
Many jurisdictions and published sources recommend that retail parking standards increase based on the size of the store or shopping centre. The justification is that patrons of larger retail establishments are more like to drive given the more regional nature of the store's market as well as the larger baggage transportation requirements typically associated with larger stores (e.g., furniture stores, or hardware stores). In addition, larger shopping centres offer more shopping opportunities and services to customers. This increases the average duration of stay, resulting in lower turnover of the parking spaces and higher parking demand.

Establishing the GFA threshold at which this higher standard will apply is not straightforward. In North York, for example, existing retail parking standards increase from 3.57 to 6.67 spaces per $100m^2$ for stores with GFA greater than $3000m^2$. Whereas Markham increases the retail parking standard from 3.33 to 5 spaces per $100m^2$ net floor area for stores larger than $6,000m^2$ [24].

The GFA threshold is intended to distinguish between neighbourhood commercial uses and more regional commercial uses. Exhibit 4-9 illustrates the gross floor area of surveyed retail sites and the relationship with peak parking demand. This graph shows that the majority of retail stores and plazas without a large anchor or consisting of "big box" retail, are smaller than $5,000m^2$ GFA. This proposed GFA threshold is relatively consistent with the North York and Markham standards identified above.

[24] The Urban Land Institute also suggests that parking needs increase with floor area for auto-dependent shopping centres. It recommends:
- 4.0 spaces/1000 ft2, Gross Leasable Area (GLA) < 400,000 ft2 (37,161 m2);
- 4.0 -4.5 spaces /1000 ft2, GLA 400,000 ft2 (37,161 m2) - 599,000 ft2 (55,741 m2), supply requirement increases proportionally with centre's square footage;
-4.5 spaces /1000 ft2, GLA > 600,000 ft2 (55,742 m2)
(Urban Land Institute and International Council of Shopping Centers. (2003) Parking Requirements for Shopping Centers, 2nd Edition. Washington, D.C.)

Exhibit 4-9: Retail Peak Parking Occupancy vs. Gross Floor Area



4.2.6 PROPOSED STANDARDS

Proposed retail parking standards are presented in Exhibit 4-10. Key elements of the proposed standards include:

- Proposed minimum requirements are substantially lower than current retail standards; however, this is largely due the high level of the existing standards. For example, proposed Base standards reflect average surveyed peak occupancies and correspond well with published sources.

- Lower minimums and maximum standards are proposed in High-Order Transit Hubs, Local Centres and Intensification Areas. This will support more compact development in these areas and discourage oversupply of parking. These lower requirements reflect the lower parking demand associated with better transit service, particularly for areas along the subway and served by other forms of rapid transit.

- The low minimum and maximum limits on private parking also reflect the need to develop a market for priced collective parking in these areas. Given the desire for space-efficient development, including shared and structured parking, proposed maximum standards for Local Centres and Intensification Areas set limits on surface parking. Structured parking supply is not limited by this maximum. Such an approach has also been adopted in Calgary.

Exhibit 4-10: Proposed Retail Parking Standards

Use Category	Description	Existing Standards	Proposed Standards (spaces/100m² GFA)						
			Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
			Min	Min	Max	Min	Max	Min	Max
Retail/Shopping Centre	<=5000m², eating establishments no greater than 20% of GFA*	2 – 6	3.5	2	4	3	4.5 surface parking	3	4.5 surface parking
	>5000m², eating establishments no greater than 20% of GFA*	2 – 6	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking
Supermarket (standalone)	>1000 m²	6	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking
Bank or Financial Institution (standalone)		6	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking

*Eating establishment floor area above 20% of site GFA, should be assessed at the proposed eating establishment rate

4.3 Restaurant Uses

4.3.1 ISSUES AND CONSIDERATIONS

Restaurant parking demand is composed of customer and employee parking demand and is affected by a variety of use-specific factors outlined below:

- Parking demand is highly correlated to sales, even more than retail establishments. This is likely due to the fact that there is less variation in spending per customer in a restaurant than in a retail establishment;

- The type of restaurant (e.g. family restaurant vs. fine dining restaurant) and the customer base (e.g. office employees vs. families) will affect the daily and weekly parking demand profile;

- Restaurant parking demand is inversely related to customer turnover. More upscale restaurants are typically characterized by more leisurely dining, and thus lower turnover, which means these establishments will have higher parking demand than their fast-food counterparts (all else being equal). Dedicated take-out and drive-through restaurants will have even lower parking demand than family restaurants;

- Parking demand increases with seat density;

- Parking demand is inversely related to the average size of dining parties, since party size is highly correlated to auto occupancy;

- Employees account for approximately 15% of parking demand at casual restaurants and most employees have other options besides driving alone including carpooling, being dropped off, or taking transit;

- Trips to and from a restaurant are typically made during the off-peak periods, which makes auto travel more attractive due to lower levels of transit service and less congested roads during these times; and

- Trips to and from a restaurant typically have low baggage requirements, which makes non-auto options more attractive.

4.3.2 EXISTING REQUIREMENTS

According to the City of Vaughan's zoning bylaw, restaurant parking requirements fall under the uses of eating establishments and outdoor patios. Existing requirements include:

Eating Establishment and Tavern	-	Greater of 16 spaces / 100m^2 GFA or 1.0 parking space for each four persons in the designed maximum capacity
Eating Establishment, Convenience	-	Greater of 20 spaces / 100m^2 GFA or 1.0 parking space for each four persons in the designed maximum capacity
Eating Establishment. Convenience Drive-Through	-	Greater of 16 spaces / 100m^2 GFA or 1.0 parking space for each four persons in the designed maximum capacity
Eating Establishment, Take-Out	-	Greater of 10 spaces / 100m^2 GFA or 1.0 parking space for each four persons in the designed maximum capacity
Outdoor Patio	-	Additional parking requirement equal to that of the main eating establishments

The parking standards for restaurants in the City range from 10 to 20 spaces per 100 m^2 with take-out establishments have a lower requirement and non-convenience eating establishments and taverns having the highest standard. In addition, outdoor patios are treated as an extension of the building and the parking requirement is also applied to patios at a rate that is equal to that of the main eating establishment.

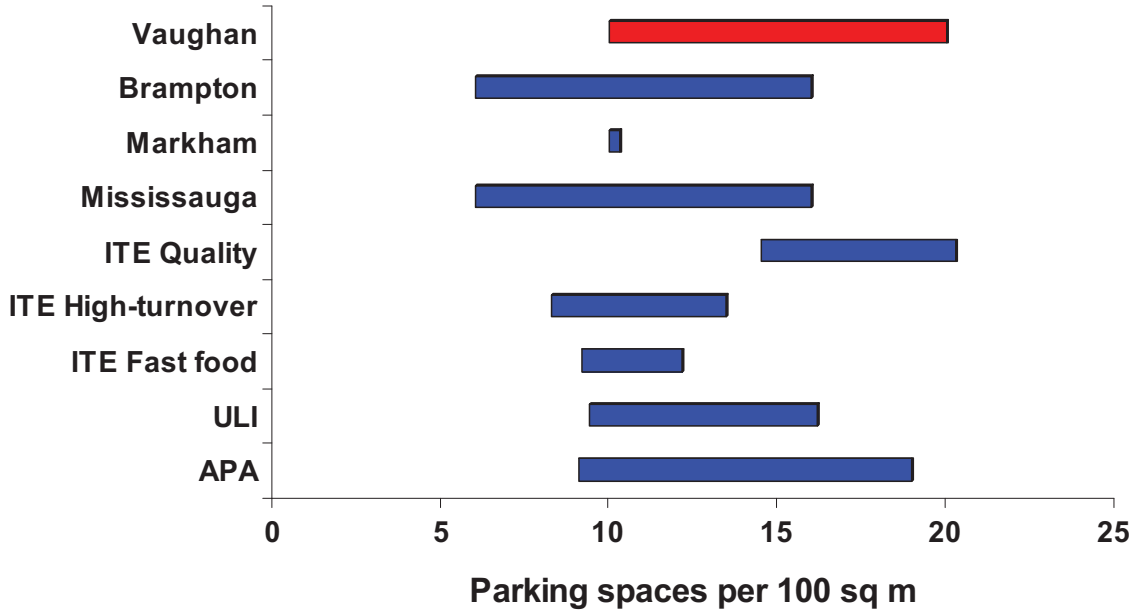
Eating establishments considered include convenience, convenience drive-through, take-out, and tavern. The City's categories for eating establishments reflect differences in customer turnover, which affects parking demand. However, the number of categories reportedly makes it difficult for zoning officers to distinguish between types of use and therefore apply the appropriate parking requirement.

4.3.3 REQUIREMENTS IN OTHER MUNICIPALITIES

There is a very wide range in restaurant parking requirements across jurisdictions (Exhibit 4-11). Some places, such as Vancouver and more transit-accessible areas in Toronto, require only a basic amount of parking (e.g., 2 spaces per 100 m^2). Requirements in other jurisdictions, such as Vaughan, Brampton, and Mississauga are designed to ensure that the potential peak parking demand can be accommodated on-site and range from 10 to 20 spaces per 100 m^2. This tenfold difference in required parking reflects the high parking demand generated by restaurants in auto-oriented areas. Vaughan's requirements need to be reviewed in the context of transitioning to a more urban environment.

Other than in Vaughan, no jurisdictions were found to specify parking requirements for outdoor patios.

Exhibit 4-11: Comparison of Restaurant Minimum Parking Requirements



Notes: ITE demand, ULI, and APA values refer predominantly to single-use, suburban sites with little transit.
ITE Demand = Parking demand ratios (i.e., not recommended parking standards) from Parking Generation, 3rd Edition, Institute of Transportation Engineers, 2004.
ULI = Recommended parking standards from Shared Parking, Urban Land Institute and the International Council of Shopping Centers, 2005.
APA = Surveyed parking standards from American cities in Parking Standards, American Planning Association, 2002

4.3.4 PARKING DEMAND

Restaurants have high peak parking demands ranging from approximately 8 to 20 spaces per 100 m^2 for auto-dependent sites, according to the ITE. As such, restaurant parking provides unique challenges in terms of promoting reduced parking, more compact development, and reducing development costs. Given that peak parking demand for restaurants typically occurs at off-peak times for retail and office uses, there are opportunities for shared parking between such uses in mixed use development. The availability of nearby collective parking (e.g., on-street) also needs to be considered when reducing required parking.

Exhibit 4-12 illustrates published parking demand results for restaurants based on surveys of parking accumulations for fine dining, casual and family establishments per 100 m^2 GFA on weekdays and weekends. The large range in peak parking demand is evident from these results.

Exhibit 4-12: Observed Parking Accumulations for Quality/Casual Restaurants (Spaces/100 m^2)

	Fine/Casual Dining		Family Restaurants	
	Weekdays	Saturdays	Weekdays	Weekends
Study days	49	80	51	32
Range	4.8-29.3	5.5-29.7	1.0-21.8	4.5-19.3
85th Percentile	18	20	10.5	14.8
Average	12.5	14.8	6.7	10.6
Recommended Ratio	18	20	10.5	15

Source: Urban Land Institute and International Council of Shopping Centres, Share Parking 2nd Edition, 2005, 51.

4.3.5 PROPOSED STANDARDS

Exhibit 4-13 presents the proposed eating establishment parking standards and proposed adjustment factors follow.

Exhibit 4-13: Proposed Parking Standards for Eating Establishments

Use Category	Existing Standards	Proposed Standards (spaces/100m^2 GFA)						
		Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
		Min	Min	Max	Min	Max	Min	Max
Eating Establishment	16-20	10	6	10	8	-	8	-
Take-Out Easting Establishment	10	6	3	6	4	-	4	-
Outdoor Patio	Equal to main eating establishment	0	0	-	0	-	0	-

In addition, it is recommended that the parking requirement for outdoor patios be removed. Outdoor patios are seasonal and while they do increase the capacity of the establishment, indoor seating is often less occupied when outdoor seating is available since customers may relocate outdoors rather than significantly increasing parking demand. In addition, outdoor patios encourage street life and contribute to the pedestrian environment, which is desirable. Assessing a parking requirement on patios discourages the building of patios.

4.4 Office Uses

4.4.1 ISSUES AND CONSIDERATIONS

Office parking serves employees as well as visitors, such as contractors, couriers, and clients. The office land use can be subdivided into several categories for the purposes of parking standards. The most common category, 'general office', refers to standard work offices where the majority of parking demand comes from employees. Parking demand for offices is subject to a variety of considerations outlined below:

- Even in suburban communities, most employees have other options besides driving alone, such as carpooling, taking transit, walking or cycling;

- Trips to and from an office typically have low baggage requirements, which make non-auto options more feasible;

- The employee density (i.e. the number of employees per unit floor area) may vary widely between offices (e.g. a call centre with high employee density vs. a law firm with low employee density);

- Not all employees are at work on any given day due to illness, vacation, meetings, etc.; Although the percentage would vary by type of business, previous studies have generally adopted a figure of 10%. This may be growing as telecommuting is becoming more accepted by employers.

- Some employees require a car for work due to physical disability, shift work, off-site meetings, etc.;

- Visitor activity (e.g. clients, contractors, etc.) may vary between offices, affecting parking demand; and

- Whether an employer grants employees parking space for free can significantly influence parking demand.

Other important types of the office land uses include government offices and medical offices. Since these offices typically have a high service component, they tend to generate higher parking demand from visitor activity, particularly in the case of medical offices/clinics. Medical office parking serves employees (i.e. doctors, support staff, etc.) as well as patients and other visitors, such as contractors, couriers, and clients. Parking demand for medical office employees is affected by many of the key factors outlined above for the general office use, however, it is also subject to a variety of additional considerations:

- Medical offices have significantly more visitors than general office buildings due to the large number of clients/patients who make many short-term visits over the course of the day;

- Many patients are elderly, disabled, or ill and are thus more likely to use a private vehicle over transit or active modes of transportation. Furthermore, off-site patient parking may be undesirable due to mobility limitations; and

- In many cases, patients may not be familiar with available transit options or off-site parking options as they are infrequent visitors; and

- Medical offices typically have a significantly lower employee density than the general office use due to the floor area dedicated to patients (e.g., waiting rooms, dentist chairs, etc.).

4.4.2 EXISTING REQUIREMENTS

The present zoning by-law identifies five types of office uses:

Business or Professional Office	-	3.5 spaces / 100m2 GFA
Office Building	-	3.5 spaces / 100m2 GFA devoted to office uses + the requirements for any other use
Real Estate Office	-	4.5 spaces / 100m2 GFA
Regulated Health Professional Office or Clinic	-	5 spaces / practitioner

Office buildings are defined in the City's zoning by-law as having more than one storey used for business or professional office purposes. Where the building exceeds three storeys, some ground-floor retail, personal services and eating establishments are permitted, provided that their combined GFA does not exceed 15% of the building's GFA. However, as shown above, the parking requirements for these other uses are determined separately, based on the requirements for each particular use.

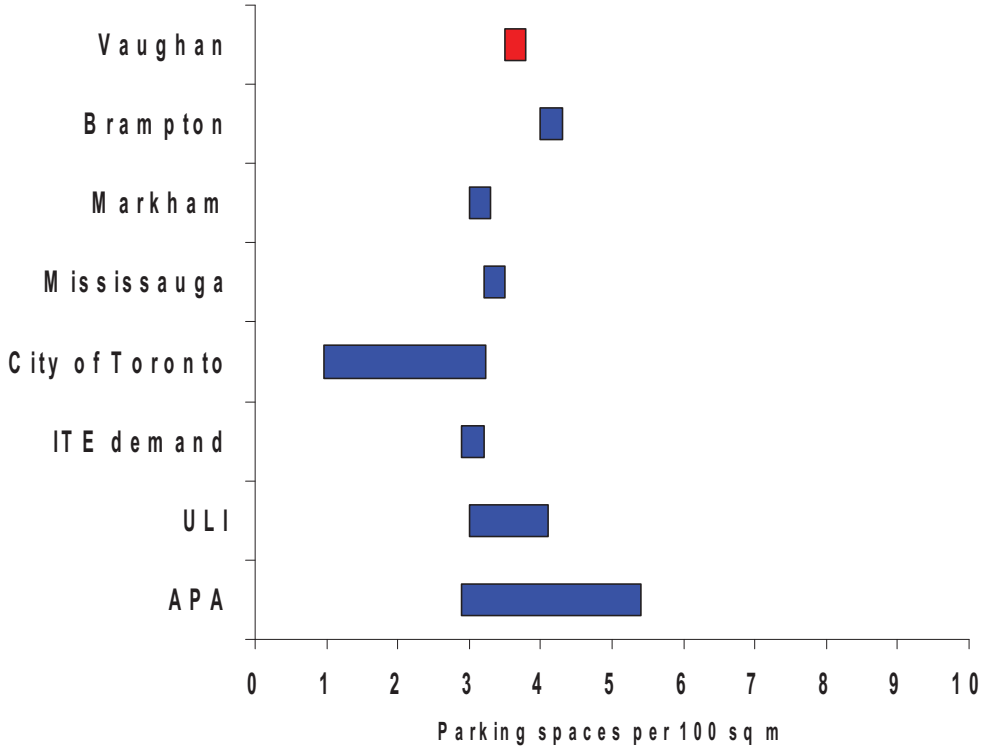
4.4.3 REQUIREMENTS IN OTHER JURISDICTIONS

Exhibit 4-14 illustrates a comparison of Vaughan's general office parking standards with standards from other publications and similar jurisdictions (see also Appendix C for a detailed comparison of Vaughan's parking standards with other Canadian jurisdictions). Key observations from this comparison include:

- General office parking standards in the City of Vaughan are similar to those found in Brampton and Mississauga, but higher than those of Markham and considerably higher than those of suburban Toronto, which range from 1 to 3.2 spaces per 100m^2 GFA. General office requirements in Vaughan are above or towards the upper range of office parking ratios in the ITE, ULI, and APA documents (all three of which refer predominantly to single-use, suburban sites with little transit).

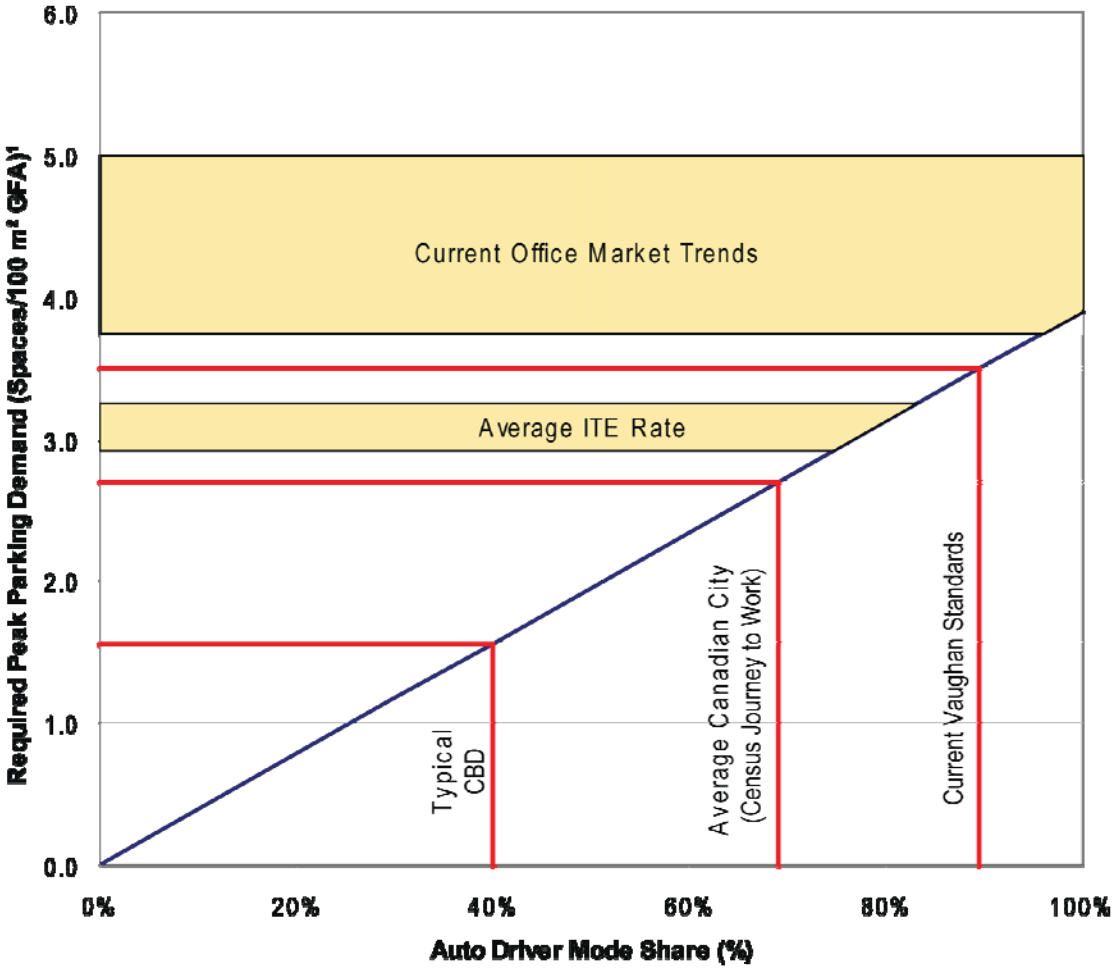
- Based on typical employee densities for offices, general office standards in the City of Vaughan assume over 85% of employees drive to work (Exhibit 4-15). Assuming a small portion of employees carpool or are dropped off, the parking requirement effectively assumes that all employees drive to work. Requiring a large amount of parking encourages provision of free employee parking, which provides employees with little incentive to use alternative modes.

Exhibit 4-14: Comparison of *General* Office Minimum Parking Requirements



Notes: ITE demand, ULI, and APA values refer predominantly to single-use, suburban sites with little transit.
ITE Demand = Parking demand ratios (i.e., not recommended parking standards) from *Parking Generation*, 3rd Edition, Institute of Transportation Engineers, 2004.
ULI = Recommended parking standards from *Shared Parking*, Urban Land Institute and the International Council of Shopping Centers, 2005.
APA = Surveyed parking standards from American cities in *Parking Standards*, American Planning Association, 2002.

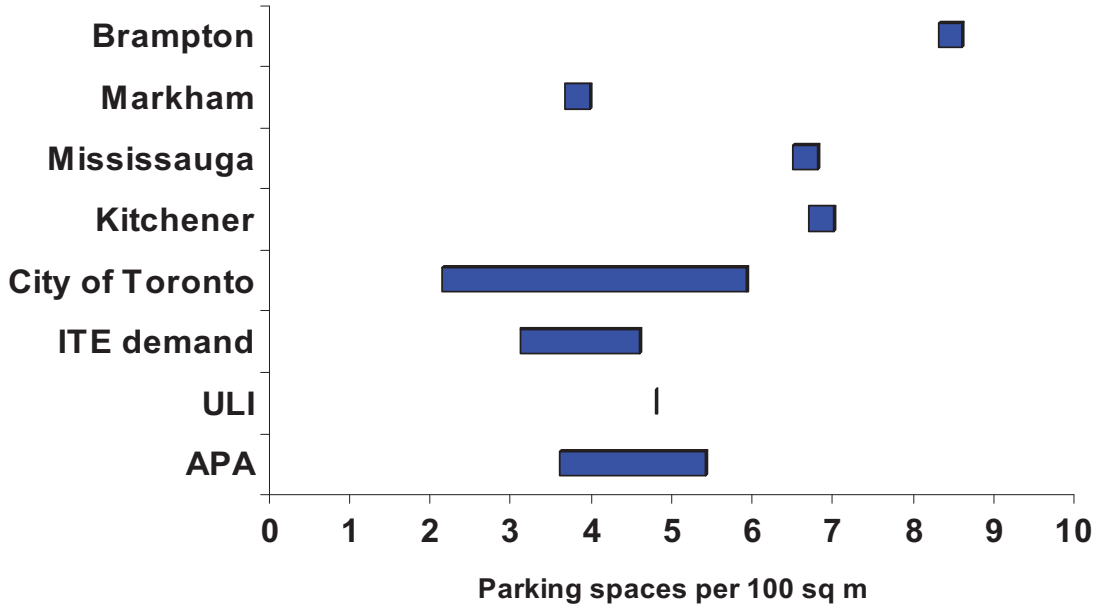
Exhibit 4-15: Travel Behaviour and Office Parking Demand Ratio



(1) Based on 3.9 employees per 100m^2 GFA

For medical offices, Vaughan is relatively unique in specifying the parking requirement in terms of the number of practitioners. Since it is difficult to assess the number of practitioners in a medical building at the site design stage and since this number may change over time, medical office standards in other jurisdictions typically specify required parking in terms of gross floor area. Exhibit 4-16 provides a comparison of medical office parking standards from publications and similar jurisdictions. The graph shows that there is a wide range in medical office parking requirements, although the standards in the ULI, ITE, and APA publications are in range of 3.0 to 5.0 spaces per 100m^2.

Exhibit 4-16: Comparison of *Medical* Office Minimum Parking Requirements



Notes:

- ITE demand, ULI, and APA values refer predominantly to single-use, suburban sites with little transit.
- For Markham, parking requirements are specified based on net floor area (3.3 spaces / 100m^2 NFA). The ratio was therefore multiplied by 0.9 to convert it to GFA. This factor is approximate, but considered acceptable for the purpose of this study.
- **ITE Demand** = Parking demand ratios (i.e., not recommended parking standards) from *Parking Generation*, 3rd Edition, Institute of Transportation Engineers, 2004.
- **ULI** = Recommended parking standards from *Shared Parking*, Urban Land Institute and the International Council of Shopping Centers, 2005.
- **APA** = Surveyed parking standards from American cities in *Parking Standards*, American Planning Association, 2002.

4.4.4 PROPOSED STRUCTURE OF STANDARDS

Aside from medical uses, the three other office land use categories identified in the City of Vaughan parking standards (professional offices, office buildings, and real estate offices) typically exhibit similar parking demand. Although real estate offices would normally experience more visitors, this is compensated by lower demand from employees due to frequent travel and off-site meetings. As a result, most surveyed jurisdictions do not have a unique parking standard for real estate offices.

As with other uses, complications often arise in a mixed-use setting. In many cases, particularly where there are sizeable concentrations of office workers, ancillary retail and personal services tend to primarily serve local employees, and therefore generate little additional parking demand. Given that multi-unit office plazas comprise a considerable portion of Vaughan's office land uses and that medical service office buildings often also contain retail, food, and personal services, it is important that the office parking standards address mixed uses within office buildings. To an extent, the existing standards do so, however their parking requirements treat each use in isolation. That is, the zoning by-law allows mixed uses within office buildings, however the parking requirements for such buildings are simply the sum of each individual use within the building.

Since the uses other than office experience a wide variety of peak parking periods, it is felt that these other uses can be reasonably accommodated by the office parking requirements, provided these other uses do not overwhelm the site. Furthermore, much of the demand for these ancillary uses during office peak periods comes from the demand for the primary office use, thus they do not

significantly alter parking demand. Therefore, it is recommended that the parking standard's existing four office-based land uses be reduced to two:

Office Building Use

Means the use of a building or part of a building in which one or more persons are employed in the administration, direction or management of a business, agency, brokerage or organization, or by professionally qualified persons and their support staff, and shall include but not be limited to an office or a lawyer, dentist, architect, engineer, stock broker, accountant, real estate or insurance agency, veterinarian or a similar professional person's office but shall not include a veterinary clinic. Where retail, personal services, and eating establishment uses also share floor area with the primary office use, then the parking requirements corresponding to these other uses will apply to their GFA in excess of 15% of the total site GFA.

Medical Services Building Use

Means the use of a building or part of a building in which one or more persons are employed in the administration, direction or management of medical services and shall include but not be limited to a regulated health professional, such as audiologists, chiropodists, chiropractors, dental hygienists, dental technologists, denturists, dentists, dieticians, massage therapists, medical laboratory technologists, medical radiation therapists, midwives, naturopaths, nurses, occupational therapists, opticians, optometrists, pharmacists, physicians, physiotherapists, podiatrists, psychologists, respiratory therapists, speech language pathologists. Where retail, personal services, and eating establishment uses also share floor area with the primary office use, then the parking requirements corresponding to these other uses will apply to their GFA in excess of 15% of the total site GFA.

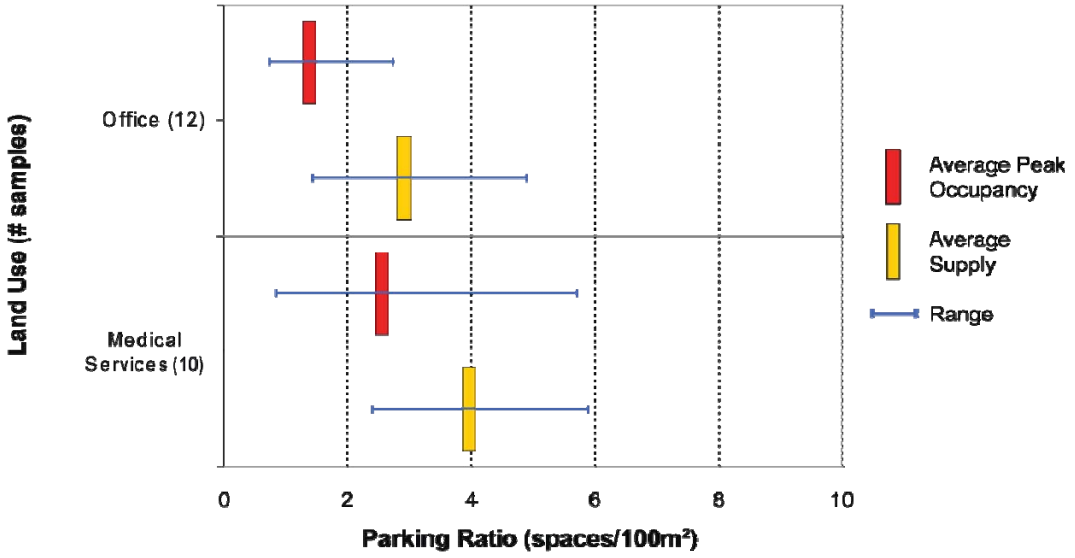
Parking demand for medical office employees is affected by many of the same key factors as for the general office use (outlined above), however, the larger number of patients/clients affect parking demand sufficiently for medical offices to warrant their own classification in the parking by-law.

4.4.5 PARKING DEMAND

The average peak occupancy rate for office buildings is approximately 1.4 spaces per 100 m^2 GFA, while the average parking supply rate is more than twice that level at 2.9 spaces per 100m^2 GFA (see Exhibit 4-17). This average supply ratio is somewhat lower than the required minimum. In fact, 36% of the office sites do not meet the minimum parking requirement. While these results are surprising at first glance, there are several possible explanations. First, it is likely that some survey sites were developed before the existing parking standards were instituted. They may also be due to the potentially common use of zoning variances to reduce minimum parking requirements on a site-by-site basis. If the "undersupplying" of parking at all sites is representative of current building practices, they may indicate a willingness of developers to supply less parking than is currently required in parking standards.

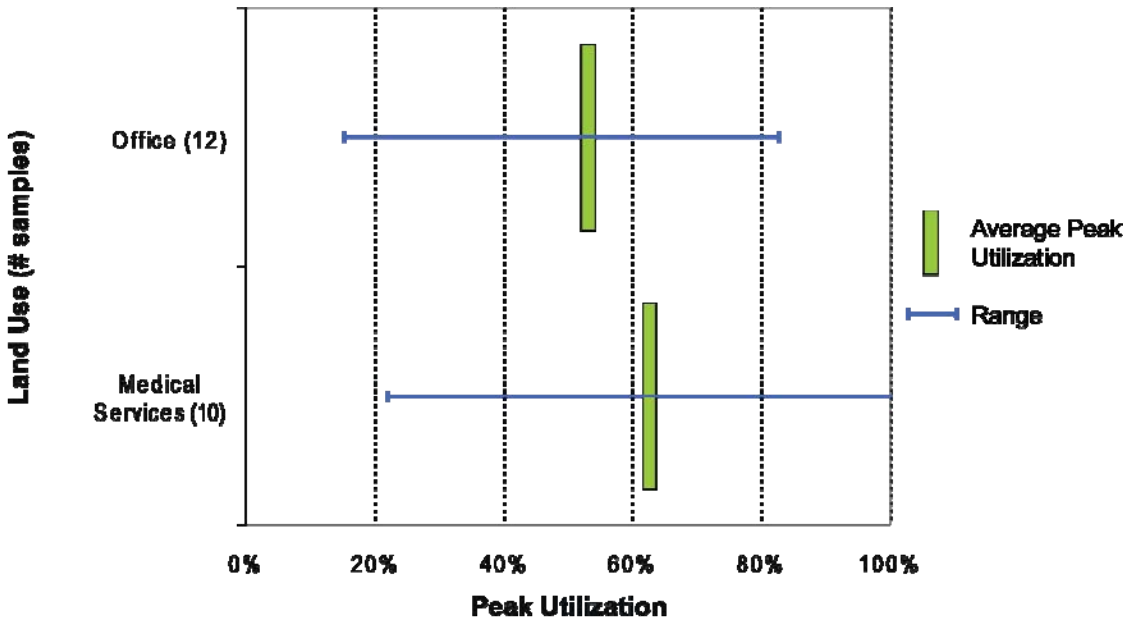
As expected, the average parking occupancy for medical service buildings was somewhat higher at 2.5 spaces per 100m^2 GFA and the average supply was also correspondingly higher at 4 spaces per 100m^2 GFA (see Exhibit 4-17).

Exhibit 4-17: Office Parking Supply and Peak Occupancy



Peak parking utilization (i.e. peak parking occupancy/parking supply) is a good indicator of whether a parking facility is appropriately sized. As discussed in Section 4.2.4, a parking facility exhibiting a peak parking utilization below 0.70 (i.e., 30 percent of spaces are unused at the time of peak parking demand) is considered to provide excess capacity. Similarly, a parking facility exhibiting peak parking utilization above 0.95 could be considered to be under capacity. Thus general office parking utilization in Vaughan is quite low at an average of 52 percent (see Exhibit 4-18). Only 23 percent of the surveyed sites exceeded the 70 percent utilization threshold, and none exceed the 85 percent utilization mark.

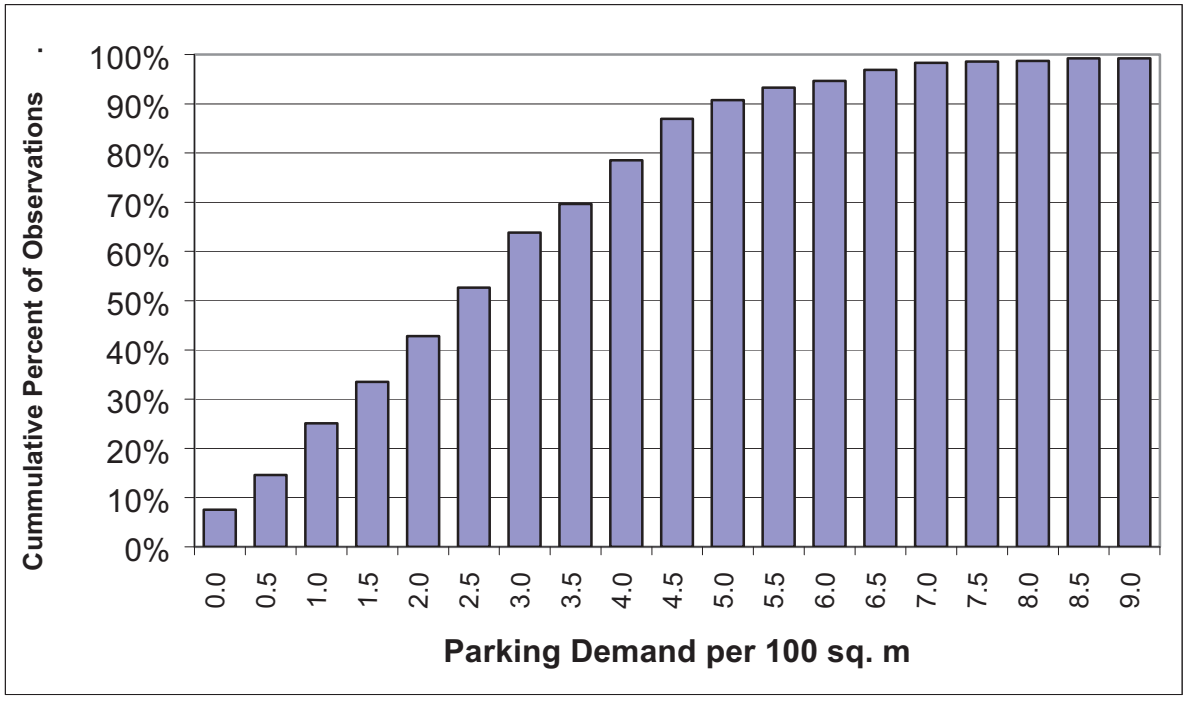
Exhibit 4-18: Peak-Adjusted Office Parking Utilization



Parking facilities at multi-unit medical service buildings appear to be better utilized. At these medical centres, average utilization was 62 percent. This is largely a result of higher parking occupancy at medical offices, as shown in Exhibit 4-17. These results indicate that a small, but significant proportion of medical service building lots are under capacity, while the majority of general office building sites provide substantially more parking than required.

Further insights on medical office parking demand can be extracted from a previous parking study on medical offices/clinics conducted for the former City of Toronto[25]. This study surveyed 81 clinics located in 49 buildings located in the former City of Toronto, but outside the central area. These detailed surveys collected data on parking demand over the course of a day, including the number of patients and staff that parked on-site, parked on-street, parked in other off-street lots, or used alternative modes of transportation. As such, these surveys provide a more complete picture of medical office parking demand than spot surveys, which can only capture on-site parking demand. Exhibit 4-19 shows the observed cumulative parking demand per 100m^2 GFA. These results represent observed parking demand values throughout the day for each site as opposed to peak parking occupancy. The study recommended a medical office/clinic parking standard of 4 spaces per 100m^2 GFA, corresponding with the 80th percentile parking demand.

Exhibit 4-19: Cumulative Parking Demand Per 100 m2 (77 clinics in 45 buildings)



[25] IBI Group (1998) Parking Standards for Clinics Outside of the City of Toronto Central Area. City of Toronto.

4.4.6 PROPOSED STANDARDS

The proposed office parking standards are presented in Exhibit 4-20 below and proposed adjustment factors follow.

Exhibit 4-20: Proposed Office Parking Standards

Use Category	Description	Existing Standards	Proposed Standards (spaces/100m² GFA)						
			Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
			Min	Min	Max	Min	Max	Min	Max
Office Building	Also includes retail, personal services, and eating establishment uses no greater than 15% of GFA*	3.5	3	1.5	2.5	2	3	2	3
Medical Services Building		5 / practitioner	4.5	2.5	4	3	4.5	3	4.5

*Retail, personal services, and eating establishment floor area above 15% of site GFA, should be assessed at the use-specific rate

The existing office parking standard requires a typical office to provide sufficient parking for all of its employees[26]. This parking is typically provided free, which effectively subsidizes auto commuting.

The proposed office parking requirements are designed to encourage more compact development and support transit investments in key nodes and corridors. This includes relatively low minimum parking requirements as well as maximum parking limits in many areas. For example, in High-Order Transit Hubs, the maximum of 2.5 spaces per 100m^2 corresponds to an auto commuting mode split of approximately 70%. This maximum corresponds to the proposed maximum standard in Markham Centre[27].

It is important to keep a separate medical office use due to higher demand compared to general office uses. Although per practitioner based standards may provide a better correlation with parking demand, it is very difficult to enforce as the number may change frequently over time and it is difficult to assess at the site design stage. For this reason, most other jurisdictions typically specify required parking in terms of gross floor area.

4.5 Industrial Uses

4.5.1 ISSUES AND CONSIDERATIONS

For most industrial uses, parking demand is generally a function of the number of employees on-site arriving by car, plus any allowances for business visitors. As such, sites with higher employee density will generally exhibit higher parking demand. Employee density at these sites, however, is consistently low compared to other land uses. Thus, GFA is generally a reasonable indicator of parking demand.

[26] Assuming an employee density of 3.9 employees/100m^2 and an average auto occupancy of 1.1 employees per vehicle. Employee absenteeism and visitor parking demand typically cancel one another out and are not considered in the calculation

[27] BA Group. (October 2005). *Parking Strategy for Markham Centre – Final Report: Appendix A*

Light industrial uses makes up a large portion of the business activity in Vaughan and multi-unit, low-rise industrial plazas are a significant component of the built form. Given that such uses tend to have large paved areas for storage and loading, the minimum parking requirement may have little effect on built form.

4.5.2 EXISTING REQUIREMENTS

The present zoning by-law identifies seven types of industrial uses, which fall under the following three categories:

- **Industrial Use**: Use of land, buildings, or structures for the warehousing, manufacturing, processing or assembly of materials to finished products or by-products, including the storage of such materials and products.

- **Employment Use**: Identical to the industrial land use, but does not include the storage of materials and products, and may also include other similar operations, such as, but not limited to, data processing, research and development, and printing and publishing.

- **Warehouse Use**: A building or part of a building where wares or goods are stored, but should not include a retail store.

Parking standards are presently defined for three types of industrial uses, three types of employment uses, and one type of warehouse use as follows:

Industrial Use and Employment use other than Warehousing (building > 3,700m^2 GFA)	**The greater of,** 1.5 spaces / 100m^2 GFA devoted to industrial use + 2 spaces / 100m^2 GFA devoted to ancillary office use + the requirements for any other use **OR** 3.5 spaces / unit
Industrial Uses and Employment use other than Warehousing (building ≤ 3,700m^2 GFA)	**The greater of,** 2 spaces / 100m^2 GFA **OR** 3.5 spaces / unit
Industrial Use and Employment use, Multi-Unit, containing more than four (4) units	**The greater of,** 2 spaces / 100m^2 GFA **OR** 4 spaces / unit
Warehouse Use	1 spaces / 100m^2 GFA

4.5.3 REQUIREMENTS IN OTHER JURISDICTIONS

A jurisdictional review found that there is a small range for industrial and warehousing parking standards. In general, warehouse parking requirements are below 1 space per 100 m^2 GFA.

Industrial and employment uses are difficult to compare, however, as there is a wide variation in parking requirement structures. Generally, the industrial parking requirements vary from 0.45 to 2.25 spaces / 100m^2 GFA. See Appendix C for further details.

4.5.4 PROPOSED STRUCTURE OF STANDARDS

Most industrial sites in Vaughan are in fact defined as Employment Use or Warehouse sites, with only pockets of designated Industrial sites remaining in Maple and Woodbridge. Historically, the Employment Use land use designation was created around the time of the early 1980s recession to "open up" the struggling industrial lands to other uses.

However, in terms of parking demand, these three broad land use categories (industrial use, employment use, and warehousing) exhibit similarly low demand and there is little need or incentive for distinguishing between them. Furthermore, there is inconclusive evidence to suggest that multi-unit or larger industrial buildings will exhibit different parking demand. Complications arise where non-industrial uses (e.g. restaurant, retail, banquet halls, etc) are also on-site as they generally exhibit higher parking demand. Thus it is recommended that the parking standard's existing seven industrial-based land uses be reduced to two:

Industrial Use, Single Tenant

Means the use of a single-unit building for the warehousing, manufacturing, processing wholesale, or assembly of materials to finished products or by products, including the storage of such materials and products. May also include other similar operations such as, but not limited to, data processing, research and development, and printing and publishing.

Mixed Industrial Use

Means the use of multi-unit buildings or structures for the warehousing, manufacturing, processing wholesale, or assembly of materials to finished products or by products, including the storage of such materials and products. May also include other similar operations such as, but not limited to, data processing, research and development, and printing and publishing. Ancillary office, retail, personal services, and eating establishment uses may also share floor area with the primary industrial use, but should these ancillary uses exceed 15% of the site's GFA then the parking requirements corresponding to that particular use will apply to the GFA in excess of 15%.

By directly addressing mixed use in the parking requirements, the intent is to accommodate land uses secondary to the primary use which are unlikely to dramatically affect a site's overall parking demand. As a result, there is less ambiguity in the parking standards around such mixed-use sites and the standards are more supportive of transitions between different land uses rather than posing unnecessary barriers.

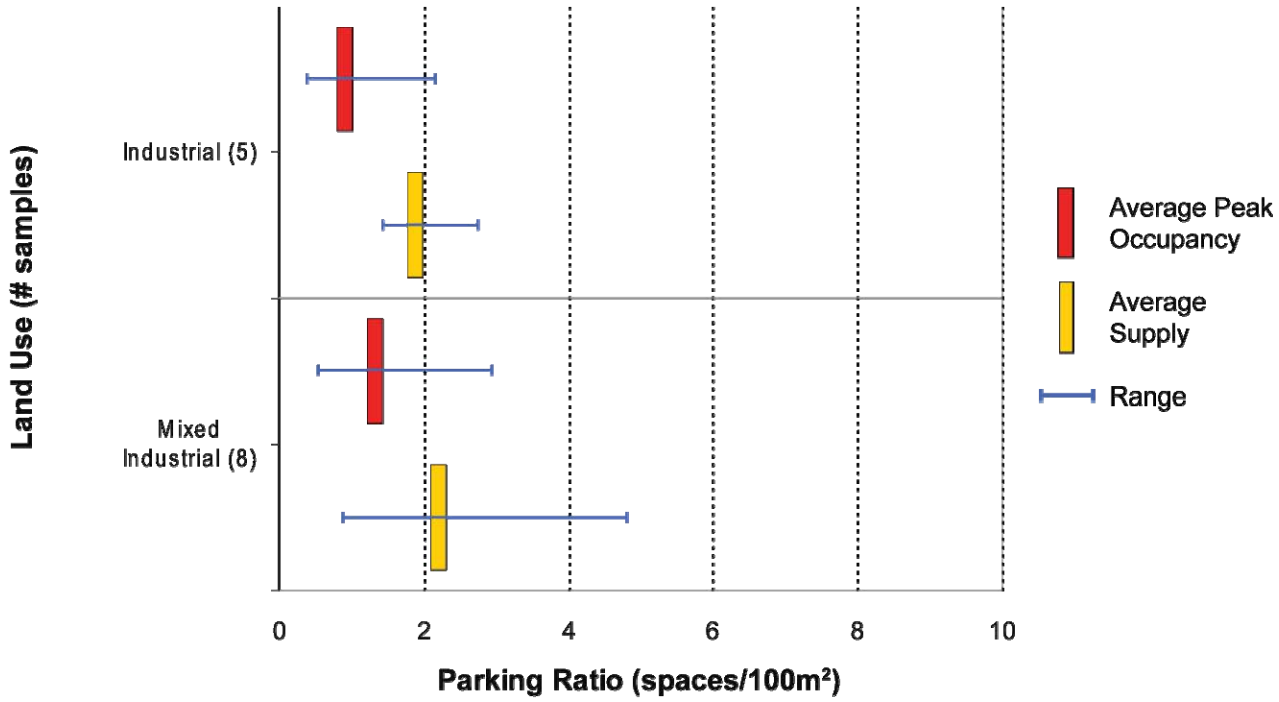
4.5.5 PARKING DEMAND

Within the City of Vaughan, the observed average industrial parking supply and peak occupancy ratios for these two land use categories are shown in Exhibit 4-21. Due to low employee densities and presumably less frequent visits from clientele, both ratios are considerably lower than for other land uses. The single tenant industrial sites have slightly lower occupancy and supply levels than the mixed industrial sites, likely due to the higher parking demand associated with the non-industrial uses at the latter. Several industrial sites showed parking supply levels below the required minimum. This "undersupplying" may indicate a willingness of developers to supply less parking than is currently required in the City's parking standards. However, City staff also pointed out that

most of these industrial sites were built to the standard but have simply lost their parking lines after a few winters.

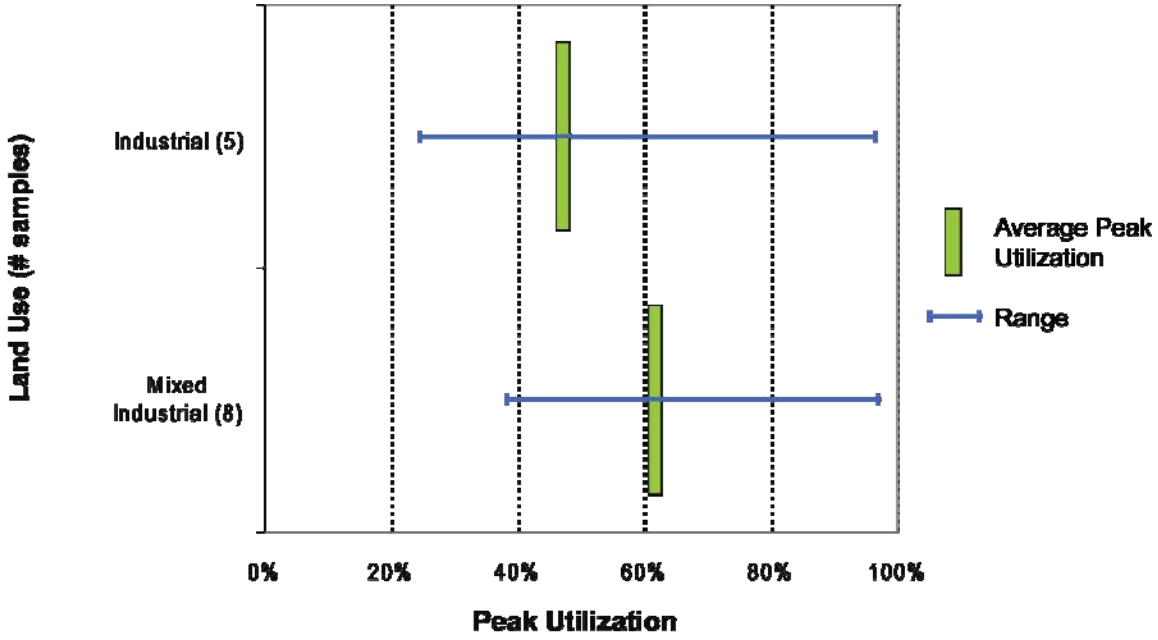
Thus, measuring parking supply at these industrial sites was complicated by most of them having large surface areas of asphalt which is often used for parking, despite not having specifically demarcated parking spaces. As a result, supply figures in many cases can significantly misrepresent the de facto parking space available. This inconsistency was the reason for excluding a number of the surveyed sites from the analysis.

Exhibit 4-21: Industrial Parking Supply and Peak Occupancy



Despite issues quantifying parking supply at these sites, Exhibit 4-22 shows average utilization is still quite low with 92 percent showing excess capacity since their utilization rates were below 70 percent. In many cases it was well below this level. Only one of the sites had parking occupancy nearly matching parking supply. In light of these results and the fact that parking supply was likely undercounted for industrial land uses, many industrial land uses appear to provide substantial excess parking.

Exhibit 4-22: Peak-Adjusted Industrial Parking Utilization



4.5.6 PROPOSED STANDARDS

The proposed industrial standards are presented in Exhibit 4-23 and proposed adjustment factors follow.

Exhibit 4-23: Proposed Industrial Parking Standards

Use Category	Description	Existing Standards	Proposed Standards (spaces/100m² GFA)						
			Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
			Min	Min	Max	Min	Max	Min	Max
Industrial - Single Tenant		1 - 2	1	-	-	-	-	-	-
Mixed Industrial Site	Also includes ancillary office, retail, personal services, and eating establishment uses no greater than 15% of GFA*	1 - 2	1.5	-	-	-	-	-	-

*Office, retail, personal services, and eating establishment floor area above 15% of site GFA, should be assessed at the use-specific rate

4.6 Places of Worship

4.6.1 ISSUES AND CONSIDERATIONS

It is a challenge to create a single parking requirement for all places of worship in a diverse city that contains many religious groups as there are many factors influencing parking demand and parking requirements at such uses:

- Places of worship may contain a number of uses (e.g., worship spaces, banquet halls, offices, daycares, etc.) that may or may not generate parking demand at the same time;
- Worship schedules vary by faith and denomination. For example, while Christian churches typically have their weekly peak hours on Sunday, Muslim mosques typically have their weekly peak on Friday afternoon;
- Many ethnic places of worship (e.g., Buddhism, Hinduism, Islam and Sikhism) do not used fixed seating in their worship areas, which makes it difficult to establish a worship capacity for the purposes of parking analysis and setting parking requirements;
- Places of worship tend to experience a very high parking demand several times a year during particular festivals or holidays, which tend to be double that of regular services, but may be up to 2.5 to 5 times the number at regular services[28];
- Places of worship may attract worshippers from the nearby community that have alternatives to driving, such as walking, or may primarily draw from a regional base which primarily drives. For example, at Orthodox synagogues, most congregants will only walk to synagogue on the Sabbath;
- Since many worshippers arrive as a family, there is a high level of ridesharing among worshippers;
- Large places of worship may be a tourist attraction;
- There is often a high potential for shared parking between places of worship and nearby or adjoining schools or other uses; and
- Places of worship are often located in residential areas, which typically provide ample on-street parking that can serve worshippers during peak demands; however, parking spillover may be a nuisance to local residents.
- Increasingly there are concerns that residential homes are being used for formalized worship services and in some cases homes are being converted into Places of Worship. This causes problems for on-street parking in existing these residential areas.

In addition to these factors, there is the trend that, on average, places of worship are becoming bigger. There are fewer neighbourhood or “territorial” churches and more and more new facilities now serve not just their immediate neighbourhood but also a more widely dispersed congregation, extending beyond the municipal boundaries[29]. Examples of large facilities in Vaughan include the Ahmadiyya Mosque and St. Claire of Assissi Church.

[28] Macaulay Shiomi Howson Ltd. for the Town of Markham, *Places of Worship Study: Background Issues & Options Report*, June 2002
[29] Agrawal, Sandeep. 2008. New Ethnic Places of Worship and Planning Challenges, Plan Canada. (forthcoming)

A second issue is the trend for places of worship to contain a significant portion of non-worship uses, such as religious personnel residences, memorial hall, ablution facilities, garden, parks, retreat centre, classrooms, daycare centres, libraries, bookstores, kitchen and dining hall, funeral home, offices (administration) or caretaker's residence. A survey in the Town of Markham, for example, found that places of worship with GFA of over 1,000m^2 were more likely to have a secondary use. Out of the 29 places of worship surveyed over 1,000m^2, 10 (34%) have day care or a private school and 12 (41%) have indoor recreational facilities. Of the 12 places of worship surveyed under 1,000m^2, none had such facilities, although they likely had some secondary uses such as kitchens and multi-purpose halls.[30] The wide variety of activities that happen at places of worship indicates that such facilities are important to communities and, further, that some are in use for many or all days of the week. Auxiliary use creates a parking demand at off-worship hours that needs to be considered in parking policy.

[30] Analysis of Town of Markham Places of Worship Survey, 2001 prepared by Town staff as reported in Macaulay Shiomi Howson Ltd. for the Town of Markham, *Places of Worship Study: Background Issues & Options Report*, June 2002

Ahmaddiya Mosque, Vaughan

St. Claire of Assisi, Vaughan

Source: Agrawal, Sandeep. 2008. New Ethnic Places of Worship and Planning Challenges, Plan Canada. (forthcoming)

4.6.2 EXISTING REQUIREMENTS

The existing place of worship parking requirement is similar to that of other place of assembly uses (e.g., banquet hall, dance hall, theatre) at 11 spaces per 100 m2 GFA.

4.6.3 REQUIREMENTS IN OTHER JURISDICTIONS

A summary of parking policy in major cities across Ontario is provided in Exhibit 4-24. As shown, parking requirements across Ontario are not uniform and vary widely both in magnitude as well as how they are specified. The main approaches involve specifying requirements based on the number of seats, worship space floor area, gross floor area, or person capacity. Others are based on the

higher of two calculations. The advantages and disadvantages of each approach are compared in Exhibit 4-25.

Exhibit 4-24: Place of Worship Parking Requirements for Ontario Jurisdictions

Per Seat Rate		
Ajax	1 per 5 seats	
Per Seat OR GFA	(higher of)	
Markham	1 per 6 seats	5.7 per 100m^2 GFA
Cobourg	1 per 6 seats	11.1 per 100m^2 GFA
Guelph	1 per 5 seats	10 per 100m^2 GFA
Stouffville	1 per 5 seats	10 per 100m^2 GFA
Richmond Hill	1 per 2.4 seats	6.4 per 100m^2 GFA
Worship Area OR GFA	(higher of)	
North York	21.3 per 100m^2 worship area	4.8 per 100m^2 GFA
GFA Rate		
Scarborough	7.7 per 100m^2 GFA	
Waterloo	8 per 100m^2 GFA	
Burlington	6 per 100m^2 GFA	
Milton	16.7 per 100m^2 GFA	
Vaughan	11 per 100m^2 GFA	
Per Seat or Worship Area	(higher of)	
Oshawa	1 per 6 seats	16.7 per 100m^2 of worship area
Mississauga	1 per 4.5 seats	27.1 spaces per 100m^2 of worship area
Brampton	1 per 4 seats	11.9 per 100m^2 of worship area
Person Capacity		
Brantford	1 per 5 persons	
Hamilton	1 per 6 persons	
Pickering	1 per 4 persons	

Source: Macaulay Shiomi Howson Ltd., Town of Markham Places of Worship Study, Background Issues & Options Report

Exhibit 4-25: Options for Measurement Basis of Place of Worship Parking Standards

Measurement Basis	Advantages	Disadvantages
Per Seat	• Captures worship space capacity in facilities with only fixed seating • Easy to apply in facilities with fixed seating	• Cannot be applied where there is no fixed seating • Seating can change over time • Does not account for secondary/auxiliary uses
Gross Floor Area	• Most easy to apply to all places of worship with and without fixed seating • Accounts for all space, not just worship space	• Does not distinguish between varying uses in a facility • May lead to parking oversupply if assumes that all space in the facility is used at once
Floor Area of the Worship Space	• Most easy to apply to all places of worship with and without fixed seating • Focuses on primary demand generating space	• Does not account for secondary/auxiliary uses • Person capacity of the worship space may vary across facilities with the same GFA (e.g. worship spaces without fixed seating generally have higher person capacity) • Size/capacity of the worship spaces can often be expanded with additional services, video links to the main worship area from another room, etc.
Person Capacity	• Easy to apply to all places of worship with and without fixed seating • Accounts for all space, not just worship space	• Does not distinguish between varying uses in a facility • May lead to parking oversupply if assumes that all space in the facility is used to maximum at once • Varies based on amount of fixed seating • Difficult to measure
Person Capacity of the Worship Space	• Easy to apply to all places of worship with and without fixed seating • Focuses on primary demand generating space	• Does not account for secondary/auxiliary uses • Size/capacity of the worship spaces can often be expanded with additional services, video links to the main worship area from another room, etc. • Varies based on amount of fixed seating

The assessment in Exhibit 4-25 demonstrates that a robust parking standard for places of worship should specifically account for the parking demand generated by the worship space, the main parking generator, but also consider parking demand generated by secondary and auxiliary uses. In addition, the standard should be applicable to worship spaces with and without fixed seating. Vaughan's existing standard is a GFA-based requirement so it can be applied to worship spaces with and without fixed seating; however, it does not account for higher person capacity of worship spaces without fixed seating. In addition, it does not distinguish between the parking demand generated by the worship space and other accessory and auxiliary uses.

4.6.4 PARKING DEMAND

Parking demand generated by the worship space is assessed using a first principles approach based on a person capacity standard and a GFA standard, as shown in Exhibit 4-26. Based on the person capacity or the area required for each person, the maximum parking demand generated by the worship space is calculated. Results are presented as the proportion of the maximum parking demand served by the required parking supply. For example, a standard of 1 parking space for every five person capacity or 6 spaces per 100 m2 of the worship area would meet approximately half of the generated parking demand if the worship space was at full capacity. Note that these calculations assume all worshippers arrive by private vehicle and an average auto occupancy of 2.5.

Exhibit 4-26: First Principles Calculation of Parking Demand for Worship Space

Person Capacity Standard	Maximum Possible Worship Space Parking Demand / Required Parking Supply	Worship Area Standard		Maximum Possible Worship Space Parking Demand / Required Parking Supply
1 space/ 7.0 Persons capacity	36%	4	Spaces/100 m^2 worship area	34%
1 space/ 6.5 Persons capacity	38%	4.5	Spaces/100 m^2 worship area	38%
1 space/ 6.0 Persons capacity	42%	5	Spaces/100 m^2 worship area	43%
1 space/ 5.5 Persons capacity	45%	5.5	Spaces/100 m^2 worship area	47%
1 space/ 5.0 Persons capacity	50%	6	Spaces/100 m^2 worship area	51%
1 space/ 4.5 Persons capacity	56%	6.5	Spaces/100 m^2 worship area	55%
		7	Spaces/100 m^2 worship area	60%
1 space/ 4.0 Persons capacity	63%	7.5	Spaces/100 m^2 worship area	64%
		8	Spaces/100 m^2 worship area	68%
1 space/ 3.5 Persons capacity	71%	8.5	Spaces/100 m^2 worship area	72%
		9	Spaces/100 m^2 worship area	77%
1 space/ 3.0 Persons capacity	83%	9.5	Spaces/100 m^2 worship area	81%
		10	Spaces/100 m^2 worship area	85%
		10.5	Spaces/100 m^2 worship area	89%
		11	Spaces/100 m^2 worship area	94%
1 space/ 2.5 Persons capacity	100%	11.5	Spaces/100 m^2 worship area	98%

Note: These calculations are based on 2.5 persons per car occupancy and 3.4m^2 GFA per seat based on surveys conducted in the Town of Markham (Source: Macaulay Shiomi Howson Ltd., Town of Markham Places of Worship Study, Future Policy Directions Report). These calculations also assume 100% auto mode split. To account for nonauto modes, the proportion of the maximum parking demand served by required parking would be increased by 0.4 x the percent of worshippers arriving by walk, cycle, or transit modes.

While these results are illustrative, should the standard be set sufficiently high so that a significant portion of parking is underutilized aside for several major festivals each year? On the other hand, some congregations may have worship spaces that are close to capacity on a regular basis. Data from nearby municipalities shows that worship spaces are not typically at full capacity. For example, the 85th percentile demand based on surveys conducted in Brampton was estimated at 1 occupied parking space per four seats. This means that 85 percent of facilities had a peak parking demand less than 1 space per 4 seats, or less than 63% of the theoretical maximum parking demand according to Exhibit 4-26.

Another point is that the relationship between parking standards specified by person capacity versus those specified by GFA is very dependent on the arrangement of the worship space. Exhibit 4-26 assumes a relationship of 1 person per 3.4 m^2 based on typical seating densities[31]. However, assembly occupancy under the Ontario Building Code is 0.75 m^2 per person for areas with non-fixed seating. As such, while a standard of 1 parking space for every five person capacity or 6 spaces per 100 m2 of the worship area may require similar levels of parking for facilities with fixed seating, for those without fixed seating, the person capacity standard could require between four and five times the parking as the GFA standard. It is therefore proposed that the standard be based on GFA rather than person capacity.

[31] Macaulay Shiomi Howson Ltd., Town of Markham Places of Worship Study, Future Policy Directions Report

4.6.5 PROPOSED STANDARDS

As discussed, a robust parking standard for places of worship should specifically account for the parking demand generated by the worship space, the main parking generator, but also consider parking demand generated by secondary and auxiliary uses. In addition, the standard should be applicable to worship spaces with and without fixed seating.

Exhibit 4-27 presents the assumed auto mode split and facility/parking occupancy level and corresponding proposed minimum and maximum parking standards for each geographic category. Different parking standards are proposed for places of worship with and without fixed seating, reflecting the higher person capacity typical of worship spaces without fixed seating.

For comparison purposes, it is typical that the worship area would represent approximately 30% of the total GFA of a place of worship facility (the other areas being comprised of corridors, offices, sanctuaries, etc.). Therefore, the existing standard of 11 spaces per 100 m^2 translates into 36 spaces per 100 m^2 of worship area, which is similar to the proposed base minimum for variable seating (i.e. 34 spaces per 100 m^2).

Exhibit 4-27: Base Assumptions and Proposed Parking Standards by Geographic Category

Area	Assumptions for Minimum Standard		Assumptions for Maximum Standard		Proposed Parking Standard (spaces/100 m^2 GFA of Worship Area)			
	Auto Mode Split	Facility/Parking Occupancy Factor (1)	Auto Mode Split	Facility/ Parking Occupancy Factor(1)	Permanent Seating		Variable Seating	
					Minimum	Maximum	Minimum	Maximum
High-order Transit Hubs	50%	50%	70%	70%	9.0	18.0	13.0	26.0
Local Centres	70%	60%	80%	80%	15.0	23.0	22.0	34.0
Primary Centres and Intensification Areas	70%	70%	90%	90%	18.0	29.0	26.0	43.0
Base	80%	80%	-	-	23.0	-	34.0	-
Places of Worship > 2,800 m^2 (~30,000 ft^2 GFA)- Increase minimum and maximum standard (if applicable) by 10%								

(1) Factor to account for attendance levels as well as the potential for off-site parking.

The proposed parking standards are based on the floor area of the worship space. A "worship area" should be defined as:

The aggregate of those areas whether above or below established grade measured between the walls of the sanctuary, hall or meeting room(s) which a religious group, organization or denomination utilizes for the observance of its religious services, including any balcony or area which can be opened on a temporary basis to such a sanctuary, hall or meeting room(s) by the removal or opening of any walls or partitions and any choir or musicians' area, but excluding any areas intended solely for the use of the worship group leader such as altar or pulpit areas. (Source: City of Mississauga)

In addition, parking requirements for auxiliary uses, such as residences, schools and day cares should be based on the specific requirements for these uses, in which case their floor area should be excluded from the GFA of the facility.

Therefore the total parking requirement would be

- Parking requirements for worship uses and accessory space, *plus*
- Parking requirements for non-worship areas that have auxiliary uses based on the City's current standards for those individual uses.

To account for the fact that large places of worship typically attract a more regional congregation who are more likely to drive, it is also proposed that the minimum and maximum parking standards be increased by 10% for facilities larger than 2,800 m^2 GFA (~30,000 ft^2 GFA). The City of North York has used 2,787 m^2 (30,000 ft^2) as a threshold for regional places of worship[32]. Approximately 14% of places of worship established since 1990 are above this threshold.

Given the wide variation in parking demands generated by places of worship, it is recommended that a parking study be undertaken for all places of worship that require 100 parking spaces or more, based on the recommended parking standards. A parking study should also be undertaken for places of worship that seek a reduction in required parking.

4.7 Places of Assembly, Places of Entertainment, and Related Uses

This section presents proposed parking requirements for places where people commonly gather for business or recreation such as places of assembly or entertainment, and convention centres and hotels.

4.7.1 EXISTING REQUIREMENTS

Existing requirements for places of assembly and related uses are presented in Exhibit 4-27. The uses are organized to show which uses have similar minimum parking requirements. As shown, most of the presented uses have parking requirements of 11 spaces per 100 m2 GFA (i.e., dance hall, club, banquet hall, convention centre, and places of entertainment) or 0.33 spaces per person in the maximum design capacity (1 space per 3 person capacity). Museums and art galleries have a lower standard of 0.2 spaces per person in the maximum design capacity (1 space per 5 person capacity), while bowling alley requirements are specified per lane and hotel requirements are specified per bedroom.

The existing standards illustrate two main approaches to specifying parking requirements for such uses: spaces per 100 m2 GFA or spaces per person in the maximum design capacity. The merits of each approach will be discussed further in the following section.

Exhibit 4-27: Existing Parking Requirements for Places of Assembly and Related Uses

Use	Minimum Parking Requirement
Hotel/Motel	1 per bedroom plus the requirements for any other use
Dance Hall, Club, Banquet Hall	11/100m^2 GFA
Convention Centre	11/100m^2 GFA
Place of Entertainment (including movie theatre, other theatre, arena, auditorium, and public hall)	11/100m^2 GFA
Place of Assembly	0.33/person in the maximum design capacity
Community Centre (recreational and institutional uses)	0.33/person in the maximum design capacity

[32] City of North York Places of Worship in Industrial Zones, Official Plan Amendment and Zoning By-law Amendment, 1994.

All Season Sports Facility	0.33/ person in the maximum design capacity
Museum, Art Gallery, Y.M.C.A., Y.W.C.A.	0.2/ person in the maximum design capacity
Place of Amusement meaning an arcade	0.17/ person in the maximum design capacity
Bowling Alley	4 per lane
Funeral Home	4/100m^2 GFA with a minimum of 15 spaces

4.7.2 REQUIREMENTS IN OTHER JURISDICTIONS

Vaughan's parking requirements are compared with other Canadian jurisdictions for places of assembly and entertainment, theatres and arenas, banquet halls, and hotels in Exhibit 4-28.

Exhibit 4-28: Comparison of Parking Requirements Across Canadian Jurisdictions for Places of Assembly and Related Uses

Jurisdiction	Place of Assembly/ Entertainment	Stadium/Arena/ Theatre	Banquet Hall	Hotel/Motel
Vaughan	0.17-0.33 per person capacity	Arena/theatre: 11 Sports facility: 0.33 per person capacity	11	1.00 per bedroom plus requirements for other uses
Mississauga	0.17 per seat	0.33 per seat	10.8	1 per room
Hamilton	0.17 per seat	0.17 per seat		1 per room
Kingston	0.1 per seat	0.1 per seat		0.33 per guestroom + 0.2 per employee + 0.25 per person capacity for beverage rooms.
Niagara Falls		0.2 per seat		0.5 per room +18.2 per 100m2 of place of assembly area
London	Area2 - 0.125 per seat or 2.86 per 100m2, Area 3 - 0.14 per seat or 4 per $100m^2$	Arena - Area2 - 0.125 per seat or 2.86 per 100m2, Area 3 - 0.14 per seat or 2.86 per 100m2 . Stadium - Area2 - 0.13 per seat, Area 3 - 0.17 per seat	Area2 - 0.125 per seat or 2.86 per 100m2, Area 3 - 0.14 per seat or 4 per $100m^2$	1.25 per unit
Brampton	12.5 per $100m^2$		12.5 per $100m^2$	
Markham	10 per $100m^2$	0.17 per seat	10 per $100m^2$	
Vancouver	4.84 per $100m^2$	Theatre - 9.68, Stadium/Arena - 0.2 per seat or 9.68, whichever is greater		1 per unit + 0.5 per sleeping/ housekeeping unit
Calgary		0.33 per seat		1.00 per room, 0.33 for Central Business Area
Winnipeg	11 per $100m^2$	11 per $100m^2$	11 per $100m^2$	1 per unit + 1 per 8 seats of auxiliary rooms
ITE Average Rate		0.2 per seat		0.8 per room

This table further illustrates that parking requirements for such places of assembly and related uses are typically specified as spaces per 100 m2 GFA or spaces per seat or person in the maximum design capacity. The GFA-based approach is the simplest to apply and considers all area in the establishment. On the other hand, the per seat or per person capacity approach is directly related to the peak occupancy of the development and thus the peak parking demand. In addition, using design capacity as the measurement basis will distinguish between different spaces in a facility (e.g., a gym, versus a swimming pool, versus a multi-purpose room).

4.7.3 PROPOSED STRUCTURE OF STANDARDS

The proposed organization of parking requirements for places of assembly and related uses is slightly modified from the existing structure, as follows:

- Hotel/Motel
- Banquet Hall, Dance Hall, Club, Convention Centre
- Heath/Fitness Club
- Place of Assembly and Place of Entertainment including theatre, auditorium, public hall arena, and all seasons sports facility
- Community Centre and Library
- Museum and Art Gallery
- Bowling Alley
- Funeral Home

4.7.4 HOTELS AND MOTELS

Issues and Considerations

Typically, Hotel parking requirements are specified per guest room and are typically in the range of 1 space per bedroom as shown in Exhibit 4-28 earlier. However, if there is a significant draw to the hotel from non-guests, this approach may be inaccurate. Reflecting this, Vaughan's current standard specified that parking requirements for other uses, such as convention space, restaurants and meeting rooms be assessed separately. However, if such uses are assessed separately, the per-room requirement of 1 parking space is likely high, based on the above parking demand data. In addition, parking demand at hotel restaurants and convention centres will likely be lower than similar stand alone sites, since a certain portion of patrons are expected to include hotel guests who do not require additional parking. The percent of restaurant patrons or conference attendees who are also guests will vary significantly based on the type of restaurant or gathering event. *Shared Parking*[33] indicates that guests make up between 10 – 70 percent of restaurant patrons and 10- 75 percent of meeting attendees.

Other factors to consider are that a number of hotel rooms are frequently unoccupied and many travellers arrive by taxi, transit, or hotel-operated shuttles, which reduce the need for parking by hotel guests.

Parking Demand

The parking demand at hotels is affected by the way they are used. The Institute of Transportation Engineers (ITE) identifies four main types of hotels:

- **Hotels**: a full-service establishment with restaurants and cocktail lounges as well as meeting/banquet/convention space in addition to rooms;
- **Business Hotels**: have limited restaurant and meeting facilities compared to full-service hotels;

[33] *Shared Parking 2nd Edition*, Urban Land Institute and the International Council of Shopping Centers, 2005.

- **Motels**: oriented to automobile travellers and offer little or no restaurant or meeting space; and

- **Resort Hotels**: similar facilities to full-service hotels, but oriented towards leisure travellers.

Exhibit 4-29 below provides parking data for the four types of hotels. Note that the quantity of space for the meeting rooms, banquet hall and convention area can vary significantly by site. Parking demand varies significantly by type of hotel with full service hotels having higher parking demands due to auxiliary uses, such as restaurants and convention space.

Exhibit 4-29: Parked Vehicles per Hotel Guest Room

	Hotel	Business		Motels	Resort
	Weekdays	Weekdays	Saturdays	Weekdays	Weekdays
Sites	14	3	3	5	3
Range	0.6 - 1.9	0.57 - 0.74	0.58 - 0.75	0.76 - 1.1	0.95 - 2.16
85th Percentile	1.14	0.71	0.72	1.02	1.86
Average	0.91	0.6	0.66	0.9	1.42

Source: Institute of Transportation Engineers, Parking Generation, 3rd ed

Full-service hotels was further investigated through a 1988 study of four luxury hotels. Exhibit 4-30 presents the results for guest room and employee parking demand from this study based on 90th percentile values. These results are similar to the ITE values and indicate that hotel parking accumulation for guests and employees is often below one space per room.

Exhibit 4-30: Results Comparison for Hotels Serving Office Parks and Airports

	Office Park		Airport	
	Weekdays	Weekends	Weekdays	Weekends
Guest Rooms				
Percent Occupancy	100%	90%	100%	90%
Number of Guests per Occupied Room	1.2	1.7	1.2	1.3
Auto Mode Split per Room	66%	77%	54%	59%
Peak Parking Accumulation, Average Spaces per room	0.66	0.69	0.54	0.53
Employees				
Peak Number Present per Occupied Room	0.33	0.25	0.33	0.25
Percent Drivers	75%	70%	75%	70%
Equivalent Parking Accumulation, Spaces per Room	0.25	0.18	0.25	0.18
Total	0.91	0.87	0.79	0.71

Source: Salzman, G. (1988) *Hotel Parking: How Much is Enough?*, Urban Land, January.

Proposed Standards

Based on this analysis, proposed hotel/motel standards are presented in Exhibit 4-31 and proposed adjustment factors follow. It is recommended that the current requirement of one space per

bedroom be maintained as the basic requirement. In High-Order Transit Hubs this is reduced to 0.8 spaces per bedroom reflecting that more guests and employees have transit options. In addition, there is little risk in reducing the standard to this level given that peak parking accumulation at hotels is typically below this rate as shown in Exhibit 4-29 and Exhibit 4-30 above.

Exhibit 4-31: Proposed Hotel Parking Standards

Use Category	Existing Standards	Proposed Standards (spaces per bedroom)						
		Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
		Min	Min	Max	Min	Max	Min	Max
Hotel/Motel	1 per bedroom plus the requirements for any other use	0.9(1)	0.75(1)	-	0.85(1)	-	0.85(1)	-

(1) Plus 90% of the requirements for any other use (e.g., restaurant, convention centre) to account for shared parking

4.7.5 BANQUET HALLS, DANCE HALLS, CLUBS, AND CONVENTION CENTRES (EXCLUDING HEALTH/FITNESS CLUBS)

Issues and Considerations

Banquet halls are a prevalent use in Vaughan. As shown in Exhibit 4-28 above the existing standard of 11 spaces per 100 m2 is similar to the standards in a number of other jurisdictions including Markham (10), Winnipeg (11), Brampton (12.5), and Mississauga (10.8).

Parking demand at banquet halls and related uses is a function of guest and employee demand. The number of guests that can be accommodated is related to the size of the event and the area dedicated to seating versus dancing or performance and kitchens. Large banquet facilities can also have more than one hall, possibly having one large hall and other small halls. The halls may or may not be used simultaneously based on the individual banquet hall.

Convention centres, conference centres, meeting rooms, and banquet halls often serve related functions both for personal and business use. Thus, it makes sense to consider them in a single parking standard.

Parking Demand

Parking demand at such facilities is primarily a function of guest demand, although there is also an employee component. Exhibit 4-32 provides a first principles estimation of parking accumulation for banquet and meeting facilities. Key variables include:

- **The capacity of the facility** – This depends on the layout of the space and the area dedicated to seating versus dancing or performance and kitchens. The ITE Parking Generation database recommends a person density of 33 seats per 100 m2 for fine dining restaurants, which includes kitchens. Banquet hall capacity may be somewhat lower than this rate due to the provision of space for dancing and greater amounts of public space (e.g. lobby). Another study of hotel parking found that attendees occupy

meeting rooms at a rate of 22-43[34] people per 100m^2; however, this rate does not include non-meeting space (e.g. kitchens, bathrooms, etc.). Based on these values, three capacity rates are considered: 20, 30, and 40 people per 100m^2

- **Auto occupancy** – Auto occupancy is expected to be higher for personal functions (e.g. weddings) and lower for business functions (e.g. professional conferences). For simplicity, one auto occupancy rate of 2 people per vehicle was used as a mid-range value.

- **Auto mode split** – The proportion of guests arriving by private vehicle depends on the transit accessibility of the location as well as the proportion of guests arriving by foot if the facility is integrated with a hotel as is often the case. Two auto mode split values of 85% and 100% are used to consider a site with reasonable transit access compared to a fully auto-oriented site.

- **Occupation of the space** – The capacity values consider the layout of the gathering space (e.g. conference seating versus dining tables and a dance floor), assuming that all gathering space is occupied. However, it is rare for a banquet hall or conference event to use all available space at once (i.e., referred to as simultaneous occupation). For example, a wedding may involve the ceremony in one room followed by the reception in another (referred to as sequential occupation). Parking accumulation for simultaneous occupation is multiplied by 0.6 to derive the sequential occupation parking rate.

Exhibit 4-32: First Principles Calculation of Parking Demand for Banquet Halls/Convention Centres

Capacity (people/100m^2)	Auto Occupancy (people/vehicle)	Auto Mode Split	Parking Accumulation (spaces/100m^2)	
			Simultaneous Occupation(1)	Sequential Occupation(2)
22	2	85%	8.5	5.1
		100%	10.0	6.0
33	2	85%	12.8	7.7
		100%	15.0	9.0
43	2	85%	17.0	10.2
		100%	20.0	12.0

[34] Salzman, G. (1988) *Hotel Parking: How Much is Enough?*, Urban Land, January. This paper reports 43 people per 100m^2 as the 90th percentile event.

(1) Simultaneous occupation assumes that all the public space in the banquet hall/convention centre is used at once

(2) Sequential occupation assumes that space is used in sequence (e.g. wedding ceremony followed by reception in a separate room) so results from simultaneous occupation are multiplied by 60%

These results show that the current parking requirement of 11 spaces per 100m^2 corresponds to the high capacity scenario with almost 100% auto mode split, relatively low auto occupancy, and sequential occupation. This parking requirement likely accommodates for the vast majority of events at such facilities.

Of note, for full-scale convention centres *Shared Parking* recommends a rate of 5.9 spaces per 100m^2 (excluding employees)[35]. This reflects the conditions that such facilities are rarely used to full capacity and are typically located in downtown areas with good transit access and off-site parking alternatives.

Proposed Parking Standards

Based on this analysis, the proposed parking requirements for banquet halls, dance halls, clubs, and convention centres are presented in Exhibit 4-31 and proposed adjustment factors follow. It is recommended that the current requirement of 11 spaces per 100m^2 be reduced slightly to 10 spaces per 100m^2 bringing it in line with the proposed eating establishment parking requirement.

Exhibit 4-33 presents the assumed auto mode split and proposed minimum and maximum parking standards for each geographic category. These calculations are based on a capacity of 30 people per 100m^2 and an assumed auto occupancy of 2.0 persons per vehicle. As discussed in Section 4.2, a further adjustment factor (75%) is applied to account for the fact that in many places with non-fixed seating (e.g. convention centres), not all spaces are used simultaneously. Parking ratios have been rounded to the nearest half space for simplicity.

Exhibit 4-33: Proposed Banquet Hall, Dance Hall, Club, and Convention Centre Parking Standards

Area	Facility/ Parking Occupancy Factor	Assumed Auto Mode Split	Simultaneous Occupancy Factor	Proposed Parking Standard (spaces / 100m^2 GFA)
				Minimum
Higher Order Transit Hubs	50%	50%	75%	3.0
Local Centres	60%	70%	75%	4.5
Primary Centres and Primary Intensification Areas	70%	70%	75%	5.5
Base	80%	80%	75%	7.0

The base standard for the 'Base' category is based on an auto mode split of 80% and design facility/parking occupancy factor of 80%. As discussed, this corresponds to a typical weekly peak attendance. Auto mode splits are reduced for other areas based on higher levels of transit service and the more walkable environments typical of these areas.

[35] *Shared Parking 2nd Edition*, Urban Land Institute and the International Council of Shopping Centers, 2005.

4.7.6 HEALTH/FITNESS CLUB

Issues and Considerations

- There is currently no specific requirement for health clubs. They would likely be grouped under "clubs" with an existing parking requirement of 11 spaces per 100m^2
- Health clubs often have multiple uses (e.g. pools, fitness rooms, gyms) which may make it difficult to determine the person capacity or cause parking demand to vary between clubs based on the facilities they offer.
- New fitness clubs are large and can be quite popular.

Parking Demand

As part of a parking zoning review in Hamilton, parking surveys were conducted at a fitness club and found a peak parking demand of 7.5 spaces per 100m^2 The corresponds well with the 85th percentile parking accumulation observed from surveys conducted by the Institute of Transportation Engineers, as shown in Exhibit 4-34. Based on this data, the ITE recommends 7.5 parking spaces per 100m^2 with 0.4 per 100m^2 already added for employee parking.

Exhibit 4-34: Weekday Parking Generation at Health Clubs

	ITE Health/Fitness (Study 1)	Health Club Study (Study 2)
Sites	20	16
Peak Hour	6 p.m.	6 p.m.
Range (Spaces per 100m^2 GFA)	1.9 - 17.2	1.5 - 14.4
85th percentile accumulation	8.9	7.4
Average accumulation	5.6	5.0
Employees/100m^2	0.61	-

Study 1: ITE, *Parking Generation*, 3rd Ed., Study 2: John Dorsett, "Parking Requirements for Health Clubs," *The Parking Professional*, April 2004

Proposed Parking Standards

Based on this analysis, the proposed parking requirements for health and fitness clubs are presented in Exhibit 4-35 and represent a significant reduction over the existing standard. The proposed adjustment factors follow below.

Exhibit 4-35: Proposed Health or Fitness Club Parking Standards

Use Category	Existing Standards	Proposed Standards (spaces per 100 m^2)						
		Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
		Min	Min	Max	Min	Max	Min	Max
Health Club or Fitness Club	11 spaces / 100 m^2 GFA	7	5	-	6	-	6	-

4.7.7 THEATRE, AUDITORIUM, PUBLIC HALL, ARENA, ALL SEASONS SPORTS FACILITY, AND OTHER PLACES OF ASSEMBLY AND ENTERTAINMENT

Issues and Considerations

- Parking requirements for stadiums, arenas, and theatres are typically based on the number of seats or person capacity;
- Parking requirements for such uses typically range from 0.1-0.33 spaces per seat, which means that Vaughan's requirement of 0.33 spaces per person in the maximum design capacity is on the high end;
- The existing requirement for places of entertainment (11 spaces per $100m^2$) is difficult to relate to expected parking demand based on the range of capacity and occupancy patterns across these uses;
- Specifying parking rates based on design capacity requires additional parking for non-seating public areas in theatres, such as food services and arcades, which are primarily patronized by theatre guests. This may result in an oversupply of parking is parking requirements are designed based on the maximum capacity of the entire space rather than the theatre space.

Parking Demand

Parking demand is presented for movie theatres, performing arts theatres, and arenas and sports facilities based on published studies. Movie theatres are generally multi-screen facilities where the new development range is typically between 8 and 20 screens. The employee ratio per seat is typically less than 0.01[36]. Results from 5 studies are provided below in Exhibit 4-36. The sites are generally auto-oriented and have limited alternative transportation options.

Exhibit 4-36: Peak Parking Accumulations in Movie Theatres (Spaces per Seat)

	Parking Generation		WSA Study		WPC Study		PHR&A Study			
Day	FRI	SAT	WED	FRI/SAT	WED	SAT	WED/THUR	WED/THUR	FRI	FRI
Month			JUN	JUN	AUG	AUG	JAN	DEC	JAN	DEC
Sites	6	7	1	2	1	4	4	4	4	4
Range	0.11-0.46	0.11-0.23	0.04	0.18-0.23	0.04	0.08-0.16	0.03-0.14	0.13-0.30	0.2-0.34	0.16-0.36
85th Percentile	0.36	0.23	-	0.23	-	0.16		0.18		0.26
Average Ratio	0.26	0.19	0.04	0.21	0.04	0.11	0.07	0.18	0.25	0.24

Sources: ITE, *Parking Generation*, 3rd ed.; Wilbur Smith Associates, unpublished study of movie theatre parking patterns, Pigeon Forge, Tennessee, June 2001; Walker Parking Consultants, unpublished study of movie theatre parking patterns, 2003; Patton Harris Rust & Associates, *Fairfax Corner Shared Parking Study*, including Addendum 2, February 2001.

The 85th percentile parking accumulation ranges from 0.16 to 0.36 spaces per seat, while the average ranges from 0.07 to 0.26 spaces per seat.

Performing arts theatres house live plays, musical/individual performances, comedy shows and special shows. Large theatres are generally in downtown areas where shared parking can occur more easily. Performing arts theatres mostly peak around Christmas time and reach 90% of peak in the summer months. *Shared Parking* specifies a maximum parking demand rate of 0.4 spaces per

[36] *ibid.*

seat based on a sold out show, three attendees (customers) per car, 0.08 employees per seat and 1.2 persons per car[37]. This standard assumes little use of transit or buses.

For arenas, *Shared Parking* specifies a maximum parking demand rate of 0.33 parking spaces per seat based on lower number of employees and lower attendee density. It is important to recognize that these recommended parking rates are based on the peak parking accumulation associated with little walking, bussing or public transit, sold-out events, and free parking.

Proposed Parking Standards

Proposed standards are based on GFA of the facility. The proposed parking requirements for theatres, auditoriums, public halls, arenas, all seasons sports facilities, and other places of assembly and entertainment are presented in Exhibit 4-37 along with the assumed auto mode split and proposed minimum parking standards for each geographic category. These standards are based on a combination of the first-principles analysis using an assumed auto occupancy of 2.0 persons per car and a design capacity of 80%. Standards have been rounded to the nearest half. As with standards for other places of assembly, the standards have been reduced for geographic categories other than the base. These reductions are notional and also reflect the fact that there would be more off-street parking available in the Higher-order transit hubs and centres.

Exhibit 4-37: Base Assumptions and Proposed Standards by Geographic Category

Area	Facility/ Parking Occupancy Factor	Assumed Auto Mode Split	Proposed Parking Standard (spaces / 100m² GFA)
			Minimum
Higher Order Transit Hubs	50%	50%	5.0
Local Centres	60%	70%	8.0
Primary Centres and Intensification Areas	70%	70%	8.0
Base	80%	80%	10.0*

4.7.8 COMMUNITY CENTRES AND LIBRARIES

Issues and Considerations

- Community centres can contain a variety of uses from meeting spaces, to recreational facilities and office space.

- As is currently the case for the community centres parking requirement, maximum design capacity is an appropriate factor for specifying parking requirements, since person capacity and peak parking demand will vary between different types of uses in one facility.

- Libraries typically collocate with other municipal facilities (e.g., community centres, arena, sports facility, pools, etc.), which is why it makes sense to consider one parking standard for both uses.

[37] *ibid.*

Parking Demand

Community centres often contain space that could be classified as place of assembly or entertainment. The maximum parking demand for this space would be similar to the results reported in the previous section, 4.7.7. Libraries also often contain meeting space, although the parking demand at such facilities tends to be lower than places of assembly. Library parking requirements in other jurisdictions range from 1.1 to 4.8 spaces per 100m^2

Proposed Parking Standards

A single parking standard is proposed for community centres and libraries reflecting that libraries often collocate with community centres. The proposed basic minimum requirement for such uses is 2 spaces per 100m2. This is slightly lower than the proposed place of assembly and place of entertainment requirement, since community centres typically have multiple uses, which rarely all experience peak occupancy at similar times.

The proposed parking requirements for community centres and libraries are presented in Exhibit 4-38 and proposed adjustment factors follow.

Exhibit 4-38: Proposed Community Centre and Library Parking Standards

Use Category	Existing Standards	Proposed Parking Standard (spaces / 100m^2 GFA)						
		Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
		Min	Min	Max	Min	Max	Min	Max
Community Centre, Library	3.5/ 100 m^2 GFA[(1)] and 0.33/ person in the maximum design capacity[(2)]	2	1	-	1.5	-	1.5	-

[(1)] Library
[(2)] Community Centre

4.7.9 OTHER USES

Additional uses include:

- **Museum and Art Gallery**: The current requirement is 0.2/person in the maximum design capacity. Parking needs vary substantially based on the popularity of the facility. Given the non-profit nature of most of these facilities, parking costs may be a significant issue. However, parking requirements may be substantially higher if the facility is used for banquets and receptions. The community centre/library standard of 2 spaces per 100 m^2 is proposed. Similar to the community centre/library uses, reduced requirements are proposed in High-Order Transit Hubs, Local Centres, and Primary Centres/ Primary Intensification Areas.

- **Place of Amusement**: This use is defined as an arcade not located within 300 metres of a school. It is proposed that the standard for other Places of Assembly as outlined above be adopted.

- **Bowling Alley**: The current requirement is 4 spaces per lane. This is relatively average requirement compared to other jurisdictions and it is proposed that this requirement be maintained.

- **Funeral Home**: The current parking requirement is 4 spaces per 100m^2 with a minimum of 15 spaces. The existing standard is actually at the low end of the spectrum based on other jurisdictions. Mississauga, for example, requires 7.5 spaces per 100m^2 Some jurisdictions base the requirement on seating in the principal assembly area ranging from 0.14 spaces per seat (1 space/7 seats) to 0.2 spaces per seat (1 space/5 seats). Since no issues have been identified with the current requirement, it is recommended that the existing requirement be maintained.

4.8 Institutional Uses

This section presents proposed parking requirements for schools, day cares, and hospitals.

4.8.1 EXISTING REQUIREMENTS

The existing requirements for City of Vaughan's institutional uses are presented in Exhibit 4-39. As shown, there are several approaches to framing such parking requirements. Some standards are employee-based with others are framed based on 100m^2 GFA. The merits of each approach will be discussed further in the following sections.

Exhibit 4-39: Existing Parking Requirements for Institutional Uses

Use	Minimum Parking Requirement
Day Nursery	1.5 / employee
Public or Commercial School (Elementary)	1.5 / teaching classroom
Public or Commercial School (Secondary)	4 / teaching classroom
Technical School	Greater of 4 / classroom or 6 / 100m^2 GFA
Hospital, Private and/or Public	3 / 4 beds in addition to 1 / 4 employees

4.8.2 REQUIREMENTS IN OTHER JURISDICTIONS

In Exhibit 4-40, Vaughan's parking requirements are compared with other Canadian jurisdictions for institutional uses, with the scope of the technical school land use broadened to include non-technical post-secondary institutions.

Exhibit 4-40: Comparison of Parking Requirements Across Canadian Jurisdictions for Places of Assembly and Related Uses

Jurisdiction	Elementary School	Secondary School	Community College / University / Other Post-Secondary Institution	Day Nursery	Hospital
Vaughan	1.5 per classroom	4 per classroom	Greater of 4 per classroom or 6 per 100m^2 GFA	1.5 per employee	3 per 4 beds plus 1 per 4 employees
Mississauga	1 per 100m^2 GFA	1.5 per 100m^2 GFA	1.5 per 100m^2 GFA	2.5 per 100m^2 GFA	2.5 per 100m^2 GFA
Markham	1 per classroom	4 per classroom	5 per classroom plus 1 per 6 seats in an auditorium / theatre	1.5 per classroom plus 1 per 5 children	Greater of 0.5 per bed or 2.7 per 100m^2 NFA (approx 3 per 100m^2 GFA)
Hamilton	1.25 per classroom	3 per classroom plus 1 per 7 seats in an auditorium / theatre / stadium	5 per classroom plus the greater of 1 per 7 seats in an auditorium / theatre / stadium OR 4.35 per 100m2 GFA of an auditorium / theatre / stadium	0.8 per 100m^2 GFA	1 per 100m^2 GFA
Kingston	1 per 2 employees	1 per 2 employees	1 per 2 employees	0.85 per 100m^2 GFA	1 per 6 beds plus 1 per 6 employees
Niagara Falls	1 per teacher plus 1 per 2 employees	1 per teacher plus 1 per 2 employees plus 1 per 20 students			1 per 2 beds
London	3 spaces plus 1 per classroom	3 per classroom	1 per 100m^2 GFA plus 1 per 15 students	2.5 per 100m^2 GFA	1.25 per bed or 3 per bed[38]
Brampton	1 per 100m^2 GFA + 1 per portable	1.5 per 100m^2 GFA + 1 per portable	Greater of 5 per 100m^2 GFA OR 4 per classroom	1 per employee plus 1 per 10 children	
Vancouver	0.67 per employee	1.25 per employee	- determined by planning director -		1.08 per 100m^2 GFA
Calgary	1 per 15 students plus 2.5 per 100 students for pick-up/drop-off[39]	1 per 8 students plus 2.5 per 100 students for pick-up/drop-off[40]	- requires parking study -	Greater of 0.5 per employee or 1 per 10 children	
ITE Average Rate[41]	0.28 vehicles per student	0.26 vehicles per student	0.3 vehicles per student	1.35 vehicles per employee	4.7 per bed

[38] Depends on the region of the hospital (area 2 or area 3)
[39] Grades 1 - 6
[40] Grades 10 - 12
[41] Institute of Transportation Engineers (2004) Parking Generation, 3rd Edition. Aside from Day Care Centre, these averages are based on very low suburban sample sizes.

This table illustrates that parking requirements for institutional uses are specified in diverse terms; aside from Mississauga, GFA-based requirements tend to be the exception. The GFA-based approach is the simplest to apply, however, the per student/employee capacity approach is directly related to the peak occupancy of the development and thus the peak parking demand. In addition, using design capacity as the measurement basis will ensure that ancillary uses within the building are not falsely assumed to generate more parking demand (e.g. gymnasiums, swimming pools, arenas, play areas). The merits of each approach will be discussed below, in reference to each particular land use.

4.8.3 HOSPITALS

Issues and Considerations

As shown in Exhibit 4-40, hospital parking standards in other jurisdictions are based on a wide range of units, with approximately half basing their standards on GFA and the other half on the number of beds/employees. Vaughan's current standard is based on the latter, requiring 3 parking spaces for every 4 hospital beds in addition to 1 space per 4 employees. Relative to Kingston and Niagara Falls, this standard is high. However, it appears to be on par with the requirements of suburban London[42].

Parking Demand

Hospital parking demand is increasingly less correlated with the number of beds as the current trend in health care provision is to devote increasingly more floor area to outpatient care rather than inpatient care. As such, it is recommended that Vaughan not continue to base its hospital parking requirements on the number of beds or the number of employees. Similarly, it is felt that a GFA-based standard is inappropriate for hospitals given the diversity in the nature of services they provide.

Further complicating matters, many hospitals opt to charge parking fees, which can substantially reduce parking demand. This demand reduction was observed through ITE surveys in the U.S., which are unable to provide statistically significant data suggesting appropriate corresponding parking demand rate reductions[43].

Proposed Standards

Due to the above complications, it is recommended that the City of Vaughan not specify a standard for hospital land uses, as is practiced in the City of Toronto and as was recently recommended for the City of Hamilton[44]. Thus new hospitals and hospital expansions will require parking studies. Given the magnitude of hospital developments, developers typically do their own traffic and parking studies regardless. Thus, in most cases this recommendation is not expected to generate extra work for developers or municipal staff. Rather, it better reflects the reality of developing hospitals and promotes sensitivity to local context and parking needs. Pricing and other TDM measures offer the potential to significantly reduce parking demand, thus they should be strongly encouraged throughout the development approval process to promote more compact development.

4.8.4 ELEMENTARY AND SECONDARY SCHOOLS

Issues and Considerations

As shown in Exhibit 4-40 above, the existing elementary school standard of 1.5 spaces per 100m^2 is high compared to other jurisdictions which also specify their standard based on the number of classrooms: Markham (1), Hamilton (1.25), and London (1). For secondary schools, the Vaughan

[42] Assuming an employee to bed ratio of 8, as observed in ITE (2004) Parking Generation, 3rd Edition.
[43] Ibid.
[44] Marshall Macklin Monaghan (2005) CITY-WIDE and Downtown Parking and Loading Study

standard is typical and on par with Markham (4) and Hamilton (3+), but higher than London (3). As with elementary schools, some standards are GFA-based and others based on the number of employees.

Parking demand at elementary schools derives primarily from employees since the children are too young to be driving themselves. With staffing levels and the number of students being tightly correlated, these metrics tend to be better indicators of parking demand for schools than GFA. Nevertheless, the cities of Mississauga and Brampton opted for GFA-based elementary school requirements, perhaps for the sake of ensuring they are simple to apply.

Minimum parking requirements for secondary schools are significantly higher than for elementary schools since a large portion of the student population is able to drive. However, older studies and standards should be referenced with caution since in recent years two factors have combined to significantly reduce the portion of secondary students that drive to school: 1) In 1994 the Ontario Government introduced a 2 year graduated licensing scheme 2) Since 2004 Ontario has not had OAC (grade 13).

Parking Demand

A 1999 York Region study identified a parking demand of 0.075 spaces per student at elementary schools, based on the facilities maximum enrolment[45]. Assuming a maximum capacity of 20 students per classroom, the findings of this York Region study would equate to exactly the conservative standard currently in place in Vaughan. The same study also suggested 0.145 spaces per student at secondary schools. If the maximum capacity of secondary school classes were 25 students, than the corresponding requirement per classroom would be 3.6 spaces – slightly lower than the City's existing standards. However, it should be noted that this study was conducted before the elimination of OAC.

Since elementary school parking primarily serves school staff, it is important that elementary schools provide appropriate lay-by or on-street space for pick-up and drop-off[46]. Similarly, a significant number of secondary school students are shuttled to school by their parents. Only Calgary's minimum parking requirements mandate that drop-off/pick-up spaces be provided.

Over 90 per cent of school-aged children have access to a bicycle, and almost 45 per cent of Canadian children live two kilometres (km) or less from the school they attend. However, 64 per cent never cycle and 47 per cent never walk there[47]. As schools are frequently within walking or cycling distance from home, school travel represents an ideal situation to promote the benefits of walking and cycling. Children themselves are enthusiastic about the independence and fun aspect of active transportation – almost 75 per cent of Ontario elementary school children said they would prefer to walk or cycle to school on a regular basis[48].

As activity levels among Canadian children fall, Canadian schools are critical hubs for promoting active transportation and encouraging healthy habits early in life. The travel behaviour of young children is particularly sensitive to environmental and cultural influences. The propensity of students to choose alternative modes of commuting to school is affected by factors such as neighbourhood walkability / urban form, their parents' values, available public transit services, school bus service, and how they and/or their parents' perceive the safety and security of these alternate modes. TDM measure should play an important role at all schools and must take the above issues seriously if they are to be effective.

[45] Region of York, Transportation and Public Works Department (1999) Safety and Traffic Circulation at School Sites Guidelines Study.
[46] Of the two, pick-up periods will demand more parking since parents will have to wait longer for their child(ren) as oppose to quickly dropping them off.
[47] Go for Green (1999) The Case for Active and Safe Routes to School.
[48] Ontario Walkability Study (2001) Trip to School: Children's Experiences and Aspirations.

Proposed Parking Standards

Based on this analysis, the proposed parking requirements for elementary and secondary schools are presented in Exhibit 4-41 and proposed adjustment factors follow.

Exhibit 4-41: Proposed Elementary and Secondary School Parking Standards

Use Category	Existing Standards	Proposed Minimum Parking Requirements						
		Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
		Min	Min	Max	Min	Max	Min	Max
Elementary Schools	1.5 spaces / classroom	1.5 space / classroom + pick-up/drop-off	1 space / classroom+ pick-up/drop-off	-	1.25 space / classroom + pick-up/drop-off	-	1.25 space / classroom + pick-up/drop-off	-
Secondary Schools	4 spaces / classroom	3.5 space / classroom + pick-up/drop-off	2.5 space / classroom+ pick-up/drop-off	-	3 space / classroom + pick-up/drop-off	-	3 space / classroom + pick-up/drop-off	-
Pick-Up/Drop-Off Requirement	No requirement	3 spaces + 0.02/student	3 spaces + 0.015/ student		3 spaces + 0.015/ student		3 spaces + 0.015/ student	

Where schools provide both elementary and secondary level education, the parking requirements can be derived by determining the number of classrooms devoted to each function.

Since it is difficult to determine the number of school employees at the time of a development application, which derives from provincially mandated student-teacher ratios, it is recommended that the standards be based on either the maximum number of students or the number of classrooms. Since the two are closely correlated, the proposed standards are based on the number of classrooms since the City has already been applying school parking requirements using this metric.

In addition to the above requirements, for the base standards, it is proposed that a minimum of 3 spaces be allocated for drop-off/pick-up and this minimum would increase at a rate of 0.02 per student in the school's maximum design capacity. For High-order transit hubs, Local Centres, and Primary Centres /Primary Intensification Areas, the minimum would be the same but it should increase at a rate of 0.015 per student.

4.8.5 POST-SECONDARY SCHOOL (UNIVERSITY, COLLEGE OR TECHNICAL SCHOOL)

Issues and Considerations

As shown in Exhibit 4-40, the existing post-secondary school standard of 4 spaces per classroom or 6 spaces per 100m^2 (whichever is greater) is difficult to compare with other jurisdictions as there is a considerable variety in the way post-secondary parking standards are specified and they are the most complex among institutional uses. Only the City of Brampton uses a comparable scheme, and its minimum requirements are slightly higher than the City of Vaughan's. The standards for the City of Vaughan, however, only apply to technical schools and none are specified for universities or colleges.

Parking Demand

Many factors influence parking demand at post-secondary schools and demand can vary considerably. In particular, such institutions often reside in a campus setting, with on-campus residences for students. As such, parking demand is significantly reduced since many students live within walking distance of their classes. Transit levels of service can also vary widely. As with hospitals, parking fees can also significantly alter parking demand.

The ITE Parking Generation manual includes data for community colleges, however, it is only based on 6 study sites. The average parking rate for these suburban sites was 0.21 per student and never exceeded 0.36 vehicles per student. Thus, for technical schools in a suburban setting, most of the parking demand is likely to come from the student population as oppose to staff, although the two are closely correlated. Not surprisingly, ITE data suggests parking demand at suburban universities and colleges is slightly higher, however, this is also based on a small sample size of 8. Demand at universities and colleges can vary significantly depending on available transit service, the proximity and volume of on-campus residences, the accessibility of nearby retail and services, and support for active modes of transportation. University and college student populations tend to be among the most active demographic in any city. These diverse needs are addressed in the following section.

Proposed Parking Standards

Based on this analysis, the proposed parking requirements for post-secondary institutions are presented in Exhibit 4-42 and proposed adjustment factors follow.

Exhibit 4-42: Proposed Post-Secondary School Standards

Use Category	Existing Standards	Proposed Minimum Parking Requirements						
		Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
		Min	Min	Max	Min	Max	Min	Max
Post-Secondary Schools	Greater of 4 spaces / classroom or 6 spaces per 100m^2 GFA (applies to technical schools only)	4 per classroom plus 1 per 6 seats in an auditorium / theatre	3 per classroom plus 1 per 7 seats in an auditorium / theatre	-	3.5 per classroom plus 1 per 7 seats in an auditorium / theatre	-	3.5 per classroom plus 1 per 7 seats in an auditorium / theatre	-

For all post-secondary schools in a campus setting, is it recommended that a parking study be required to estimate parking demand and also detail strategies for managing this demand to encourage more sustainable travel. For the smaller post-secondary schools in non-campus settings (often technical schools), the base requirement is 4 spaces per classroom plus 1 space per 6 seats (maximum capacity) in an each auditorium/theatre. In both cases, there is tremendous potential for TDM initiatives to resonate with typically cost-sensitive students and realistically reduce single occupancy vehicle trips to/from campus by 20%.

Such initiatives might include:

- transit subsidies

- rideshare programs
- class scheduling to maximize facility sharing and avoid large peaks in demand
- paid parking
- bicycle facilities
- limited parking supply

Alternatives to single occupancy vehicle travel are often quite viable in major educational hubs, particularly campus settings, and can be strongly encouraged by limiting parking supply.

4.8.6 DAY NURSERY

Issues and Considerations

As shown in Exhibit 4-40, the existing day nursery parking standard requires 1.5 spaces per employee. Other jurisdictions use several different means of specifying a standard for this land use, such as GFA, the number of children, and the number of classrooms. None of the jurisdictions surveyed base their standard solely on the Day Care's number of employees.

Parking Demand

As with elementary schools, managing the temporary pick-up and drop-off parking space is important since longer-term parking demand will derive almost solely from employees. That is, most parents are not parking on the site but are simply dropping off or picking up their children.

Proposed Parking Standards

Since the classroom size for day nurseries is somewhat arbitrary and there may be more than one employee managing a classroom at a time, it is recommended that the standards remain based on the number of employees but that parking supply to employee ratio be reduced and provision for pick-up/drop-off parking be added. The requirements for the latter should be slightly higher than for elementary schools since more time would be needed for smaller children.

Exhibit 4-43: Proposed Day Nursery Standards

Use Category	Existing Standards	Proposed Minimum Parking Requirements						
		Base	High-Order Transit Hubs		Local Centres		Primary Centres and Primary Intensification Corridors	
		Min	Min	Max	Min	Max	Min	Max
Day Nursery	1.5 spaces / employee	1 space / employee	0.75 space / employee + pick-up/drop-off (see below)	-	0.85 space / classroom+ pick-up/drop-off (see below)	-	0.85 space / classroom+ pick-up/drop-off (see below)	-

In addition to the above requirements, for the base standards, it is proposed that a minimum of 3 spaces be allocated for drop-off/pick-up and this minimum would increase at a rate of 0.05 per student in the school's maximum design capacity. For High-Order Transit Hubs, Local Centres, and

Primary Centres/ Primary Intensification areas, the minimum would be the same but it should increase at a rate of 0.03 per student.

5. OTHER PARKING REQUIREMENTS AND PROVISIONS

5.1 Bicycle Parking

5.1.1 ISSUES AND CONCERNS

The provision of adequate bicycle parking and associated shower and change facilities is an important element in the promotion of bicycle use. The absence of these supportive facilities is a deterrent to more widespread bicycle travel across Vaughan. The Pedestrian and Cycling Master Plan identifies the need for supportive bicycle facilities in Vaughan and the parking zoning by-law is one way to accomplish this for new developments.

5.1.2 REQUIREMENTS IN OTHER MUNICIPALITIES

Vaughan does not currently have bicycle parking requirements in the zoning by-law. A review of standards in other jurisdictions reveals that requirements for bicycle parking spaces are not common in Canadian cities, but have been established, for example, in Halifax, Calgary, Vancouver, Ottawa, Kingston, and Toronto (to a limited extent). Exhibit 5-1 and Exhibit 5-2 compare bicycle parking supply requirements across these other jurisdictions.

Bicycle parking supply requirements are generally specified in terms of Class 1 and Class 2 parking defined as follows:

- **Class 1:** Long term secure parking that is provided in a locked separate bicycle room located within a building or automobile parking facility. Lockers, bicycle rooms, bicycle cages

- **Class 2:** Short term parking provided in racks. The racks should be in a convenient and if possible sheltered location and should be of a suitable design to lock the frame and a wheel to the rack using a conventional U-lock.

5.1.3 PARKING DEMAND

Bicycle parking requirements are typically expressed in terms of GFA or dwelling units in the case of residential uses, similar to vehicle parking requirements. The selected jurisdictions specify bicycle parking requirements for many uses including office, retail, residential, restaurant, etc. The proportion of short-term vs. long-term bicycle parking reflects whether cyclists are primarily parking their bicycles for long periods of time (e.g., employees, residents) or if cyclists are primarily short-term users (e.g., retail and restaurant customers).

Some municipalities, such as Vancouver require locker and shower facilities while others, such as Halifax, allow reductions in motor vehicle parking (up to 10% of the required amount) given the provision of additional bicycle parking, sheltered bicycle parking, and/or the provision of showers or clothes lockers.

Exhibit 5-1: Bicycle Parking Supply Requirements from Selected Jurisdictions

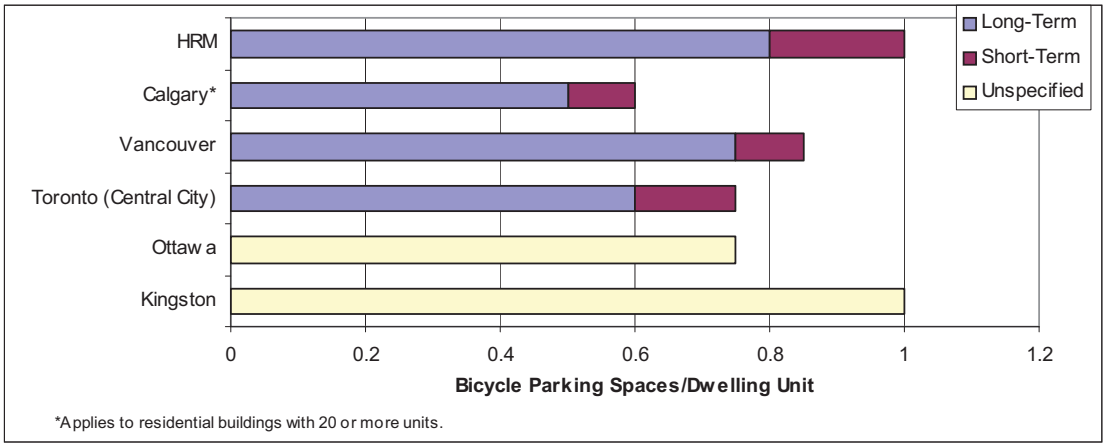
Use	Halifax Regional Municipality (HRM)		Calgary		Vancouver		Ottawa	Kingston	Toronto[6]
	Class 1	Class 2	Class 1	Class 2	Class 1	Class 2			
Office	0.10 spaces/ 100m^2	0.10 spaces/ 100m^2 min 2 spaces	0.17/0.1 spaces/ 100m^2[2]	0.1 spaces/ 100m^2/ 6 spaces[2]	0.13 spaces/ 100m^2 city-wide	Minimum of 6 spaces where GFA>2000 m^2	0.10 spaces/ 100m^2	0.40 spaces/ 100m^2	0.08 spaces/ 100m^2 min 6 spaces GFA>2000 m^2
Retail	0.07 spaces/ 100m^2	0.27 spaces/ 100m^2 min 2 spaces	0[3,4] 2% auto spaces[5]	0.4 spaces/ 100m^2[3] 5% auto spaces[4] 3% auto spaces[5]	0.13 spaces/ 100m^2 city-wide	Minimum of 7 spaces where GFA>1000 m^2	0.08 spaces/ 100m^2	0.50 spaces/ 100m^2	0.08 spaces/ 100m^2 min 6 spaces GFA>2000 m^2
Medical	0.1 spaces/ 100m^2	0.1 spaces/ 100m^2 min 2 spaces	4% of employees[1]	0.1 spaces/ 100m^2[1]	4% of employees during max work shift[1]	6 spaces at each public entrance[1]	0.05 spaces/ 100m^2	-	-
Restaurant	0.02 spaces/ 100m^2	0.8 spaces/ 100m^2 min 2 spaces	-	0.4 spaces/ 100m^2	0.13 spaces/ 100m^2	0.7 spaces/ 100m^2	0.10 spaces/ 100m^2	-	-
Multi-Unit Residential	0.8 spaces/ unit[7]	0.2 spaces/ unit[7]	0, 0.5 spaces/unit[8]	Minimum of 6, 0.1 spaces/unit[8]	0.75 spaces/unit	Minimum of 6 spaces	0.75 spaces/ unit	1 space/ unit	0.75 spaces/ unit
Schools	0.08 spaces/ 100m^2	0.32 spaces/ 100m^2	3% of employees[9]	10% of students[9]			0.4 spaces/ 100m^2		
Parking Structures /Lots	5% of motor vehicle spaces, min of 2 spaces, max of 50 spaces		2.5% of motor vehicle spaces	2.5% of motor vehicle spaces					

Class 1 = Long-term (secure) parking Class 2 = Short-term (convenience) parking

Notes:
[1]Hospital uses
[2]Higher standard applies to downtown
[3]Individual Establishment
[4]Regional/Neighbourhood Shopping Centre
[5]Enclosed Shopping Mall
[6]Former City of Toronto only. Standards require 80% of spaces to be occupant and 20% to be visitor. For non-residential uses, standards apply to buildings with non-residential gross floor area greater than 2,000m^2.
[7]Applies to dwellings with minimum of 4 units.
[8]First value applies to dwellings with less than 20 units. The second value applies to dwellings with 20 units or greater.
[9]For post-secondary institutions, Class 1=3% of students+staff, Class 2 = 3% of students

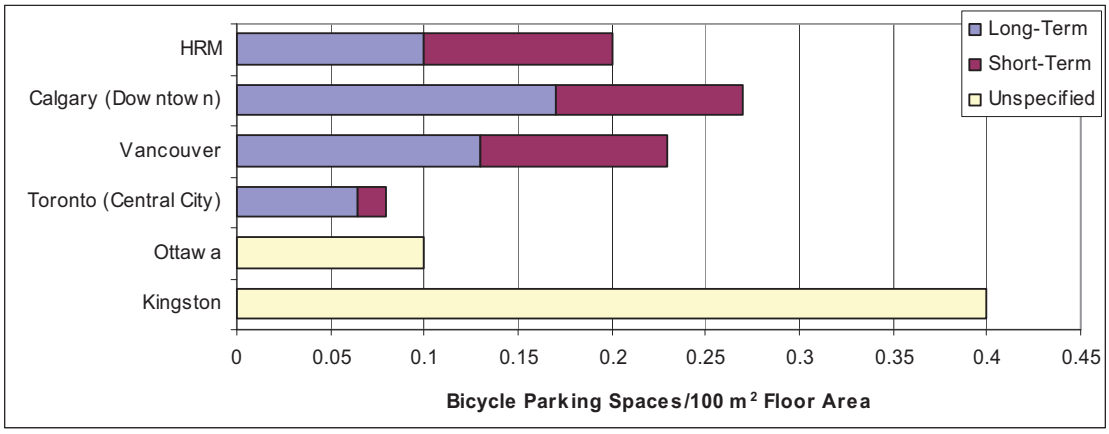
Exhibit 5-2: Comparison of Bicycle Parking Standards for Selected Land Uses

A. Multi-Unit Residential

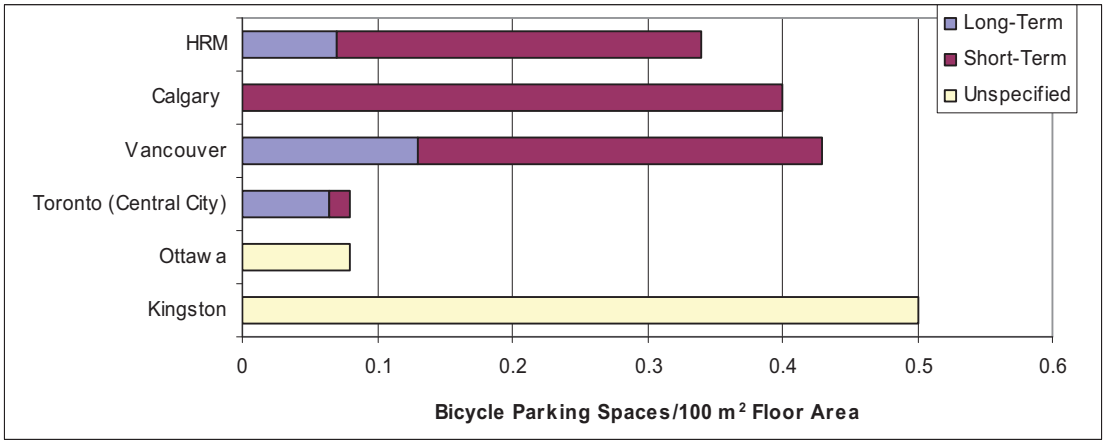


*Applies to residential buildings with 20 or more units.

B. Office



C. Retail



5.1.4 RECOMMENDATIONS

Based on a review of standards in other municipalities, bicycle parking ratios are recommended for all office, medical, retail/restaurant, multi-unit residential and schools. In addition, a minimum bicycle parking standard is proposed for commuter parking lots as discussed in the Section 5.3. It is recognized that parking needs will vary based on land use such as High-Order Transit Hubs, Local Centres, and Primary Centres/Intensification Corridors compared to other areas in Vaughan. High standards are recommended for higher density and mixed use areas since it is expected that there will be more cyclists and therefore greater demand for bicycle parking. As a result, requirements are organized under long term (class 1) and short term (class 2) parking for each area. Requirements for Class 2 are primarily based on the gross floor of each type of use since it is not anticipated that uses below 1000m^2 will generate sufficient demand for bicycle parking. Exhibit 5-3 illustrates the proposed requirements for bicycle parking in Vaughan.

At this time, requirements are not proposed for bicycle supportive facilities such as showers, change rooms and lockers. Standards can be considered and are typically expressed in terms of the number of Class 1 bicycle parking spaces for non-residential uses.

Exhibit 5-3: Proposed Bicycle Parking Standards

Use Category	High-Order Transit Hubs, Local Centres, Primary Centres/Primary Intensification Areas		Base/Other Areas	
	Class 1[1]	Class 2[1]	Class 1	Class 2
Office	0.13 spaces/100m^2	Greater of: 0.1/100m^2 or 6 spaces	0.08 spaces/100m^2	Greater of: 0.05/100m^2 6 spaces
Retail/Restaurant	0.1 spaces/100m^2	Greater of: 0.15/100m^2 or 6 spaces	0.05 spaces/100m^2	Greater of: 0.1/100m^2 spaces
Medical Office	0.1 spaces/100m^2	Greater of: 0.1/100m2 or 6 spaces	0.05 spaces/100m^2	Greater of: 0.05/100m^2 6 spaces
Multi-Unit Residential	0.5 spaces/unit for buildings with > 100 units	Greater of: 0.2 spaces/unit or 6 spaces	0.5 spaces/unit for buildings with > 100 units	Greater of: 0.1 spaces/unit or 6 spaces
Schools	0.05/100m^2	0.4/100m^2	0.05/100m^2	0.4/100m^2

Note:

(1) Class 1: Long term secure parking that is provided in a locked separate bicycle room located within a building or automobile parking facility - lockers, bicycle rooms, and bicycle cages

(1) Class 2: Short term parking provided in racks that are designed to lock the frame and a wheel to the rack using a conventional U-lock.

5.2 Accessible Parking

Revised accessible parking supply and design requirements are not proposed at this time. Rather, the intent is that Vaughan will adopt revised standards in line with the provisions under the

Accessible Built Environment Standards being developed as part of the Accessibility for Ontarians with Disabilities Act[49].

5.3 Parking Considerations for Commuter Parking Lots

As part of the expansion of the VIVA rapid transit service the construction two subway extensions (Vaughan Subway and Yonge Street Subway), there is and will continue to be a growing need for commuter parking lots. Parking space requirements and opportunities for these new rapid transit lines are generally established through the Environmental Assessment and Preliminary Design processes and take into account factors such as demand, land constraints and traffic capacity. In many cases, the supply of parking is limited by land availability.

Based on information in the Toronto-York Spadina Subway Extension Report (Downsview Station to the Vaughan Metropolitan Centre) Environmental Assessment Report, the proposed parking capacity for each of the stations is as follows:

- Steeles West Station – up to 2,500 parking spaces
- Highway 407 Station – up to 1,000 spaces (600 initially)
- Vaughan Metropolitan Centre – primarily walkin-in and transfers from other transit modes

The EA also identifies passenger pick-up and drop-off space requirements which range from 20-50 spaces.

On the Yonge Subway Extension, a major parking facility of up to 2,000 parking spaces is proposed at Long Bridge Station (south of Highway 407).

Although facilitating park and ride is an important consideration in ensuring the investments in transit and associated ridership are maximized, it is also important to balance these objectives with urban design considerations, as well as the needs of other modes. The presence of large expansive surface parking near subway stations could be a deterrent to walking and cycling, as well as future development opportunities.

It is therefore recommended that the following considerations adopted as general guidelines or as part of a future zoning by-law amendment:

- Commuter parking lots shall contain 1 secure bicycle parking space for every 10 peak period transit riders (as estimated using travel demand models), but no less than 15 spaces.
- Commuter parking lots will designate 5% of parking spaces to registered carpool vehicles with enforcement of these spaces overseen by the transit authority.

It is recognized that there are issues related to the estimation of ridership, which cannot be tied to a zoning by-law process.

[49] For the Built Environment Standards Development Committee Terms of Reference (dated January 2008), see http://www.mcss.gov.on.ca/mcss/english/pillars/accessibilityOntario/accesson/business/environment/reference.htm

5.4 Shared Parking

5.4.1 ISSUES AND CONSIDERATIONS

The concept of shared parking involves the use of one parking facility by more than one land-use activity. This approach takes advantage of different parking demand patterns based on the time of day for each type of use. Shared parking ensures that parking spaces are not designated for a particular user, but operate as a pooled parking resource. This strategy can be utilized on a "micro" scale within a single development, or on a "macro" scale between several developments. However, sharing parking between multiple parcels can create enforcement issues when uses or ownership changes.

Benefits are maximized with mixed-use developments, where uses have different peak demand times. For example, a restaurant and an office can share a parking facility with fewer total parking spaces than would otherwise be required for two separate parking facilities.

To ensure that shared parking is only considered for land uses with complementary patterns of parking demand, an assessment of land uses that can work together in a shared parking facility is required. Land uses that have reduced parking demands during the day and higher demands at night (e.g. restaurants) can be paired with land uses that have higher demands during the day and lower demands at night (e.g. offices). Different parking demands can also occur on a seasonal basis, especially for educational land uses.

The consideration of shared parking requires some assessment of typical occupancy rates during different times of the day for each of the activities to be included in a shared parking scheme. An example of occupancy rates is included in Exhibit 5-4 below.

Exhibit 5-4: Typical Parking Occupancy Rates

Land Uses	Weekday	Weekday	Weekday	Weekend	Weekend	Weekend
	Daytime	Evening	Overnight	Daytime	Evening	Overnight
Residential	60%	100%	100%	80%	100%	100%
Office/Industrial	100%	20%	5%	5%	5%	5%
Retail	90%	80%	5%	100%	70%	5%
Hotel	70%	100%	100%	70%	100%	100%
Restaurant	70%	100%	10%	70%	100%	20%
Movie Theatre	40%	80%	10%	80%	100%	10%
Entertainment	40%	100%	10%	80%	100%	50%
Conference/ Convention	100%	100%	5%	100%	100%	5%
Institutional	100%	20%	5%	10%	10%	5%
Place of worship	10%	5%	5%	100%	50%	5%

Source: Adapted from ITE Parking Management Report, prepared by Todd Litman for the ITE Parking Council and Planners Press, Draft Report, August 2003 (Unpublished)

A significantly more detailed version of the above table is contained in the ULI Shared Parking report, although the same general patterns are evident.

5.4.2 EXISTING PROVISIONS

The current zoning by-law specifies shared parking rates for mixed-use development in the Metropolitan Centre Zone. Existing provisions include fewer uses than specified in Exhibit 5-4, above. Shared parking rates are specified as follows:

Exhibit 5-5: Existing Shared Parking Rates

Percent of Peak Period Parking Demand (Weekly)

Land Use	Morning	Noon	Afternoon	Evening
Business and Professional Office	100	90	95	10
Retail Stores[1]	65	90	80	100
Eating Establishment[2]	20	100	30	100
Residential	80	55	80	100

Percent of Peak Period Parking Demand (Saturday)

Land Use	Morning	Noon	Afternoon	Evening
Business and Professional Office	10	10	10	10
Retail Stores[1]	80	85	100	40
Eating Establishment[2]	20	100	50	100
Residential	100	100	100	100

[1] Includes Retail Warehouse, Personal Service Shop, Bank or Financial Institution and Health Centre

[2] Includes Eating Establishment, Take-Out, Eating Establishment Convenience and Tavern

5.4.3 RECOMMENDED STANDARDS

Shared parking is an effective approach to make more efficient use of parking for mixed use developments. Considering this as well as the enforcement difficulties associated with sharing parking across adjacent parcels, **it is proposed that shared parking be allowed across the City of Vaughan for single sites with a mix of uses**, not only in the Metropolitan Centre Zone. Expanded tables of shared parking rates are presented in Exhibit 5-6. While shared parking may be appropriate for other uses, such as banquet halls and places of worship, specific shared parking rates are not proposed for the by-law for these uses, since the time-profile of the parking demand is highly variable. For example, some banquet halls also host office lunches on a regular basis, creating a peak demand on weekday midday rather than just on the weekend as might be expected.

Exhibit 5-6: Proposed Shared Parking Rates

Percent of Peak Period Parking Demand (Weekly)

Time Period Land Use	Morning	Noon	Afternoon	Evening
Business and Professional Office	100	90	95	10
Retail Stores[1]	65	90	80	100
Eating Establishment[2]	20	100	30	100
Residential (visitor)	80	55	80	100
Hotel	70	70	70	100
Theatre	10	40	40	80
Institutional (school)	100	100	100	20

Percent of Peak Period Parking Demand (Saturday)

Time Period Land Use	Morning	Noon	Afternoon	Evening
Business and Professional Office	10	10	10	10
Retail Stores[1]	80	85	100	40
Eating Establishment[2]	20	100	50	100
Residential	100	100	100	100
Hotel	70	70	70	100
Theatre	10	50	80	100
Institutional (school)	10	10	10	10

[1] Includes Retail Warehouse, Personal Service Shop, Bank or Financial Institution and Health Centre

[2] Includes all Eating Establishments

It is a key requirement for the municipality that the agreement concerning a shared parking facility can be reviewed and enforcement undertaken if necessary. This is particularly important in the event of a change of use (or change in intensity of use) of one of the shared parking land uses, or if observations after a year or two of operation show that the shared parking provision is insufficient to meet the demand. If there is a change of use, shared parking calculations should be recalculated and additional parking will should be required if the minimum requirement increases by more than 10%.

The maximum acceptable walking distance for users of the shared parking facility may be an important consideration in determining the feasibility of shared parking. General ranges of acceptable walking distances should be established based on the land use and also the expected users. For example, walking distances of 300 metres may be acceptable for people travelling to a restaurant, while more than 100 metres may be undesirable for people arriving at a medical office. Particular consideration must be given to disabled users of a parking facility, for whom a significant distance between the parking space and the land use destination may not be feasible if no suitable pedestrian connections exist.

5.5 Off-Site Parking

5.5.1 ISSUES AND CONSIDERATIONS

Parking by-laws traditionally require that parking be provided on the same site as the land use activity. However, in some cases there may be benefits to allowing parking to be provided on another site nearby, especially in the case of redevelopment of existing buildings, or where a centralized parking facility is desirable. Estimation of the acceptable walking distances from a parking lot to a particular land use is usually a consideration when assessing whether off-site parking is appropriate. For remote off-site parking lots, parking shuttles or valet parking may be an option depending on the size and use of the facility, however these strategies have impacts in terms of increased traffic generation that must be explicitly accounted for.

5.5.2 EXISTING STANDARDS

The provision of off-site parking is specified for the Metropolitan Centre Zone and Metropolitan Centre District Zone. Off-site parking may be provided on one or more lots subject to:

- The off-site portion of parking is implemented through a site plan agreement with the City and any permanent easements of rights or rights of way, required to secure public access and parking availability;

- Off-site parking is located on a lot that is either adjacent to the lot which the use is located or a lot directly across a public street (with a width of 30m or less) and no farther than 300m from the lot use where the off-site parking is provided; and

- By-law requirements are met on the lot where off-site parking is provided.

5.5.3 RECOMMENDED STANDARDS

In order to develop more transit-supportive land uses, the preferred approach would be to allow off-site parking within a specified distance within designated corridors and nodes. While there is not a direct correlation between allowing off-site parking and transit use, the intent would be to provide more flexibility for those developments located in transit corridors to construct more compact buildings. **In accordance with the City's existing standards, off-site parking provisions should therefore be considered for High Order Transit Hubs, Local Centres and Intensification Corridors**.

Implementation of this practice will initially be done through guidelines on a site-specific basis. If it were to be included in the zoning by-law, mechanisms to secure the off-site parking on title would need to be put in place. One option would be to ensure the off-site parking under consideration would at least be registered on the title of the donor site as a restrictive covenant and easement. An easement registered on title will solidify this agreement. This way, the City will not need to police the agreement should the conditions change for any reason. Rather, landowners will have to resolve related issues themselves.

The disadvantage of this approach is that it will significantly discourage off-site parking opportunities, particularly since there is little incentive for the donor site to register an easement on title. As the City moves to develop more public parking, there may be cases where the City can be a donor of off-site parking.

Further discussion with the legal department on implementing this recommendation is required.

6. PARKING DESIGN

Given the expansive parcel area developments in Vaughan devote to space for parking, its design can have a profound impact on the City's environment, both visually and functionally. The purpose of this section is to summarise the background research conducted on parking design (specifically with respect to existing by-laws and guidelines) and to provide recommendations on how to enhance and augment these by-laws. In addition, as part of this study, IBI Group staff and City of Vaughan staff worked to prepare a draft set of **Parking Design Standards** which are provided under separate cover. Some of the contents of this separate document is in the form of "guidelines" which may or may not be enforceable under the parking-by-law. The remainder of this section focuses on the basic elements that would be suitable for inclusion in the zoning by-law.

The primary objectives of parking design standards include:

- Improving the public realm safety, comfort, and connectivity;
- Integrating as best as possible with existing or planned urban context;
- Enhancing/maintaining green spaces;
- Mitigating the urban heat island effect;
- Managing stormwater run-off; and
- Encouraging the use of recycled and environmentally sensitive materials.

There is no universally ideal solution to designing parking. Rather, the issue often requires careful site-by-site consideration that links with the City's broader urban design strategies. Design requirements are difficult to address in a traditional zoning by-law such as Vaughan's, and would typically be articulated in design guidelines, such as those recently released by the City of Toronto's Planning Department. The table below summarizes Vaughan's existing policies related to parking design and lists related policies used by other municipalities, primarily through design guidelines. The latter come primarily from the City of Toronto's draft surface parking guidelines, research by Donald Shoup, and in-house work[50]. Examples of Urban design Policies were used in developing the Parking Design Guidelines referenced above.

Topic	Existing By-laws and Policy	Examples of Urban Design Policy
Location & Layout	Driveways and parking spaces are not permitted between buildings and the street. (Steeles Corridor OPA 620) Parking, servicing, mechanical equipment and automobile drop offs are to be located in a	Parking only allowed behind/below/beside buildings (not along street frontages) Split larger parking lots into smaller parking modules to reduce the size and visual impact of expansive parking areas.

[50] City of Toronto (2007) Design Guidelines for 'Greening' Surface Parking Lots
Shoup (2006) Quantity versus Quality in Off-Street Parking Requirements

Topic	Existing By-laws and Policy	Examples of Urban Design Policy
	manner that has a minimal physical impact on public sidewalks and accessible open spaces. (Steeles Corridor OPA 620) Appropriate landscape treatments, including trees and lighting, throughout parking lots and along their edges, in order to improve the appearance of the lots and along the edges, contribute to the visual continuity of the street edge, mitigate the heat island effect, and encourage the safe use of these spaces (Steeles Corridor OPA 620, 4.3f) Large surface parking areas are generally discouraged. (Steeles Corridor OPA 620) Surface parking areas shall generally be located behind buildings fronting onto Steeles Avenue. (Steeles Corridor OPA 620) Parking facilities, service access points and any visible mechanical equipment are to be located in a manner that has a minimal physical impact on public sidewalks and accessible open spaces. (Carrville OPA 651, 4.3c) Access to parking and servicing areas should occur off local streets or service lanes and to the side or rear of buildings. (Carrville OPA 651, 4.3e) Parking areas shall be directed to areas less visible from the street. (Carrville OPA 651, 6.2a) On corner lots, the driveway access is preferred to be from the minor street and located as far as possible from the intersection. (OPA 400, 4.2.4) On lots adjacent to Open Spaces, driveways should be located as far as possible away from the Open Space (OPA 400, 4.2.4) Parking lots for uses fronting onto Arterial and Primary Roads should be located at the rear (preferably) or side of the property. (OPA 400, 4.3.4) Surface parking lots should be located away from the intersection on corner lots to maintain the definition and continuity of the street edge.	Organize parking spaces and lanes so as to maximize space for landscaping and on-site stormwater management. Orient parking rows perpendicular to building entrances in order to maximize opportunities for safe and convenient pedestrian aisles. The number of access points should be limited to only those absolutely necessary to serve the property and minimize the number of potential conflict points with public streets. Minimize driveway throat distance where possible to reduce any effect of traffic When possible, segregate employee parking from customer parking as employees will generally walk further from parking to their work destinations than shoppers will walk from parking to stores. Establish a direct and continuous pedestrian network within and adjacent to parking lots to connect building entrances, parking spaces, public sidewalks, transit stops and other pedestrian destinations. All pedestrian routes within a parking lot should include a barrier-free pathway, with a minimum clear width of 1.7m; shade trees (or a shade structure) along one or both sides of the pathway; pedestrian-scale lighting to illuminate and define the route; and a clear division from vehicular areas, with a change in grade, soft landscaping and a change in surface material. Limit the width of driveways and drive aisles to reduce the expanse of parking areas and provides more opportunity for soft landscaping. Minimize turning radii to reduce the length of pedestrian crossings and encroachment into landscaped areas. Provide snow storage areas away from public streets and other areas where motorist/pedestrian sight distance and continuous landscape screening are essential. Where overflow parking or bio-retention areas are provided, these areas may be used for snow storage.

Topic	Existing By-laws and Policy	Examples of Urban Design Policy
	Street edge continuity should be maintained at street edge parking lots using architectural elements, fencing, enclosure walls and generous landscaping. (OPA 400, 4.3.4) Provide pedestrian connections to parking areas that are clearly defined with walkways, lighting, signage and landscaping. (OPA 400, 4.3.4)	
Parking Structures	Prestige Office Employment uses shall include a minimum of one level of underground parking. (Steeles Corridor OPA 620, 4.3.4) All parking for residents in apartment buildings shall be provided underground. (Steeles Corridor OPA 620) Structured parking garages are required within the 'High Density Residential' designation. 90 percent of the required parking shall be provided in structures. A maximum of 10 percent of the required parking for any development may be provided at grade, subject to approval by the City. (Carrville OPA 651, 3.4c) Parking is encouraged to be provided below grade but, alternatively, may be provided in above grade structures faced with active uses, or in landscaped surface lots to the rear or side of buildings. (Carrville OPA 651, 4.3e) Entrances to below grade or structured parking and service areas should occur within the building. (Carrville OPA 651, 4.3e) Surface parking lots or spaces should be set back 3.0 metres from the property line. The setback should be substantially landscaped with decorative fencing and coniferous and deciduous planting providing seasonal interest in order to continue to define the street edge and provide an enhanced environment for pedestrians and drivers alike. (Carrville OPA 651, 4.3e) The provisions of underground parking shall be encouraged for higher density, mixed use developments within the Kleinburg-Nashville Village Core Area to reduce the impact of surface parking and to provide at-grade amenity areas. (Kleinburg-Nashville Community Plan OPA 601, 4.7.6.8)	Require structured parking in some areas, with preference for below grade parking where possible and practical. At least the first floor of structure should be surrounded by retail or residential uses, particularly along street frontages, to maintain a unified street wall, enhance the public realm and improve pedestrian safety. Venting for parking structures should be integrated into the hard surface areas with minimum impact on the pedestrian amenity or landscaped areas. Vents should not be located in, or directed towards, pedestrian areas. Landscaped screening should be incorporated into the design of the parking structure where feasible. Flat floors (as apposed to sloping floors) are encouraged on outer tiers of above grade garages since they facilitate conversion to other uses in the future.
Lighting		Where rear facades abut public spaces such

Topic	Existing By-laws and Policy	Examples of Urban Design Policy
		as streets and parking areas, facades should be upgraded so that they are attractive and well-lit, to create a safe and comfortable pedestrian environment. Building exteriors should be well lit and loading and servicing areas should not create hiding places, or blind spots. Install lighting that is appropriately scaled to its purpose, i.e. avoid "over lighting" Direct light downward and avoid light overspill on adjacent open spaces. Use energy-efficient fixtures and bulbs. Incorporate opportunities for off-grid power generation, e.g. solar, wind, etc. Provide pedestrian-scaled lighting, such as bollards or lower-scale pole fixtures along pedestrian routes. Consider lighting elements for their aesthetic and design value, not simply their lighting function or ease of maintenance.
Storm Water Management	To integrate stormwater management and water recycling facilities in the design of parking areas. (Steeles Corridor OPA 620, 6.2) The integration of stormwater management and water recycling facilities in the design of buildings, open spaces and parking areas is encouraged. (Steeles Corridor OPA 620, 6.2) Development shall provide for the management of stormwater runoff, and the promotion of water quality treatment on a comprehensive watershed basis. On-site storage of stormwater (e.g. parking lots and rooftop controls) will also be considered as an option for the treatment of stormwater. (Steeles Corridor OPA 620, 6.2) Development shall provide for the management of stormwater runoff, and the promotion of water quality treatment on a comprehensive watershed basis. On-site storage of stormwater (e.g. parking lots and rooftop controls) will also be considered as an option for the treatment of stormwater within the District Centre. (Carrville OPA 651, 5.1d)	Parking lots should be designed to avoid erosion damage to grading and surrounding landscaping. Whenever possible, permeable paving systems should be incorporated. To reduce impervious surface area, one-way drive aisles should be encouraged as well as small parking stalls and limited driving aisle width. Parking lots should incorporate methods for storm water management utilizing low impact development (LID) techniques. These include: bio-retention cells located on islands or around the lot perimeter, breached curb drainage inlets (or curb cuts) to collect runoff, installing bio-retention cells in the medians between rows of parking spaces. Manage rainwater and snowmelt on-site with designs that encourage infiltration, evapotranspiration and water re-use. Incorporate opportunities to harvest rainwater (active or passive) from rooftops and other hard surfaces for landscape irrigation. Hard surfaced areas used for snow storage

Topic	Existing By-laws and Policy	Examples of Urban Design Policy
		are encouraged to have permeable paving to retain snowmelt on-site.
Landscaping	A minimum of 10% of the area of every lot on which a building or structure is erected shall be used for no other purpose than landscaping. In addition, a strip of land at least 6m wide shall be provided along a lot line which abuts a street line, and shall be used for no other purpose than landscaping. (1-88, 3.13) For multiple family dwellings, a strip of land at least 3m wide surrounding the periphery of a surface lot shall be used for no other purpose other than landscaping. As well, such a lot shall be screened from the street and any adjacent premises. Screening shall consist of either a landscaped earthen berm, or an evergreen hedgerow, and shall have a minimum height of 1.2m. (1-88, 4.1.4b) Where surface parking is provided beside buildings located on Steeles Avenue and the north-south local roads, low walls and landscaping should be used to continue the visual street wail along the right-of-way. (Steeles Corridor OPA 620, 4.3.4) The design of rooftops and parking areas should minimize the heat island effect, through rooftop gardens, green roofs and the planting of shade trees between parking aisles. (Steeles Corridor OPA 620, 6.1) Design service and parking facilities to complement the pedestrian system and enhance the attractiveness of the public realm. (Carrville OPA 651, 2.2h) Large surface parking areas are generally discouraged and, in the long term, parking is encouraged to be located below grade. Where surface parking must be provided, the visual impact of large surface lots shall be mitigated by a combination of setbacks, and significant landscaping including: pavement treatments, low walls or decorative fencing, landscape materials, trees and lighting throughout parking lots and along the edges. (Carrville OPA 651, 4.3e) Off-street parking areas and service areas shall be screened to minimize adverse visual effects, and wherever practical, directed to	Retain and protect existing trees, vegetation, natural slopes and native soils and integrate these features into the overall landscape plan. Distribute landscaping throughout the site to soften and screen parking lot edges, reinforce circulation routes, create pleasant pedestrian conditions and maximize shade and stormwater benefits. Parking lots should be screened from surrounding public streets, sidewalks, parks and other public properties. Berms, walls, fences, plants, planters or similar means should be used to create the parking lot screen. Whenever structures such as walls or fences are used to create a screen, plants should be located on the side of the structure which can been seen from the surrounding streets, sidewalks, parks and other public properties. All areas within the perimeter of parking lots not used for parking, loading, circulation, transit or pedestrian facilities should be landscaped to minimize the feeling of expansive hard surfaces areas. A ratio of six cars to one tree is encouraged, for aesthetics and to help reduce urban heat island effects. Limit the use of retaining walls, particularly along street frontages, parks, ravines and other areas of the public realm. Note: Where retaining walls cannot be avoided, minimize the overall height or provide low terraces, use durable attractive materials, and incorporate intensive soft landscaping. Apply a cross-grade for paved surfaces as low as 1.5% to encourage slower stormwater flow. Slope surfaces to direct stormwater toward landscaping, bio-retention areas or other water collection/treatment areas as identified on the site. Avoid planting invasive species near ravines and other natural areas. Avoid monocultures which can be susceptible to disease.

Topic	Existing By-laws and Policy	Examples of Urban Design Policy
	back and/or side yard locations. (OPA 450, 2.2.7.2c & 2.3.3.1f) Surface parking lot areas within parks should be minimized and their visual impact on the street and park reduced with the use of landscaping and pedestrian walkways. Design of landscape buffers should balance the screening function with safety concerns. (OPA 400, 3.2.7)	Incorporate a variety of deciduous and coniferous trees and shrubs for year-round interest, texture, shape and seasonal colour. Where possible, collect rainwater from rooftops and other surfaces for plant irrigation. For parking lot edges adjacent to streets, parks or other public open space, screening should be provided, consisting of continuous planting, alone or in combination with a low decorative fence/wall or a landscaped berm. Shrubs, fences or walls should be no higher than 1m. Lots should have a coordinated appearance with the existing or planned streetscape treatment. For parking lot edges not adjacent to the public realm, provide soft landscaping with a variety of deciduous and coniferous trees and plantings. Include bio-retention or other stormwater management systems as appropriate. (TO DGs)
Loading and Trash Collection		Loading and unloading facilities shall take place on site and not on public right-of-way. Loading, outdoor storage and trash collection is encourage from back lanes where provided. Loading areas should be screened from entrances and other highly visible areas of the site.
Bicycle Circulation and Parking	An adequate supply of secure bicycle parking shall be provided at the subway station, near bus stops, in urban squares, and in other high activity areas. (Steeles Corridor OPA 620) An adequate supply of secure bicycle parking shall be provided near bus stops, in high activity areas and park areas. (Carrville OPA 651, 6.4c)	Bicycle parking facilities should be made out of a durable and strong material, be permanently anchored to the ground Bicycle parking facilities should be sufficiently illuminated, with weather protection, ideally located close to an entrance or window to ensure passive observation for safety and theft prevention. Locate short- and long-term bicycle parking in highly visible, well-lit, accessible and weather protected areas. Incorporate way-finding signage as appropriate.
Barrier Free Access		Locate and provide accessible parking spaces in accordance with applicable disabled parking by-laws. Barrier free design should use the same access routes as those used by non-handicapped users where possible. If not

Topic	Existing By-laws and Policy	Examples of Urban Design Policy
		feasible, the access routes should be clearly visible from the main entrance and well marked. Ramps and related elements should be simple in their design and be visually integrated with the overall building design and site plan. They should not appear as a non-integrated add-on to a building face.
Surfaces	For all commercial, industrial and institutional uses, the surface of all loading spaces and related driveways, parking spaces and manoeuvring areas shall be paved with hot-mix asphalt or concrete. (By-law 1-88) For multiple family dwellings, outdoor parking areas, aisles and driveways shall be surfaced with hot-mix asphalt or concrete and shall b provided with adequate drainage. (By-law 1-88, 4.1.4b) The use of permeable materials for parking areas is encouraged. (Steeles Corridor OPA 620, 5.1)	Where possible, install surfaces containing recycled or sustainable material. Use light-coloured materials, such as concrete, white asphalt or light-coloured pavers, in the hardscape to reduce surface temperatures and contribution to the urban heat island effect. Install permeable/porous pavement, such as open-jointed pavers, porous concrete/asphalt, or turf/gravel grids, as appropriate to parking lot use and conditions.

6.1 Parking Space Access and Dimensions

6.1.1 REVIEW OF EXISTING STANDARDS AND COMPARISON WITH OTHER JURISDICTIONS

Parking Space Width

The Urban Land Institute document "The Dimensions of Parking" recommends the following minimum parking widths based on type of space[51]:

- Low turnover (e.g. residential, employees) - 2.6m
- Low-moderate turnover visitor spaces (e.g. business visitors, shopping centre) – 2.6 m – 2.67 m
- Moderate to high turnover visitor parking – 2.67 – 2.74 m

These are similar to the width of 2.7m contained in the existing by-law[52]. Although slightly higher than the City of Vancouver (2.5m) and the City of Toronto (2.6m).

A more recent document, ITE's Transportation and Land Development[53], suggests that for employee or all day parking spaces, the minimum mid-size parking space is 2.4 m and a compact parking space is 2.1 m.

[51] Urban Land Institute, The Dimensions of Parking, 2000.
[52] City of Vaughan by-law 1-88, section 2.0.93
[53] Stover, Vergil G.; Koepke, Frank J.; Institute of Transportation Engineers - ITE (2002) Transportation and Land Development, 2nd Edition

Parking Space Length

Most manuals suggest that the typical stall length is 5.5 m, which is based on the length of a typical vehicle plus 150 mm for bumper clearance. This is exactly the requirement for the City of Vancouver, while the City of Toronto requires 5.6m. This refers to the length of a perpendicular stall. When rotated, stall lengths increase by up to 0.3 m, although the City of Toronto requires an extra 1.1m. Small car spaces typically are 4.6 m in length. Stall length is somewhat dependent on aisle width, however. As with parking space width, it is proposed that residential spaces be distinguished from commercial spaces.

Aisle Width

In most by-laws, minimum aisle widths are set at 6.0 metres. This is slightly higher than the recommended minimum width of 5.5 m in the above noted manuals but less than some other by-laws such as Calgary, which is 7.2 m. The current by-law defines aisle widths based on the parking angle and these minimum dimensions would appear to be reasonable and shown on Exhibit 6-1.

Exhibit 6-1: Existing and recommended minimum aisle widths for the City of Vaughan

Angle	Minimum Aisle Width
90 – 60 degrees	6m
59 – 45 degrees	5m
0.1 - 44 degrees	4m
Zero degrees (parallel)	3.5 m

Note: Where aisle width is less than 6m, traffic shall be one-way.

Small Car Spaces

In selecting minimum parking space dimensions, consideration was given to whether to adopt minimum parking space dimensions or more conservative dimensions to allow for larger vehicles. It is generally felt that the City should promote the use of smaller (i.e. more fuel efficient) vehicles and that the trend toward larger vehicles has peaked and we are seeing signs that it has reversed.

While extensive provision of small car spaces is discouraged[54], allowances for a small percentage of spaces to be designated for small cars[55] may provide designers with some flexibility to use leftover space to encourage more compact development and allow room for more sustainable design. The recommended minimum dimensions for small cars are 4.6 m x 2.3 m and that they not be allowed to exceed 15% of a development's required parking supply, except in the case of reserved employee parking and residential parking, which could reach 25% of the parking supply. The small car allowance should not be applied to visitor parking.

Bicycle Parking

Many cities, including Edmonton, Vancouver, Halifax and Toronto, are introducing bicycle parking requirements into their zoning by-laws. Beyond requirements around the provision of bicycle parking, minimum dimensions must also be met. As discussed in section 5.1, parking requirements typically distinguish between long-term/occupant and short-term/visitor parking. For occupant parking, it should be provided in a secure environment such as a bicycle room, an individual garage, a bicycle compound, or bicycle lockers. Visitor bicycle parking, on the other hand, should not be placed in a secure location and should be conveniently located within 15m of the main building entrance, preferably where there is considerably pedestrian traffic for informal surveillance. In both cases, the bicycle parking should be in a well-lit environment and they should support CSA certified U-locks. The typical required minimum dimensions for horizontal bicycle parking are 0.6m

[54] Urban Land Institute, The Dimensions of Parking, 2000.
[55] For example, the City of Vancouver allows up to 25% of the required spaces to be "small car" and 40% for reserved employee parking.

by 1.8m, and for vertical spaces they are 0.6m by 1.2m. Both should provide 2m of vertical clearance.

6.1.2 PROPOSED PARKING SPACE DIMENSIONS

Based on the review of existing standards, and comparison to other jurisdictions such as Vancouver and Toronto, the following dimensions are suggested for the City of Vaughan's new parking standards:

	Existing by-law			Proposed Standard		
	Length	Width	Aisle	Length	Width	Aisle (see Aisles section above)
Perpendicular Spaces (residential)	6m	2.7m	4-6m	5.7m	2.6m	6m*
Perpendicular Spaces (all other)	6m	2.7m	4-6m	5.7m	2.6m	6m*
Parallel Spaces/layby parking	6m	2.7m	4-6 m	6.7m	2.6m	3.5m
Small Car Spaces (perpendicular only)	-	-	-	4.6m	2.3m	same as standard
Bicycle (horizontal)	-	-	-	1.8m	0.6m	0.9m
Bicycle (vertical)	-	-	-	1.8m	0.3m	0.9m

* Reduced aisle widths may be permitted where parking spaces are angled and the drive aisle is one direction only, consistent with the existing by-law.

Accessible parking space dimensions are not proposed. It is expected that the City will adopt revised accessible parking space dimensions based on the Built Environment Standards being developed as part of the Accessibility for Ontarians with Disabilities Act.

6.1.3 OBSTRUCTIONS

Another recommended provision is for spaces that are adjacent to walls or other obstructions. Parking space dimensions should be increased by 0.3 m where one side of the space abuts a wall and 0.6 m where two sides of the space abut walls. For example, a parking space within a single space residential townhouse garage would be a minimum of 3.1 m wide (i.e. 2.5 m + 0.6 m). This will address many of the problems currently being experienced where townhouse garages are not useable because people can't get out of their vehicles.

7. PUBLIC PARKING

There is growing interest in Vaughan and across York Region in taking a more pro-active approach to parking management, including supply and pricing. As the first in the Region to establish priced public parking, Markham initiated a paid parking program in 2005, starting with a number of on-street locations. A key objective of the Markham Centre parking strategy is to establish a market for paid parking with a large role for publicly provided parking[56]. On the enforcement side, Vaughan was the first municipality in Ontario to embrace the Administrative Monetary Penalty process for parking enforcement. Traditional Provincial Offices Act enforcement has been replaced with a process where violations are dealt with through a monetary penalty rather than a fine established through the Provincial Offence Act. Administration Penalties is a significant and successful shift in enforcement regulation and policies.

Across the entire York Region, the Transportation Master Plan specifies that a parking supply and pricing strategy should be developed for the Region's designated centres and corridors. Whether York Region will establish a parking authority is currently in discussion. Within Vaughan's borders, a cash-in-lieu by-law for the Kleinburg-Nashville core area was created in 2006.

There are many factors to consider in implementing a successful public parking program:

- The location and type of public parking (on-street, surface parking, structured parking);
- Regulation and enforcement policies, by-laws, and programs (e.g. fine structure, residential parking permit programs, etc.);
- Pricing practices and technology (e.g., single-space meters, pay and display, pay by cell phone, etc.);
- Funding of parking facilities (e.g., cash in lieu, user fees, tax increment financing, reserve funds); and
- Administration of parking programs.

This section describes the reasons for promoting priced parking, outlines the potential benefits and challenges of developing public parking in Vaughan, and recommends strategies for funding and managing public parking, including cash-in-lieu and parking governance models. Each of these strategies would need to be explored further in consultation with the legal department. It is also suggested that the City undertake an overall Business Plan for the management of public parking.

7.1 Parking Pricing

The overwhelming majority of parking in Vaughan is not priced. In other words, the cost of constructing and maintaining parking is not directly passed on to its users. The Markham Centre Parking Strategy estimates that the true cost of providing surface parking in Markham Centre is approximately $72 per space per month for surface parking, versus $172 for above grade structure parking, and $250 for below

[56] BA Group. (October 2005). *Parking Strategy for Markham Centre – Final Report: Appendix A*

grade structure parking[57]. Thus, a typical 100 space surface parking lot with free parking costs its owners over $85,000 per year.

The Markham experience with paid parking has demonstrated that there is interest and opportunity to institute parking pricing in more suburban areas. While some may view priced parking as a by-product of the undesirable condition of parking undersupply, inevitably, vibrant and celebrated urban areas have constrained parking supply and charge for its use. As in any market, demand is not fixed but rather hugely influenced by a variety of factors, particularly pricing. Thus, at the most basic level, charging for parking allows for the best use of a limited resource, encouraging higher turnover in the most convenient spaces, increasing parking availability, and generating revenue to fund community improvements.

Parking pricing also significantly impacts travel behaviour, as indicated by attitudinal surveys conducted in Toronto and Halifax[58]. Free parking is effectively a subsidy towards auto use and priced parking "levels the playing field" in terms of out-of-pocket costs between the car and other modes of travel such as public transit, walking or cycling. In Toronto, 24% of single occupant vehicle (SOV) commuters who currently receive free parking responded that they would *definitely* shift to another mode if parking was not free. Similarly, in Halifax, 17% of auto commuters (i.e., drive alone and carpool) would *definitely* shift to another mode if parking was no longer free. An additional 19% in Toronto and 12% in Halifax would shift depending on the price of parking. In most cases, these auto commuters would shift to transit. These results indicate that parking pricing offers significant potential to support Vaughan's sustainable transportation goals of reducing SOV trips and its associated congestion and emissions, particularly when pricing strategies are combined with enhancements to alternative modes, such as through bus rapid transit investments, shuttle services, and pedestrian improvements. Parking fees can also influence the vehicles we chose to buy. For example, Vancouver's parking authority, EasyPark, offers a 50% discount at its lots for hybrids and Smart cars, and a 25% discount for high occupancy vehicles carrying three or more people.

How can a market for priced parking develop in areas where none currently exists? Such a market may develop with or without municipal intervention. In built up urban areas undergoing redevelopment or intensification, the increasing value of land may lead to constrained parking and encourage building operators to charge for parking. This will only occur if sufficient development is allowed and parking requirements are not so high as to require an oversupply of parking and undermine the potential for priced parking.

Developing a market for priced parking is most feasible in areas where there is a shortage of parking and/or where significant transit investment already exists or is planned. The Vaughan Metropolitan Centre, Steeles Corridor (Jane to Keele), Regional Corridors[59], and some Local Centres meet these criteria. With its vision for becoming a downtown area, Vaughan Metropolitan Centre is likely the best candidate for developing supportive conditions for priced parking. Strategies that will help to establish a market for priced parking in these areas include:

- **Reducing minimum** parking requirements and placing restrictions on new parking, particularly free parking;

- Encouraging **redevelopment** on existing surface parking facilities;

[57] This includes both capital and operating costs and assumes amortization over 25 years. BA Group (October 2005). *Parking Strategy for Markham Centre – Final Report: Appendix A*

[58] Toronto survey conducted in 2005 included 1,433 residents over the age of 16 as reported in *Commuter Attitudinal Survey 2005, Transportation Planning, City of Toronto, July 2006.* Halifax survey included 600 Halifax Regional Municipality residents over the age of 18 and was conducted by the Study Team for the Halifax Regional Municipal Parking Strategy

[59] As identified in the York Region Official Plan.

- Providing incentives (e.g., subsidies, tax reductions, etc.) for providing **shared parking** in strategic locations, ideally as priced parking in structures and on-street;

- **Unbundling** parking costs from building occupancy costs; and

- Developing a significant stock of **priced public parking**, through on-street and off-street facilities.

As indicated, strategies to promote priced parking can be directed at both private and public parking. However, given current market and development conditions in Vaughan, it is unlikely that priced parking will establish in a newly developing area, such as the Vaughan Metropolitan Centre, without the City playing a strong role. Such municipal involvement could take the form of:

- On-street parking – Maximizing the supply of convenient on-street parking should be a key consideration for the Vaughan Metropolitan Centre at the design stage given that this type of parking is relatively low cost to provide and improves the viability of mainstreet retail;

- Off-street public parking – The City could begin with publicly owned and operated surface lots to control the use of temporary parking facilities and secure strategic locations for parking structures or redevelopment; and

- Joint public private partnership – This could take a number of forms including the City providing land or financing some or all of construction with a private firm operating the parking, or the City leasing privately owned parking and operating it as public access.

A more detailed investigation of opportunities for developing collective and priced in the Vaughan Metropolitan Centre and other areas is required to further explore these opportunities. This investigation should be developed in coordination with TTC, York Region and YRT.

The role of public parking and funding options are discussed in the following section.

7.2 Role of Public Parking

Public parking can include both on- and off-street facilities. The City currently provides some on-street parking in various locations as well as some off-street parking in the Woodbridge Core (behind the Market Lane Complex). At present, none of this parking is priced.

There are a number of benefits to building the institutional capacity for developing publicly owned parking facilities:

Generate Funds

Municipally owned parking lots have the potential to generate significant funds through parking fees and increasing land values. Solely in terms of operating budgets, the Calgary Parking Authority net revenue for 2006 was $52.7 million, which generated $16 million in funds for the City of Calgary. In the City of Toronto, the parking authority's net revenue for 2006 was $97 million, of which the City's share was approximately $33 million. Thus, in both cases, roughly 1/3 of net parking authority revenues contributed to city budgets. Naturally, this ignores the potential revenue (among other benefits) of strategic real estate development as areas with public parking intensify.

Promote Efficient Use of Parking

Development of public parking facilities can be used in concert with parking supply regulations (e.g., lower parking minimums requirements, maximum parking requirements, etc.) to promote collective and priced parking over free private parking. This will support more efficient use of the parking supply, thus supporting TDM and creating room for more compact, walkable, and transit-supportive developments, such as envisioned in the Vaughan Metropolitan Centre and other selected centres and corridors. In conjunction with on-street parking, well-signed and appropriately priced off-street public parking in mixed-use compact centres can support “park once” environments where drivers can park and then walk to a series of services or shops, without having to drive from one to the next.

Support Vibrant Centres

By providing paid on-street parking, a city is able to grant convenient access to retail that engages the street, thus encouraging a vibrant street environment. By pricing this parking supply, the city creates a higher turnover rate and therefore prioritizes shoppers by helping to ensure parking vacancies. As well, a source of revenue is available to devote investments in the community it comes from. To minimize spillover into nearby residential streets and ensure locals can still find parking, priced on-street parking is typically combined with a residential permit system.

Create Market for Paid Parking

In areas such as the Vaughan Metropolitan Centre and Local Centres, where vibrant pedestrian-friendly, transit-supportive, and compact developments are envisioned, public sector parking provision is required to initiate and sustain a market for paid parking. Such a market is unlikely to develop if parking is left solely to private developers. The current trend in these areas is to roll some or all of the costs of parking into the cost of real estate development.

More Control over Community Development

By increasing the amount of municipally owned land in key areas, Vaughan will have increased control over how these parking lots are eventually redeveloped to ensure that such projects support the planning visions for the area.

Meet Community Design Objectives

With more control over the development of the City’s parking supply, the City can play a more direct role in its design and ensure urban design priorities are met, such as improved wayfinding, managing stormwater run-off, enhanced green spaces, enriching the public realm, and helping to mitigate the urban heat island effect.

Promote TDM

When a municipality manages public parking facilities, it has access to a diverse kit of tools for promoting TDM objectives. First and foremost, it provide the municipality with greater control over the amount of parking and its price, as noted above. This in turn reduces the amount of free parking, which is a barrier to increasing transit ridership. In addition, customized pricing can be introduced for carpool vehicles, low emission vehicles, car share vehicles, and even motorcycles.

There are a number of challenges to the development of public parking in Vaughan, even in a key area such as the Vaughan Metropolitan Centre. Start-up costs can be significant, such as from lot construction or installing pay and display stations for on-street spaces. Given the infancy of Vaughan's market for priced parking, it is unlikely that public parking facilities will generate substantial revenue over the initial stages. As well, other funding mechanisms, such as cash-in-lieu, are not likely to generate sufficient revenue to fully fund developing parking facilities. The role of public parking in each of Vaughan's communities will determine the funding opportunities available, as discussed in section 7.3. Furthermore, resources and expertise are required to manage public parking effectively. Some type of parking governance structure would need to be established as discussed in Section 7.4.

While the benefits and costs of developing public parking require careful consideration, there is no doubt that priced collective parking plays an important role in helping to achieve development objectives in a sustainable manner. Although the private sector should ultimately play a large role in the provision of priced parking in Vaughan, City involvement is critical to developing such a market in the early stages.

7.3 Financial Considerations: Cash in Lieu and Other Strategies

With capital costs for parking facilities range anywhere from $8,000 per space for a suburban surface parking lot to $60,000 per space for an underground parking facility (construction and land cost)[60], financing parking can be one of the most challenging parts of parking development. There are a wide variety of fiscal tools available to finance parking development. These can generally be grouped under four categories i) cash in lieu, ii) user pricing, iii) parking tax reform, and iv) capital funds, as discussed below.

Given direction in the Terms of Reference, the role of cash in lieu is a key focus in the review of funding options. However, it should be noted that prior to the adoption of any cash in lieu strategy, an overall parking management business plan should be developed. It would also be noted that a policy confirming the use of cash in lieu would need included in the Official Plan.

7.3.1 CASH IN LIEU

Issues and Considerations

Cash in lieu of parking programs enable developers to pay a fee in lieu of providing parking spaces required under municipal zoning by-laws. The revenue is typically utilized to finance collective parking spaces to replace some or all of the private spaces that developers would have provided. Section 40 of the *Planning Act* provides the basis for municipalities to allow cash-in-lieu of parking.

There are a number of factors that contribute to the effectiveness of cash in lieu:

- **Rapid growth**: Cash in lieu practices tend to be most successful in cities undergoing rapid growth in business development - overall and specifically in downtown areas[61].

- **Designated areas**: Applying cash in lieu only in designated areas in a municipality, such as the downtown core or heritage areas, allows the collected funds to be re-invested specifically into these designated areas. To ensure accountability and equity, there may be a requirement that the funds are spent in the same area in which they are collected, as is currently the case in Kleinburg. However, this may not result in the most efficient allocation of funds. If an area currently has a surplus of parking, the funds would be

[60] Developing Parking Policies to Support Smart Growth in Local Jurisdictions: Best Practices, Metropolitan Transportation Commission, 2007. www.mtc.ca.gov/planning/smart_growth/parking_seminar/BestPractices.pdf
[61] Stantec. (November 2002). *City of Windsor Cash-in-Lieu of Parking Study*.

frozen until parking deficiencies occur. Without restrictions, funds raised from multiple areas can be used in areas of most need, such as those with parking deficiencies[62].

- **Well utilized parking supply**: If there is sufficient or an oversupply of parking in an area, requiring a payment for additional parking may not be justified since it is likely unnecessary to invest in increasing parking supply.

- **Avoidance of Contradictory Parking Policies**: There is a tension between reducing parking requirements and developing a successful cash in lieu program. Partial or full parking exemptions will reduce potential for collecting in lieu funds, while overly high parking requirements may be viewed as a cash grab by the City.

- **Cost per Stall**: The cash in lieu per stall should be set based on the cost of land and the cost per stall of the type of parking facility to be developed as well as the portion of operating and capital costs that each municipality wants to recover. The typical discounted rate for a cash in lieu payment is discounted at 50% of the actual cost of providing parking to encourage developers to participate, and recognize that the contributor does not obtain ownership in the parking facility and that there will be a delay between contribution and parking provision.[63].

A key challenge to cash in lieu programs is that there may be a long delay between when a developer provides funds in lieu and the time that a municipality or parking authority raises sufficient funds to construct a parking facility. Cash in lieu does not typically generate sufficient funds on its own to construct parking, as discussed below in the examples from other jurisdictions.

Existing Kleinburg Cash in Lieu By-Law

In 2006, the City of Vaughan implemented a Cash in Lieu of Parking policy[64] for the community of Kleinburg-Nashville. The by-law applies to properties designated as “Mainstreet Commercial”, in accordance with the Official Plan Amendment 601[65], and areas permitted for commercial uses. Key elements of the by-law include:

- Application requires the property owner’s justification of their inability to provide and/or maintain the parking spaces required;

- Collected revenue will go to the Kleinburg Parking Reserve Fund and will be dedicated to managing existing public parking resources and/or establishing new parking facilities (in Kleinburg); and

- The cash in lieu required per space is $31,746 for new construction or building additions, although this amount is reduced to $3,174 if an owner proposes to reuse an existing building. The intent of this is to encourage adaptive reuse of buildings, which may have heritage value.

Clearly, the by-law strongly favours adaptive reuse of buildings. The Kleinburg cash in lieu by-law has been applied on several occasions and there may be an opportunity to use some of these funds to develop public parking.

Examples in Other Jurisdictions

Cash in lieu exists in Toronto and is also prevalent in other cities in Ontario and across Canada, though the extent to which it has successfully generated revenues for parking is limited.

[62] Stantec.
[63] BA Group. (October 2005). *Parking Strategy for Markham Centre – Final Report: Appendix A*
[64] City of Vaughan By-law 159-2006
[65] Kleinburg – Nashville Community Plan

In Toronto, funds from cash-in-lieu currently make up a very small portion of Toronto Parking Authority (TPA) revenue. In fact, TPA has deployed other options in the past for funding new parking structures, including the application of a commercial parking tax in specific areas. This is a "benefiting assessment" fee charged to businesses over a period of time in a designated area. The fee is tied to the construction of designated parking facilities that benefit specific businesses. The fee is intended to cover any revenue losses to TPA for the operation of the facility. Approximately 30 parking structures across the City have been constructed this way.

Calgary's cash in lieu program is the most widely used in Canada. In Downtown Calgary, new developments are required to provide half of required parking as cash in lieu fees. These fees have been used to develop parking structures at the periphery of the downtown.

Proposed Approach

Cash in lieu is one approach to help raise funds for the development of public parking that also provides flexibility to developers to provide less parking on-site. Cash in lieu will serve different purposes based on where it is applied:

- In newly developing areas, such as the Vaughan Metropolitan (Metropolitan) Centre, the main role of cash in lieu is to raise funds for the development of public parking, a key aspect in establishing a market for paid parking in the area.

- In Local Centres, such as Kleinburg-Nashville and Woodbridge Core, cash in lieu provides a means to reduce parking requirements and encourage adaptive reuse of existing buildings, and development or redevelopment on smaller lots. It is unlikely that cash in lieu will raise significant funds for public parking development, although these funds could improve the efficiency and capacity of parking in the area if used for the right projects.

Based on the review of success factors and experience in Vaughan and elsewhere, it is recommended that cash in lieu be expanded and modified as follows:

Designated areas: Cash in lieu should be expanded to areas where public parking could potentially be needed and developed in the near to medium term. This includes the Vaughan Metropolitan Centre, Steeles Corridor (i.e., Jane to Keele), and Local Centres, particularly the Woodbridge Core and Kleinburg-Nashville.

Allocation of funds: For equity and accountability, it is recommended that collected funds be reserved for areas in which they are collected. In order to avoid collected funds remaining unspent for an extended period of time due to lack of opportunity or need for public parking, creative approaches to using the funds are proposed.

When appropriate reserve funds are established, as defined under Section 417 of the Municipal Act, their purpose can include anything for which the City has authority to spend money. As such, cash in lieu funds do not need to be limited to constructing and operating public parking, but could also be spent on measures relating to improving parking efficiency and reducing parking demand in the area, such as improving parking signage, subsidizing redesign of existing lots, and enhancing the pedestrian environment, for example. This would ensure that collected cash in lieu fund can be spent on appropriate measures in a reasonable period of time.

Cost: It is recommended that there be one approach to determining the cost per space based on the type of parking to be built although the actual cost per space can vary based on local property costs. It is proposed that the cash in lieu payment be discounted at 50% of the actual cost of providing parking to encourage developers to participate, and recognize that

the contributor does not obtain ownership in the parking facility and that collective parking can replace several private spaces. The cost per space by type of parking should be determined as follows:

Cost per space ($) = ($C_i$ +P/N) x A_i x 0.5
C_i = construction cost per m^2 of parking space including landscaping and lighting by type of parking (surface, above grade garage, below grade garage)
P = appraised land acquisition cost per m^2
N = number of parking levels (1 for surface parking)
A_i = m^2 per parking space
$ = amount to be charged per parking space

Limit on participation: The Kleinburg cash in lieu by-law requires the applicant or owner to enter into a cash in lieu agreement with the City if the proposed number of parking spaces is less than the number of parking spaces required and less than the number of parking spaces recommended from a Parking Generation Assessment. It is also contingent on the owner's inability to meet the required parking levels. However, should there be a limit on the amount of on-site parking that can be avoided through cash in lieu?

There should be no limit in newly developing areas well served by transit, such as the Vaughan Metropolitan Centre, since the main role of cash in lieu in these areas is to raise funds for the development of public parking. In Local Centres, such as Kleinburg-Nashville and Woodbridge Core, however, cash in lieu provides a means to reduce parking requirements and encourage adaptive reuse of existing buildings, and development or redevelopment on smaller lots. As such, in Local Centres, the option for cash in lieu should be limited to the greater of 15 spaces or 10% of required parking. As such, small developments would be able to proceed with no parking provided that they made a cash in lieu contribution, while larger developments would be able to provide cash in lieu of a portion of their required parking. In all cases, the use of cash-in-lieu would need to be supported by a minor variance or other mechanism to record the reduced parking requirement on title.

7.3.2 OTHER FUNDING SOURCES

In addition to cash in lieu and the capital budget, there are a number of sources that can be used to fund term long term capital and operating costs of public parking. This includes user fees, tax increment financing, and parking taxes.

User Fees

User fees or parking charges are important from a transportation demand management perspective and are one of the most effective tools available to encourage transit use and carpooling and reduce single occupant vehicle travel. Pricing also promotes the best use of limited parking resources, inducing greater turnover of the most convenient spaces, increasing parking availability, and generating revenue. The benefits of parking pricing and strategies for establishing a market for priced parking can be developed in areas were discussed in 7.1.

As a general strategy, it is recommended that over time, the full costs of parking be better reflected in both user fees and public parking pricing strategies. Over time, user fees should make up an increasing portion of the revenue required to fund parking facilities.

Tax Increment Financing

A directed tax reserve could be established to help fund parking structures in a specific area, such as the Vaughan Metropolitan Centre. This approach, similar to Tax Increment Financing (TIF), would use the estimated net increases in property taxes that would result from new development stimulated by a capital investment (e.g. new parking structure) and borrow against this expected

future revenue. The funds from the tax uplift could be used to finance a variety of infrastructure projects required to support increased density in the area, including parking structures.

Parking Tax Reform

The costs of constructing and maintaining parking are often not passed on to its users. Similarly, the true costs of parking on the environment (e.g., increased stormwater runoff, urban heat island effect, increased auto use) and need for supporting transportation facilities are seldom quantified. One approach to better 'internalize' these costs and is through parking tax reforms. While parking tax reforms are more complex and controversial, funds raised from such reforms could potentially be used to support parking management activities as well as the development of more strategic and environmentally responsible parking facilities. Potential approaches include:

- **Commercial parking taxes** – taxes on paid parking transactions. Such an approach is adopted in many cities, such as San Francisco, California and Pittsburgh, Pennsylvania.

- **Parking space levies** – generally applied as an annual tax on all non-residential parking spaces. The Greater Vancouver Transportation Authority (TransLink), for example, charges an annual non-residential parking tax of $0.78 per m^2, or approximately $30 per stall, which raises approximately $25 million per year in support of transportation projects across the region. A variation on this approach is to assess the levy on unpriced parking only.

- **Stormwater management fees** – which reflect the large amount of stormwater runoff generated by parking facilities, particularly surface lots, and associated environmental impacts to water resources and costs for treatment of this runoff. Such a fee could be based on parking area or alternatively on the total impermeable land cover on a site. This would favour parking structures over surface parking lots, and more compact downtown sites over sprawling suburban sites. In addition, fees could be reduced if operators adopt measures to capture and treat stormwater runoff onsite (e.g., increased landscaping, bio-swale, permeable pavement, etc.).

All of these options would require further consideration as part of a tax reform initiative. As a general strategy, it is recommended that over time, the full costs of parking be better reflected in both user fees and property taxes.

7.4 Management of Public Parking

If Vaughan plans to increase its role in parking management and the provision of public parking, it will need an appropriate organizational structure to guide and implement these activities. Currently, there is no body in Vaughan that sees parking in a broad scope, sets objectives for the parking system (e.g., increase the amount of collective parking), and helps to coordinates parking-related activities between the departments.

Parking management or oversight can be delivered in various forms. There are advantages and disadvantages to each that need to be weighed and considered in context of the City of Vaughan and the existing municipal governance structure. Five parking management types are described below and assessed in Exhibit 7-1.

- **Parking committee** - Parking management that uses a parking committee is essentially run by a variety of departments with Council and/or citizen oversight. Each department oversees an area of the system particular to the departments mandate (i.e. police department oversees enforcement, public works oversees parking metres and general maintenance). The committee can consist of a group of Councillors, stakeholders from

the municipality, or a combination of the two. This group meets to discuss parking related issues and act as a guide, making recommendations to Council; who then make the final decisions and instruct the various departments accordingly. The Parking Advisory Committee in the Town of Markham is made up of both municipal and regional councillors.

- **Parking authority** - Parking Authorities are a governing body unto themselves. The point of forming an authority is to create an independent unit that oversees all aspects of the parking operation and may own the land resources that the parking is located on. By having full control and possible ownership of the parking system, parking authorities are able to undertake bond issuance for repairs, replacement and expansion of the parking system since all parking revenues would go to the authority. Typically, parking authorities answer directly to a board of directors comprising citizens and elected officials from council.

- **Parking department** - Similar to a parking authority, parking departments oversee all aspects of the parking system and its operation. The key difference is that parking departments are a division of the municipal government and answer directly to a council as any other department would. The municipality maintains ownership over the parking facilities and property.

- **Parking district** - A Parking District is a form of governance that blends a parking department with community representation through a committee or board. The district is ultimately accountable to a council the same as a department, but incorporates direct community representation by being governed by a board. In this case, the board has direct authority over the function of the parking system by overseeing a dedicated parking district staff. Council empowers the board by appointing members and authority, but is ultimately responsible for major policies and annual budgets. Day-to-day operations and decisions are the responsibility of the board and the parking district manager. Often parking districts are established in a building or location separate from the municipal government in order to stress the community involvement and directive.

- **Parking manager** - A parking manager is assigned to oversee parking and act as a principal liaison between a council and the other departments that manage various aspects of the parking system. This form of management allows for the centralization of the parking system management function through one individual who then becomes the face for the municipality's parking system. A parking manager allows for parking decision making to be streamlined and up-to-date. Similarly, Council is privy to continuous feedback and information updates on the parking system and is able to enact changes that represent the best interest of the Community. Parking management can be either a new position within the municipality, a re-assignment of an existing staff person or can be contracted out to a third party professional.

Exhibit 7-1: Assessment of Types of Parking Management

Management Type	Advantages	Disadvantages
Parking Committee	• Low cost, as committee membership is voluntary. • If councillors are included on the committee, they become educated on parking issues and can be effective champions for municipal parking issues • May include community representation. • Parking management is a forefront issue that is actively managed prior to issues that demand full Council attention.	• Cumbersome due to committee-council-staff order of operations. • Committees have a tendency to focus solely on serving the needs of the community without consideration to budget constraints and burden to staff.
Parking Authority	• Often more efficient than a city department operation and is a complete management package that alleviates responsibility from the municipal government. • High priority on operating budget based parking system.	• High degree of autonomy can lead to a loss of control on the part of the municipal government. • Community interest often becomes a secondary issue as Authorities inevitably become increasingly business like as they undertake debt to provide parking resources. • Added staffing costs.
Parking Department	• High priority on parking system operation. • Overall fit with other local initiatives, department projects and vision for community. • Council is provided with recommendations and insight into parking decision making matters allowing them to make informed decisions and directives to staff. • Parking management is a for-front issue that is actively managed prior to issues arising that demand Council attention. • Lower cost for staffing as some existing City staff could be assigned to Parking Department.	• Added layer of management and new department require additional staff and increase local government operating costs. • Council maintains sole responsibility for decision making without the benefit of citizen advisory board.
Parking District	• High priority on community goals and interrelationships with other Municipal Departments. • Board takes responsibility for most decisions with policy being established at the directive of Council. • Lower cost since some existing staff could be assigned to Parking District.	• Added layer of management and new department require additional staff and increase local government operating costs.
Parking Manager	• Higher priority on parking system operation. • High degree of interrelationship with other departments. • Low cost as only one manager plus optional support staff are required. • One individual coordinates parking, advises Council, interfaces with the Community, and provides interdepartmental coordination. • Parking management is a for-front issue that is actively managed prior to issues arising that demand Council attention.	• Council is still responsible for oversight and limited staff resources may hinder optimal decision making with regard to parking initiatives and fundamental changes.

Creating a Parking Advisory Committee, similar to that created in the Town of Markham, consisting of Regional and Municipal Councillors is recommended as the **preferred approach** that can be put in place relatively quickly to ensure more strategic and coordinated planning and action regarding parking management. **A Parking Manager position should be created to coordinate staff support for this committee from various City departments**.

This governance structure is a demonstrated low cost and effective approach to initiate and grow priced public parking. In the future, there may be a need for a more consolidated parking

management structure with the consolidated authority to collect revenue, acquire land, and develop and operate parking facilities, such as a parking authority. A parking authority is not warranted in the City of Vaughan in the short- to medium-term; however, the City should coordinate efforts with the Region if it moves to establish a parking authority, as recommended in York Region Transportation Master Plan.

7.5 Woodbridge Core

As part of this parking standards review, IBI Group was requested to conduct a "Specific review of opportunities and options to guarantee a sufficient number of parking spaces available for use by the public within the Woodbridge Core, whether on private or public lands or both". This review has been prompted by on-going development and growth in the area. In particular, there are several condominium developments being built in the area and there has been an application to redevelop a component of Market Lane with commercial, office, and residential uses. Given the growth occurring in this area, it makes sense to consider broader parking strategies for ensuring the availability of public parking in tandem with recommended changes to the parking requirements.

A number of activities were carried out as part of this review including in-person surveys of businesses in the Woodbridge Core, on- and off-street parking surveys, consultation with key stakeholders, such as the Woodbridge Ratepayers Association, and review of related studies, such as the Parking Plan for the Woodbridge Core Area, prepared in 1990, and the Parking Study for the Proposed Redevelopment of the Market Lane Complex, prepared recently in May 2008.

7.5.1 BUSINESS SURVEY

In person surveys were conducted with a random selection of businesses in the Woodbridge Core to assess attitudes towards parking availability and gauge support for various parking strategies. Parking strategies presented for feedback included improving signage to available parking, more regular enforcement, charging for on-street parking, improving transit service and cycling conditions, facilitating greater cooperation among businesses over parking issues, requiring new development to provide ample parking, cash in lieu for public parking, and using cash in lieu funds to allow developers to increase availability of public parking on-site. Fifteen businesses were surveyed on Friday, July 18th, 2008. These included a variety of establishments along Woodbridge Avenue and in the Market Lane complex including banks, restaurants, cafes, and other stores. A copy of the survey is presented in Appendix E.

While there was a diversity of opinions on many issues, key findings include:

- Many establishments report that some of their customers and employees walk, although the majority of customers and employees drive. Transit and cycling were not identified as common modes of transport in the area.

- Approximately 60% of surveyed establishments reported that their customers sometimes or always have difficulty finding convenient parking, typically on Fridays and Saturdays. Note, this does not mean parking was unavailable. These businesses are generally located in the high activity area between Clarence Street and Wallace Street.

- A number of establishments with easily accessible parking often have customers from nearby establishments parking in their lot. A number of businesses see improved enforcement of on-street and private off-street lots as a key priority.

- Generally, local businesses support the use of clear and consistent signage that

directs customers to available parking. Signage would be especially beneficial to stores with rear surface or structured parking that is not immediately visible to customers, such as the mixed use condominium developments at 53 and 131 Woodbridge Avenue. In addition, some business owners/employees as well as many visitors to the area are not aware of the public parking at the back of Market Lane that is significantly underutilized on a typical day.

- The majority of businesses surveyed are in favour of a strategy that facilitates cooperation among businesses in order to ensure parking is available to customers. This includes ensuring that employees do not park in prime locations and could potentially involve other marketing and educational efforts.

- Local businesses tend to be strongly against charging for on-street and off street parking since most of their customers drive and this could negatively affect patronage. In addition, some viewed metered on-street parking as unfairly penalizing businesses that do not have their own on-site parking and rely on on-street parking.

- Views on improving transit service to reduce parking demand were mixed. A number of interviewees commented that the buses that go along Woodbridge Ave. are often empty.

- Responses to strategies that encourage developers to supply ample parking or increase the availability of public parking were mixed. However, most businesses tend to be in favour of all strategies that increase parking supply in the area.

- An additional transportation concern raised by a number of interviewees is that more attention needs to be paid to ensuring a safe and walkable environment, particularly given the many senior citizens living in the area.

- Other strategies that received some support include the use of a permit system and adding bicycle parking to strategic and visible areas.

7.5.2 EXISTING PARKING CONDITIONS

In order to better understand the use and availability of publicly accessible parking in the Woodbridge Core, surveys of patron and public parking were conducted. Parking surveys of on- and off-street parking were conducted on Friday, July 18th, 2008 between 11:30 AM and 4:15 PM to measure typical peak parking conditions. This day and time period were selected based on a recent parking study of the Market Lane complex[66]. Based on surveys conducted on two Fridays and Saturdays in late March and early April, this study found the peak parking accumulation to occur in different areas between approximately noon and 4:15 PM on Friday. Overall peak parking accumulation occurred at 4:15 PM.

On-street surveys were conducted at half hour intervals and measured parking duration, turn-over, and conformity with regulations. All on-street parking along Woodbridge Avenue in the study area was surveyed. Survey locations and results are presented in Exhibit 7-2.

For efficiency, off-street parking supply was surveyed during the expected peak time, between 4:00 and 4:15 PM. Over 500 spaces were surveyed and off-street survey locations and results are presented in Exhibit 7-3. Market Lane survey locations are identified more precisely in Exhibit 7-4.

Surveyed parking supply is as follows:

[66] Mark Engineering. Parking Study for the Proposed Redevelopment of the Market Lane Complex, City of Vaughan. May 2008.

- On-street: 71 marked spaces between Islington Avenue and James Street;
- Off-street: 532 spaces in total consisting of:
    - Market Lane: 293 spaces (several spaces in the east lot were unavailable due to construction in the area;
    - Other lots along Woodbridge Avenue between Islington Avenue and Fairground Lane: 185 spaces in eleven lots;
    - Selected sites at Kipling Avenue and Woodbridge Avenue: 54 spaces in three lots.

Exhibit 7-2: On-Street Parking Surveys

Location (Street)	Actual Number of Spaces	Time Limits	Max Occupancy %	Peak Time	Average Length of Stay (Minutes)	Turn-over[1] (avg. vehicles/ space/hour)	Illegal Parking (hours)
1. Islington Ave. - Clarence St. (south side)	14	2 hours from 9AM to 6PM	50%	12:00	99	0.23	7
2. Islington Ave. - Clarence St. (north side)	12	No parking from 4 PM to 6 PM Mon-Fri	25%	12:00	47	0.15	0
3. Clarence St. - Market Lane (south side)	7	1 Hour	86%	1:00	38	1.14	0
4. Market Lane - Wallace St. (south side)	3	1 hour	200%	3:30	66	0.80	12.5
5. Clarence St. - Wallace St.(north side)	19	1 hour parking and no parking from 4PM - 6PM Monday-Friday	84%	3:30	37	1.04	1
6. Wallace St. - Fairground Lane (north side)	5	no signage	60%	3:00	114	0.25	0
7. Fairground Lane - James St. (north side)	9	no signage	44%	1:30	90	0.14	0

(1) Turn-over = Total Different Cars Parked/ Number of Spaces/ Hours Surveyed

On-Street surveys conducted between 11:30 AM and 4:15 PM on a Friday

Exhibit 7-3: Off-Street Parking Surveys

Area		Actual Number of Spaces	Utilization	
			Occupancy (vehicles)	Occupancy %
Market Lane	A: Centre Lot	48	32	67%
	B: Northeast Rear Lot	88	53	60%
	C: North Rear Lot	70	31	44%
	D: West Lot	70	53	76%
	E: East Lot, some construction	17	6	35%
Subtotal Market Lane		293	175	60%
Woodbridge Ave.	G: 53 Woodbridge Ave.	60	17	28%
	H: 93 Woodbridge Ave.	9	5	56%
	I: 97 Woodbridge Ave.	11	9	82%
	J: 110 Woodbridge Ave.	10	6	60%
	K: 131 Woodbridge Ave./Terrace Condo.	57	38	67%
	L: Bank of Montreal	10	9	90%
	M: Not in business.	5	4	80%
	N: Salon Jewls	8	2	25%
	O: Medical Pharmacy/Desserts Store	9	4	44%
	P: 185 Woodbridge Ave., not open	6	0	0
Subtotal Woodbridge Ave.		185	94	51%
Market Lane & Woodbridge Ave.		478	269	56%
Kipling Ave. & Woodbridge Ave.	Q: North West Corner	24	20	83%
	R: North West Overflow Lot[1]	20	10	50%
	S: South West Corner[1]	10	2	20%

Note: Off-street surveys were conducted during the expected peak time, between 4:00 and 4:15 PM on a Friday

Exhibit 7-4: Market Lane Survey Areas

Source: Mark Engineering. Parking Study for the Proposed Redevelopment of the Market Lane Complex, City of Vaughan. May 2008. Similar survey areas were used as this study to facilitate comparison.

The surveys show that there is significant parking availability at peak times; however, the most convenient spaces are highly utilized, with some illegal parking observed in particular areas. Even at peak times, only about 60% of the customer and publicly accessible parking supply is occupied over the surveyed area. Interestingly, this finding is consistent with the surveys conducted as part of the 1990 parking plan[67].

The Market Lane development is the largest single supply of parking in the area with close to 300 spaces in total. This parking primarily serves the needs of Market Lane businesses, but also acts as off-site parking for some of the surrounding businesses. Market Lane was found to be 60% utilized at the expected peak occupancy time. Other surveys conducted in March and April found a slightly higher peak utilization of approximately 72%, which may be due to seasonal effects[68]. In general, the centre (A) and west lots (D) are the most heavily utilized, since they most directly serve businesses. The rear lots are less utilized since they are less convenient and less visible from Woodbridge Avenue. It was found through the business surveys that some employees in the area as well as visitors do not know that there is publicly available parking in the rear of the Market Lane complex, primarily due to poor signage.

[67] Delcan Corporation. Parking Plan for the Woodbridge Core Area, Final Summary Report. Town of Vaughan. June 1990.
[68] Mark Engineering. Parking Study for the Proposed Redevelopment of the Market Lane Complex, City of Vaughan. May 2008

Utilization of on-street parking varies significantly by location, with the parking between Clarence Street and Wallace Street experiencing the highest utilization. In particular, on-street parking between the entrance to Market Lane and Wallace Street is heavily utilized with significant illegal parking. This occurs particularly on the south side of Woodbridge Avenue, which has limited on-street parking. Despite clear signage, illegally parked vehicles were observed in this area for over three hours. This is because the Bank of Montreal is a high demand generator and several businesses on the south side of the street either do not have their own parking or have rear parking, which is poorly signed.

Utilization results for other off-street lots along Woodbridge Avenue were not significantly different from Market Lane, on average, with parking utilization typically in the 60% range. Since many of these are smaller lots, employee parking is expected to take a larger proportion of this parking, resulting in less turnover for these lots. In addition, most of these lots are located behind buildings, with two large lots either underground (53 Woodbridge Avenue) or at-grade, but below a condo development (131 Woodbridge Avenue). For rear parking lots, proper signage is key to make customers aware of the parking and decrease pressure on on-street parking in high demand areas.

Overall, it appears that there is ample parking in the Woodbridge Core, although patrons may not be always able to find the most convenient spaces at peak times. Parking constraints with minor traffic impacts were most clearly observed on the south side of Woodbridge Avenue between the entrance to Market Lane and Wallace Street around the Bank of Montreal.

7.5.3 PROPOSED PARKING POLICY

A number of strategies are proposed to guarantee access to publicly available parking in the Woodbridge Core given ongoing development. These strategies are designed to make better use of existing parking supply, ensure new parking supply is added with new development at appropriate levels and reduce parking demand, where possible.

Improved Signage

Appropriate signage is particularly important when much of the parking supply is behind buildings and not directly visible from Woodbridge Avenue, as is commonly the case in the Core. In most cases, signage to available parking is inconsistent and not clearly visible, as identified through business surveys and site visits. Some businesses have a small sign on their door or in front of their establishment indicating that parking is in the rear. In addition, “Green P” signs to the public parking at the rear of Market Lane complex do not provide sufficient guidance or information.

With increasing mixed-use, high rise development in the Woodbridge Core, underground and structured parking for customers and employees will become more prevalent. This is already evident with examples at 53 and 131 Woodbridge Avenue. Appropriate signage for such facilities is particularly important to ensure that customers are aware of them and feel comfortable using them.

Green P signs to the public parking at the rear of Market Lane complex are not sufficiently clear.

Underground customer parking is not clearly signed from the street.

Improving parking signage was supported by most businesses as a simple approach to increase efficiency of the existing parking supply for businesses with and without their own parking supply. Given that most parking in the Woodbridge Core is privately owned, efforts for improved signage will require involvement of the business community. It is recommended that the City of Vaughan collaborate with businesses and developers in the Woodbridge Core to develop a more consistent and clear approach to parking signage. As a starting point, the components of good parking wayfinding, qualities of good signage, and examples are presented in Appendix E.

More Consistent Parking Enforcement

For on-street parking to function as intended, there should be regular turnover, particularly for attractive spaces near businesses with limited parking. While illegal parking is not a common occurrence in most areas of the Woodbridge Core, frequent illegal parking (i.e., parking longer than time restriction, parking in areas not reserved for on-street parking) was observed in the area between the entrance to Market Lane and Wallace Street. Most businesses and other stakeholders surveyed reported that parking enforcement occurs infrequently and sporadically in the Woodbridge Core.

As discussed, with increasing mixed-use, high rise development in the Woodbridge Core, underground and structured parking for customers and employees will become more prevalent. Since this type of parking is often less attractive to customers than on-street or visible surface parking, this development will likely put greater pressure on on-street parking, only the increasing the importance of turnover.

To enhance parking availability at peak times regular enforcement should be initiated at such times. Ideally, additional enforcement would be combined with improved signage and education so that people are aware of their parking options.

Other options to increase parking turnover are tighter parking time restrictions and the potential to introduce metered parking. Current on-street time restrictions are considered appropriate (i.e., 1 hour parking in high demand areas, 2 hour parking closer to Islington Avenue). Metered on-street parking received little support from businesses and is not viewed as an appropriate strategy as long as there is ample off-street parking. At this time, priced on-street parking would likely encourage people to park on residential streets and in off-street lots. Such a strategy could be considered if the City is actively looking or opportunities to reduce parking demand and establish a market for priced parking.

Improve Parking Design of Existing and New Facilities

To encourage visitors and customers to use rear parking facilities and structured parking, in particular, parking should be designed with appropriate lighting, pedestrian pathways, and rear entrances from the parking lot, wherever possible. These topics are discussed further in the Section 0.

In addition, there are opportunities to increase the capacity and efficiency of existing facilities through improved design. For example, there are a number of small rear lots adjacent to one another on the south side of Woodbridge Avenue between the entrance to Market Lane and Wallace Street. Integrating these lots into one would improve access and potentially increase the overall supply. This initiative would require cooperation among neighbouring businesses and land owners as discussed in the following section.

Facilitate Cooperation Among the Business Community

There is currently no business improvement association or related group in the Woodbridge Core that the study team is aware of, other than the Ratepayers Group. Given that most parking in the Woodbridge Core is privately owned, efforts to improve parking availability and management will require active involvement of the business community. While most off-street lots are privately owned, given the concentration of uses and pedestrian-oriented nature of the area, many of such lots are used at least partially as collective lots, serving all the surrounding buildings. As such, it is in the interest of the City and the business community to establish some sort of business group to get feedback, cooperate on, and lead initiatives related to parking and other business concerns. Potential initiatives that would enhance parking availability to the public include:

- Improved and consistent approach to parking signage;
- Educational campaigns and marketing material for the public to increase awareness of parking regulations and options in the Woodbridge Core (see Appendix E for an example);
- Educational campaigns and marketing material to businesses/employees to ensure they do not occupy attractive customer parking spaces;
- Projects to increase parking supply, such as integrating adjacent small lots or sharing visitor parking with customer parking where possible; and
- Other creative solutions (e.g., increasing availability of bicycle parking).

Revised Parking Standards

As part of this study, revised parking requirements have been proposed for Local Centres, which includes the Woodbridge Core Area. These include minimum and maximum parking requirements for retail, restaurant, office, and residential development. Proposed minimum parking requirements are generally lower than existing requirements reflecting the greater amount of walking that occurs in these historic places, constraints of smaller lots and older built form, as well as that existing standards are quite high for a number of uses (e.g. the propose retail standard for Local Centres is 3 spaces/100m^2 versus the current standard of 6 spaces/100m^2). The proposed requirements should be more reflective of actual parking demand in the area and require new development to provide sufficient on-site parking, while encouraging reuse of existing buildings, redevelopment, and intensification.

Along with the revised parking rates the proposed parking standards include provisions for:

- Shared parking: As part of encouraging shared parking, it is recommended that visitor parking be shared with commercial development in mixed use developments. This is already the case at 53 Woodbridge Avenue. Opportunities for making similar arrangements with other existing visitor parking in the area should be investigated as a "quick win" approach to expanding the availability of customer parking.

- Off-site parking: Off-site parking should be allowed if parking cannot be accommodated on-site as long as the additional parking is secured within 300 m of the site, clearly marked and appropriate pedestrian or shuttle connections are available. This may assist with the redevelopment of smaller sites where it is not feasible to provide all required parking on-site. Cash in lieu is another option in such cases as described in the following section.

Cash in Lieu

Cash in lieu of parking (CILP) programs enable developers to pay a fee in lieu of providing parking spaces required under municipal zoning by-laws. The revenue is typically utilized to finance collective parking spaces to replace some or all of the private spaces that developers would have provided. Recommendations on cash in lieu for the City are provided above in Section 7.3.1.

In Local Centres, such as Kleinburg-Nashville and Woodbridge Core, the main value of cash in lieu is in providing flexibility to developers to reduce parking requirements and encourage adaptive reuse of existing buildings, and development or redevelopment on smaller lots. It is unlikely that cash in lieu will raise significant funds for public parking development, nor is there a strong need for additional parking in the Woodbridge Core as the parking supply is less than 70% occupied at regular peak times. In addition, there is a lack of obvious areas close enough to the core that the City could purchase and develop parking on to be considered sufficiently convenient for parkers. However, cash in lieu funds could still improve the efficiency and capacity of parking in the area if used for the right projects.

Despite the low need and land for public parking at present, opportunities for purchasing land and developing parking cannot always be predicted. Secondly, there are creative ways that cash in lieu funds can be used to guarantee sufficient public parking is available into the future. The following cash in lieu approach is proposed for the Woodbridge Core:

- Participation in cash in lieu must be approved by the City and based on justification that the necessary parking cannot be provided on-site.

- Funds collected in the Woodbridge Core should be spent in this area. As allowed Section 417 of the Municipal Act, the reserve fund revenue need not be limited to constructing and operating public parking. It should also be open to on measures relating to improving parking efficiency, such as improving parking signage and subsidizing redesign of existing lots.

- Since options for public parking development are limited in Woodbridge Core and the intent of cash in lieu in this area is primarily to encourage redevelopment and reuse of small sites, participation in cash in lieu should be limited. Maximum participation should be set to the greater of 15 spaces or 10% of required parking. As such, small developments would be able to proceed with no parking (e.g. 500m^2 retail GFA or less based on proposed 3 spaces/100 m^2 requirement) provided that they made a cash in lieu contribution, while larger developments would be able to provide cash in lieu of a portion of their required parking.

Seek Opportunities to Increase On-Street Parking Supply

On-street parking represents some of the most convenient and well-used parking in the Woodbridge Core. As such, opportunities to increase the supply of on-street spaces should be pursued. Road and sidewalk reconstruction projects should include the objective of maximizing on-street spaces. If such projects are associated with new development, there may be opportunity to get private funds to create additional lay-by parking.

8. SUMMARY

8.1 Highlights of the Proposed Standards

As the City of Vaughan continues to evolve into an increasingly urban environment with more pervasive and frequent public transportation, the City has recognized the need to review its parking standards. This report proposes new parking standards for the City of Vaughan regulating the supply and design of private, off-street parking. It also discusses options and provides recommendations regarding the development of public parking.

This study adopts a much broader understanding of the role of parking standards. In addition to minimizing parking spill-over into sensitive areas, minimum and maximum parking requirements along with supporting standards are viewed as key parking management tools to help promote more sustainable forms of development. This includes supporting more cost- and land-efficient forms of development, supporting the envisioned urban structure and public transit investments, encouraging transportation alternatives to the automobile, and mitigating the environmental impacts of parking facilities. The overall approach adopted in this study is that **parking zoning standards should be responsible, implementable, and promote more sustainable forms of development.**

Highlights of the proposed parking standards include:

- **"Responsible" parking requirements**: The existing parking requirements are quite high for many uses, sometimes higher than comparable jurisdictions in the GTA or across the country. Revised parking requirements have been developed to better reflect a responsible level of parking, balancing the need to require appropriate levels of parking without contributing to extensive oversupply and inefficient land use.
- **Reduced number of uses**: Currently, parking requirements are specified for over 60 uses, many of which have significant overlap or are not justified in having their own parking requirement (e.g., video store versus convenience store versus retail store). To simplify the standards and improve their accuracy, the proposed standards consolidate uses, where appropriate, particularly for retail, restaurant, and industrial/employment uses.
- **Sensitivity to urban context**: The existing parking standards generally follow a "one size fits all approach". However, due to differences in built form, transit service, and planning visions across the City (e.g., Vaughan Metropolitan Centre – OPA 500, Steeles Corridor – OPA 620, etc.), the same parking requirement will not be appropriate everywhere. The proposed standards specify alternative minimum and maximum (in certain cases) parking requirements for four different urban categories, reflecting alternative transportation conditions and planning visions for these areas.
- **Sensitivity to parking demand and existing supply**: In addition to urban classifications, adjustment factors are specified to tailor parking requirements to local conditions. Examples include parking reductions for sites in close proximity to frequent transit service and mixed-use sites that can share parking among uses with offset peak demands.
- **Cash-in-lieu and Public Parking**: With development of the Vaughan Metropolitan Centre and growth in the Local Centres, there is opportunity and need for Vaughan to take a greater role in parking management. Cash-in-lieu is recommended as one strategy to help raise funds for the development of public parking that also provides flexibility to developers to provide less parking on-site. It is recommended that collected funds need not be limited to constructing and operating public parking, but

could also be spent on measures relating to improving parking efficiency (e.g., improved signage and access to existing lots) and reducing parking demand in the area (e.g., pedestrian improvements).

- **Improved parking design**: Recommendations are provided regarding parking space access and dimensions. This includes dimensions for typical automobile spaces, small car spaces to promote the uses of smaller, more fuel-efficient vehicles, and bicycle parking. Potential by-law requirements are also provided regarding many design aspects, such as landscaping, location and layout, and stormwater management.
- **Bicycle parking**: To promote cycling as a more sustainable mode of travel, bicycle parking requirements are specified for office, retail, restaurant, multi-unit residential, and school uses, including requirements for short- and long-term spaces.
- **Accessible Parking**: Revised accessible parking supply and design requirements are not proposed at this time. Rather, the intent is that Vaughan will adopt revised standards in line with the provisions under the Accessible Built Environment Standards being developed as part of the Accessibility for Ontarians with Disabilities Act.

Recommendations are also provided regarding public parking. Collective parking can be provided by the City or by the private sector and is typically priced. Collective, priced parking is seen as an important element of the transportation strategy for the Vaughan Metropolitan Centre, in particular, and potentially at other high order transit hubs, as it promotes alterative modes of transportation and TDM, reduces parking demand and the land required for parking, and generates revenue to fund parking structures or potentially other community improvements.

Financing parking can be one of the most challenging parts of parking development. Based on a specific review of opportunities, cash in lieu is recommended as one approach to help raise funds for the development of public parking in the Vaughan Metropolitan Centre, Steeles Corridor (i.e., Jane to Keele), and Local Centres, particularly the Woodbridge Core and Kleinburg-Nashville. Other funding options such as user fees and tax increment financing also hold promise in particular areas, but require further investigation as part of more location-specific parking strategies.

If Vaughan plans to increase its role in parking management and the provision of public parking, it will need an appropriate organizational structure to guide and implement these activities. Five parking management types are considered. Creating a Parking Advisory Committee, similar to that created in the Town of Markham, consisting of Regional and Municipal Councillors is recommended as the preferred approach that can be put in place relatively quickly to ensure more strategic and coordinated planning and action regarding parking management. A Parking Manager position should be created to coordinate staff support for this committee from various City departments.

This governance structure is a demonstrated low cost and effective approach to initiate and grow priced public parking. In the future, there may be a need for a more consolidated parking management structure with the consolidated authority to collect revenue, acquire land, and develop and operate parking facilities, such as a parking authority. A parking authority is not warranted in the City of Vaughan in the short- to medium-term; however, the City should coordinate efforts with the Region if it moves to establish a parking authority.

Prompted by on-going development and growth in the Woodbridge Core, a specific review of opportunities and options to guarantee a sufficient number of parking spaces available for use by the public was conducted for this area. Based on in-person surveys of businesses in the Woodbridge Core, on- and off-street parking surveys, consultation with key stakeholders, such as the Woodbridge Ratepayers Association, it was found that there was adequate parking availability at peak times; however, the most convenient spaces are highly utilized. A number of strategies are recommended to improve parking efficiency and increase parking supply including improved signage, facilitating cooperation among local businesses, and creative use of cash in lieu funds,

among other strategies. The consolidated parking by-law will also serve to improve parking in the Woodbridge Core and other local centres as the proposed standards will be tailored to these areas.

8.2 Proposed Parking Standards

For each use, proposed standards are subdivided by urban structure category, reflecting the intent of these standards to be sensitive to planning visions and current and future transportation conditions in each area. Unique minimum and maximum parking standards are proposed for many uses in High-Order Transit Hubs, Local Centres, and Primary Centres/ Primary Intensification Areas, with city-wide minimum standards applying to all remaining areas.

Exhibit 8-1 and Exhibit 8-2 present a summary of the proposed minimum and maximum parking standards for non-residential and residential uses, respectively.

In addition to vehicle parking, the recommendations in this report also address bicycle parking, accessible parking, shared parking, and off-site parking in detail, as described in Section 5, and parking design, as described in Section 0.

8.2.1 POTENTIAL ADJUSTMENT FACTORS

Proposed adjustment factors are summarized in Exhibit 8-3. It is recommended that the proposed adjustment factors would be implemented on a case by case basis, typically where there is the possibility of a site-specific by-law. It is also recommended that the City conduct further discussions and studies on each adjustment factor to refine the proposed specifications. For example, some of the recommendations will require input from the legal department.

8.2.1.1 Residential

Proposed adjustment factors and additional considerations for residential development include:

- **Transit access:** Reduce residential parking requirement (tenant and visitor) outside of High-Order Transit Hubs for sites within 400 m of frequent transit service (at least 15 minute peak period service).
- **Unbundled parking**: Reduce residential parking requirement (tenant) if parking sold/leased separately from units.
- **Shared parking**: Promote shared parking between visitor parking and customer parking for commercial uses on the same site.
- **Tandem parking**: Tandem parking is an affordable way for developers to provide, and residents to obtain an additional parking space. It also allows for more efficient use of the parking area and may eliminate the need for additional parking structure levels. Tandem parking should be allowed if the overall tenant parking requirement is greater than one space per unit as an efficient means of providing more than one parking space per unit.
- **Car-share spaces –** reduction of four parking spaces for each car-share space subject to maximums (See City of Toronto Car-Share Study)

8.2.1.2 Retail

Proposed adjustment factors and additional considerations for retail development include

- **Mixed-use and shared parking**: The key disadvantage of the shopping centre standard approach is that the parking requirement is less sensitive to actual parking demand at a development and may require an oversupply of parking where there is a high proportion of office uses or other lower demand generating uses. As such, mixed use developments where the Shopping Centre standard would apply should be subject to the lesser of the shopping centre standard or the required parking calculated from a shared parking analysis (see Section 5.3).

- **Transit access:** Reduce parking requirement outside of High-Order Transit Hubs for sites within 400 m of frequent transit service (at least 15 minute peak period service).

- **Lay-by/on-street parking**: Reduce off-street parking requirement at a 1 to 1 ratio for lay-by parking abutting the site and where lay-by parking is not restricted during retail hours.

- **Off-site parking**: Off-site parking should be allowed in High-Order Transit Hubs, Local Centres, and Primary Centres/Primary Intensification Areas as long as the additional parking is secured within 300 m of the site, clearly marked and appropriate pedestrian or shuttle connections are available (see Section 5.5).

8.2.1.3 Office and Industrial

Proposed adjustment factors and additional considerations are similar for office and industrial uses and include:

- **Transit access:** Reduce parking requirement outside of High-Order Transit Hubs for sites within 400 m of frequent transit service (at least 15 minute peak period service).

- **On-street parking**: Reduce off-street parking requirement at a 1 to 1 ratio for number of on-street spaces that are physically separated or otherwise designated as being available during all office hours (i.e. no peak period restrictions). Substitute on-street parking for required off-street parking where considered appropriate at the City's discretion.

- **Off-site parking**: Off-site parking should be allowed in High-Order Transit Hubs, Local Centres, and Primary Centres/Primary Intensification Areas as long as the additional parking is secured within 300 m of the site, clearly marked and appropriate pedestrian or shuttle connections are available (see Section 5.5).

- **Carpool parking:** For office uses with more than 20 parking spaces, five spaces or five percent of the parking spaces on site, whichever is less, should be reserved for carpool use. These spaces should be clearly signed and located closest to the building entrance, although not closer than mobility disabled or customer-reserved parking space. Typically, signage for carpool spaces is included as a requirement at the site plan stage and on-going enforcement is at the responsibility of the land owner. The practice of mandating preferential carpool is stipulated in the new York Region Transportation Master Plan.

Exhibit 8-1: Summary of Proposed Parking Standards – Non-Residential Uses

	Use Category	Description	Existing Standard	Proposed Standards (spaces / 100m² GFA)						
				Base (Other Areas)	High-Order Transit Hubs		Local Centres		Primary Centres/Primary Intensification Areas	
				Min	Min	Max	Min	Max (4)	Min	Max
Retail	Retail/Shopping Centre	<=5000m², eating establishments limited to 20% of GFA at this parking rate(1)	2.0-6.0	3.5	2	4	3	4.5 surface parking	3	4.5 surface parking
	Retail/Shopping Centre	>5000m², eating establishments limited to 20% of GFA at this parking rate(1)	2.0-6.0	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking
	Supermarket	>1000 m²	6	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking
	Bank or Financial Institution (standalone)		6	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking
Eating Establishment	Eating Establishment		16-20	10	6	10	8	-	8	-
	Take-Out Eating Establishment		10	6	3	6	4	-	4	-
	Outdoor Patio		Equal to eating establishment	0	0	-	0	-	0	-
Office	General Office Building	Ancillary retail, personal services, and eating establishment limited to 15% of GFA at this parking rate(2)	3.5	3	1.5	2.5	2	3 surface parking	2	3 surface parking
	Medical Office Building		5/ practitioner	4.5	2.5	4	3	4.5 surface parking	3	4.5 surface parking
Industrial	Industrial/Warehousing		1.5-2	1	-	-	-	-	-	-
	Mixed Industrial Building	Ancillary office, retail, personal services, and eating establishment limited to 15% of GFA at this parking rate(3)	1.5-2	1.5	-	-	-	-	-	-

(1) Eating establishment floor area above 20% of site GFA, should be assessed at the proposed eating establishment rate

(2) Retail, personal services, and eating establishment floor area above 15% of site GFA, should be assessed at the use-specific rate

(3) Office, retail, personal services, and eating establishment floor area above 15% of site GFA, should be assessed at the use-specific rate

(4) Maximum does not apply if parking is below grade

Exhibit 8-1: Summary of Proposed Parking Standards – Non-Residential Uses (cont.)

	Use Category	Existing Standard	Proposed Standards (units as specified)						
			Base (Other Areas)	High-Order Transit Hubs		Local Centres		Primary Centres/Primary Intensification Areas	
			Min	Min	Max	Min	Max	Min	Max
Places of Assembly and Related Uses	Hotel/Motel	1 per bedroom plus the requirements for any other use	0.9/bedroom(1)	0.75/bedroom(1)	-	0.85/bedroom(1)	-	0.85/bedroom(1)	-
	Banquet Halls, Dance Halls, Clubs and Convention Centres	11/100m^2 GFA	7/100m^2 GFA	3/100m^2 GFA	-	4.5/100m^2 GFA	-	4.5/100m^2 GFA	-
	Health or Fitness Club	11/100m^2 GFA	7/100m^2 GFA	5/100m^2 GFA	-	6/100m^2 GFA	-	6/100m^2 GFA	-
	Theatre, Auditorium, Public Hall, Arena, All Seasons Sports Facility, and Other Places of Assembly and Entertainment	11 / 100 m^2 GFA(2) and 0.33/ person in the maximum design capacity(3)	10/100m^2 GFA	5/100m^2 GFA	-	8/100m^2 GFA	-	8/100m^2 GFA	-
	Community Centre and Libraries	3.5/ 100 m^2 GFA(6) and 0.33/ person in the maximum design capacity(7)	2.0/100m^2 GFA	1.0/100m^2 GFA	-	1.5/100m^2 GFA	-	1.5/100m^2 GFA	-
	Museum, Art Gallery, Y.M.C.A., Y.W.C.A.	0.2/ person in the maximum design capacity	2.0/100m^2 GFA	1.0/100m^2 GFA	-	1.5/100m^2 GFA	-	1.5/100m^2 GFA	-
	Place of Amusement	0.17/ person in the maximum design capacity	2.0/100m^2 GFA	1.0/100m^2 GFA	-	1.5/100m^2 GFA	-	1.5/100m^2 GFA	-
	Bowling Alley	4 per lane	4 per lane	-	-	-	-	-	-
	Funeral Home	4/100m^2 with a 15 space minimum	4/100m^2 with a 15 space minimum	-	-	-	-	-	-

(1) Parking requirements for other uses (e.g., restaurant, convention centre) should be determined based on a shared parking calculation

(2)Theatre, Auditorium, Public Hall, Arena and other Places of Entertainment

(3) Place of Assembly and All Season Sports Facility

(4) Library

(5)Community Centre

Exhibit 8-1: Summary of Proposed Parking Standards – Non-Residential Uses (cont.)

	Use Category	Description	Existing Standard	Proposed Standards (units as specified)						
				Base (Other Areas)	High-Order Transit Hubs		Local Centres		Primary Centres/Primary Intensification Areas	
				Min	Min	Max	Min	Max	Min	Max
Institutional Uses	Place of Worship	Permanent Seating	11/ 100 m^2 GFA	23/ 100 m^2 GFA of worship area	9/ 100 m^2 GFA of worship area	18/ 100 m^2 GFA of worship area	15/ 100 m^2 GFA of worship area	23/ 100 m^2 GFA of worship area	18/ 100 m^2 GFA of worship area	29/ 100 m^2 GFA of worship area
		Variable Seating		34/ 100 m^2 GFA of worship area	13/ 100 m^2 GFA of worship area	26/ 100 m^2 GFA of worship area	22/ 100 m^2 GFA of worship area	34/ 100 m^2 GFA of worship area	26/ 100 m^2 GFA of worship area	43/ 100 m^2 GFA of worship area
	Hospital, Private and/or Public		0.75/bed in addition to 0.25/employee	No standard specified(2). Require studies be conducted for new hospitals and hospital expansion.	-	-	-	-	-	-
	Elementary and Secondary School	Parking	1.5 - 4(3)/Teaching Classroom	1.5 / classroom	1 / classroom	-	1.25 space / classroom	-	1.25 space / classroom	-
		Pick-Up/Drop-Off Spaces	0	3 spaces + 0.02/student	3 spaces + 0.015/ student		3 spaces + 0.015/ student		3 spaces + 0.015/ student	
	Post-Secondary Schools		Greater of 4/classroom or 6/100 m^s GFA	4/ classroom plus 1/ 6 seats in an auditorium or theatre	2.5/classroom plus 1/7 seats in an auditorium or theatre	-	3/classroom plus 1/7 seats in an auditorium or theatre	-	3/classroom plus 1/7 seats in an auditorium or theatre	-
	Day Nursery	Parking	1.5/Employee	1/Employee	0.75 / employee	-	0.85 / employee	-	0.85 / employee	-
		Pick-Up/Drop-Off Spaces	0	3 spaces + 0.1/ student	3 spaces + 0.05/ student		3 spaces + 0.05/ student		3 spaces + 0.05/ student	

(1) Required parking for auxiliary uses, such as residences, schools and day cares should be based on the specific requirements for these uses

(2) Due to the variation in hospital parking requirements, it is recommended not specify a standard for hospital land uses, as is practiced in the City of Toronto

(3) Secondary, Public, or Commercial School

Exhibit 8-2: Summary of Proposed Parking Standards – Residential Uses

Use Category	Description	Existing Standard	Proposed Standards (spaces per unit)						
			Base (Other Areas)	High-Order Transit Hubs		Local Centres		Primary Centres/Primary Intensification Areas	
			Min	Min	Max	Min	Max	Min	Max
Detached; Semi-Detached; Street Townhouse		2-3	2 per unit, with tandem parking permitted	1 per unit	-	1 per unit	-	1 per unit	-
Multiple Family Dwelling	Bachelor/1 Bedroom	1.75 (1.5 + 0.25 visitor/unit)	0.9	0.7	1	0.8	1.2	0.85	1.2
	2 Bedrooms		1.1	0.9	1.3	1	1.4	0.95	1.4
	3 Bedrooms		1.2	1	1.5	1.1	1.7	1.15	1.7
	Visitor		0.2	0.15		0.2		0.2	
Residential - Senior Citizen's Dwelling - Independent	Bachelor/1 Bedroom	1 per unit	0.6	0.45	-	0.5	-	0.5	
	2 Bedrooms		0.8	0.6	-	0.7	-	0.7	
	3 + bedrooms		0.95	0.8	-	0.85	-	0.85	
Senior Citizens Dwelling - Supportive	Supportive: seniors-oriented multi-family housing with some services provided	1 per unit	0.5	0.4	-	0.45	-	0.45	
Senior Citizens Nursing Home	Nursing home: with full services provided	0.5 per bed	0.25/bed	0.2/bed	-	0.25/bed	-	0.25/bed	
Senior Citizens Visitor(1)	Applies to all SC dwelling types		0.2	0.15	-	0.2	-	0.2	
Home Occupation	Cottage Industry, Home Occupation, Private Tutor	1-2 in addition to res. requirements	1 in addition to residential requirements (can be tandem)						

(1) Applied per bed in the case of nursing homes.

Exhibit 8-3: Summary of Potential Adjustment Factors

Factor	Multiple Family and Senior Citizens Dwellings	Retail	Restaurant	Office	Industrial
Mixed Use and Shared Parking	Allowed with visitor parking based on shared parking rates	Lesser of: Shopping Centre standard or required parking based on shared parking analysis	Based on shared parking rates	Lesser of: Office building standard or require parking based on shared parking analysis	Lesser of: Mixed industrial standard or required parking based on shared parking analysis
Transit Access	Excluding High-Order Transit Hubs, reduce tenant and visitor requirement by 5% for sites within 400 m of frequent service	Excluding High-Order Transit Hubs, reduce by 5% for sites within 400 m of frequent service		Excluding High-Order Transit Hubs, reduce by 10% for sites within 400 m of frequent service	
On-street parking		Reduce off-street parking requirement at a 1 to 1 ratio for lay-by parking abutting the site.			
Off-site parking		In high-order transit hubs, local centres and intensification areas, allow at a 1 to 1 ratio if within 300m of the site, clearly marked and appropriate pedestrian or shuttle connections are available.			
Carpool Parking				If > 20 off-street spaces required, lesser of 5 spaces or 5% of total spaces must be reserved for carpool use.	
Car-Share Parking	The minimum parking requirement may be reduced by up to 4 parking spaces for each dedicated car share stall				
Unbundled Parking	Reduce residential parking requirement (tenant) by 5% if parking sold/leased separately from unit for multi-unit residential and senior citizens dwellings				
Shuttle Services	Reduce tenant parking requirement by 15% for Senior Citizens Dwelling providing shuttle services to residents				

Tandem Parking	Allow if overall tenant parking requirement is greater than 1 /unit				

Exhibit 8-3: Summary of Proposed Adjustment Factors (cont.)

Factor	Institutional Uses				
	Elementary and Secondary School	Post-Secondary School	Day Nursery	Hospital, Private and/or Public	Place of Worship
Transit Access	Excluding High-Order Transit Hubs, reduce by 10% for sites within 400 m of frequent service.		Excluding High-Order Transit Hubs, reduce by 5% for sites within 400 m of frequent service.		
On-street parking	Reduce pick-up/drop-of parking requirement at a 1 to 1 ratio for lay-by parking abutting the site. Substitute on-street parking for required pick-up/drop-off parking where considered appropriate at the City's discretion.		Reduce pick-up/drop-of parking requirement at a 1 to 1 ratio for lay-by parking abutting the site. Substitute on-street parking for required pick-up/drop-off parking where considered appropriate at the City's discretion.	Reduce off-street parking requirement at a 1 to 1 ratio for lay-by parking abutting the site. Substitute on-street parking for required off-street parking where considered appropriate at the City's discretion.	
Off-site parking	In high-order transit hubs, local centres and intensification areas, allow at a 1 to 1 ratio if within 300m of the site, clearly marked and appropriate pedestrian or shuttle connections are available.				
Carpool Parking	If > 20 off-street spaces required, lesser of 5 spaces or 5% of total spaces must be reserved for carpool use.				
Parking Studies					Undertake parking study for places of worship that require 100 or more spaces and/or request a reduction in required parking.

Exhibit 8-3: Summary of Proposed Adjustment Factors (cont.)

Factor	Places of Assembly					
	Hotel and Motels	Banquet Halls, Dance Halls, Clubs and Convention Centres	Health/Fitness Club	Theatre, Auditorium, Public Hall, Arena, All Seasons Sports Facility, and Other Places of Assembly and Entertainment	Community Centres and Libraries	Other Uses (Museum and Art Gallery, Place of Amusement and Funeral Home)
Mixed Use and Shared Parking	Reduce required parking for other (restaurant, meeting room) uses by 10% due to use by hotel guests. In addition, encourage further shared parking arrangements.	Encourage shared parking arrangements, where appropriate.				
Transit Access	Excluding High-Order Transit Hubs, reduce by 5% for sites within 400 m of frequent service					
On-street parking		Reduce off-street parking requirement at a 1 to 1 ratio for lay-by parking abutting the site. Substitute on-street parking for required off-street parking where considered appropriate at the City's discretion.				
Off-site parking	In high-order transit hubs, local centres and intensification areas, allow at a 1 to 1 ratio if within 300m of the site, provided clearly marked and appropriate pedestrian or shuttle connections are available.					

8.3 Next Steps and Implementation Considerations

Moving forward from these recommendations, proposed standards will need to be put forward to Council for approval. A zoning by-law amendment to implement these recommendations has been drafted, which will spells out the fine implementation details, such as how specific uses will be defined and what adjustment factors should be implemented through the zoning by-law or through Official Plan policies.

As with any zoning change, a number of implementation issues will need to be considered. It is recommended that the new parking standards will apply to all development, new and existing within the City. In general, proposed minimum parking standards are lower than existing standards so most existing developments will not have a deficit of parking if they are reassessed with the new standards. In some cases, existing development may have more parking than allowed by a maximum parking standard. In either case, existing development not in compliance with the parking standards will be considered "legal non-conforming". It is recommended that no existing developments be required to get rid of parking if they supply spaces above the maximum standard. However, if such a site undergoes a major addition/reconstruction project and/or requests a zoning variance, this maximum parking standard should come into force.

One of the key issues that has arisen with respect to implementing the standards is that they will not be implemented as part of an overall zoning by-law update, which is still pending. Therefore, if the old use definitions are replaced by the new use definitions, this would mean that all of the existing site-specific by-laws (some 1,300 by-laws) would become obsolete. It is therefore proposed that two sets of definitions be retained until the new comprehensive zoning-by-law is finalized. This could be achieved by simply adding the old uses to the closest land use category under the new parking standards, or incorporating an equivalency table within the parking standards zoning by-law amendment.

As shown in Exhibit 8-4, the changes in use definitions mostly relate to a simplification and consolidation of definitions. In many cases, there are no changes. The most significant changes relates to the consolidation of industrial use categories, which for the most part had similar parking standards under the old zoning by-law.

Exhibit 8-4: Comparison of Use Definitions

Use Category	Use as Defined in By-law 1-88	Proposed Definition for Amended Zoning By-law
Residential	Residential - Single Family Detached Dwelling; Semi-Detached Dwelling	Residential - Single Family Detached Dwelling; Semi-Detached Dwelling, Street Townhouse
	Residential - Multiple Family Dwelling; Apartment Dwelling	No change
	Residential - Senior Citizen's Dwelling	Senior's Housing
	Residential - Senior Citizen's Nursing Home	Nursing Home
	Residential - Street Townhouse Dwelling	Included above
	Cottage Industry	Covered by Home occupation
	Home Occupation	No change
	Private Home Day Care, Private Home Tutoring	Covered by Home occupation
Office	Business or Professional Office	General Office
	Office Building	General Office
	Real Estate Office	General Office
	Regulated Health Professional Office or Clinic	Medical Office Building

Use Category	Use as Defined in By-law 1-88	Proposed Definition for Amended Zoning By-law
	Bank or Financial Institution	No Change
Retail	Retail Store	Retail/Shopping Centre (two size categories)
	Shopping Centre	Retail/Shopping Centre (two size categories)
	Retail Store, Convenience	Retail/Shopping Centre (two size categories)
	Supermarket	No Change
	Brewers Retail & LCBO	Retail/Shopping Centre (two size categories)
	Building Supply Outlet	Retail/Shopping Centre (two size categories)
	Personal Service Shops, Laundromat	Retail/Shopping Centre (two size categories)
	Print Shop	Retail/Shopping Centre (two size categories)
	Retail Warehousing	Retail/Shopping Centre (two size categories)
	Video Store	Retail/Shopping Centre (two size categories)
Restaurant	Eating Establishment and Tavern	Eating Establishment
	Eating Establishment, Convenience	Take out Eating Establishment
	Eating Establishment, Convenience Drive-Through	Take out Eating Establishment
	Eating Establishment, Take-Out	Take out Eating Establishment
	Outdoor Patio	Take out Eating Establishment
Industrial	Employment Uses other than Warehousing (Building 3,700 sq.m. or less G.F.A.)	Mixed Industrial Building
	Employment Uses other than Warehousing (Building with greater than 3,700 sq.m. G.F.A.)	Mixed Industrial Building
	Employment Uses in Multi-Unit Buildings containing more than four (4) units	Mixed Industrial Building
	Industrial Buildings, Multi-Unit, containing more than four (4) units	Mixed Industrial Building
	Industrial Uses Other Than Warehousing (<= 3,700m2 GFA)	Mixed Industrial Building
	Industrial Uses Other Than Warehousing (> 3,700m2 GFA)	Mixed Industrial Building
	Warehousing (Single Use)	Industrial/Warehousing
Institutional	Community Centre	Community Centres and Libraries
	Day Nursery	No change (except added pick-up and drop-off)
	Hospital, Private and/or Public	No change
	Museum, Art Gallery, Y.M.C.A., Y.W.C.A.	No change
	Place of Assembly	Theatre, Auditorium, Public Hall, Arena, All Seasons Sports Facility, and Other Places of Assembly and Entertainment
	Public Library	Community Centre and Libraries
	Public or Commercial School (Elementary)	Elementary and Secondary School
	Public or Commercial School (Secondary)	Elementary and Secondary School
	Technical School	Post Secondary School
Place of Assembly	All Season Sports Facility	Theatre, Auditorium, Public Hall, Arena, All Seasons Sports Facility, and Other Places of Assembly and Entertainment
	Bowling Alley	No change
	Convention Centre	Banquet Hall, Dance Halls, Clubs and Convention Centres

Use Category	Use as Defined in By-law 1-88	Proposed Definition for Amended Zoning By-law
	Dance Hall, Club, Banquet Hall	Banquet Hall, Dance Halls, Clubs and Convention Centres
	Place of Amusement	No change
	Place of Entertainment including Curling Rink, Skating Arena, Theatre, Auditorium, Public Hall, Health Centre & Church	Place of Assembly Place of Worship
Commercial Other	Automobile Service Station/Autobody Repair Garage	Mixed Industrial Building
	Automotive Retail Store	Retail/Shopping Centre (two size categories)
	Car Brokerage	Retail/Shopping Centre (two size categories)
	Car Wash	Not included
	Hotel/Motel	No change
	Motor Vehicle Sales Establishments	Retail/Shopping Centre (two size categories)
Other	Funeral Home	No change
	Other Uses Not Specifically Listed	Not included
	Post Office	General office
	Tourist Home	Not included
Mixed Use	Mixed Use Development in the C9 Corporate Centre Zone	To be retained until replaced

Another implementation issue is how the new parking standards are phased in. One option is to adopt all the standards in one step. Alternatively, proposed standards for each urban classification could be adopted at different times. For example, City-wide basic standards could be adopted first, and standards for other categories, such as the High-Order Transit Hubs, could be adopted upon construction of the subway.

Even though reduced minimums and parking maximums proposed in some areas are partially based on future transit improvements (e.g., subway, VIVA dedicated busway/light rapid transit), it is recommended that adoption of proposed parking standards occur as soon as possible, rather than being tied to these improvements. New development takes time and is difficult to change once it is in place. The development applications occurring now in the Steeles Corridor and Vaughan Metropolitan Centre may only be built several years before the subway opens.

Parking standards are one of the most powerful tools available to a municipality for influencing its off-street parking supply, particularly for new development. However, progressive parking standards are only one component in promoting more sustainable development in Vaughan. Particularly in areas where maximum parking limits are proposed and structured parking is desired, proper incentives will need to be in place to encourage the type of development desired. Examples of such incentives include good transit service, density bonuses, joint development of parking or public parking provision nearby, and a taxation structure that does not favour free surface parking over priced structured parking.

In summary, it is envisioned that the parking zoning by-laws will be “living” regulations that evolve as required to meet changing conditions, just as they have done in the past. The proposed standards and supporting recommendations regarding public parking are important tools for the City of Vaughan, as it continues to evolve into an increasingly urban environment with more pervasive and frequent public transportation.

APPENDIX A

REVIEW OF BEST PRACTICES: ALTERNATIVE APPROACHES TO PARKING REQUIREMENTS

IBI GROUP

Alternative Approaches to Parking Requirements

REDUCED MINIMUM REQUIREMENTS

Definition

Reduces the amount of parking developers are required to provide based on local context (e.g., quality of transit service).

Description

Parking standards are often a blunt policy tool. As stated in a recent US Environmental Protection Agency (EPA) publication, "Generic parking standards have not kept up with the complexity of modern mixed-use development and redevelopment."[1], and this has so far been the case in Vaughan. The parking standards in Vaughan's zoning by-law are not sensitive to recent development trends and thus give no consideration to transit-oriented development, infill development, or affordable housing, which often have unique parking requirements.

There are many factors that influence parking demand including development type and size, development density and design, availability of transportation choices, surrounding land-use mix, off-site parking availability, and demographics (e.g., income, age, etc.). There are two main approaches to reducing minimum requirements to reflect local conditions. The first is to adopt unique parking standards for a specific area (e.g., Vaughan Corporate Centre) reflecting the land use and transportation objectives for that area. The second is to adopt modifying factors that reduce minimum parking requirements based on site-specific conditions (e.g., proximity to rapid transit, availability of good pedestrian infrastructure, adoption of TDM programs, etc.). Modifying factors must be developed with careful consideration to the factors influencing parking demand.

Litman[2] summarizes the potential parking demand reductions that can be achieved based on a variety of site-specific factors, such as lower average income, availability of carshare vehicles, and land use mix, as shown in Exhibit 1. While the actual demand reductions should be applied with care, this list provides a good summary of the many factors affecting parking demand.

[1] US Environmental Protection Agency. (2006) Parking Spaces/Community Places – Finding the Balance Through Smart Growth Solutions. Washington, DC.
[2] Litman, T. (2006) Parking Management Best Practices. American Planning Association, Chicago, IL.

Exhibit 1: Potential Adjustment Factors for Parking Requirements

Factor	Description	Typical Adjustments
Geographic Location	Vehicle ownership and use rates in an area.	Adjust parking requirements to reflect variations identified in census and travel survey data.
Residential Density	Number of residents or housing units per acre/hectare.	Reduce requirements 1% for each resident per acre: Reduce requirements 15% where there are 15 residents per acre, and 30% if there are 30 residents per acre.
Employment Density	Number of employees per acre.	Reduce requirements 10-15% in areas with 50 or more employees per gross acre.
Land Use Mix	Range of land uses located within convenient walking distance.	Reduce requirements 5-10% in mixed-use developments. Additional reductions with shared parking.
Transit Accessibility	Nearby transit service frequency and quality.	Reduce requirements 10% for housing and employment within ¼ mile of frequent bus service, and 20% for housing and employment within ¼ mile of a rail transit station.
Carsharing	Whether a carsharing service is located nearby.	Reduce residential requirements 5-10% if a carsharing service is located nearby, or reduce 4-8 parking spaces for each carshare vehicle in a residential building.
Walkability	Walking environment quality.	Reduce requirements 5-15% in walkable communities, and more if walkability allow more shared and off-site parking.
Demographics	Age and physical ability of residents or commuters.	Reduce requirements 20-40% for housing for young (under 30) elderly (over 65) or disabled people.
Income	Average income of residents or commuters.	Reduce requirements 10-20% for the 20% lowest income households, and 20-30% for the lowest 10%.
Housing Tenure	Whether housing are owned or rented.	Reduce requirements 20-40% for rental versus owner occupied housing.
Pricing	Parking that is priced, unbundled or cashed out.	Reduce requirements 10-30% for cost-recovery pricing (i.e. parking priced to pay the full cost of parking facilities).
Unbundling Parking	Parking sold or rented separately from building space.	Unbundling parking typically reduces vehicle ownership and parking demand 10-20%.
Parking & Mobility Management	Parking and mobility management programs are implemented at a site.	Reduce requirements 10-40% at worksites with effective parking and mobility management programs.
Design Hour	Number of allowable annual hours a parking facility may fill.	Reduce requirements 10-20% if a 10th annual design hour is replaced by a 30th annual peak hour. Requires overflow plan.
Contingency-Based Planning	Use lower-bound requirements, and implement additional strategies if needed.	Reduce requirements 10-30%, and more if a comprehensive parking management program is implemented.

Source: Litman, T. (2006) Parking Management Best Practices. American Planning Association. Chicago, IL

It is important to note that reductions in required parking from adjustment factors are multiplicative, not additive. For example, assuming an apartment building receives a 10% reduction for proximity to transit and a 20% reduction for affordable housing, the minimum parking requirement would be reduced by:

1-(1-10%)*(1-20%)=28%, which is slightly less than 30% (i.e., 10%+20%).

For lower minimum parking requirements to be successful, developers must be willing to provide less parking. This is often the case as parking is costly and providing less parking can help developers to increase the economic value of a project. However, for retail and some office

development, developers may wish to provide large amounts of free parking for marketing reasons. If ensuring developments do not oversupply parking is a prime concern, such as in close proximity to rapid transit or in downtown areas, parking maximums may be appropriate, as discussed in the following section.

Examples

There are many innovative parking alternatives that regulate how parking requirements can be altered to better reflect the true demand for parking and to balance parking with wider community goals:

- Los Angeles grants a reduction of 0.5 spaces per unit for affordable housing units, with further reductions if they are within 1,500 feet of mass transit or a major bus line.
- Portland, Oregon removes minimum parking requirements for sites located within 500 feet from a transit street with 20-minute peak hour service;
- For offices within one quarter mile of a light-rail station, Pasadena, California, applies a maximum parking standard equivalent to 75% of the minimum standard in other areas;
- Montgomery County, Maryland's office zoning requirements allows a 15 percent reduction in minimum parking requirements if businesses participate in the "Share-A-Ride" program. Participation involves designating a transit co-coordinator and reserving at least 20% of parking for carpools. Other ways to qualify include subsidizing transit passes to employees[3].
- South San Francisco has enacted a citywide Transportation Demand Management Ordinance, which allows reduced parking requirements for projects meeting TDM requirements. The ordinance applies to all nonresidential developments that expect to generate 100 or more average daily trips, or to projects seeking a floor area ratio (FAR) bonus. Parking reductions are not fixed, but are subject to case-by-case review and depend on the number and extent of implementation of TDM strategies (e.g., parking for carpools and vanpools, transit subsidies, guaranteed ride home, parking charges for employee spaces, etc.).

PARKING MAXIMUMS

Definition

Maximum parking requirements set an upper limit on the amount of parking developers may provide, as specified in land use by-laws.

Description

The maximum parking standard is a policy-based parking management tool that is receiving increased attention. By limiting the amount of automobile parking for in specific sub-regions or urban contexts, a municipality makes a statement that parking provision must be balanced with other land use and transportation objectives and that the automobile is not the only mode for travel to that area.

The current practice among many commercial developers is to provide as much parking as possible. For example, the industry standard among shopping centres is to supply sufficient parking

[3] Smith, T. (1983) Flexible Parking Requirements. American Planning Association. Planning Advisory Services Report #377. Chicago, IL.

to meet the parking demand of customers and employees at the 20th busiest hour of the year. This means that parking facilities will not be fully occupied during 99 percent of operating hours and that typically over half of the available spaces will be vacant during 40 percent of the year's operating hours[4].

Parking maximums are intended to:

- Reduce the amount of space dedicated to parking and support transit and pedestrian-oriented development;
- Provide a strong incentive for transportation demand management[5]
- Curb practices among some industries towards parking oversupply, particularly in areas in close proximity to transit stations, where transit use may reduce parking demand;
- Potentially allow parking pricing to come into play with associated transportation demand management benefits (e.g. increased transit use); and
- Allow the City to have input on how all parking is built, which enhances its ability to help create well-designed urban areas.

On this final point, the City can currently only regulate how parking on a site is built up to the minimum required supply. This has implications for the City's ability to set urban design standards to which parking is built. Instituting parking maximums in areas where good urban design is a City priority will allow the City to regulate all on-site parking.

Despite the benefits of parking maximums, strategies to reduce and limit parking must be implemented carefully. Parking maximums may be opposed by the development community and imposing parking maximums that are too restrictive may encourage development to go elsewhere or result in parking spill-over problems, particularly if there is poor transit accessibility.

There are a number of approaches to facilitate effective implementation of parking maximums:

- Maximums should be based on research regarding parking demand and involvement with key stakeholders;
- To ensure that parking maximums do not discourage development, other incentives, such as density bonuses in intensification areas may be advisable;
- Maximum standards can be phased in over time as demand reduction programs and transit improvements are provided;
- Individual developments may be allowed to exceed parking maximums if other objectives are met (e.g. sharing of commercial parking with transit park and ride, structured parking, etc.);
- Maximum limits can be set to only apply to surface parking, as in Calgary; and

---

[4] Urban Land Institute and International Council of Shopping Centers. (2003) Parking Requirements for Shopping Centers, 2nd Edition. Washington, D.C.

[5] The undersupply of parking for employees is a key incentive for employers to adopt and promote workplace transportation demand management. Ample, free parking at workplaces has been cited as one of the biggest barriers to TDM in Markham (Lorenzo Mele, SmartCommute Co-ordinator, Markham, personal communication).

- Supplemental strategies, such as preferential parking for residents and parking enforcement may be required to minimize spill-over issues.

Examples

The use of parking maximums is growing in Canadian municipalities. Traditionally, maximum parking standards have been designed to limit automobile volumes entering downtown or central business areas such as in Vancouver and Toronto. However, parking maximums are being used increasingly in suburban contexts to support intensification areas. In Vaughan, the Carville District Centre Plan specifies maximum parking limitations for retail commercial, office, and residential uses.

In addition to setting a maximum parking ratio by use, maximum parking standards have been implemented in a variety of ways:

- The Land Use Bylaw Review Parking Strategy for Calgary, AB proposes that office parking requirements be set to a minimum of 1.5 stalls per 100 square metres gross floor area, with a maximum rate of 3 stalls per 100 square metres gross floor area *in surface parking*. This specification limits the amount of surface parking, while providing some flexibility to a development to provide more parking if desired in parking structures. However, given that above ground structured parking typically costs more than three times the amount of surface parking to build, developers have a strong disincentive to build more parking.

- Beaverton, Oregon regulates the land devoted to parking instead of the number of spaces. If additional parking is required, developers can choose to build parking structures within the allowable footprint.

- San Francisco permits only 7% of a building's gross floor area for parking.

Elsewhere, a significant emergence of the use of parking maximums recently occurred in the United Kingdom, when the government planning policy on parking was reviewed and a new version issued in 2001. The revision included a nation-wide shift from the previous use of minimum parking standards to the use of maximum parking standards. Scotland has also instituted nation-wide parking maximums.

SHARED PARKING

Definition

Shared parking involves the use of one parking facility by more than one land-use activity, typically taking advantage of different parking demand patterns by time of day to reduce the total amount of parking that would have been required if facilities were not shared.

Description

Shared parking ensures that parking spaces are not designated for any particular user, but operate as a pooled parking resource. This strategy can be considered on a "micro" scale within a single development, or on a "macro" scale between several developments.

The biggest benefits are realized with mixed-use developments, where uses have different peak demand times. For example, a restaurant and an office can share a parking facility with fewer total parking spaces than would otherwise be required for two separate parking facilities. As a result, shared parking encourages more efficient use of the parking supply regardless of the location of the development.

The consideration of shared parking requires some assessment of typical occupancy rates during different times of the day for each of the activities to be included in a shared parking scheme. An example of occupancy rates is included in Exhibit 2 below.

Exhibit 2: Typical Parking Occupancy Rates

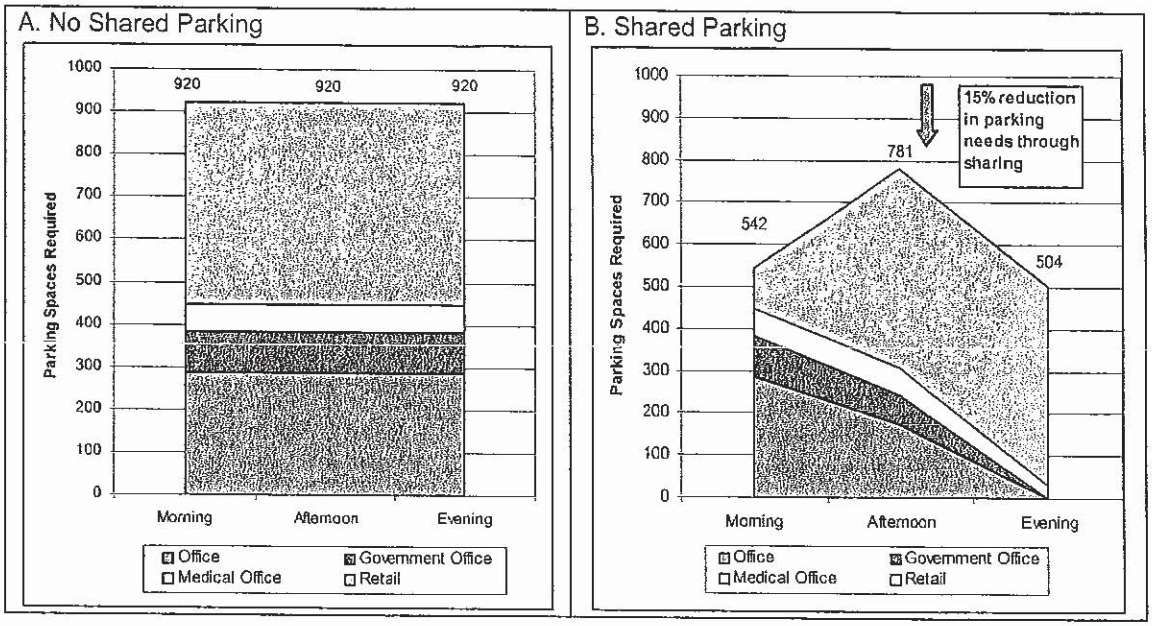
Land Uses	Weekday	Weekday	Weekday	Weekend	Weekend	Weekend
	Daytime	Evening	Overnight	Daytime	Evening	Overnight
Residential	60%	100%	100%	80%	100%	100%
Office/Industrial	100%	20%	5%	5%	5%	5%
Retail	90%	80%	5%	100%	70%	5%
Hotel	70%	100%	100%	70%	100%	100%
Restaurant	70%	100%	10%	70%	100%	20%
Movie Theatre	40%	80%	10%	80%	100%	10%
Entertainment	40%	100%	10%	80%	100%	50%
Conference/ Convention	100%	100%	5%	100%	100%	5%
Institutional	100%	20%	5%	10%	10%	5%
Place of worship	10%	5%	5%	100%	50%	5%

Source: Adapted from ITE Parking Management Report, prepared by Todd Litman for the ITE Parking Council and Planners Press, Draft Report, August 2003 (Unpublished)

From the above table, it can be seen that the combination of office and retail uses within the same building would lead to an overall reduction in the total number of parking spaces that would be required if the uses were considered in isolation. Differences in morning, afternoon, and evening parking demand are shown graphically for a hypothetical development with a variety of office uses and retail in

Exhibit 3. Without shared parking, the total development would require 920 parking spaces. However, if parking was appropriately designed to be shared among uses, a max of 781 spaces would be required in the afternoon peak representing a 15% reduction in parking supply.

Exhibit 3: Hypothetical Mixed-Use Development: Non-Shared vs. Shared Parking



There are a number of factors that need to be considered in implementing shared parking effectively:

- A mixed use development must be planned with use types by proportion of floor area known in advance (e.g., retail, office, restaurant) so that a shared parking calculation can be conducted;
- Parking must be unreserved and designed to serve all uses;
- When a new business moves in to a development, its parking demand profile may be different from the original use, which may reduce the potential for shared parking and lead to parking undersupply;
- The submission of a shared parking agreement between the proposed users of a shared parking facility can be required to ensure that it can be reviewed and enforcement undertaken if necessary

Examples

Provisions for shared parking are included in some form in zoning by-laws of a number of Canadian municipalities. The City of Vaughan currently allows shared parking in the C9 Corporate Centre Zone for mixed use development. Vancouver, Hamilton, Mississauga, and Toronto, all allow reductions in required parking for mixed use developments with the potential for shared parking.

OFF-SITE PARKING

Definition

Off-site parking provisions allow some or all of required parking to be provided on a nearby site.

Description

Parking by-laws traditionally require that parking be provided on the same site as the land use activity. However, in some cases there may be benefits in allowing parking to be provided on another nearby site, especially in the case of redevelopment of existing buildings, or where a centralized parking facility is desirable. Off-site parking has the benefit of allowing more of a particular site to be used for buildings, open space, and other non-parking uses, particularly when above- or below-grade parking is not financially feasible. It may reduce the cost of parking provision. It is particularly applicable in areas undergoing intensification or heritage areas where they may be little room on a site for additional parking.

The maximum acceptable walking distance for users of the off-site parking facility to travel between the parking spaces and the land use is an important consideration in determining the feasibility of off-site parking. General ranges of acceptable walking distances should be established based on the land use and also the expected users. For example, walking distances of 300 metres may be acceptable for people travelling to a restaurant, while more than 100 metres may be undesirable for people arriving at a medical office. Particular consideration must be given to disabled users of a parking facility, for whom a significant distance between the parking space and the land use destination may not be feasible if no suitable pedestrian connections exist.

Implementation issues to consider include what constitutes an appropriate location for off-site parking often indicated as a maximum distance from the receiving site, how the off-site parking should be secured (e.g., registered on the title of the receiving site, site plan agreement) and how it should be monitored and enforced by the City.

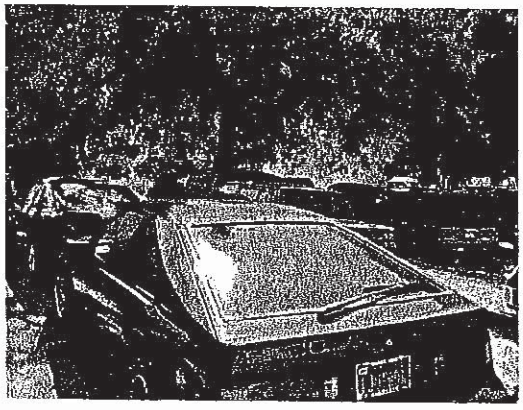
Examples

Provisions for off-site parking are included in some form in zoning by-laws of a number of Canadian municipalities (e.g., Toronto, Vancouver, Calgary, Kingston). The City of Vaughan currently allows for off-site parking in the C9 Corporate Centre Zone and C10 Corporate District Zone.

TANDEM PARKING

Definition

Tandem or stacked parking is when there are two or more parking spaces, one behind the other, with a common or shared point of access to the manoeuvring aisle.



Description

Tandem parking removes many of the access lane requirements from a parking facility, which significantly increases the space available for vehicles. By reducing the amount of land and impervious surface for parking, stacked parking can facilitate more compact development and reduce stormwater runoff from parking facilities. Stacked parking is typically implemented in a limited number of situations that justify having a parking attendant to move or direct vehicles (e.g., high parking demand, constrained parking supply). It is often used for event parking and other locations with highly peak parking demands, such as funeral homes and places of worship. It is also used at commercial lots, which allows operators to maximize revenue.

To encourage smaller parking facilities and more land-efficient development, tandem parking could potentially be allowed in Vaughan for a number of uses where attendants could be used such as with banquet halls, places of worship, funeral homes. As these uses typically experience much higher parking demand than most other land uses, tandem parking might allow more potential for converting a site to one of these land uses – a conversion which would otherwise be banned as the site would not meet the higher parking requirements. In other words, it can help to facilitate adaptive land re-use.

Examples

Ottawa allows a portion of parking spaces to be stacked for larger sites. Where an office use, a light or heavy industrial use, a warehouse, a hospital, a funeral home, or a place of worship is required to provide 50 or more motor vehicle parking spaces, 10% of those required motor vehicle parking spaces need not have direct, unobstructed access to a public street.

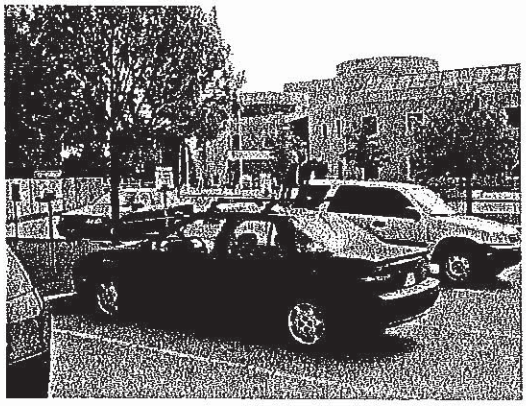
Portland, Oregon allows stacked parking provided an attendant is present to move vehicles.

PREFERENTIAL CARPOOL PARKING

Definition

Desirable parking spaces are set aside for car and van pools.

Description



Preferential parking provides an incentive to ridesharing by providing reserved spaces to carpool vehicles. In addition to the TDM benefits, encouraging carpooling also reduces parking demand. Preferential parking is normally applied at off-street facilities at workplaces or institutions. The effectiveness of such a strategy will depend on the relative attractiveness of preferential parking (i.e., shortage of easily accessible and convenient all day parking). Preferential parking is most attractive in large, well-utilized lots where preferential parking spaces closer to building entrances will provide a shorter walk and potentially an enhanced sense of security and a better chance of finding a parking space. It is particularly applicable in areas where transit options are minimal, such as many workplaces in Vaughan.

Monitoring is required to ensure appropriate use. Carpoolers may be required to register to be eligible for preferential spaces. Unless parking facilities are attended, a transportation or parking coordinator would need to be designated to monitor carpoolers.

Examples

Designated spaces for carpoolers are fairly common in cities implementing TDM programs.

- Markham Civic Centre provides preferential parking;
- In Portland, Oregon, for office uses with more than 20 required parking spaces, five spaces or five percent of the parking spaces on site, whichever is less, must be reserved for carpool use. These sites must be located close to the building entrance.

BICYCLE PARKING REQUIREMENTS

Definition

Similar to vehicle parking requirements, requires parking facilities to be provided for bicycles.

Description

The provision of adequate bicycle parking and associated shower and change facilities is an important element in the promotion of bicycle use. The absence of these supportive facilities is a deterrent to more widespread bicycle travel across Vaughan. More bicycle trips will reduce the number or growth of vehicle trips and leads to a more sustainable pattern of urban travel. As a method of promoting cycling a number of municipalities have begun to institute minimum requirement for bicycle facilities

A review of best practices in terms of bicycle parking requirements elsewhere revealed the following:

- A comprehensive bicycle parking program will provide both short-term parking to accommodate customers, visitors, couriers, etc. who will be parking for no more than one or two hours and longer-term parking for employees, students, residents, etc. who will be parking for more than two hours. Short-term parking can be provided as basic bike parking, which is typically a bike stand or rack, ideally no more than 15 metres from a building entrance and in a clearly visible area to support informal surveillance. Long-term parking requires an enhanced level of service, such as a secure, weather-protected location on a building site.

- The appropriate proportion of long-term versus short-term spaces is not uniform across uses. For example, office uses will be more heavily weighted towards long-term bike parking, while retail uses will require more short-term parking.

- Bicycle-supportive land use by-laws can also specify requirements for lockers, wash basins, and showers to ensure cyclists have adequate facilities to shower and change upon arriving at their place of work. Such requirements can be based on the number of long-term bicycle parking spaces required. For example, the City of Vancouver has mandated at least one water closet, washbasin and shower for both genders for any building that requires at least 4 long-term bicycle stalls. Alternatively, Halifax does not require shower facilities, but allows reductions in motor vehicle parking (up to 10% of the required amount) given enhanced bicycle facilities, including additional bicycle parking, sheltered bicycle parking, and the provision of showers or clothes lockers.

- Experience has shown that there should be no upper limits on bike parking supply and that bicycle parking demand is essentially proportional to the number of employees, customers, etc.

- Bike parking should not be specified as a percentage of auto spaces since one would not want to limit the number of bike spaces on the basis of auto spaces. Indeed, there may be an inverse relationship between the two in some cases.

Bicycle parking requirements are typically specified based on number of residential units or gross floor area for other uses, such as offices. Calgary specifies some bicycle requirements in terms of required automobile spaces, although this is not recommended, since areas with reduced minimum requirements, such as community core areas, may actually have higher cycling rates.

Examples

A review of standards in other jurisdictions revealed that requirements for bicycle parking spaces are not common in Canadian cities, but have been established, for example, in Calgary, Vancouver, Ottawa, Kingston, Halifax, and Toronto (to a limited extent).

Bicycle parking standards for office uses are typically in the range of 0.1 long-term spaces per 100 m^2 of gross floor area. Assuming a typical density for office employees of 3.9 employees per 100 m^2, this requirement works out to about 1 long-term space for every 40 employees. This corresponds to a long-term bicycle parking space for approximately 2.5% of employees.

CASH IN LIEU

Definition

Cash in lieu of parking (CILP) programs enable developers to pay a fee in lieu of providing parking spaces required under municipal zoning by-laws. The revenue is typically utilized to finance collective parking spaces to replace some or all of the private spaces that developers would have provided.

Description

Where provision for cash-in-lieu of parking exists, developers have the option (subject to certain conditions) of paying into a fund for off-site municipal parking facilities, which allows the parking facility to be situated at the most optimal position, while meeting urban design objectives. The centralized parking is typically provided by the municipality and operated as a shared parking facility accessible to the public with priced parking. A key challenge to cash in lieu programs is that there may be a long delay between the moment a developer provides funds in lieu and the time that a municipality or parking authority raises sufficient funds to construct a parking facility.

Most cash-in-lieu of parking schemes specify that the money collected is placed in a specific parking fund and spent on parking facilities in the future. However, there is typically no requirement that the money be spent in a specific location. Section 40.1 of the *Planning Act* provides the basis for municipalities to allow cash-in-lieu of parking. Section 40.3 requires that the money received shall be paid into a special account that may be invested until such time as the funds are required.

There are a number of factors that contribute to the effectiveness of CILP:

Pace of Growth and Development: CILP practices tend to be most successful in cities undergoing rapid growth in business development - overall and specifically in downtown areas[6]. The pace of growth is significant in generating sufficient CILP revenue to fund additional parking supply and management. For instance, cities such as Calgary, Ottawa, and Kelowna have experienced strong growth (downtown and business areas) and as a result the continued use of CILP is justified[7]. In dynamic growth centres, there is stronger incentive for businesses to build and operate in these areas despite CILP costs. In contrast, cities with slower growth tend to avoid the CILP approach since it poses as a possible disincentive to the revitalization of their economy and downtown areas.

Designated Areas: Applying CILP only in designated areas in a municipality, such as the downtown core or heritage areas, allows the CILP fund to be re-invested specifically into these designated areas.

---

[6] Stantec. (November 2002). *City of Windsor Cash-in-Lieu of Parking Study*.
[7] Stantec.

Avoidance of Contradictory Parking Policies: There is a tension between reducing parking requirements and developing a successful CILP. The use of CILP in areas can be compromised by partial or full parking exemptions. Partial reductions in required parking decreases potential revenue gained from CILP; while full exemptions lead to a program that is not feasible and/or underutilized[8].

Existing Parking Supply: If there is sufficient or an oversupply of parking in an area, requiring a payment for additional parking may not be justified since it is likely unnecessary to invest in increasing parking supply.

Cost per Stall: The cash in lieu per stall should be set based on the cost of land and the cost per stall of the type of parking facility to be developed as well as the portion of operating and capital costs that each municipality wants to recover. The typical discounted rate for a cash in lieu payment is discounted at 50% of the actual cost of providing parking[9]. Reduced rates are set in order to:

- Provide financial incentives to developers to contribute to creating strategically located public parking facilities;
- Recognize that the municipality will be able to recover some of the costs through user fees;
- Acknowledge that municipal facilities, such as parking facilities, are not subject to certain taxes; and
- Recognize that the developer/cash in lieu contributor does not obtain ownership in the parking facility[10].

Examples

CILP exists in Toronto and is also prevalent in other cities in Ontario and across Canada, though the extent to which it has successfully generated revenues for parking is limited. In 2006, the City of Vaughan implemented a Cash in Lieu of Parking policy[11] for the community of Kleinburg. A CILP has also been recommended for the developing Markham Centre[12].

In Toronto, funds from cash-in-lieu currently make up a very small portion of Toronto Parking Authority (TPA) revenue. In fact, TPA has deployed other options in the past for funding new parking structures, including the application of a commercial parking tax in specific areas. This is a "benefiting assessment" fee charged to businesses over a period of time in a designated area. The fee is tied to the construction of designated parking facilities that benefit specific businesses. The fee is intended to cover any revenue losses to TPA for the operation of the facility. Approximately 30 parking structures across the City have been constructed this way.

Calgary's CILP is the most widely used in Canada. In Downtown Calgary, new developments are required to provide half of required parking as cash in lieu fees. These fees have been used to develop parking structures at the periphery of the downtown.

---

[8] Stantec.
[9] BA Group. (October 2005). *Parking Strategy for Markham Centre – Final Report: Appendix A*
[10] BA Group.
[11] City of Vaughan By-law 159-2006
[12] BA Group.

Applicability to Vaughan

There are challenges depending on ability to develop public parking. In many cases, parking requirements need to be reduced first and then determine if there is a need. Given existing high parking standards, there is an abundance of parking in many of the core areas and a need to raise funds to build parking facilities.

APPENDIX B

SURVEY DATA COLLECTION PROCESS

IBI GROUP

SURVEY DATA COLLECTION PROCESS

Data Cleaning

More than 170 spot surveys were completed, which provides a reasonable sample population to inform the study. Before survey data could be analyzed, however, it was processed and filtered to ensure that all site data was consistent with aerial images and site photographs. A conservative approach was adopted in performing this data cleaning to guarantee quality over quantity. Samples were typically removed because either parking supply and/or occupancy were not accurately observable. A follow up survey was conducted in March to correct and update many of the problematic sites. Despite this follow up survey, the data collected at 94 of the sites was deferred from the analysis. Exhibit 0.1 displays the number of completed surveys, samples filtered out, and remaining clean data samples.

Exhibit 0.1: Number of Samples Before and After Data Cleaning

Category	Completed Surveys	Removed Samples	Clean Data Samples	Data Capture Rate
Retail	94	52	42	45%
Office[1]	38	16	22	58%
Industrial	39	26	13	33%
Total	171	94	77	45%

The majority of removed samples were filtered out due to concerns with parking supply and/or occupancy observations.

The Municipal Property Assessment Corporation (MPAC) database was used to obtain gross floor area (GFA) data, but as this involved time consuming coordination, the site surveys had to start before any GFA data was available. In the end, GFA data was not available for all of the surveyed sites and some had to be either dropped or estimated from aerial photographs. There are several other reasons why surveyors may not have been able to accurately record parking supply and/or occupancy, including:

- Shared parking with other uses;
- Significant on-street parking;
- Secure access parking;
- MPAC GFA data not representative;
- Snow cover obscuring spaces; and
- Large areas used for parking despite a lack of explicitly demarcated spaces (primarily an issue at the predominantly industrial sites)

[1] GFA data was not available for a majority of the sites surveyed.

The low data capture rates shown in Exhibit 0.1 were anticipated due to the challenges of acquiring GFA data and the difficult nature of conducting parking spot surveys. To compensate, several sites were surveyed to ensure a reasonable sample size after data cleaning. The remaining clean data set is sufficient to provide insight into the predominant land use patterns in Vaughan and thus inform this study.

Peak Time Adjustment

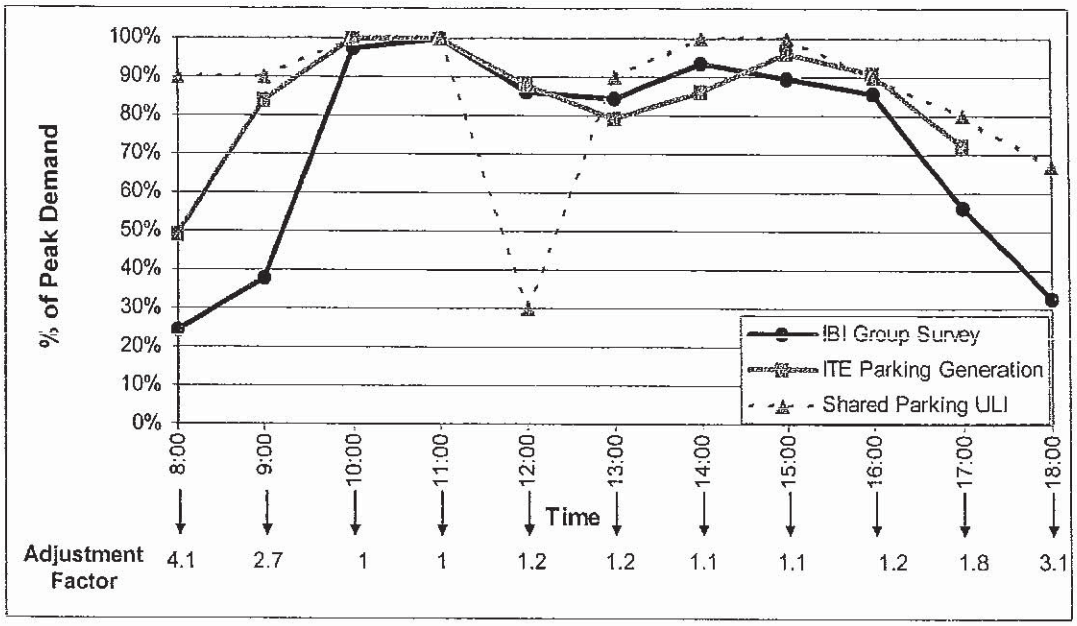
Parking demand varies by time of day, time of week, and time of year. Furthermore, these variations are not necessarily consistent across land use categories. At 10 a.m. on a weekday or noon on a Saturday, for example, the parking demands at an office building compared to a large grocery store will be very different. Parking standards are typically developed with consideration to peak parking requirements, thus it is important to ensure that surveyed parking occupancy represents peak conditions for each use. To this end, observed parking occupancies were adjusted using time-of-day and day-of-week factors. No adjustments were applied for the day of year as most spot surveys were conducted in early to mid-December, which corresponds with the busiest period of the year for retail activity (ULI, 2005).

TIME-OF-DAY FACTORS

In order to determine time-of-day peak adjustment factors, the results of a large 2006 parking survey conducted by IBI Group for the City of Toronto are used. This data is based on parking surveys of sites for each land use category, conducted on an hourly basis over the course of a day. The resulting parking profiles for each land use were applied to the Vaughan data to scale up observed parking occupancy to the expected daily peak if the data was not collected during peak periods.

Exhibit 1.2 displays an example of the daily parking profile for medical office use, comparing surveyed results to reported results in ITE Parking Generation and ULI's Shared Parking (ULI, 2005). It also displays the adjustment factors calculated from the parking profile, which ranges from 1.0 at the time of peak parking occupancy (11 a.m.), to 4.1 at the time with the lowest parking occupancy (8 a.m.).

Exhibit 0.2: Medical Office Time-of-Day Adjustment

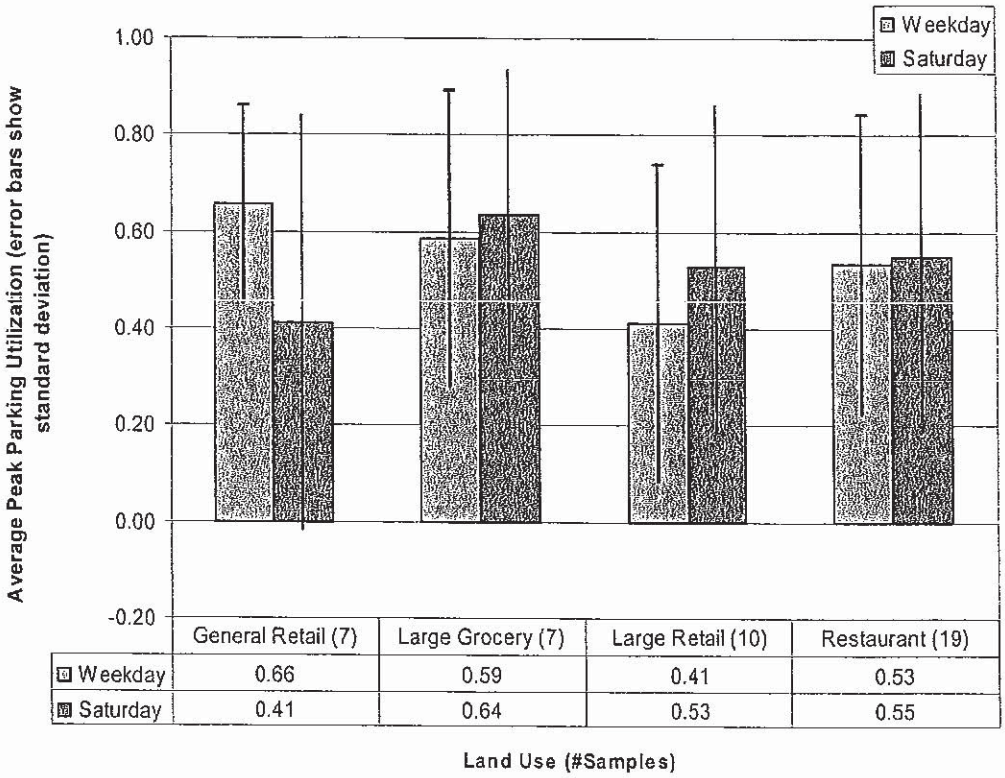


TIME-OF-WEEK FACTORS

Parking demand also varies by time of week. It is expected that Saturday demand for parking will be different than weekdays both in terms of quantity and time of day distribution for most office and retail uses. It is important to understand these differences in order to properly assess the effects of different parking standards. This is particularly the case for retail uses where peak Saturday parking occupancy may be substantially higher than peak weekday parking occupancy. It is assumed that Saturday peak parking occupancy for office and industrial uses is substantially lower than weekday conditions.

A large 2006 parking survey conducted for the City of Toronto by IBI Group, which involved 787 sites, found significant differences between weekday and Saturday average peak parking occupancies. The report's comparison is illustrated in Exhibit 0.3, which shows average results for peak parking utilization for weekday and Saturday as well as the standard deviation. Standard deviations indicate a large distribution in peak parking utilization, particularly for general retail uses.

Exhibit 0.3: Weekday and Saturday Average Peak Parking Lot Utilization for Select Retail Uses



	General Retail (7)	Large Grocery (7)	Large Retail (10)	Restaurant (19)
Weekday	0.66	0.59	0.41	0.53
Saturday	0.41	0.64	0.53	0.55

All except general retail exhibited higher average peak parking utilization on Saturday. Only large retail and large grocery showed substantial differences with Saturday utilizations 28 percent and 8 percent higher than weekday conditions respectively. On average, more shopping trips for large retail items (e.g., furniture) and groceries are made on Saturday than on any one weekday. Meanwhile, general retail trips (e.g., pharmacy) are made more on weekdays. While restaurant trips may peak at different times between the weekend and weekday, it is not surprising that peak parking utilizations are relatively consistent between the weekday and Saturday conditions. Even though there may be more restaurant customers on Saturday, the lunchtime peak is more spread out on this day (ULI, 2005).

Given these results and that all spot surveys in Vaughan were conducted on weekdays, observed parking occupancies for large retail and large grocery uses were scaled up by 28 percent and 8 percent, respectively, to yield the peak parking occupancy over the course of an entire week. For personal service uses, the relationship between Saturday and weekday peak parking occupancy is assumed to be similar to general retail and, thus, no compensation factor was applied.

Survey Limitations

The spot survey approach was adopted to allow data collection over a large study area, with a variety of different land use categories. There are several limitations to this approach, however, which should be identified.

First, as the predominant commercial land uses involved shared parking (shopping plazas, big box retail) and multi-use buildings, the survey sites could not be limited to single-use stand-alone buildings. Thus, in many cases the effects associated with particular land uses are difficult to isolate.

Secondly, even with stand-alone sites, there is still no way to be certain that the observed parking occupancy is specifically for the site of interest. A retail customer, for example, may park in the lot of a nearby office building. The only way to determine the amount of observed parking associated with a site is to survey each customer/employee regarding their mode of transportation and their parking location, such surveys are not feasible given the resource requirements for such an extensive study.

Thirdly, the survey could not assess building occupancy rate, particularly for office buildings. All buildings were assumed to be 100 percent occupancy unless the surveyor noticed obvious vacancy during their site visit. This may lead to an underestimation of peak parking occupancy in some cases. However, this will likely only have a minor effect on results, since the City of Vaughan has one of the lowest office building vacancy rates in North America at 6.3 percent.[2] In addition, since buildings are rarely fully occupied, it may be prudent to implicitly account for a small amount of vacancy in the office parking standards.

Finally, spot surveys only measure parking occupancy, which typically refers to the demand for free parking. Understanding actual parking demand, which varies with price, requires more detailed assessment, such as through willingness-to-pay surveys. It may be possible to derive such information from attitudinal surveys.

[2] Colliers International Greater Toronto Office Quarterly Update Q4 2006 cited in City of Vaughan (2006) Annual Economic Report. Retrieved November 6, 2006 from http://www.city.vaughan.on.ca/business/pdf/2006_annual_economic_report.pdf

APPENDIX C

REVIEW OF PARKING STANDARDS AND COMPARISON WITH OTHER JURISDICTIONS

IBI GROUP

Residential

Exhibit C-1: Comparison of Residential Parking Requirements Across Canadian Jurisdictions

Type of Use	Vaughan	Missis-sauga	Markham	Vancouver	Calgary	London [9]	Hamilton	Ottawa [8]	Winnipeg
Single-Unit	2.00 - 3.00 [10]	3.00	2.00	1.00 - 2.00 [4]	1.00	2.00	2.00	1.00	1.00
Semi-Detached	2.00 - 3.00 [10]		1.50- 2		1.00	2.00		1.00	
Street Townhouse (including Duplex or Triplex) Dwelling	2.00		1.50 - 2.00		1.00 - 1.05 [1]	Area 2 - 1.25, Area 3 - 1.50, Duplex (all types) 1.00	1.00 - 1.50	Townhouse s - 0.25 per unit, Duplex (all types) 0.50 - 1.00 [1]	
Multiple Family Dwelling	1.50	1.00 - 2.3 [5]	1.50	1.00 - 2.00 [4]	0.90 - 1.05 [2]	Area 1,2 - 1.00, Area 3 - 1.25	1.25 [1]	[7]	1.00 - 1.50
Senior Citizen's Housing	1.00 per unit, 0.5 per bed	0.20	0.75	0.17 per unit		0.25	0.33 per person	[6]	0.20

Note: Space requirements are per unit.

[1] Varies by location. Lower standard for Inner City and higher standard for Outlying areas.

[2] Varies by location and number for units. 1.00 for apartments with less than 40 units. 0.9 for apartments with more than 40 units in the Inner City area and 1.05 for apartments with more than 40 units in the Outlying areas.

[3] Varies by size of development

[4] Varies by location zone. maximum requirements given for certain zones.

[5] Varies by number for bedrooms and whether private driveway exists. Rate also includes provision for 0.05 parking spaces for recreational

[6] Varies by location.
Area X - 0.5 per unit

[7] Varies by location. Area X - first 162 units - 0.5 per unit(min) 2 per unit(max), next 150 units 0.4(min) 2(max), remaining units 0.3(min), 2(max).
Area Y - first 162 units - 0.7 per unit, next 150 units 0.6, remaining units 0.5. Area Z - first 162 units - 1 per unit, next 150 units 0.9, remaining units 0.8

[8] Visitor Parking not included.

[9] For all lands zoned Downtown Parking Area within Parking Standard Area 1 there shall be no parking required.

[10] Varies by size of frontage. 3.0 Parking spaces per dwelling unit for lots greater than 11.0m frontage and 2.0 parking spaces per dwelling unit for lots less that and equal to 11.0m frontage.

Exhibit C-2: Comparison of Visitor Parking Requirements Across Canadian Jurisdictions

Type of Use	Vaughan	Hamilton	Markham	Ottawa	Winnipeg	Missis-sauga
Multiple Family Dwelling	0.25	0.25	0.25	[1]	0.15	0.20 rental, 0.25 condo
Stacked Townhouses		0.30		Same as apartment		0.25
Senior Citizen's Housing			0.25			0.25

Note: Space requirements are per unit.

[1] Varies by location. No requirement for Apartments with less than 12 units. For the next 300 units after the first 12 - Area X - 0.083 per unit, Area Y/Z - 0.17 per unit.

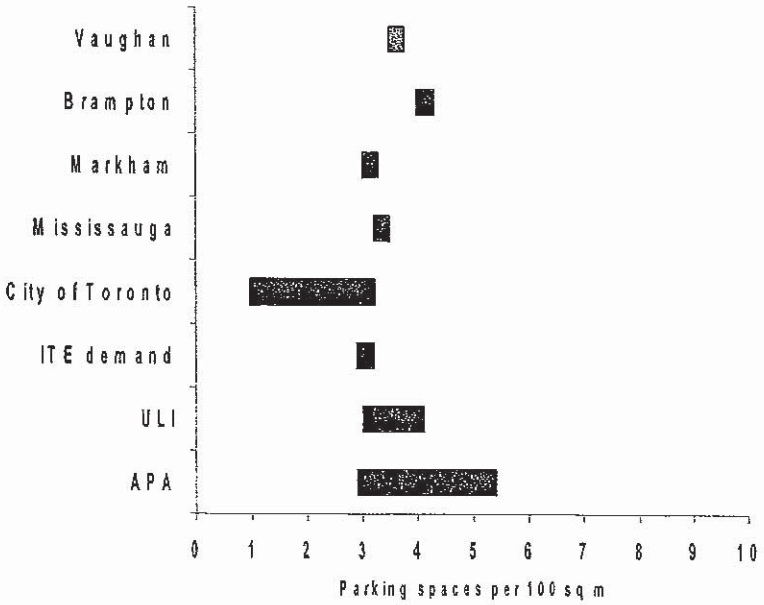
Office

Exhibit C-3: Comparison of Office Parking Requirements Across Canadian Jurisdictions

Type of Use	Vaughan	Brampton	Missis-sauga	Markham	Toronto	Vancouver	Calgary	London	Hamilton	Ottawa	Winnipeg
Office (General)	3.50	4.00	3.20	3.00	0.97-3.23 DT: 0.37 (min), 0.82 (max)	1 per 100m² up to 300m² plus 2 additional for ea	0.64-1.96 [1]	1.25	3.20	Outside CA - 2.0 CA - 0.74	1.4
Government Office					DT: 1.47 (min), 1.71 (max)				3.20		2
Medical Office	5 spaces/ practicioner	8.30	6.50	3.00	0.97-5.91 DT: 0.3 (min), 3.03 (max)	3.57		6.67	5.30		4.3
Real Estate sales Office	4.50	6.70	4.50		DT: 0.9 (min), 3.7 (max)						
Bank or Financial Institution	6.00		6.50	4.50	0-4.74 DT: 0.9 (min), 3.6 (max)		2.17 - 2.17+5min [3]	Area 2 - 3.33 per 100m², Area 3 - 6.67 per 100m²			

Note: Space requirements are per 100m² gross floor area unless otherwise stated.
[1] Varies by location. 0.64 - area north of CPR tracks within the DPA. 1.0 - area south of CPR tracks within DPA. 1.96 - all other areas.
[2] 100m² GFA devoted to office uses
[3] Varies by location. Lower standard for Central Business Area, higher for all other areas.

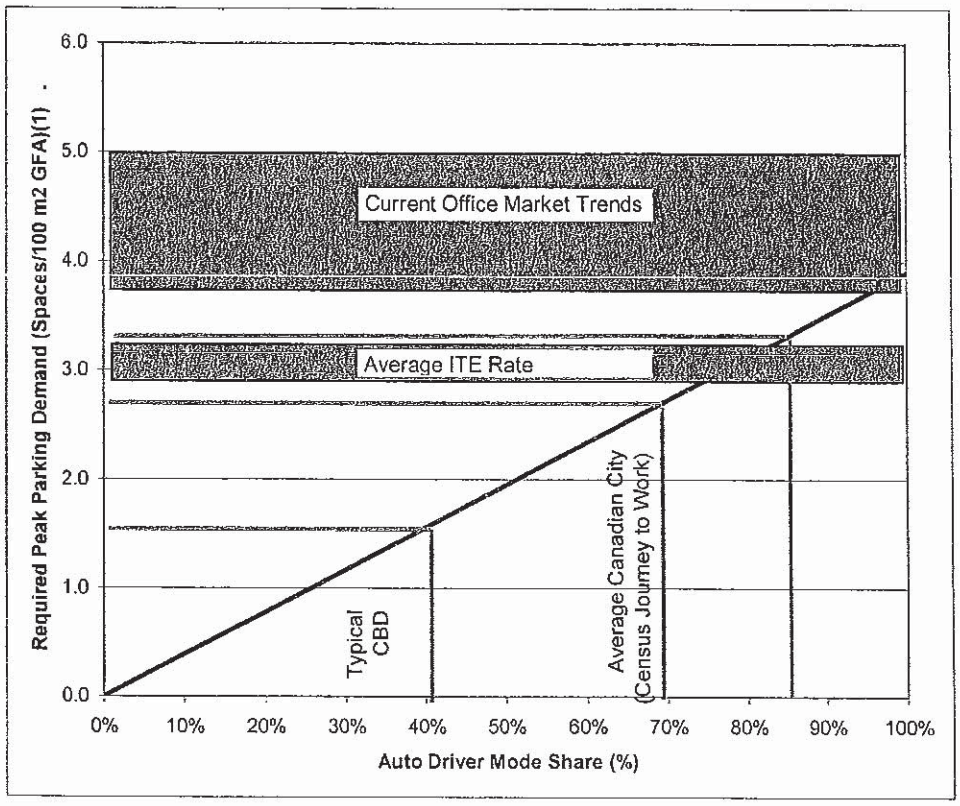
Exhibit C-4: Comparison of *General* Office Minimum Parking Requirements



Notes: ITE demand, ULI, and APA values refer predominantly to single-use, suburban sites with little transit.
ITE Demand = Parking demand ratios (i.e., not recommended parking standards) from *Parking Generation*, 3rd Edition, Institute of Transportation Engineers, 2004.
ULI = Recommended parking standards from *Shared Parking*, Urban Land Institute and the International Council of Shopping Centers, 2005.

APA = Surveyed parking standards from American cities in *Parking Standards*, American Planning Association, 2002.

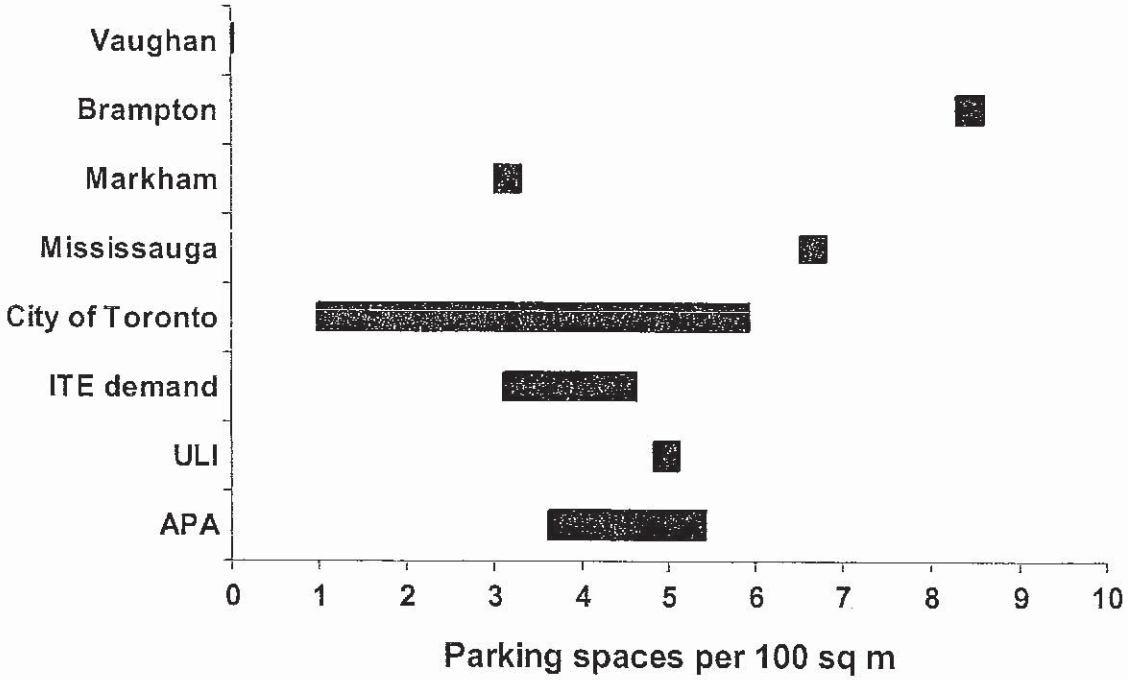
Exhibit C-5: Travel Behaviour and Office Parking Demand Ratio



(1) Based on 3.9 employees per 100 m^2 GFA

Medical Office

Exhibit C-6: Comparison of *Medical* Office Minimum Parking Requirements



Notes: ITE demand, ULI, and APA values refer predominantly to single-use, suburban sites with little transit.
ITE Demand = Parking demand ratios (i.e., not recommended parking standards) from *Parking Generation*, 3rd Edition, Institute of Transportation Engineers, 2004.
ULI = Recommended parking standards from *Shared Parking*, Urban Land Institute and the International Council of Shopping Centers, 2005.
APA = Surveyed parking standards from American cities in *Parking Standards*, American Planning Association, 2002.

Retail

Exhibit C-7: Comparison of Retail Parking Requirements Across Canadian Jurisdictions

Type of Use	Vaughan	Brampton	Missis-sauga	Markham	Toronto	Vancouver	Calgary	London	Hamilton	Ottawa	Winnipeg
Retail - General	5.5 - 6.00	5.30	4.90	3.00 - 4.50 [1]	0-6.67 DT: 0.9 (min), 3.6 (max)	1.00-2.00 [6]	0.64 - 1.96 [2]	Area 2 - 4 per 100m^2, Area 3 - 5 per 100m^2	3.2 [3]	Outside CA - 3 per 100m^2, CA - not req'd in CB, CP, CM zones, otherwise 0.74	4.30
Groceteria/ Supermarket	6.00	5.90	5.90	4.50	3.57-6.67 DT: 0.9 (min), 4.5 (max)	1.00-5.00		Area 2 - 4 per 100m^2, Area 3 - 5 per 100m^2			
Shopping Centre	6.00			3.91 - 4.86 [5]			4.84-7.74 [4]	Area 2 >2000m^2 - 3.33 per 100m^2, Area2,3 < 2000m^2 6.67 per 100m^2, Area 3 > 2000m^2 - 5 per 100m^2	Area 2 - 4 per 100m^2, Area 3 - 5 per 100m^2		
Personal Service Shop	6.00		5.40							Outside CA - 3 per 100m^2, CA - not req'd in CB, CP, CM zones, otherwise 0.74	

Note: Space requirements are per 100m^2 gross floor area unless otherwise stated.

[1] Varies by size of development

[2] Varies by location and size. North of CPR tracks in the DPA, <9300m2 net floor area - 0.64. North of CPR tracks in the DPA, >9300m2 net floor area - 0.64 to 1.6 South of CPR tracks in the DPA - 1.00. If the site is greater than 0.4ha (1acre) - requirement as for shopping centre. In all other areas - 1.96.

[3] No requirement for institutional, public and commercial uses in defined downtown area

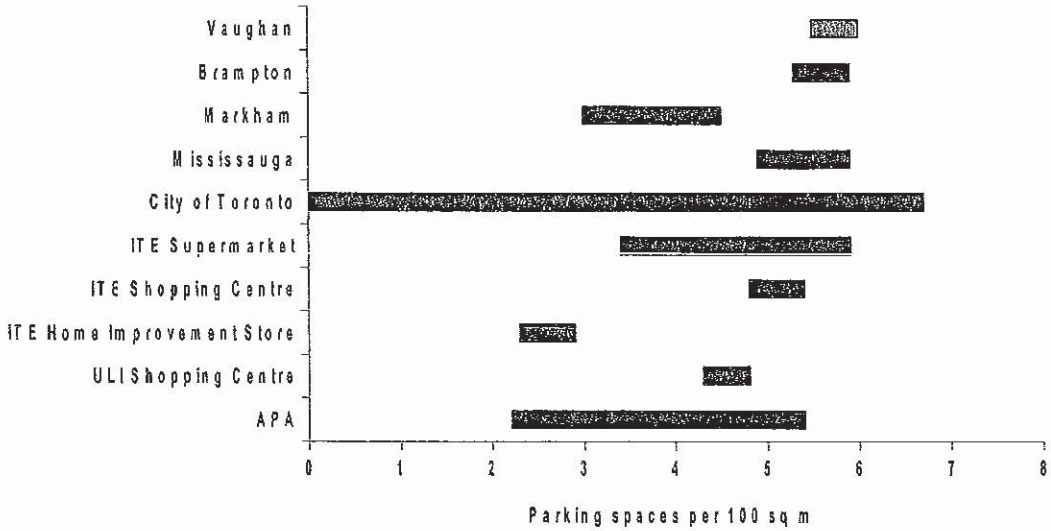
[4] Regional centre - 4.84. Community/sector centre - 5.32, Neighbourhood centre excluding liquor store/restaurant - 7.74.

[5] Restaurants within such shopping centres including associated food courts or eating areas are subjected to additional parking requirements

[6] 1 per 100m2 up to 300m2 plus 2 additional for each additional 100m2.

[7] 1/100m2 up to 300m2 plus 5 additional for ea additional 100m2 up to 2300m2, plus 3.33 additional for ea additional 100m2 over 2300m2

Exhibit C-8 - Comparison of General Retail Minimum Parking Requirements



Notes: ITE demand, ULI, and APA values refer predominantly to single-use, suburban sites with little transit.
ITE Demand = Parking demand ratios (i.e., not recommended parking standards) from *Parking Generation*, 3rd Edition, Institute of Transportation Engineers, 2004.
ULI = Recommended parking standards from *Shared Parking*, Urban Land Institute and the International Council of Shopping Centers, 2005.
APA = Surveyed parking standards from American cities in *Parking Standards*, American Planning Association, 2002.

Restaurant

Exhibit C-9: Comparison of Restaurant Parking Requirements Across Canadian Jurisdictions

Type of Use	Vaughan	Brampton	Missis-sauga	Markham	Vancouver	Calgary	London	Hamilton	Ottawa	Winnipeg
Eating Establishment Convenience	20.00 (or 1.00 for every 4 persons capacity if greater)	16.00	16.00	10.00	1.00-2.00[2]		Area 2 - 6.67 per $100m^2$, Area 3 - 10 per $100m^2$	0.17 per seat	Outside CA 3 for 1st $50m^2$ and 10 per $100m^2$ over $50m^2$, CA - 0.74	11.00
Eating Establishment Convenience Drive-Through	16.00 (or 1.00 for every 4 persons capacity if greater)									
Eating Establishment Take-Out	10.00 (or 1.00 for every 4 persons capacity if greater)	6.00	6.00			as for retail stores	12.50		Outside CA 3 for 1st $50m^2$ and 10 per $100m^2$ over $50m^2$, CA - 0.74	
Eating Establishment and Tavern	16.00 (or 1.00 for every 4 persons capacity if greater)	1.00 per 2.5 licensed capacity	1.00 per 2.5 licensed capacity			25.71[1]		0.17 per seat	Outside CA 3 for 1st $50m^2$ and 10 per $100m^2$ over $50m^2$, CA - 0.74	

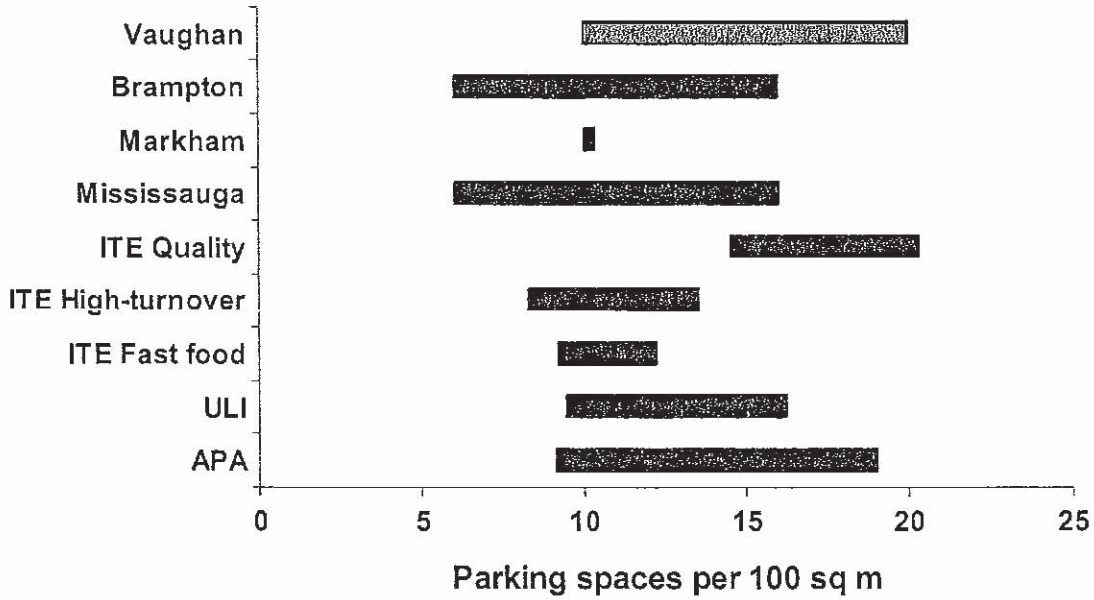
Note: Space requirements are per $100m^2$ gross floor area unless otherwise stated.

[1] No requirement if located within the Downtown Parking Area

[2] Restaurant with less than 250m2 - 2 per 100m2, not more than 2 spaces total required. Restaurants in C-3A, C-5, C-6 - 1 per 100m2 up to 300m2 and 2 per additional 100m2. Restaurants in other areas - 2 per 100m2 up to 100m2, 10 per additional 100m2 up to 500m2, 5 per additional 100m2 over 500m2

[3] Reduced by 50% if restaurant or bar is part of a hotel or motel

Exhibit C-10 - Comparison of Restaurant Minimum Parking Requirements



Notes: ITE demand, ULI, and APA values refer predominantly to single-use, suburban sites with little transit.
ITE Demand = Parking demand ratios (i.e., not recommended parking standards) from *Parking Generation*, 3rd Edition, Institute of Transportation Engineers, 2004.
ULI = Recommended parking standards from *Shared Parking*, Urban Land Institute and the International Council of Shopping Centers, 2005.
APA = Surveyed parking standards from American cities in *Parking Standards*, American Planning Association, 2002.

Industrial

Exhibit C-11: Comparison of Industrial Parking Requirements Across Canadian Jurisdictions

Type of Use	Vaughan	Markham	Vancouver	Calgary	London	Hamilton	Ottawa	Winnipeg
Industrial (general)	1.50 - 2.00[4]	0.45 - 2.25[1]					0.50	
Employment Uses	1.50 - 2.00[3]							
Warehouse/ Storage	1.00		0.54	1.08 up to 1860m^2 plus 0.22 per additional 100m^2	Open storage - 1 per ha, Warehouse 0.5 per 100m^2	0.87	0.50	1.07
Manufacturing			1.08 per 100m^2 or 0.2 per employee on a maximum shift, whichever is greater	(2)	1.00			1.07
Wholesale			1.08 per 100m^2 or 0.2 per employee on a maximum shift, whichever is greater		Area 2 - 0.67 per 100m^2, Area 3 - 0.8 per 100m^2			

Note: Space requirements are per 100m^2 gross floor area unless otherwise stated.

[1] Varies by size of development

[2] 5 per establishment or 0.33 per employees on a maximum shift or 1.08 per 100m2 upto 1860m2 and 0.22 per additional 100m2, whichever is greatest.

[3] 1.5 spaces per 100 m^2 or 3.50 spaces per unit, whichever is greater, for employment uses (other than warehousing) greater than 3,700 m^2.

2.00 spaces per 100 m^2 or 3.50 spaces per unit, whichever is greater, for employment uses (other than warehousing) at or less than 3,700 m^2.

2.00 spaces per 100 m2 or 4.00 spaces per unit, whichever is greater, for employment uses in multi-unit buildings that have more than 4 units.

[4] Greater of 1.50 spaces per 100 m^2 devoted to industrial use plus 2.00 spaces devoted to ancillary office use or 3.5 spaces per unit, for industrial uses > 3,700 m^2.

2.00 spaces per 100 m2 or 3.50 spaces per unit, whichever is greater, for industrial uses (other than warehousing) at or less than 3,700 m2.

2.00 spaces per 100 m2 or 4.00 spaces per unit, whichever is greater, for industrial uses in multi-unit buildings that have more the 4 units.

Institutional

Exhibit C-12: Comparison of Institutional Parking Requirements Across Canadian Jurisdictions

Type of Use	Vaughan	Missi-ssauga	Markham	Vancouver	Calgary	London	Hamilton	Ottawa	Winnipeg
Elementary School	1.50	1.00	1/ classroom	0.67/ employee	0.05/ student, 0.83/ employee	3 spaces + 1/ classroom	1.25/ classroom	1.5/ classroom (4)	
High School	4.00/ classroom	1.50	4/ classroom	1.25/ employee	0.05-0.2/ day-time student, 0.83/ employee (3)	3/ classroom	1.8/ classroom	4/ classroom (4)	
Community College/ University/ Educational Establishment	4.00/ classroom or 6.00 per 100 m2 whichever is greater		5/ classroom + 0.17/ seat in an auditorium/ theatre		0.67/ student	1/ 100m2 + 1/ fifteen students		1/ 100m2	1/two faculty + 1/ four employees, or 1/ six auditorium seats
Hospital	3.00 per 4 beds, 1.00 per 4 employees	1.25 per bed	0.5 per bed or 2.43 per 100m2, whichever is greater	10.75	1 per bed	Area 2 - 1.25 per bed, Area 3 - 3 per bed		1.50	
Library	3.50		2.25	4.84	1.96	Area 2 - 2 per 100m2, Area 3 - 2.5 per 100m2		Outside CA - 10 per 100m2 of assembly area and 2 per 100m2 for remaining . CA - 10 per 100m2 of assembly area and 1 per 170m2 of remaining .	
Community Centre (general)	1.00 per 3 persons in maximum design capacity								
Nursery Schools / Day Nurseries/Child Care	1.50 per employee		1.50 per class + 1.00 per 5 children		0.5 per employee	2.50		Not required	
Museum, Art Gallery, Y.M.C.A, Y.W.C.A.	1.00 per 5 persons								

Note: Space requirements are per $100m^2$ gross floor area unless otherwise stated.
(1) School, Commercial - 4.5 per 100m2, elementary - 1 per classroom, Secondary/Private - 4 per classroom. University/College - 5 per classroom + 0.17 per seat in an auditorium/theatre
(2) Elementary/Junior High Schools - 0.05 per student, Senior high school - 0.2 per daytime student, 0.33 per staff member. Educational establishment - 0.67 per student
(3) 0.05 rate applies to junior high school, while 0.2 ratio applies to high school.
(4) Standard only applies outside of central area.

Place of Assembly

Exhibit C-13: Comparison of Place of Assembly Parking Requirements Across Canadian Jurisdictions

Type of Use	Vaughan	Brampton	Missis-sauga	Markham	Vancouver	Calgary	London	Hamilton	Ottawa	Winnipeg
Place of Worship	11		0.22 per seat	5.14 per 100m2 GFA or 0.17 per seat, whichever is greater	1.08	0.2 per seat	0.25 per person	0.17 per person	10.00	11.00
Place of Amusement/ Assembly	Amusement: 0.17 per person capacity; Assembly: 0.33 per person capacity	12.50	0.17 per seat	10.00	4.84		Area2 - 0.125 per seat or 2.86 per 100m², Area 3 - 0.14 per seat or 4 per 100m²	0.17 per seat		11.00
Trade/ Convention Centre	11.00			4.50 + restaurant & banquet halls 10.00						
Banquet Hall	11	12.50	10.80	10.00			Area2 - 0.125 per seat or 2.86 per 100m², Area 3 - 0.14 per seat or 4 per 100m²			11.00
Curling	11.00	8.00 per sheet	8.00 per sheet		3.00 per sheet	-1.00				5.00 per sheet
Stadium/Arena/ Theatre	11.00		0.33 per seat	0.17 per seat	Theatre - 9.68, Stadium/Arena - 0.2 per seat or 9.68, whichever is greater	0.33 per seat [2]	Arena - Area2 - 0.125 per seat or 2.86 per 100m², Area 3 - 0.14 per seat or 2.86 per 100m², Stadium - Area2 - 0.13 per seat, Area 3 - 0.17 per seat	0.17 per seat	Cinema - Outside CA - 1 per 100m² and 10 per 100m² over 50m². CA - 0.74. Sports arena - 10 per 100m² or 1 for every 4 fixed seats, whichever is greater. Theatre - 1 per 100m² of assembly area and 2 per 100m² of remaining.	11.00
Athletic/ Recreational Establishments	11		6.00						4 per alley, court, ice sheet, game table, and 10 per 100m2 of lounge, dining, assembly, or common area.	11.00
Billiards Hall	11.00	5.00	2.70	4.50	1.00 per table/game	11.11				
Bowling Alley	4.00 per lane		4.00 per lane	4.00 per lane	3.00 per alley	-4.00	5.00	3.00 per lane	4.00 per alley, 10 per 100m2 of lounge, dining, assembly, or common area	5.00 per lane

Note: Space requirements are per 100m² gross floor area unless otherwise stated.

[1] 8 per curling sheet + 5 for staff + 0.1 per spectator seat/restaurant/drinking establishment

[2] No requirement for Downtown Parking Area

[3] Place of Amusement: 1.0 space per 8 persons and Place of Assembly: 1.0 space per 3 persons

[4] 5 per bowling alley + 5 for staff + 0.1 per spectator seat/restaurant/drinking establishment or 1 per 9m2 of space for the accommodation of the public.

Mobility Disabled Parking

Exhibit C-14: Number of Required Disabled Parking Spaces in Technical Standards

Minimum Required Parking Spaces	Required Disabled Parking Spaces		
	Toronto ADG	ADA	Vaughan
Up to 25	1	1	1 (≥10 spaces required)
Up to 50	2	2	1
Up to 100	4	4	1
Up to 200	6	6	2
Up to 300	8	7	3

*Medical facilities have additional requirements as seen below. Source: Municipal by-laws and design guidelines, and the ADA Accessibility Guidelines for Buildings and Facilities, 2002.

Bicycle Parking

Exhibit C-15: Bicycle Parking Supply Requirements from Selected Jurisdictions

Use	Halifax Regional Municipality (HRM)		Calgary		Vancouver		Ottawa	Kingston	Toronto[6]
	Class 1	Class 2	Class 1	Class 2	Class 1	Class 2			
Office	0.10 spaces/ 100m²	0.10 spaces/ 100m² min 2 spaces	0.17/0.1 spaces/ 100m²[2]	0.1 spaces/ 100m²/ 6 spaces [2]	0.13 spaces/ 100m² city-wide	Minimum of 6 spaces where GFA>2000 m²	0.10 spaces/ 100m²	0.40 spaces/ 100m²	0.08 spaces/ 100m² min 6 spaces GFA>2000 m²
Retail	0.07 spaces/ 100m²	0.27 spaces/ 100m² min 2 spaces	0[3,4] 2% auto spaces[5]	0.4 spaces/ 100m²[3] 5% auto spaces[4] 3% auto spaces[5]	0.13 spaces/ 100m² city-wide	Minimum of 7 spaces where GFA>1000 m²	0.08 spaces/ 100m²	0.50 spaces/ 100m²	0.08 spaces/ 100m² min 6 spaces GFA>2000 m²
Medical	0.1 spaces/ 100m²	0.1 spaces/ 100m² min 2 spaces	4% of employees[1]	0.1 spaces/ 100m²[1]	4% of employees during max work shift[1]	6 spaces at each public entrance[1]	0.05 spaces/ 100m²	-	-
Restaurant	0.02 spaces/ 100m²	0.8 spaces/ 100m² min 2 spaces	-	0.4 spaces/ 100m²	0.13 spaces/ 100m²	0.7 spaces/ 100m²	0.10 spaces/ 100m²	-	-
Multi-Unit Residential	0.8 spaces/ unit[7]	0.2 spaces/ unit[7]	0, 0.5 spaces/unit[8]	Minimum of 6, 0.1 spaces/unit[8]	0.75 spaces/unit	Minimum of 6 spaces	0.75 spaces/ unit	1 space/ unit	0.75 spaces/ unit
Schools	0.08 spaces/ 100m²	0.32 spaces/ 100m²	3% of employees[9]	10% of students[9]			0.4 spaces/ 100m²		
Parking Structures /Lots	5% of motor vehicle spaces, min of 2 spaces, max of 50 spaces		2.5% of motor vehicle spaces	2.5% of motor vehicle spaces					

Class 1 = Long-term (secure) parking Class 2 = Short-term parking

Notes:
[1] Hospital uses
[2] Higher standard applies to downtown
[3] Individual Establishment
[4] Regional/Neighbourhood Shopping Centre
[5] Enclosed Shopping Mall
[6] Former City of Toronto only. Standards require 80% of spaces to be occupant and 20% to be visitor. For non-residential uses, standards apply to buildings with non-residential gross floor area greater than 2,000 square metres.
[7] Applies to dwellings with minimum of 4 units.
[8] First value applies to dwellings with less than 20 units. The second value applies to dwellings with 20 units or greater.
[9] For post-secondary institutions, Class 1=3% of students+staff, Class 2 = 3% of students

APPENDIX D

CONSULTATION REPORT

IBI GROUP

City of Vaughan

A REVIEW OF PARKING STANDARDS CONTAINED WITHIN THE CITY OF VAUGHAN'S COMPREHENSIVE ZONING BY-LAW:
CONSULTATION REPORT

DRAFT

MAY 2008

IBI GROUP

TABLE OF CONTENTS

1. INTRODUCTION

Stakeholder consultation is a key element of the review of parking zoning standards in Vaughan, both in identifying issues and opportunities for the existing parking standards, and ensuring that proposed standards can be implemented and will not have unintended consequences.

The overall objectives of the consultation are as follows:

- To gain an understanding of the issues that residents, business owners, developers, etc. face in regard to parking and parking standards, in particular;
- To gain an understanding of the likely effectiveness of changes to parking standards in making more efficient use of parking, supporting compact, transit-oriented development, and other policy objectives; and
- To gain buy-in from the business and development community, ratepayers, and other interest groups on proposed parking standards.

A multi-faceted consultation approach has been pursued to date including a workshop with City staff and in-person meetings and telephone interviews with developers and landowners, development planners, ratepayer groups, and BIAs.

Due to scheduling conflicts, consultation activities are ongoing with a few stakeholders in the Kleinburg and Woodbridge Core areas and with several developers. However, the bulk of the Phase 1 consultation had been completed at the time of report preparation. This draft report summarizes the consultation activities and key insights collected through consultation to date. This report will be updated with the results of these pending discussions.

In addition to consultation activities to date, a second staff workshop is planned for June 2008 and the results of this event will be incorporated into future reports.

2. KEY FINDINGS

A wide array of feedback was received on many aspects of parking. This feedback has been synthesized into six key findings described below. While these findings paint a picture of important and common themes communicated over many discussions with key stakeholders, they blend some of the nuance and differences between individual stakeholders. The reader is directed to Section 3 for more detailed summaries of the specific feedback provided.

Note that these findings do not necessarily reflect the views of the City or of the study consultants.

Minimum Parking Requirements can be Reduced in Many Cases

There is an opportunity to reduce minimum parking requirements in many cases as expressed by City staff, developers, and BIAs. Specific candidate standards identified include those for multi-unit residential, senior citizens' dwellings, mixed-use commercial, eating establishments, and restaurant patios. In addition, there is a desire for historic areas to be treated differently than other areas of the City in terms of parking, given that the small lots, older development form, and look and feel of the area is often not compatible with extensive surface parking.

There is Potential Need for Public Parking in the Historic Places, but it Needs to be Planned Carefully

Some historic places, such as Kleinburg and Woodbridge Core Cash have localized parking issues at certain times. There is potential openness to the development of public parking, but it will need to be planned and implemented carefully. There was general support expressed for the City constructing parking with their own funds; however, there was concern that cash in lieu policies be implemented without the City having the capacity or land to actually build public parking. The question of pricing for both on- and off-street parking is also contentious. It is clear that, to gain acceptance, cash in lieu policies and other strategies related to the development of public parking and priced parking need to be articulated in the context of a clear and open parking planning process focusing on local needs and objectives.

Parking Constraints are a Key Motivator for Participation in TDM Programs

Major challenges to adoption of transportation demand management (TDM) measures in Vaughan include the low cost of providing parking, the fact that there is little market value for parking (i.e., little priced parking), and that ample parking is provided by most Vaughan employers and institutions (due in part to high minimum parking requirements). Businesses that work with Smart Commute North Toronto, Vaughan typically have parking constraints. Any leadership that Vaughan could provide in encouraging TDM through the parking requirements, such as reduced parking minimums, or incorporating TDM measures directly into the by-law (e.g., requirement for preferential carpool parking) could lend significant support to TDM initiatives, such as Smart Commute.

The Real Estate Market Needs to be Considered in Developing Parking Requirements, Particularly in the Vaughan Corporate Centre

There are many factors influencing parking supply decisions in addition to parking requirements including development costs and tenant demands. For example, the current market demand for office development in Vaughan rarely justifies construction of office buildings exceeding three to five storeys. At this scale, it is difficult to justify structured parking financially. In addition, large retail tenants often demand that developers provide approximately 5 surface parking spaces per 100 m^2. In addition, most office leases require 4 spaces per 100 m^2 of free, surface parking. Developers contend that if parking maximums limit parking significantly below these levels then tenants will go to other municipalities.

These market issues are particularly germane to the Vaughan Corporate Centre. Given current market conditions, the planning vision of high-density commercial development with structured parking is not financially feasible in the Corporate Centre. This will likely only change with the construction of the subway. In the short term, the City could potentially encourage desirable forms of commercial development in the Corporate Centre by building or entering into joint ventures to build above or below grade parking structures in the Corporate Centre.

Parking Requirements Need to be easily Applicable and Enforceable

The building standards department has emphasized that zoning needs to be easy to apply and enforce or else it will not be enforced. A number of specific issues in the existing zoning by-law have been identified.

Parking Requirements Should Promote Innovative Approaches to Parking Management

A number of innovative approaches to parking design and management were identified through the consultation. This included condominiums that provided a number of tandem underground parking stalls for tenants wishing to have two parking spaces, sharing surface visitor parking and customer parking at multi-unit residential developments with a ground-floor commercial component, and providing shuttle services at senior citizen residences. Other strategies to which some stakeholders expressed interest include off-site parking, shared parking, and bicycle parking requirements.

3. SUMMARY OF COMMENTS

3.1 Historic Places

The historic downtowns and main street areas of Thornhill, Kleinburg, Maple, and Woodbridge share similar characteristics in that historically, they provided services to the rural areas of the former township. These areas have unique characteristics, including pedestrian orientation, older built form, heritage designation in certain cases, and presence of on-street parking. As such, parking requirements for these areas need to be considered carefully. In addition, the City has expressed in interest in investigating the potential for public parking in these areas.

To gain further insight into these issues, consultation was conducted with the Kleinburg Business Improvement Association, Maple Village Ratepayers' Association, and Woodbridge Core Ratepayers' Association. The Kleinburg Area Residents' Association has been contacted, but an interview has not been conducted at time of report preparation. Key points raised in these discussions are summarized by area.

Note that the issues presented are as expressed by the stakeholders and do not necessarily reflect the views of the City or of the study consultants.

3.1.1 KLEINBURG BUSINESS IMPROVEMENT ASSOCIATION

Parking Supply

- Kleinburg has a unique parking situation because of the tourist element. Without tourist-related demand, there is adequate parking; but parking is very constrained on summer weekends due to the large number of visitors.
- There may be adequate supply even at peak demand, but available parking supply is likely not used effectively due to:
    - Poor signage for on-street parking and preference for off-street parking;
    - Lack of awareness that people can park in the McMichael lot; and
    - People want to park as close to their destination as possible and may not be willing to walk from an off-site location.
- There is a desire for the City to take more responsibility for providing parking in Kleinburg to meet tourist-related demand; however, there is limited land to build more parking.

Minimum and Maximum Parking Requirements

- Parking standards in the Kleinburg Village Core can be significantly reduced without incurring major impact on neighbouring residents. Reducing parking standards will:
    - Protect existing landscaped yards where businesses want to expand;
    - Allow for more restaurant and outdoor patio uses, which, under the current standards, require many properties to tear up yards for more parking;
    - Help in the revitalization of the core area and businesses by allowing for more retail, commercial uses and less parking area on sites; and

- Encourage a more pedestrian-oriented environment.

- The current parking standards require that parking be provided for outdoor patios at the "Eating Establishment" rate, which is very high. There should be no parking requirement for patios.

- Land values are very high in the Kleinburg Core and currently act as self-enforcing parking maximums.

- Shared parking between retail customer parking and residential visitor parking has been implemented at Canadiana Square in Kleinburg.

- Provisions for off-site parking would provide flexibility in meeting parking requirements given the small existing parcels in Kleinburg.

- There is a need for more bicycle parking in Kleinburg and it would reasonable for new commercial development to be required to provide short-term bicycle parking.

Public Parking and Cash In Lieu

- There was some openness to charging for on-street parking in Kleinburg, but concern that developments with surface parking would then need to monitor their lots to ensure only customers parked there.

- There was strong interest in having the City provide public parking.

- Now that there is a cash-in-lieu policy and some developers have paid into the fund, it is important that the parking requirements be applied consistently. It is unfair if some developments get a reduction in required parking while others have to effectively pay for the reduction.

- Cash in lieu is currently viewed as a way of buying your way out of the parking requirements. There is skepticism that the City will use the funds to build parking in Kleinburg even though it is considered to be needed.

3.1.2 MAPLE RATEPAYERS' ASSOCIATION

Parking Supply

- There is not a shortage of commercial parking in Maple core.

- Lay-bys for on-street parking are a great idea as long as they do not impact traffic.

- Most residential lots in the area are wide and have large driveways to accommodate all resident and visitor parking needs. Overnight on-street parking is not allowed on residential streets. Local residents might be unhappy if there were people parking in front of their house overnight.

Minimum and Maximum Parking Requirements

- There may be issues with reduced parking requirements if they result in insufficient parking.

Public Parking and Cash In Lieu

- Cash in lieu would be good if the City actually uses the money to build public parking.

Current Travel Patterns

- Transit service is poor and the vast majority of trips to Maple Village are made by car, even by local residents.

Urban Design

- Parking should not be an eyesore. It is good to put parking behind buildings.
- Streetscaping and putting buildings up against the street is good in theory, but what happens when the City wants to widen the road?
- Condo development along Keele Street is desirable, preferably 4-5 storey buildings with some retail component on the ground floor.

3.1.3 WOODBRIDGE CORE RATEPAYERS' ASSOCIATION

Parking Supply

- There is not a shortage of parking in Woodbridge Core overall; however, there are parking issues on Woodbridge Avenue in the vicinity of the Royal Bank. Since their surface parking is often full, customers sometimes park illegally on-street or double park. More parking for such a thriving business is necessary.
- The dominant use in Woodbridge core is mixed use. For some multi-unit residential buildings with ground-floor retail, the trend has been to include commercial client parking underground (e.g., 140 Woodbridge Avenue). Retail customers are very reluctant to park underground for a short visit and often park on-street or in other surface lots instead. This creates a shortage of on-street spaces. It is also a waste of money for the developer to provide customer parking underground if it is rarely used.
- Better enforcement may reduce illegal on-street parking. In the past, police have patrolled the parking carefully for a couple of days, but then the problems have resumed once the police leave.

Bicycle Parking Requirements

- People only bicycle for recreational purposes.
- There should not be bicycle parking requirements.
- Bike racks are an eyesore and should be in the backs of buildings and the City should put them in.

Public Parking and Cash In Lieu

- There is little appropriate land available in the Woodbridge Core for parking. As a result cash in lieu is a very bad idea unless there is actually land predesignated where a public parking facility would be developed.
- Parking meters were considered in the past for Woodbridge Avenue, but the idea was strongly opposed and it was never implemented.

Urban Design

- Parking should not be visible from the street, but should ideally be behind the buildings.
- The actually design of parking is of little concern provided that it is properly lit and safe. The main issue is the design of the fronts of buildings visible from the street.

3.1.4 THORNHILL

Interviews were conducted with developers active in the Thornhill heritage core. Comments from these discussions are summarized in the following section.

3.2 Developers

Telephone and in-person interviews were conducted with a number of developers and development planners involved in high-rise residential, commercial, and mixed-use development in Vaughan. Key points raised in these interviews include:

Vaughan Corporate Centre

- There is a disconnect between what can be built in the current real estate market and the planning visions for the Vaughan Corporate Centre (VCC).
- Strong incentives are required to help achieve the land use vision for the VCC. With so much cheap commercial land available elsewhere in Vaughan (e.g. Highway 427 and Highway 400 North Employment Areas) that can be developed under typical suburban forms, high-density commercial development with structured parking is not financially feasible. If the City built or entered into joint ventures to build underground or parking structures in the VCC, this could help to make this type of development happen.
- Potential tenants in the VCC still view it as an auto-oriented suburban area that should have ample surface parking. This perspective will not change until the subway is built and there is greater opportunity for people to live and work within the Corporate Centre.
- VIVA has little impact on the corporate mindset even if directly serves the development. This may change once actual Bus Rapid Transit infrastructure is developed.

Development Costs

- The costs of development need to be considered in developing the parking requirements and supporting cash-in-lieu policies.
- A surface parking space in Kleinburg costs in the range of $20,000-$25,000 (i.e., $15,000-$20,000 for land and $4,000-$5,000 for construction). Given that rent is approximately $20/ft^2 per year, and that cash-in-lieu is currently estimated at approximately $10,000-$30,000 per space, cash-in-lieu may be a good investment for the developer.
- It is not clear why the cash in lieu by-law in Kleinburg favours existing buildings and penalizes new development in the cost per space.
- The current market demand for office development in Vaughan does not justify construction of office buildings exceeding 3 to 5 storeys. At this scale, it is difficult to justify structured parking financially.

Residential Parking Requirements

- The current parking requirement of 1.75 spaces per unit (1.5 tenant spaces/unit + 0.25 visitor spaces/unit) is excessive.
- One development planner recommended a multi-unit residential parking requirement of 1.1-1.3 tenant spaces/unit and 0.2 visitor spaces per unit.
- Another prominent residential developer recommended a multi-unit residential parking requirement of 1.1 tenant spaces/unit and 0.15 visitor spaces per unit.
- One parking space is often included with rental units. One parking space may be included with a condominium unit or sold separately. Second parking spaces are typically rented or sold separately. Even though some condominium tenants do not have cars, they often wish to purchase a parking space to facilitate future resale.
- Visitor parking is often provided as surface parking. This is partly because it is more difficult to control visitor parking and there is a desire to keep it separate from tenant underground parking.
- The requirement for retirement residences is too high at 1 space per unit. A more realistic requirement is 0.5-0.75 spaces/unit. Even in suburban areas, many seniors do not have a vehicle and the residences provide shuttle services to help residents access shopping and other amenities.

Commercial Parking Requirements

- Commercial parking supply is typically dictated by tenant demands rather than parking requirements. Large retail tenants often demand in the range of 5 surface parking spaces per 100 m^2. Most office leases demand 4 spaces per 100 m^2 of free, surface parking.
- Medical office parking requirements should be differentiated from office requirements due to the high service component.
- Eating establishment parking requirements should be differentiated between "eat-in/quality", "family/casual", and take-out restaurants.

Innovative Approaches

- A 3-phase condominium project at the NE corner of Dufferin and Steeles provided a number of tandem parking stall for tenants underground. This was a more cost- and space-efficient approach to allowing certain units to have two parking spaces. Tandem parking was allowed through a site-specific zoning by-law.
- At multi-unit residential developments with a ground-floor commercial component, Markham has started to allow surface visitor parking to be shared with commercial parking.
- Varying the parking requirement based on the number of bedrooms per unit may be a more demand-responsive approach, but may also discourage construction of large units. Parking should not drive building design.
- Charging for parking can increase turnover and support businesses.

- The Steeles corridor has relatively good transit service and a significant mix of commercial and high-density residential development, which may allow for reduced standards in this area.

3.3 Smart Commute North Toronto, Vaughan

Smart Commute North Toronto, Vaughan (SCNTV) is a non-profit Transportation Management Association, which works to develop and administer transportation demand management (TDM) services Northwest Toronto, Vaughan, and Northeast Toronto. Its goals include reducing traffic congestion, improving air quality and advocating for sustainable transportation. It encourages individuals to consider alternatives to single occupancy vehicle commuting including cycling, transit, carpooling, walking, and tele-commuting. Employers and institutions can partner with SCNTV to help implement such TDM strategies.

A meeting with Brian Shifman, Executive Director of SCNTV was held on April 7th, 2008 to discuss how parking standards affect Smart Commute's operations in Vaughan and opportunities for better coordinating parking standards with TDM objectives. Key points raised in the meeting include:

- SCNTV is currently working with 20 partners to implement TDM, but only four are in Vaughan: the City of Vaughan, Knoll, PowerStream, and Vaughan Mills Mall.

- Businesses that usually work with SCNTV are those with parking issues. Parking shortages create incentive to implement TDM to reduce parking demand, rather than the costly alternative of leasing or building additional parking. The ample parking provided by most Vaughan employers and institutions (due in part to high minimum parking requirements) means there is less incentive for TDM.

- Challenges to implementing TDM in Vaughan include the low cost of providing parking and the fact that there is no market value for parking (i.e., little priced parking). Currently, businesses in Vaughan are more likely to implement TDM for reasons other than parking costs, such as climate change and other environmental concerns. SCNTV is more successful in promoting and implementing TDM with Toronto businesses due to higher land and parking costs and lower minimum parking requirements.

- Any leadership that Vaughan could provide in encouraging TDM through the parking requirements, such as reduced parking minimums, or incorporating TDM measures directly into the by-law (e.g., requirement for preferential carpool parking) would be welcome by SCNTV.

3.4 Vaughan Chamber of Commerce

A meeting with the Vaughan Chamber of Commerce CEO, Deborah Bonk, and her assistant Christine Hamalainen, was held on April 1st, 2008. A follow-up telephone interview was conducted with Michael Manett, Secretary of the Board of Directors, Chair of the Vaughan Chamber of Commerce Advocacy Group, and principal at Michael S. Manett Planning Services Ltd. Key points raised in the meetings include:

Reducing Minimum Requirements and Implementing Maximums

- The amount you can reduce the parking requirements depends on the what you determine to be the design day (e.g., Christmas, regular weekend, regular weekday, etc.)

- Developers will oppose maximums if they cannot provide enough parking to sell/lease their units.

- Public parking lots can help meet demand in areas with parking shortages due to maximums. A parking authority would be required to develop and operate these lots.

Mixed-use Commercial

- The parking requirements could be more relaxed on mixed-use commercial sites. 4 spaces/100 m^2 is a more reasonable value.

- One option would be to specify parking requirements based on the size of the site. For example, sites under 100,000 ft^2 would get a higher standard, while sites greater than this would get a lower standard. The logic is that there are more opportunities for blending of uses with differently peaked parking demands at larger sites.

- Substantially lower parking requirements will not work on successful commercial sites

Urban Design of Parking

- Site design needs to balance land allocated to the building and parking facilities. The design of commercial sites is often driven by parking. Typically, 25 percent of a site is allotted to the building for commercial development, while parking, loading, landscaping, and access lanes take up the remaining 75 percent.

- The size of parking spaces, particularly the width needs to be considered carefully since it affects the number of parking spaces that can be built on a site as well access and safety of parking.

- There are tradeoffs to additional landscaping at parking facilities, since, on one hand it makes the parking facility more aesthetically pleasing, provides shade and reduces stormwater runoff. On the other hand, however, landscaping may increase the overall size of the parking facility, leaving less land for the building on a site, which may reduce financial feasibility of the development and make it less compact.

- Structured parking is rarely financially feasible in Vaughan.

- Developers should be in favour of reduced parking requirements and City-provided parking, since it increases the amount of a site that can be dedicated to the building, which is the revenue generating aspect of the site.

Vaughan Corporate Centre

- A particular concern of the Chamber of Commerce is ensuring that there are a mix of commercial uses in the Corporate Centre and not just residential development.

- Parking requirements in Vaughan Corporate Centre should support commercial development and reduce the risk of such development. Reducing office parking requirements and providing public parking are potential strategies.

3.5 Staff Workshop

A workshop was held with staff from the City of Vaughan on March 20th, 2008 to introduce the study and get feedback on issues, needs, and opportunities relating to parking and the parking requirements. Staff from the Town of Markham and York Region were also in attendance.

Discussion covered many topics including problematic parking requirements, on-street parking, and the design of parking.

Key Points

- The availability of parking has the potential to influence transportation mode choice and encourage more sustainable travel.
- Sustainability is a key issue and Council priority that should be an overarching goal for this study.
- Parking requirements in Vaughan should be responsible and implementable and promote more sustainable development.
- Parking problems are often an issue of perspective. Parking problems may be addressed through transportation demand management strategies.
- Parking requirements for most uses are too high (Even Smart Centres and Home Depot are asking for reductions)
- By-law enforcement must be straight forward otherwise it will not be enforced

Problematic Parking Requirements

Parking requirements that were identified as in need of change include:

- Multi-unit residential standards are too high.
- Eating establishments with a drive-through should have a reduce standard since patrons do not typically stay.
- Parking requirements for medical offices are too low.
- Currently patios at restaurants are treated as extra floor area with associated required parking. Patios do not necessarily imply more patrons, since normally seating is just moved from inside to the patio.
- Parking requirements for day cares should be lower, but a drop-off zone should be provided.

On-Street Parking

On-street parking was discussed as a key aspect of place making and encouraging more urban and pedestrian-friendly development. On-street parking may also cause difficulties for emergency vehicles or street maintenance. It was generally assumed that residents would complain about on-street parking because of privacy concerns and snow removal. However, in Markham (Cornell) residents are apparently happy with permit parking. Level of service requirements may also need to be changed to permit more on-street parking.

Through its Great Regional Streets program, York Region will be implementing on-street parking at locations serving Regional and local municipal interests through lay-bys.

Employment Areas

Employment areas are particularly challenging from a parking perspective, as future tenants may have different parking needs from the original tenants. As such, if a parking reduction is provided for

the first tenant, the future tenant may experience a parking deficit. A particular case was mentioned of a plaza where parking requirements were reduced given the potential for shared parking between office/retail (daytime peaks) and restaurant (evening peaks) uses. Now that the restaurant hosts lunch banquets, the visitors take up most of the parking when it should be available for the office/retail uses.

All parking zoning by-laws experience similar problems. The traditional parking by-law framework does not deal well with this issue as it cannot predict futures uses. Options include limiting the types of future tenants based on parking availability or more innovative approaches. For example, a shuttle could help manage parking demand for the restaurant.

There are often parking issues at multi-unit buildings (employment/commercial/industrial plazas), since the parking is shared between occupants. Since the uses change with time, this poses a particular problem for by-law enforcement.

Multi-Unit Residential Parking

It was recommended that multi-unit residential uses have a maximum parking limit rather than a minimum. The onus should be reversed such that developers must prove they need more parking rather than less. It was also suggested that standards be based on the number of bedrooms and not simply the number of units. Also, visitor parking is apparently always placed at-grade with resident parking put below grade. It was felt that all parking ought to be below-grade as in many other municipalities. It was also suggested the developers get density bonuses for including desirable features, such as structured parking. It was felt that Vaughan must have incentives (and not simply maximums as in Toronto), which could be linked to TDM initiatives.

Design of Parking Facilities

In addition to parking supply requirements, the issue of good parking design was raised. The City of Toronto's new guidelines for green parking were cited, which are to eventually be integrated into the City's by-laws. For example, parking increases could require design enhancements such as permeable paving or a scoring/point system such as in California or Seattle.

3.6 Zoning Supervisors

A meeting was held with two members of the Building Standards Department who administer the parking zoning requirements. Their primary concern is that the by-laws be straightforward and easy to enforce. Otherwise, they will not be enforced. They identified a number of specific concerns with the existing zoning by-law. A number of these relate to parking issues that arise when a development undergoes a change of use and the new use has a higher parking demand than the previous use.

1. Section 3.4 Greater Restrictions indicates that nothing in the by-law shall affect any regulations by Government Authority and Section 3.10 indicates provisions in this by-law shall not apply to a public use/local board. However, there are parking regulations for schools, community centres, hospitals, museums, arenas, post offices, public libraries, etc. Parking requirements should apply to these types of uses but section 3.10 a least should be amended to reflect this. Presently, this section allows only the application of setbacks and coverage.

2. Parking standards based on designed maximum capacity should not be in the by-law. This is an Ontario Building Code requirement. Zoning plan examiners do not determine the designed maximum capacity.

3. Uses such as parks, playgrounds, racquet courts, lawn bowling greens, athletic fields, golf driving ranges, golf courses, miniature golf courses, cemetery, crematorium, columbarium etc. are permitted uses yet there are no parking requirements in the by-law.

4. School parking is based on the number of classrooms. This may not be sufficient for secondary schools, technical schools or private schools.

5. Uses such as golf clubs, places of worship and banquet halls have multiple uses within the structures yet a place of worship and a banquet hall has one parking standard of 11 spaces per 100 square metres gross floor area (GFA). There is no parking standard for a golf club.

6. We currently do not apply any parking for mezzanines as defined by the by-law, yet the by-law does not restrict the use of mezzanines and they can be up to 40% of the GFA of the building or unit.

7. The C1 zone permits a shopping centre parking ratio when a combination of uses are developed as a shopping centre provided eating establishments doe not exceed 20% of the total GFA of all developments on the site. The C2 and C7 zones also have the shopping centre parking ratio but do not cap the percentage of eating establishments in the development.

8. There are no parking standards for drive-through banking. (queuing)

9. The day nursery parking standard is 1.5 parking spaces per employee. Many of the day nurseries provide busing yet there are no requirements for drop off lanes. The buses must park on the street to pick up and drop off children. (there is one on the south side of Major Mackenzie west of Keele St.)

10. Zoning has not yet applied the C9 Corporate Centre parking requirements, particularly the shared parking provisions, but can see difficulties in applying the requirements. They require knowledge of the building uses in advance, which may not be known.

11. A multi-unit industrial building containing more than 4 units requires 2.0 parking spaces per 100 sq.m of GFA or 4.0 parking spaces per unit whichever is the greater. The original proposal would comply but as the units get subdivided the parking requirements increase due to the requirement per unit, thus creating a parking deficiency on the site even though the overall GFA has not changed. The multi unit parking ratio does not make sense for a building in the 3700 sq.m GFA or less category.

12. There are 4 different parking standards for 4 different types of eating establishments.

13. The single use warehouse requirement is only 1 parking space per 100 sq.m. GFA. When a manufacturing use then occupies the building the site is deficient in parking.

14. A new parking requirement for mixed use developments should be considered.

15. A new parking requirement for live/work developments should be considered.

16. Parking problems arise when additional uses are permitted in an employment area zone and parking requirements are not addressed. There should be a better method then relying on parking studies provided by the applicant.

APPENDIX E

SUPPLEMENTARY MATERIAL TO WOODBRIDGE CORE PARKING REVIEW

July 2008

IBI GROUP

Review of Parking Standards Contained within The City of Vaughan's Comprehensive Zoning By-Law: Survey of Selected Establishments in the Woodbridge Core

Business name:_____

Address:_____ Date:_____

Person:_____ Phone:_____

The City of Vaughan is currently investigating opportunities to guarantee sufficient publicly available parking in the Woodbridge Core into the future.

We are conducting a random survey of businesses in the Woodbridge Core to get their feedback on parking and transportation issues.

Do you mind if we ask you a few questions?

1) **How do your customers typically get to your establishment?**

☐ Drive ☐ Walk/Cycle ☐ Transit

_____

_____

2) Where do your customers park?

☐ On-site ☐ On-street ☐ Off-site

_____

_____

3) Do your customers have difficulty finding convenient parking? If so, when?

_____

_____

_____

4) Do you and your employees drive to work? If so, where do you normally park?

_____

_____

_____

5) I am going to go through a number of potential strategies to improve public parking availability in the Woodbridge Core. Please provide feedback on each.

A. Improve signage to direct people to existing available parking

☐ Support ☐ Don't support ☐ Not sure

B. Provide more regular enforcement of existing on-street parking restrictions

☐ Support ☐ Don't support ☐ Not sure

C. Charge for on-street parking to encourage turnover

☐ Support ☐ Don't support ☐ Not sure

D. Improve local transit service

☐ Support ☐ Don't support ☐ Not sure

E. Facilitate cooperation among businesses to ensure that employees and business owners do not occupy high priority parking spaces

☐ Support ☐ Don't support ☐ Not sure

F. Require new development to provide ample parking

☐ Support ☐ Don't support ☐ Not sure

2

G. **Require new development to give money to the City to build publically accessible parking if they can't meet parking requirements**

☐ Support ☐ Don't support ☐ Not sure

_____

_____

H. **The City should work with private developers to increase the availability of publicly accessible parking on private land**

☐ Support ☐ Don't support ☐ Not sure

_____

_____

I. **Other suggestions?**

_____

_____

6) Do you have any other suggestions on how parking could be better managed in the Woodbridge Core?

_____

_____

_____

_____

_____

Thank you for your time.

Components of Parking Wayfinding

There are five fundamental parking sign types that increase drivers' and pedestrians' wayfinding experience. Examples are presented in the Exhibit below.

- **Introduction:** Introduction parking signage alerts drivers approaching the downtown of the locations of the publicly owned, off-street parking lots. This type of signage is distinctive in color and size, and it can be characterized by unique logos. The signs display the names of the off-street parking lots and the names of their streets. The signs are located on the street, and are mounted on poles of standard heights.

- **Directional:** Directional-parking signage is distinct in color, size and logo and directs drivers to off-street parking areas. The signs are mounted on poles at standard heights, on the streets.

- **Location:** Parking location signage complements the directional parking signage. The signs have arrows pointing to the off-street lots. The signs are mounted on poles at standard heights and located on-street.

- **Identification:** Identification signage is placed at the entry of each parking lot. The name of the parking area is identified and the type of parking available at the parking area is listed on the signage. The identification signage is distinctive in color and size, and it is located on a pole at a lower height.

- **Way Finding:** Way finding signs are placed at the points of pedestrian entry/exit to parking lots and structures. The sign is a map illustrating the downtown area that points out the various shops or attractions that can be found. These types of signs are placed at locations easily found by a pedestrian and are intended to help that person orient themselves to the downtown area such that they can locate their destination and then be able to return to where they parked.

The qualities of good signage include the following aspects:

- Use of common logos and colors.

- Placement at or near eye level.

- Use of reflective, durable material.

- All five types used in conjunction to guide motorist and pedestrian activity.

- All entrances to the downtown need to have introduction signage.

- All parking areas need to have identification signage.

- All routes through the downtown need to have directional and location signage.

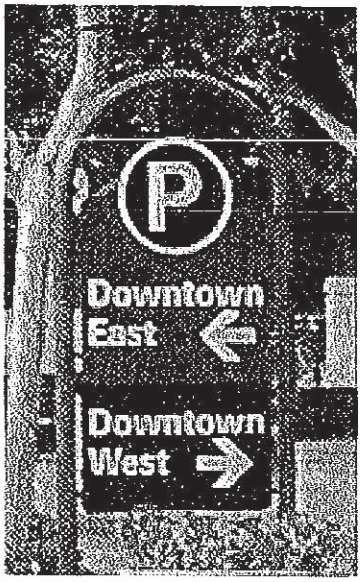
- All pedestrian routes to and from major customer/visitor parking areas need to have way finding signs.

- The identification signs located at parking areas need to convey parking rates, hours of operation, maximum durations, and validation availability.

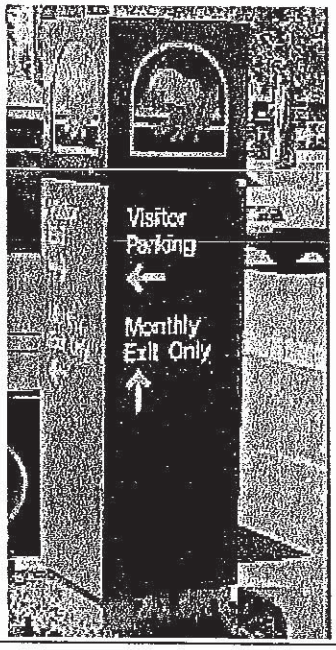
- Usually have a lettering height of about 10 centimeters for urban streets (varies according to traffic speed).

Examples of Parking Sign Types

Directional Sign

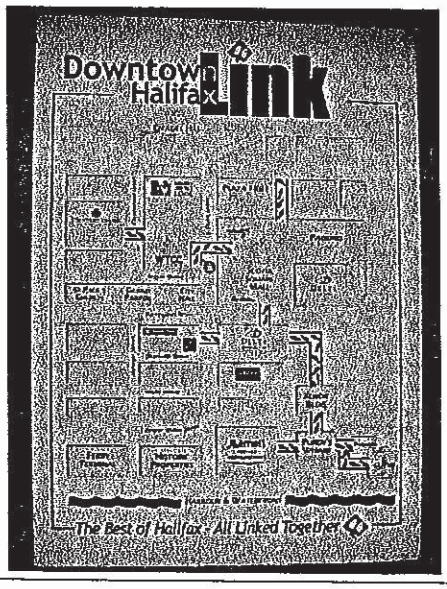


Location Sign

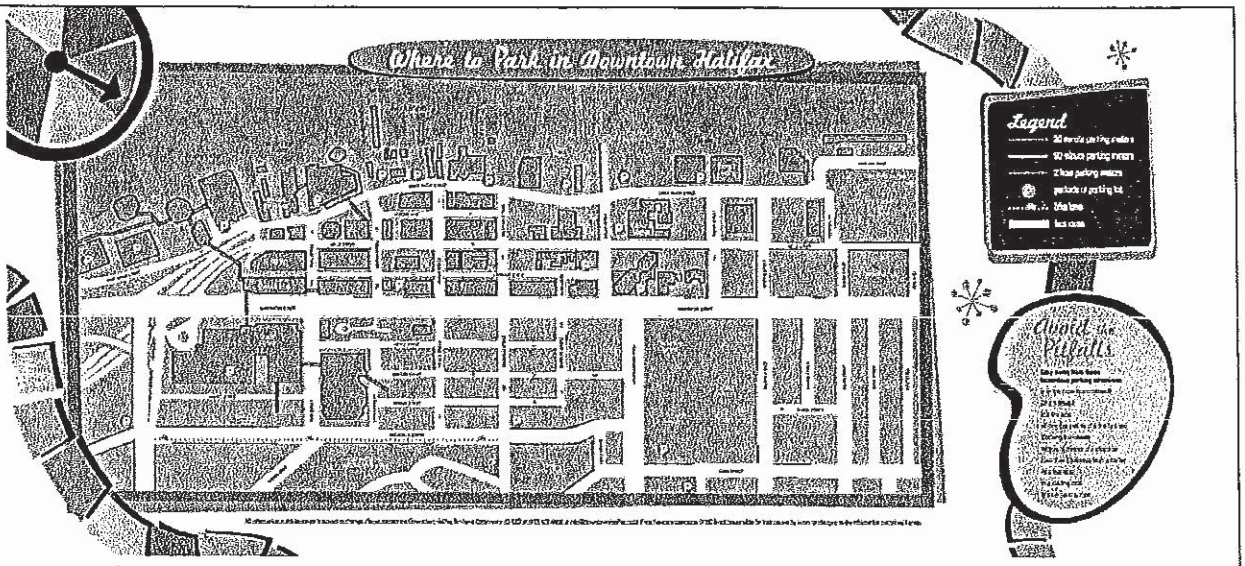


Identification Sign

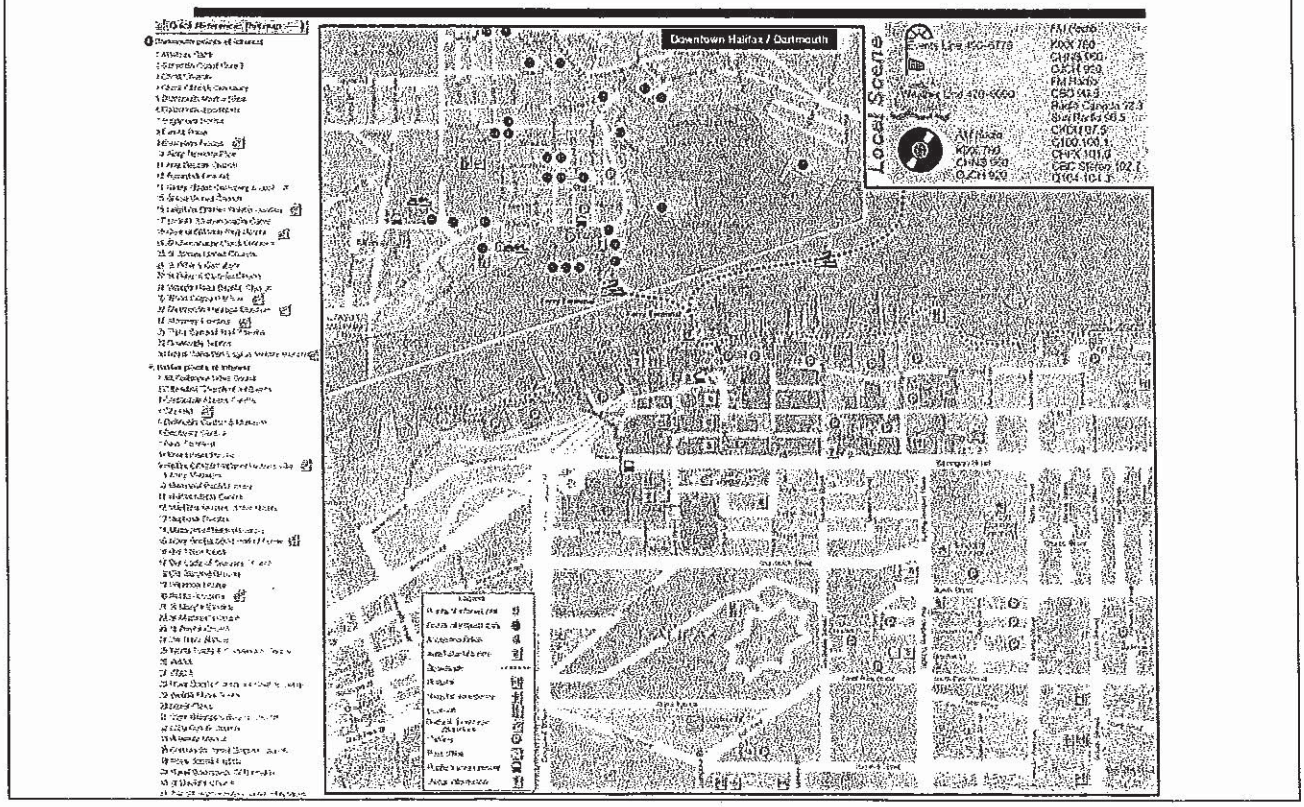
Wayfinding Sign



Examples of Promotional Parking Material Prepared by the Downtown Halifax Business Improvement Association



Source: http://www.downtownhalifax.ns.ca/images/Park%20Smart%20Final%20Web.pdf



J:\15600_PkStan_ByLaw\10.0 Reports\Final Report\Appendices\TTR_AppE_supplementarymaterial_2008-07-25.doc\2008-07-31\JEY