

City of MARKHAM

Task 9: Review & Assessment of Parking and Loading Standards

Comprehensive Zoning By-law Project



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EXECUTIVE SUMMARY

Section 1 - Introduction

The introduction describes the purpose and context of the review of parking (motor vehicle and bicycle) and loading standards. By reviewing the zoning by-laws of other municipalities and the relevant planning literature, the paper identifies “best practices” for possible incorporation into Markham’s New Comprehensive Zoning By-law. At this stage, these findings are presented as options for public discussion and final recommendations regarding an approach to revising Markham’s parking and loading standards will be shaped by the feedback received.

Three principal sections follow from the Introduction. Section 2 deals with parking standards for motor vehicles; Section 3 addresses parking standards for bicycles, and Section 4 examines loading space requirements. The report takes the perspective that the New Comprehensive Zoning By-law Project is a major opportunity to develop an updated set of parking and loading standards that support the planning objectives of Markham’s new Official Plan and the options brought forward for consideration are identified in this context.

Section 2 - Parking Standards for Motor Vehicles

These standards are looked at in terms of both the parking ratios that specify the amount of parking each land use is required to provide and also the design standards for these parking spaces. Design standards typically relate to issues such as size of a parking space, where on the lot the parking is to be provided and how it is accessed.

Parking Ratios - The discussion begins with a general description of how parking ratios for different classes of land use are expressed in most zoning by-laws. It is concluded that Markham's current parking ratios are broadly similar, in style and substance, to those of other suburban municipalities that have not recently updated their zoning by-laws. A brief history of how parking ratios have evolved in North America leads to the present day understanding that parking standards are an effective instrument of planning policy and should no longer be entirely determined by current parking demands. Now the general view is that too much parking can be as harmful as too little. Apart from effecting car use, parking standards impact on built-form and business activity, influencing the way that Markham's commercial and residential neighbourhoods look, feel and function. The New Zoning By-law Project presents a major opportunity to ensure that Markham's on-site parking requirements for new developments will align with and support the City's broader land use planning and transportation planning objectives as principally expressed in the new Official Plan.

A number of general issues related to how parking ratios are framed and applied are reviewed and options for addressing these issues presented for consideration:

- *Varying Parking Ratios by Area* - it is suggested that parking ratios in Markham could, for the first time, be designed to vary in different parts of the City depending on levels of transit service and/or other-area-based planning objectives. One approach would be to relate parking requirements to the hierarchy of mixed-use growth centres and corridors designated in the Official Plan's Urban Structure map. Consideration might also be given to phasing in changes to parking standards with the introduction of improved transit services.
- *Parking Ratios in Mixed-Use Settings* - consideration should be given to taking full advantage of the opportunities to share parking spaces in mixed-use buildings and districts by extending the application of time-of-day sharing formulae to all non-residential land uses and by developing "blended" or consolidated parking ratios for large multi-unit sites and mixed-use districts. Blended rates have the benefit of reducing the need to re-calculate the parking requirements whenever there is a change of use in a mixed-use building. Developing blended parking rates for whole districts is likely to require considerable resources for survey and analysis work, and would be a major departure from the way parking standards are currently formulated in most municipalities.
- *Applying Maximum Parking Ratios* - the imposition of parking maximums appears justifiable in terms of supporting the intensification objectives of selected growth areas. In some cases consideration should be given to applying maximums only in the case of surface parking.
- *Exercising the Payment-in-lieu Option* - there are two contexts in which payment-in-lieu of providing required on-site parking appears appropriate. In the older retail-commercial areas (e.g. Markham Village), particularly the shopping streets, where lot sizes are typically small, payment-in-lieu offers an acceptable solution to avoiding the unrealistic requirements for on-site parking. The other setting is newer, planned growth centres (e.g. Markham Centre) where the zoning standards are part of a larger parking management strategy with a long-term focus on providing off-street, centralized public parking garages.
- *Permitting Required Parking to be Off-site* - the legal and administrative difficulties of securing and enforcing off-site parking agreements suggests that these arrangements should not be an as-of-right provision in the zoning by-law, except when part of a district parking management strategy as in the case of the Markham Centre. Otherwise, off-site should be considered on a site-specific basis.
- *Charging for Required Parking* - Markham's By-law 28-97 stipulates that required parking is to be provided free. Now may be the opportune time to repeal this prohibition and let the market

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determine the price of parking. Charging for parking in some areas would support the objectives of the new Official Plan and the City's sustainability goals.

A number of issues related to the parking ratios of a few selected uses are identified and options for addressing them are presented:

- *Apartment Dwellings* - By-law 28-97 specifies a uniform parking rate of 1.50 parking spaces per unit (1.25 occupant, plus 0.25 visitor). Many municipalities vary the parking rate for apartment buildings by unit size, usually measured in terms of the unit's number of bedrooms. Markham should consider moving away from the current uniform standard for all units.
- *Accessory Dwelling Unit* - this review supports the findings of Markham's Sub-committee on Second Suites as presented in the Markham staff report of February, 2008 which conclude that no additional parking space should be required for a secondary suite (or accessory dwelling unit as referred to in the zoning by-law). As a general principle, accessory dwellings should only be permitted where there is sufficient on-site parking already available.
- *Places of Worship* - there is a wide variation in the level of parking generated by this particular land use and it is suggested that Markham consider simplifying the complex parking standard for Places of Worship found in By-law 28-97 and, perhaps, replacing it with a more straightforward requirement. An alternative approach for new, large Places of Worship might be to require an individual parking study to be undertaken to determine the appropriate parking standard.
- *Consolidation of Retail Parking Standards* - advantage should be taken of the opportunity to consider the consolidation of the parking standards for various types of retail uses and Shopping Centres. Such consolidation would maximize the benefits of shared parking and simplify the application and administration of the parking requirements.
- *Consolidation of Parking Standards for Places of Assembly* - as with retail uses, consolidation opportunities should be explored as part of the New Comprehensive Zoning By-law Project.
- *Other Considerations* - Introducing stacking lane requirements for drive-throughs and the question of assigning parking ratios to "Other" (undefined or unlisted) uses are two other specific issues that are briefly addressed.

Parking ratios can also be developed as part of a local area parking management strategy. In America, these types of strategies sometimes employ "adjustment factors" (such as proximity to good transit service, the presence of an abundant supply of off-street parking and a local pattern of mixed-use development) to estimate reduced parking requirements. However, some of the proposed adjustment factors can be difficult to apply through zoning provisions and the more important of them may already be largely accounted for in a zoning by-law whose parking requirements vary by area. This review does not propose that consideration be given to the formal inclusion of parking adjustments factors in the New Comprehensive Zoning By-law.

Parking Design Requirements - A number of issues related to zoning provisions regarding the design of parking spaces are discussed. Attention is also drawn to taking the opportunity presented by the New Comprehensive Zoning By-law Review Project to develop parking design standards that more directly address broader urban design concerns, particularly with regard to surface parking. The following design issues are put forward for consideration in the New Comprehensive Zoning By-law:

- *Aisle Widths* - minimum width requirements for aisles in structured parking facilities and the layout of parking spaces in relation to different aisle widths.
- *Parking Obstructions* - provisions that prohibit the obstruction of required parking spaces by such features as walls, stairs, columns and pipes.

- *Parking Spaces in Rear Yards* - provisions to restrict parking in the rear yards of non-lane-based residential lots with flankage yards.
- *Lane Access* - requiring access to parking for ground-oriented residential dwellings to be from a lane where the property abuts a lane.
- *Private Garage Setbacks and Sizes* - consolidate and strengthen Markham's zoning provisions related to these features.
- *Circular Driveways* - clarification of clause 6.2.4.5 in By-law 28-97 regarding provisions for circular driveways on residential lots.
- *"Hammerheads"* - include standards for the provision of turnaround space or hammerheads on residential lots.
- *Parking of Commercial Vehicles on Residential Driveways* - lower the permitted weight limit for commercial vehicles parked on residential driveways to 3,000 kg (from 4,536 kg) and further consider replacing the weight restriction by other measures such as minimum lot areas, setbacks or enclosure in a building.

The use of illustrations to help explain some of the more difficult to follow parking design provisions should also be considered for inclusion in the New Comprehensive Zoning By-law and a number of examples from other municipal zoning by-laws are provided.

Section 3 Introducing Standards for Bicycle Parking in the Zoning By-law

Based on a review of bicycle parking provisions in other municipal zoning by-laws and other related literature on this topic, the key issues to be assessed in framing Markham's new zoning provisions for bicycle parking are:

- Should bicycle parking requirements apply to new developments on a city-wide basis or only for selected areas, such as the designated growth centres and corridors, where conditions are more conducive to cycling;
- Developing requirements for shower/change facilities in non-residential developments;
- Distinguishing between the bicycle parking requirements of long-term and short-term parkers;
- Determining the number of non-residential land use classes to which distinct bicycle parking requirements should apply;
- Deciding the basis upon which to establish bicycle parking rates (e.g. by informed judgment; adapting rates from elsewhere, or policy-driven targets);
- Requiring bicycle parking spaces for both occupants and visitors to be conveniently located in relation to the building's pedestrian entrances;
- Specifying minimum dimensions for bicycle parking spaces;
- Including exemptions for small buildings or lots (and, possibly, specific land uses), and
- Allowing the provision of bicycle parking spaces to partly off-set or lower the requirements for vehicle parking under certain specified conditions.

Section 4 Loading Standards

Markham's requirements for loading spaces are found in By-law 177-96 and a number of the other parent by-laws. Generally, Markham's loading standards are similar to those of other comparable municipalities. Compared to the parking provisions for vehicles, the requirements for on-site loading facilities are typically much less detailed and apply to only one or a few broad land use classes. The relative simplicity of loading standards may partly be attributable to the fact that loading is an operational requirement and it is in the interest of developers to provide sufficient loading spaces to make their buildings functional.

A review of the loading standards in other by-laws suggests a number of features that could be considered for inclusion in Markham's New Comprehensive Zoning By-law:

- Introducing a loading requirement for residential buildings with 30 or more dwelling units, including provisions for garbage collection trucks;
- Specifying minimum driveway widths for trucks and maximum permitted slopes;
- Applying loading requirements over a wider range of non-residential floor area sizes with more steps in the range;
- Possibly creating a finer breakdown of non-residential uses among which separate loading standards would apply, and
- Specifying loading exemptions on the basis of small lot sizes as well as floor area.
- Consolidating loading standards into one consistent set of requirements that apply across the City.

1. INTRODUCTION

The purpose of this paper is to review and assess parking (motor vehicle and bicycle) and loading requirements as part of the Markham New Comprehensive Zoning By-law Project. The paper identifies issues that should be considered in the drafting of the New Comprehensive Zoning By-law and suggests options for addressing them. These options are identified from a review of relevant zoning practices in other municipalities, particularly those within the Greater Toronto Area (GTA), and from other published research sources. By looking at the parking and loading provisions of other municipalities, alternative regulatory approaches can be assessed in terms of their potential to be incorporated into Markham's New Comprehensive Zoning By-law as a "best practice".

Another important facet of this review relates to developing parking and loading provisions in the New Comprehensive Zoning By-law that maximize the opportunity to support Markham's broader planning objectives, particularly as expressed in the policies of the new Official Plan. The parking provisions of the Zoning By-law can be employed as an effective planning tool which impacts on the use of the car, the City's built-form and its economic functioning. A major issue in this regard is to introduce parking provisions that support and facilitate the City's goal of encouraging mixed-use development in targeted growth areas that are well served by transit.

Markham's parking standards are found in By-law 28-97, a city-wide by-law that establishes one set of standards for consistent application throughout the municipality. The later adoption of the Markham Centre By-law 2004-196 introduced a new, more consolidated set of parking standards for this major, designated Regional Centre. By-law 2004-196 incorporates much of the new thinking on how to develop parking standards to help achieve the successful implementation of planned, transit-oriented, mixed-use growth centres or districts. These two by-laws provide the focus for the review of parking standards in Markham.

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Currently, there are no zoning provisions for bicycle parking in Markham, although recent draft guidelines for introducing requirements for Transportation Demand Management (TDM) plans for residential/mixed use buildings and employment/office buildings include the provision of bicycle parking facilities in such plans. Policy 7.1.4.2(h) of the new Official Plan directs that the Zoning By-law be updated to include bicycle parking. This review identifies a number of key factors and issues that the City of Markham should take into consideration in developing requirements for bicycle parking facilities in the New Comprehensive Zoning By-law and in maintaining Markham's reputation as a leader in active transportation initiatives.

Loading space requirements are largely found in the New Urban Area By-law 177-96, although most parent by-laws in commercial and industrial areas include loading space requirements as well. However, the differences in loading space requirements between by-laws are relatively minor. Zoning by-law provisions for on-site loading facilities are generally less detailed than those related to vehicle parking requirements. This may be partly due to the fact that loading is an operational requirement and greater reliance can be placed upon developers to voluntarily provide sufficient loading facilities to make their buildings functional and marketable.

Following this introductory section, this paper is divided into three main sections. Section 2 deals with parking standards for motor vehicles; Section 9.2 addresses parking standards for bicycles, and Section 3 examines loading space requirements. Zoning by-laws typically devote by far the greatest attention to parking standards for motor vehicles and the length of Section 2 of this paper is a testimony to this fact. There are many aspects to the development of vehicle parking standards and this review has taken a comprehensive approach to ensure, as far as possible, that all issues and topics that are relevant to the Markham New Comprehensive Zoning By-law Project are brought forward for consideration.

2. PARKING STANDARDS FOR MOTOR VEHICLES

2.1 Parking Standards in General

Parking standards for motor vehicles are prescribed by two general types of requirements in zoning by-laws. One set of requirements relates to the number of parking spaces that have to be provided on site, typically expressed as a ratio of one space per given amount of development. The other set of requirements relate to the design of parking spaces in terms of dimensions, on-site location, use and access.

Parking ratios are specified for classes of use and, as a result, vary substantially between uses that generate a high demand for parking, such as banquet halls, and those that create little demand, such as industrial uses. Design standards vary in the degree of attention that is given to different uses, with grade-related residential uses usually having the most detailed requirements. Design standards for parking spaces relate to issues of both functionality and aesthetics.

Markham's By-law 28-97, as amended, specifies parking ratios for 8 types of residential use and 46 types of non-residential uses. The tenant and visitor parking ratios for residential uses are based on the number of dwelling units, except for Bed & Breakfast Inns where the number of guest rooms applies. Of the 46 non-residential uses, 30 have their parking ratios based on floor space as measured by net floor area (NFA). The two exceptions are Shopping Centre where net leasable floor area is the relevant measure and Place of Worship where worship area is part of the basis. The remaining 16 uses apply non-floor area measures such as seats, classrooms and suites.

It should be noted that By-law 28-97 contains definitions of uses (such as "bake shop" and "recreational establishment") for which parking ratios are not specified, while there are parking ratios assigned to uses

(such as “arena” and “nursery garden centre”) that have no definition. The definitions contained in By-law 28-97 will be reviewed as part of the broader analysis of definitions in the 46 parent zoning by-laws that is being undertaken by Task 5 of the new Comprehensive Zoning By-law Project.

Generally, the parking ratios based on floor space do not vary with the size of the establishment. The exceptions are Retail Store and Shopping Centre uses that each have a floor space threshold above which the parking ratio increases, and the Industrial use which has parking ratios that decline over three progressively larger class sizes. Although there are 30 non-residential uses to which a floor space ratio of some type applies, there are only 13 distinct ratios. That is to say, many of these 30 uses have the same required parking ratio.

The most common required parking ratio is 1 space/20.0 m² that is shared by 9 uses (including large Retail Stores). However, 8 non-residential uses have unique parking ratios, including the use with highest required rate of parking (Nightclubs, at 1 space/7.5 m²) and that with the lowest (Industrial under 6,000 m², at 1 space/200.0 m²). The catch-all “Other” use category has a unique ratio of 1 space/25.0 m² and applies to any use not specified in the 46 non-residential uses listed in the By-law 24-97.

When comparing features such as: (i) the list or range of uses, (ii) the mixture of parking ratios based on floor space or other measures, and (iii) variations in the ratios by size of establishment for certain uses, the current Markham Zoning By-law is similar to most by-laws for other municipalities in the Greater Toronto Area and across the country. Exact, one-to-one comparisons of by-laws are difficult to make and where such comparisons are presented in tabular form there are usually many qualifying footnotes attached.

The IBI Group’s “Draft Markham Parking Strategy” (December, 2009) provides a comparison of parking ratios across selected Canadian municipalities in a series of tables for residential uses and six broad categories of non-residential uses. Similar comparative tables of parking ratios can be found in other reviews such as the HDR/iTRANS “Final Draft Report - Richmond Hill Parking Strategy” (June, 2010), Appendices B & C and in the IBI Group’s report “Review of Parking Standards Contained within the City of Vaughan’s Comprehensive Zoning By-law” (March, 2010), Appendix C. The comparative analysis in the “Draft Markham Parking Strategy” concluded that overall “(Markham’s) parking standards are consistent with other suburban municipalities, but on the low-end in some cases” (p.13).

The recent parking studies in Vaughan and Richmond Hill, along with recently adopted comprehensive zoning by-laws in Oakville (2014) and Toronto (2013), point to new directions in the formulation of parking standards in the GTA. These and other published sources will be drawn upon in this review to identify issues, options and potential best practices that might be incorporated into Markham’s New Comprehensive Zoning By-law.

2.2 Parking Standards as a Policy Instrument

The parking provisions of the Zoning By-law can be employed as an effective planning tool in support of broader policy objectives. As noted in the text of the Markham Official Plan:

“The availability of parking, in terms of amount, price and location, can be a determining factor in choosing whether or not to travel by car. Parking also impacts built-form and business activity, influencing the way that Markham’s commercial areas and residential neighbourhoods look, feel and function” (p. 7-14).

Parking ratios largely control the growth in the supply or amount of off-street parking and the associated design standards affect the location and, to some degree, the appearance of the required

parking spaces. The current review of the Zoning By-law presents a major opportunity to ensure that Markham's off-street parking standards align with and support the City's broader land use planning and transportation planning objectives.

A major goal of the Official Plan is to accelerate Markham's transition from a primarily car-dependent community to one where walking, cycling, transit and carpooling are seen as increasingly viable and attractive alternatives. Future development growth is to be directed to higher density mixed use centres and corridors that are designed to support good levels of transit service and to provide more attractive conditions for pedestrians and cyclists. This shift in policy direction requires that the future growth in the supply of off-street parking be balanced in a way that meets essential parking needs without leading to an abundance of free parking that would only serve to needlessly promote car use.

As noted in the "Draft Markham Parking Strategy" (2009), current trends in parking management are moving away from a "more parking is better" approach to one that recognizes that too much parking is as harmful as too little. Increasingly, cities in North America are recognizing that parking requirements are a policy choice that lies at the intersection of land use and transportation planning and not simply a technical matter best addressed by traffic engineers. In Markham, the realization of these trends can be seen in the progressive parking policies and standards adopted for the development of the Markham Centre as found in the provisions of By-law 2004-196.

Section 7.1.5 of the Official Plan addresses Vehicle Parking policies and speaks to the need to develop a city-wide parking strategy to be implemented through individual business plans of which revisions to the current Zoning By-law standards would be a part. Included among the proposed revisions are:

- varying minimum parking ratios by location
- increased opportunities for shared parking in mixed use developments
- introducing maximum parking ratios in areas well served by transit
- increasing parking ratios to provide for more accessible parking

The Official Plan gives particular attention to limiting the expansion of surface parking in Markham by specifying that new parking spaces required in intensification areas be generally located in structures or garages, preferably underground. These and other parking initiatives that can be addressed through zoning provisions will be addressed in subsequent sections of this review.

2.3 Estimating Parking Ratios

Ideally, parking ratios should be derived from sample surveys of parking demand. For residential uses the key variable is car ownership per household plus, for multi-unit residential developments, an accommodation for visitor parking. Generally, a more complex set of considerations applies to determining the parking demands of various types of non-residential uses, which require surveys to be made of employee parking needs and the needs of visitors such as customers, clients, patrons, guests and attendees. The most comprehensive surveys are of individual travel behaviour from which parking needs can be derived but, more often, the short-cut method of observing "parking utilization rates" is applied to gauge the level of parking demand for a given use. Surveys of travel behaviour and parking utilization should be based on carefully selected samples that capture statistically significantly response rates from all the different types of parkers or uses at their times of peak demand.

However, the cost and effort to conduct comprehensive surveys of the types described above can be prohibitive and it is common practice for municipalities to borrow and adapt existing parking ratios, either from respected research sources and/or from the zoning provisions of other comparable cities. Typically,

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municipal parking reviews conduct local parking surveys of only certain important or frequently disputed uses such as medical offices or places of worship.

A commonly used research source for parking ratios in North America is found in the Institute of Traffic Engineers' (ITE) handbook entitled "Parking Generation", most recently published in its 4th. Edition in 2010. Parking ratios are determined by observing the peak period occupancy rates of parking lots attached to single-use sites, typically in suburban US locations where transit is lacking and the parking is free. The ITE's findings can be related to other recognized research sources. Davidson and Dolnick's study of "Parking Standards" (2002), prepared for the American Planning Association (APA), presents a compendium of parking ratios for over 700 uses found in zoning by-laws (or codes) across the US. The Urban land Institute (ULI) has produced reports on "Parking Requirements for Shopping Centres" (2nd. Edition, 2003) and "Shared Parking" (2nd. Edition, 2005). The Washington-based National Parking Association (NPA) also collects and publishes reports on parking issues.

The unqualified application of these published parking ratios results in many developments being required to provide high levels of "minimum" parking that can result in an abundant supply of often under-utilized free parking. Consequently, the parking ratios suggested by the ITE, APA, ULI and NPA reference documents are now increasingly seen as starting points for current reviews of parking standards. In fact, most comprehensive reviews of parking ratios take a combined approach that incorporates, to varying degrees, elements of:

- surveys of observed parking demand (car ownership, travel behaviour, parking utilization),
- trip estimation formulae of predicted parking demand;
- comparisons of parking ratios and related "best practices" in other, comparable cities,
- review of recognized, published research sources (e.g. ITE and ULI), and
- direction of approved planning policies.

As noted above, parking standards are increasingly being seen as an instrument of planning policy and parking ratios are now beginning to be looked at as much in their role of shaping car use as they are in simply accommodating it. That is to say, parking ratios are no longer being entirely determined by the parking demands of the day.

Parking ratios have existed in most cities since at least the 1950's and have often been amended incrementally by various means over time. Consequently, it is not surprising to find that municipalities are often unable to trace the justification or reasoning behind some of the older parking ratios found in their current zoning by-laws.

Finally, parking ratios need to be written in the clear, unequivocal language of an effective zoning by-law. Parking standards need to be easily understood by everyone and straightforward to implement or apply. Given that parking standards reflect an "average" condition, they will rarely prescribe the number of parking spaces to exactly match the parking demands of any individual development project. The empirical challenge is to develop some understanding of the range over which parking demand for a given use may vary and the policy question is where in that range should the parking standard or ratio be set.

2.4 Markham's Parking Ratios Reviewed

As noted, the parking ratios of By-law 28-97 generally prevail across the City with the one major exception of the parking ratios found in the Markham Centre By-law 2004-196. The parking provisions for the Markham Centre will be referred to later at various points in this report to illustrate how zoning standards for parking can be an important part of a local parking management strategy that is designed to support the urban planning goals of a particular area.

The parking ratios prescribed by By-law 28-97 are, for the most part, easy to understand and apply. They form a good basis from which to move forward to assess the role of parking ratios in Markham's New Comprehensive Zoning By-law. In reviewing the existing parking ratios, two themes of commentary emerge. First, there are comments on general issues about the way the parking ratios are framed and presented and, second, there are comments related to issues concerning a few specific ratios.

2.4.1 General Features

(1) *Issue: Should Parking Ratios Vary by Area?*

The minimum parking requirements of By-law 28-97 are applied uniformly across the City for all uses. However, this one-size-fits-all-areas approach is becoming less common. The recent widespread adoption of urban "smart growth" practices, with their emphasis on transit-supportive development, is leading to the adoption of lower parking standards in many cities of all sizes that are investing in transit in both downtown and more suburban settings. The most common trend has been to lower minimum parking requirements in areas with the best transit service and/or where there are concerns that too much parking will detract from the achievement of other more important planning and design objectives.

The first step in this process has already been taken in Markham with the adoption of the reduced parking standards of By-law 2004-196 for the Markham Centre, the City's major growth node. By-law 2004-196 also imposes, for the first time in Markham, strict limits on the amount of parking to be provided by stipulating that the minimum requirement also acts as a maximum limit. Overall, the parking provisions are designed to encourage greater transit use in the Markham Centre and to assist in the creation of a dense, mixed-use growth centre of regional significance. In addition to supporting greater transit use, lower parking requirements for new developments will encourage active transportation by helping to create a better designed urban environment for pedestrians and cyclists. A similar approach to creating tailored parking standards is expected to be applied in the future development of the City's other major regional centre, the Langstaff Gateway.

Markham's Draft Parking Strategy (2009) proposes building on the Markham Centre example by developing parking standards that vary among different parts of the City as defined by the new Official Plan's Urban Structure map. The approved version of the Urban Structure map has changed somewhat from the draft proposal of 2009 and the hierarchy of mixed-use growth centres and corridors is now defined as:

- **Regional Centres** comprising Markham Centre and Langstaff Gateway
- **Regional Corridors & Key Development Areas (KDA's)** comprising Commerce Valley/Leitchcroft; Woodbine/404; Markville; Cornell Centre; Yonge Steeles, and Yonge North.
- **Local Centres & Local Corridors** comprising German Mills Centre; Milliken Centre; Thornhill Centre; Cornell North Centre; Cathedraltown; Markham Road Corridor-Armadale, and Markham Road Corridor - Mount Joy

For the purposes of defining minimum parking requirements, areas outside the mixed-use growth centres and corridors described above are termed "Rest of the City". The general strategy is that minimum parking requirements would be set lowest in the Regional Centres then incrementally

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increased through the remaining categories to be set highest in the Rest of the City where transit service is least available.

Other municipalities in the GTA are recognizing the advantages of varying parking ratios by planning areas in support of broader Official Plan objectives:

- Oakville's new Zoning By-law (2014-014) introduces parking requirements that vary by district based on the Official Plan's designation of five mixed-use "Growth Areas" where "a more stringent" approach to parking standards was taken. Interestingly, commercial uses in Downtown Oakville had already been exempt from minimum parking requirements and this feature has been maintained in the new zoning provisions. For the four other Growth Areas, all non-residential uses are assigned a common (or "blended") minimum parking ratio that varies across the areas from 2.5 to 4.2 spaces/100 m² of net floor area. A sidebar in the parking section of Oakville's new Zoning By-law comments that: "In the Growth Areas, the minimum number of parking spaces required are reduced to support the Town's strategic and policy objectives related to transit, growth management and design".
- Toronto's new Zoning By-law (569-2013), apart from consolidating the provisions of the six former local municipalities, initiates a new set of parking ratios that vary across the planning policy districts identified in the Official Plan's urban structure map. On this basis, four "Parking Policy Areas" with successively lower levels of transit service are identified: Downtown and Central Waterfront; Centres; Avenues on a subway, and Avenues with surface transit (plus the "Rest of the City" where transit service is poorest). The overall approach is to have minimum parking requirements vary inversely with the level of transit service. Not all uses have minimum parking requirements that necessarily vary across all five types of parking area in the City and maximum ratios are only applied to the four Parking Policy Areas and not to the Rest of the City.
- Vaughan initiated a city-wide review of parking standards in 2007 in which "a more nuanced approach to parking" was taken (see IBI Group (2010)). Again, it is recommended that minimum parking requirements should vary in accordance with four "parking geographies" derived from the proposed Official Plan's urban structure map. These four geographies are: Higher-order Transit Hubs (including the Vaughan Metropolitan Centre); Local Centres; Primary Centres & Primary Intensification Corridors, and Base (Other Areas) which represent a hierarchy of increasing minimum parking requirements. Parking maximums are proposed for the Higher-order Transit Hubs, along with maximums on surface parking in the Local Centres and Primary Intensification Areas. Currently, the findings of the parking review are being applied to the Vaughan Metropolitan Centre in advance of the adoption of the new city-wide by-law.
- Richmond Hill is also pursuing the introduction of a similar set of spatially varying minimum parking requirements relating to the Official Plan's urban structure. Four types of parking areas are identified: Richmond Hill Regional Centre; Downtown Local Centre and Key Development Areas; Rapid Transit Corridors, and Business Parks including the Rest of Richmond Hill. Parking reductions of up to 30% less than the existing standards are proposed and maximum standards would be set at their lowest in the Richmond Hill Regional Centre (see HDR/iTRANS (2010)).
- Hamilton's Zoning By-law 05-200 has a separate schedule of lower parking rates that applies to all Downtown Zones.

The strategy of introducing spatially varying parking requirements is consistent with current Provincial and Regional planning policies and directives. For example, the Provincial Policy Statement (2014) directs, in Policies 1.6.7.4 and 1.6.7.5, that transportation and land use considerations are to be integrated at all stages of the planning process and that land use patterns (density and mix of uses) should minimize the length and number of vehicle trips and support the current and future use of

transit and active transportation (walking and cycling). The York Region Official Plan states in Policy 5.2.10(a) that "...secondary plans and zoning by-laws ... shall include ... (a) reduced minimum parking requirements that reflect the walking distance to transit and complementary uses".

Options in Developing Spatially Varying Parking Ratios

The movement toward introducing geographically based parking standards in support of Official Plan policies is becoming recognized as a best practice and one that is recommended in the Markham Parking Strategy (2009). Options to be considered in pursuing this new direction in the Markham case relate to:

- Creating within the New Comprehensive Zoning By-law an overlay of parking areas derived from the Official Plan Urban Structure Map that establishes four types of area to which different parking ratio schedules apply, namely: (i) Regional Centres; (ii) Regional Corridors & Key Development Areas (KDA's); (iii) Local Centres & Local Corridors, and (iv) the Rest of the City. For zoning purposes, the boundaries of these areas will need to be established at the property level.
- Taking existing city-wide parking ratios as the base for the Rest of the City and progressively reducing these standards for selected uses in the three mixed-use growth areas comprising the Regional Centres, KDA's and Local Centre/Corridors.
- Determining the basis for reducing existing parking standards in the three mixed-use growth areas by giving consideration to:
 - special parking studies for the Regional Centres (as has already been undertaken in the formulation of By-law 2004-196 for Markham Centre).
 - applying informed, policy-driven reductions to parking standards in the KDA's and Local Centres/Corridors. Reductions would be greater in the KDA's where planned levels of transit service are higher than in the Local Centres/Corridors. Site constraints and design considerations are a larger part of the case for reduced parking ratios in the smaller, more community-based Local Centres/Corridors.
 - providing empirical evidence through parking surveys where required for certain key uses to adjust the existing parking ratio and establish appropriate reductions in the KDA's and Local Centres/Corridors.
- phasing the introduction of reduced parking standards with the implementation of planned transit service expansions.

(2) Issue: How to Apply Parking Ratios in Mixed-Use Settings?

To support the increase in mixed-use development encouraged by the Official Plan, it is important for the parking provisions of the New Comprehensive Zoning By-law to capture the potential opportunity for reduced parking standards that this form of development presents. Parking standards in mixed-use developments can be reduced through the application of sharing formulae and blended rates, as discussed below. The one condition to note is that shared parking provisions are rarely extended to the residential component of a mixed-use development, with the possible exception of residential visitor parking, and blended rates seldom include residential uses.

Sharing Formulae – apply to mixed-use buildings containing a number of commercial uses that have different parking ratios and which experience different periods of peak parking utilization. For example, a mixed-use building containing a cinema and office space can partly share their parking because the demand for office parking is greatest during the day while for the cinema the greatest demand is in the evening. Markham's By-law 28-97 (see Section 4.0) permits such sharing among nine non-residential

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uses. Occupancy rates are defined for three periods of the day (morning, afternoon and evening) and the By-law explains the formula by which these occupancy rates are applied to determine the peak-period of parking for the building and how the level of parking determined by this peak becomes the parking requirement for the building.

Consideration should be given to extending the shared parking provisions of By-law 28-97 to all non-residential uses throughout the City. The City of Toronto defines occupancy rates by periods of the day for all non-residential uses and for the visitor component of multi-unit residential buildings. Uses that need all their required parking to be available at all times, such as a gas station or veterinary hospital, are assigned 100% occupancy rates for all periods of the day.

It should be noted that the sharing formula approach employs the parking ratios of individual uses and does not represent a consolidation of the parking ratios. This means that if there is a change of use in the building the sharing formula has to be recalculated. If, in the above example, the cinema moves out and is replaced by a large retail store, then the parking requirement for the building has to be determined on the basis of the new retail/office mix of uses. Some by-laws waive the requirement for additional parking that such changes of use may trigger if the resulting increase in spaces is less than a certain percentage (e.g. 10%) of the building's total existing supply.

Blended Rates – apply to large multi-unit sites, such as shopping centres, and defined sub-areas, such as the Markham Centre. A blended rate represents a consolidation of parking ratios for a number of selected non-residential uses into one single ratio. Blended rates take into account the sharing effects of different peaking characteristics plus the effects of one parking space serving more than one use (though this increases parking duration).

By consolidating parking ratios, blended rates reduce the chances of a change of use in a mixed-use development leading to a revised parking requirement. For example, if one permitted use in a shopping centre replaces another it will not trigger a change in the parking requirement even if such uses have different parking ratios that apply when located outside the centre.

For the uses included in the blended rate, some may find their parking ratio has increased and some may find it has decreased. Overall, it is assumed that the possible over-supply or under-supply of parking that could result from the application of a blended rate will generally balance out. To guard against a possible under-supply, some by-laws introduce conditions on the extent to which uses with high parking demands, such as restaurants, can take advantage of the blended rate. For example, in Markham's By-law 28-97, the minimum parking rate for restaurants in large shopping centres is set at the blended rate of 1 space/18.5 square metres of leasable floor area provided restaurant uses comprise no more than 20% of the centre's total leasable floor area. Any restaurant space in excess of the 20% limit is required to provide parking at the individual rate of 1 space/ 9.0 square metres of net leasable floor area.

Blended Rates at the District Level - Markham Centre By-law 2004-196 provides an example of the blended parking rate approach at the district level. Table 4.14.1 of the By-law, which sets out "Parking Space Requirements - Non-Residential Uses", displays a high degree of consolidation of parking requirements. The Table has one cluster of uses that are exempt from providing parking and another larger, cluster of uses that all share the same (i.e. blended) parking requirement of 1 space/30.0 m² of net floor area. This means, for example, that Banquet Halls and Financial Institutions, which in By-law 28-97 have minimum parking rates of 1 space/9.0 m² and 1 space/20.0 m² respectively, share the blended rate of 1 space/30.0 m² when located in the Markham Centre. Only six non-residential uses have their own unique parking ratio in Markham Centre.

Oakville's new Zoning By-law 2014-014 has taken the blended approach to parking ratios even further: all non-residential uses (except Hotel and Public Hall) have a common parking ratio in each of four of the Town's designated mixed-use growth areas, with the fifth, Downtown Oakville, having no minimum requirement at all.

Introducing a district blended rate is a major departure from the traditional approach of specifying individual parking rates for many different uses and, like any new approach, might be met with some skepticism. In Oakville's case, the earlier Town Zoning By-law 1984-63 included blended rates for most commercial districts. Subsequently, parking utilization surveys of Oakville's three commercial core districts were conducted to confirm the relationship between overall parking demand and total occupied non-residential floor area in each of these districts (see the Town of Oakville Parking Study Final Report (Marshall, Macklin, Monaghan, March 2006)). The development of the recommended blended rates in By-law 2014-014 drew from these earlier sources and extended blended rates to the newer, developing mixed-use planning districts of Palermo Village and the Uptown Core.

The formulation and adoption of blended district parking rates entails considerable effort and cost, particularly with regard to conducting the necessary parking surveys and public consultation process. However, blended rates appear to be a more realistic and flexible way of setting parking requirements for the development of complex, mixed-use districts and can potentially eliminate the need to recalculate the parking requirements whenever there is a change-of-use. As with shopping centres, the blended rate for a district can include conditions to guard against a possible parking shortfall created by an over-concentration of uses with high parking demands. Oakville's Zoning By-law 2014-014, for example, states that once medical offices occupy more than 60% of the net floor area in a building in Palermo Village and the Uptown Core, the parking requirement increases from the blended district rate of 1 space/24.0 m² to the individual medical office rate of 1 space/18.0 m².

The general effect of moving towards a single or limited number of blended rates is to increasingly make the parking supply a simple function of building size. Other, more limited, opportunities for the consolidation of non-residential parking rates outside the context of mixed-use development are presented later in this report in the review of individual parking rates. The consolidation of parking ratios and the adoption of blended rates might require some uses to convert their parking ratios to a floor area basis

Options in Applying Parking Ratios to Mixed-Use Developments

There are a number of responses that the City of Markham should consider in framing new parking provisions that relate better to the demands of mixed-use development:

- Expanding the potential for applying shared use formulae to all non-residential uses throughout the City by specifying time-of-day occupancy factors for every use.
- Extending the application of blended parking rates for shopping centres to other types of large sites with multi-unit structures such as found in mixed-use commercial-industrial buildings.
- Building on the Markham Centre example to explore the development and application of blended parking rates at the district level in other areas of the City. At this point in time, blended district parking rates are something of a new feature in parking regulations in Ontario and it may be too soon to recommend them as a "best practice" for every mixed-use planning area. Markham could consider undertaking parking utilization surveys in the four KDA's along the Highway 7 Rapid Transit Corridor (Commerce Valley/Leitchcroft; Woodbine/404; Markville, and Cornell Centre) to provide the empirical basis from which to analyze the appropriateness of the blended rate option. This type of study would, however, represent a considerable commitment of staff and funding resources.

(3) Issue: When to Apply Maximum Parking Ratios?

The use of parking maximums has typically applied to higher density development areas, particularly in the downtowns of major cities such as New York, San Francisco and Vancouver. In Seattle there is an absolute limit on the amount of parking a development can provide regardless of its size, and in San Francisco's downtown area parking is limited to no more than 7% of a development's floor area. Since 1982, the Manhattan Core district of New York City has only imposed maximum requirements with no minimum parking requirements. In Europe, there has been a general move away from imposing minimum parking requirements and replacing them with maximums. For example, in England, "Planning Policy Guideline 13: Transport" (updated Jan. 2011) recommends that for all non-residential development beyond a certain size there should only be parking maximums imposed. The Guideline directs that "local authorities should not require developers to provide more spaces than they themselves wish".

However, there are concerns that parking maximums may, in some cases, represent over-regulation. It is generally felt that parking maximums are best justified in more highly developed areas where the emphasis is on encouraging transit use and creating a higher quality public realm. Parking maximums need to be clearly related to policy objectives. In many areas there is little incentive for a developer to provide excess parking given its relatively high cost and low economic return. A study of residential parking in London, England (Gou & Ren, 2012) shows that reducing minimum parking requirements has a far greater impact on reducing supply than does the imposition of parking maximums.

Looking at municipalities in the GTA, the approach to parking maximums is varied. The City of Mississauga has no maximum parking ratios. In the mixed-use growth areas of Oakville, the zoning by-law imposes a 50% maximum on the amount of required parking that can be provided in surface lots but this is a restriction that applies to form rather than quantity. The parking review for Richmond Hill (HDR/iTRANS, 2010) recommends that the current minimum parking ratios in the three mixed-use growth areas become the new maximums for these areas (and the minimums reduced). The IBI Group's 2010 review of Vaughan's parking standards similarly recommended the adoption of parking maximums in the three designated planning policy areas but, in the Local Centres, it is recommended that the maximum ratios should not apply to below grade parking. The City of Toronto applies maximum parking ratios in the four designated Parking Policy areas and the maximum ratios are set at quite generous levels of at least 50% more than the applicable minimum ratio, to create a relatively wide range of permitted parking levels.

Currently, in Markham, parking maximums only apply in the Markham Centre area where By-law 2004-196 also imposes a limitation on the amount of required parking that can be provided on surface lots. As the By-law states, the intent of the parking maximums and surface parking limits is ". . . to restrict the number of parking spaces and facilitate the provision of structured parking at key locations". The Draft Markham Parking Strategy (2009) suggests that parking maximums be applied in the Regional Centres, KDA's and the Local Centres/Corridors. The report links the need for maximum ratios to the planning objectives for these mixed-use, growth areas. In the KDA's and the Local Centres/Corridors, where parking over-supply is less of an issue, it is proposed that the maximum ratios only apply with respect to surface parking to limit the impacts of this sterile use of land. The report does not propose maximum parking limits in the Rest of the City.

Directing parking to be provided underground in certain areas may create pressure from developers on constrained sites to consider building some or all of the required parking under public lands, particularly streets and parks. This may lead to requests for the City to become a party to strata title agreements, a step that needs to be carefully considered. The City is currently carrying out a review of strata conveyances in general and the result of that review will have an impact on parking regulations.

Options For Applying Parking Maximums

The imposition of parking maximums can be considered a best practice where it is justified in terms of supporting the intensification of selected growth areas. In this context, consideration should be given to incorporating the strategy for applying maximum parking ratios proposed in the Draft Markham Parking strategy (2009) into the parking provisions of the New Comprehensive Zoning By-law.

For Markham's mixed-use, growth areas outside the Regional Centres, where the maximum ratios are intended to only apply to surface parking, further analysis will be needed to determine the appropriate amounts by which the maximum ratios should exceed the minimum ratios.

(4) Issue: How to Exercise The Payment-in-lieu Option?

Section 40(1) (2) of the Planning Act allows a municipality to accept cash payments (either in lump-sum form or over time) from owners or occupants of buildings in lieu of providing all or some of the parking which otherwise would be required by the applicable zoning by-law. Payment-in-lieu assists developers in satisfying parking requirements where it is not physically feasible or desirable to provide parking on-site. By mutual consent, a municipal council and a developer may enter into a payment-in-lieu agreement. Developers have to apply for payment-in-lieu, it is not a right, and the onus is on the applicant to justify the request. The municipality has to "set forth the basis upon which such payment is calculated" (Planning Act, 40(2)) and payments collected have to be placed in a reserve fund and applied to developing and maintaining municipal parking facilities. However, the payments do not have to be invested in the area of the city from which they were raised and can be used to fund public parking where it is deemed most beneficial. Typically, payment-in-lieu is only considered for non-residential developments or the non-residential component of mixed-use developments.

Many municipalities in Ontario, such as Mississauga, Richmond Hill, Vaughan and Oakville, have payment-in-lieu programs in parts or all of their jurisdictions. Each municipality sets the payment-in-lieu fee schedule in different ways but they all relate to local estimates of the costs of providing a typical (surface and/or structured) parking space. For example, in the cases of Richmond Hill, Hamilton and Toronto the value of land enters into the calculation of fees whereas smaller municipalities often base the fee on just the cost of constructing a surface parking stall. In Toronto there is a flat-rate fee for small and medium sized developments and a variable fee for large developments over 400 m² GFA. Usually the fee per parking space is not set at a replacement cost level in recognition of the fact that the developer does not end up owning a space and may not directly benefit from the investment of the funds collected through payment-in-lieu. Setting the fee schedule is something of a balancing act. If the fee is set too high, developers will simply seek relief through a variance or zoning by-law amendment and, if set too low, it becomes an attractive way out of providing on-site parking.

Generally, despite their apparent promise, payment-in-lieu programs provide a relatively small revenue flow that may only cover a fraction of municipal parking costs. Obviously, revenues are greatest in high growth areas but even here the pattern of payments may be uneven from one year to the next and difficult to predict in the long-term. For small projects, developers are often successful in gaining relief from parking requirements through local Committees of Adjustment. The administrative costs of payment-in-lieu programs can also be quite high, although some municipalities charge non-refundable application fees to off-set the costs of processing applications, completing title searches, registering agreements and periodically updating the fee schedules. Toronto, for example, currently charges an application fee of \$300 plus GST. Recently, the City of Ottawa repealed its Cash-in-Lieu of Parking By-law and reductions in parking requirements are to be achieved through minor variances or zoning by-law amendments.

Markham's By-law 28-97 contains no provisions for the payment-in-lieu option but the Markham Centre By-law 2004-196 allows payment-in-lieu applications as part of the parking management strategy for this rapidly growing area. The Draft Markham Parking Strategy (2009) anticipates a limited role for payment-in-lieu programs and comments that "cash-in-lieu is not likely to generate sufficient revenue to fully fund developing parking facilities" (p. 23). Nonetheless, it may prove useful to have the payment-in-lieu option available in the other mixed-use centres and corridors to provide relief for developments where meeting the parking requirements on-site is physically difficult and/or extremely costly. In addition, allowing payment-in-lieu for redevelopment along traditional main streets and heritage centres would support the Official Plan's objectives of maintaining the viability of these areas.

There are two contexts in which payment-in-lieu of parking programs seem most appropriate. In the older retail-commercial areas (e.g. Markham Village), particularly the shopping streets, where lot sizes are typically small, payment-in-lieu offers an acceptable solution to overcoming the insurmountable requirements for on-site parking and enabling growth, change and redevelopment to occur in a responsible manner. The other setting is newer, planned growth centres (e.g. Markham Centre) where the zoning standards are part of a larger parking management strategy with a long-term focus on providing off-street, centralized public parking garages to enable the efficiencies of shared parking to extend between buildings as well as within them. In these planned centres, payment-in-lieu presents more of an alternative way for a developer to meet the parking requirements than as a true relief from them. In both contexts, the payment-in-lieu option for the provision of parking can be seen to be consistent with and supportive of the objectives of Markham's new Official Plan.

In hardship cases, relief from parking requirements can also be provided by exemptions. In some situations, exemptions should be considered as an alternative to the payment-in-lieu option. For example, in Toronto eating establishments, personal service shops, retail stores and service shops with a gross floor area less than 200 m² are exempt from providing parking anywhere in the city.

Options for Employing Payment-in-lieu

As described above, the payment-in-lieu option can be seen, under certain conditions, as a "best practice" that can be justified in terms of supporting the objectives of the Official Plan. In considering the expansion of the payment-in-lieu option beyond the Markham Centre, the following factors should be addressed:

- Relating the payment-in-lieu program to the policies of the Official Plan by restricting its application to certain designated areas (such as the growth centres and retail streets).
- Determining the appropriate fee schedule (including a possible administration charge) and the form of payment (lump-sum or other). Other matters to consider are varying the fee by location, size of the development, and parking type (surface or structure), along with setting the recovery rate.
- Considering, at the same time, the introduction of parking exemptions for small-scale developments of the type of uses the City is trying to encourage (such small shops and restaurants).

(5) Issue: When to Permit Off-site Parking?

Another way of providing relief from the zoning requirements for on-site parking is to permit arrangements to have the required parking located off-site on another property. The zoning by-laws of Oakville and Hamilton, for example, permit off-site parking within certain districts and provided the distance between the site and the location of the off-site parking is less than 300 metres. Off-site parking is less convenient for the user and care has to be taken in specifying the distance limitation for certain

uses, such as a medical office, where the standard 300 metres assumption may need to be lowered to a more acceptable walking distance. The Markham Centre By-law 2004-196 states that parking spaces for any use may be located on another lot within the Centre. However, Markham's city-wide parking By-law 28-97 makes no provision for allowing off-site parking.

Concerns have been raised over making off-site parking an "as-of-right" zoning provision. Securing legal agreements between private property owners and the municipality can be a legally complex process. Experience in the former City of Toronto found that often such agreements for off-site parking were allowed to lapse and, in practice, became a form of deferred parking exemption. The new zoning by-law for the amalgamated City of Toronto removes the provision for off-site parking. The IBI Group's parking study for the City of Vaughan (2010) recommends that off-site parking be introduced through guidelines on a site-specific basis and not through zoning provisions. Generally, cities are backing away from requiring long-term leasing or ownership of off-site parking spaces because of the difficulties of securing these commitments and monitoring their enforcement over time.

Off-site parking seems to work best when it is provided indirectly as part of an area-based parking management strategy in which parking standards have been reduced to support the development of off-street, publicly-provided parking facilities, as in the case of Markham Centre. The public parking facilities created by such strategies act as a type of surrogate for off-site parking, and with the advantage of placing the parking supply under municipal control.

Options for Allowing Off-site Parking

In considering the issue of permitting required parking to be provided off-site, the following options should be looked at:

- Restricting the granting of off-site parking arrangements as a general as-of-right zoning permission.
- Develop guidelines for the introduction of off-site parking on a site-specific basis.
- Permitting off-site parking on an area-wide basis only when it is part of a parking management strategy associated with the development of a designated growth centre.

(6) Issue: Should Required Parking Continue To Be Provided Free?

Now may be the appropriate time in Markham's development to consider repealing sub-section 8.1 of By-law 28-97 that places a general prohibition on charging for the use of required parking spaces. Generally, the pricing of parking spaces is best left to the market. Requiring off-street parking to be free runs counter to the policies of Markham's new Official Plan to reduce auto-dependency, particularly in the mixed growth areas where markets for paid parking are most likely to develop. Markham's new Official Plan specifically supports "... the implementation of user pay parking at transit hub locations" (Policy 7.1.5.5)

Best practices in other cities point to the need to create an urban environment that supports paid parking, both on-street and off-street, and to move away from wasteful practices of ensuring an over-supply of free parking. Interestingly, the Markham Centre By-law 2004-196 does include a prohibition on charging for the use of required parking. One of the major future challenges facing the reform of parking standards is how to transition to paid on-street and off-street parking in suburban areas, and use the pricing mechanism to produce a more efficient level of parking supply and use.

Option for Parking Pricing

Best practices would strongly suggest that it is advisable to remove By-law 28-97's current prohibition on charging for the use of parking. Generally, the pricing of parking spaces is best left to the market to

determine. Removing the prohibition on charging does not mean that fees will necessarily be levied on the use of all required parking spaces and for some spaces the market price may well be zero.

2.4.2 Specific Parking Ratios in By-law 28-97

This section of the report looks at the issues related to a few selected parking ratios in By-law 28-97 in light of the review of parking standards and best practices in other cities. The discussion of these ratios is largely independent of changes that might be brought about in response to the general issues presented in the previous section.

(1) Issue: Deciding the Basis for Parking Ratios in Apartment Dwellings?

By-law 28-97 establishes parking ratios for apartment dwellings based on an assumed average level of car ownership and parking demand per household. The By-law sets this average at 1.25 spaces per unit plus 0.25 spaces per unit for visitor parking, to produce a combined minimum parking requirement of 1.5 spaces per unit. A recent trend has been to vary the parking requirement by the mix of apartment sizes in the building as determined by the number of bedrooms in each unit. The typical scale of unit size is: bachelor; one-bedroom; two-bedroom, and three or more bedrooms. Surveys indicate that car ownership increases with unit size as a result of what is thought to be primarily an income effect. Cities that apply the bedroom-count approach include Toronto, Mississauga, and Brampton with proposals to do so in Richmond Hill and Vaughan. A British government report entitled “Residential Car Parking Research” (May, 2007) recommends using the number of all rooms, not just bedrooms, as a more accurate measure to capture the income effect of apartment size on car ownership rates.

Expressing the parking ratio on the basis of a single average car ownership figure for all households across all apartment units has the advantage of simplicity. If experience shows the single ratio to have worked relatively well, there may be little reason to change to the seemingly more refined bedroom-count approach. However, having a parking ratio that is the same for both small and large apartment units may act as a disincentive to building smaller units and could result in an over-supply of parking for small units and an under-supply for large ones. However, there are several municipalities that specify a single parking ratio for apartment dwellings and most have combined resident and visitor parking requirements that are close to Markham’s 1.50 spaces per unit standard (e.g. Vaughan 1.50; Oakville 1.50; Oshawa 1.33). Hamilton has a combined parking ratio of 1.25 but modifies the standard of one resident parking space for each dwelling unit by adding “... except where a dwelling unit is 50 square metres in gross floor area or less, in which case, parking shall be provided at a rate of 0.3 spaces for each such unit”.

It could be argued that in a building with a mix of unit sizes and “unbundled” parking, matters would tend to even out as households chose to buy the amount of parking they need from the minimum required amount provided by the developer (who could choose to provide more than the minimum). The likelihood of this evening-out process being successful would largely depend on how accurately the single parking ratio reflects the average car ownership rate and on the representativeness of the mix of unit sizes in the building.

A related issue is ensuring that visitor parking spaces are reserved for the use of visitors. Many, if not most, complaints about parking in apartment buildings relate to tenants, or people who are not visiting the building, parking in the spots that are intended for use of the building’s visitors. In large measure, this is an enforcement issue but there may be the possibility of adding zoning provisions to make it clear that visitor parking must be built, designed and maintained for the use of visitors to the building.

Options for Choosing the Basis for Parking Ratios in Apartment Dwellings

In light of the above observations, it would seem judicious for Markham to take the opportunity to assess the basis on which the parking ratios for Apartment Dwellings are established. The options to be explored include:

- Evaluating the appropriateness of the current single rate for all units found in By-law 28-97 and, depending on the results of this evaluation, deciding whether or not to consider:
 - introducing a relatively simple modification to the single uniform rate to specify a lower parking rate for small units, along the lines of the provisions in Hamilton's Zoning By-law 05-200.
 - introducing a more complex set of parking rates based on the number of bedrooms in the apartment unit.
- Exploring how to strengthen the zoning provisions to better ensure that visitor parking is built, designed and maintained for the use of visitors to the building.

(2) Issue: Parking Requirements for an Accessory Dwelling Unit (or Second Suite)

Markham's Subcommittee on Second Suites and the Interdepartmental Staff Working Group on Second Suites concluded in a report dated February 5, 2008, that no additional parking space should be required for a second suite (or accessory dwelling unit as referred to in Table A of By-law 28-97). The report gave several reasons for taking this position. Not all tenants, particularly those choosing to occupy a second suite close to transit, will have cars and require a parking space. Overall, there will be a self-regulating process where tenants with cars will favour second suites where parking is readily available and those without cars will tend to choose second suites without regard to the parking arrangements. However, as a general principle, second suites should only be permitted where there is sufficient on-site parking to accommodate the needs of the principal dwelling and the second unit. The report also pointed that requiring an additional parking space could result in undesirable driveway widenings despite the introduction of Extended Driveway Standards By-law in 2006.

As a practical matter, the parking needs of grade-related residences can fluctuate for many reasons depending on the circumstances of the household. For example, children living in the house may grow up, obtain a driving license and acquire a car or the household may buy another car for other reasons, and households may also decide to have fewer cars. None of these changes in car ownership and parking demands can be monitored and it seems somewhat arbitrary to single out the creation of an accessory dwelling unit as the determining cause for an additional parking space. There may be many houses on a given residential street that have more cars than the house with the second suite.

However, By-law 28-97 has a standard of 1 parking space for an accessory dwelling unit or secondary suite, although where a single or semi-detached house provides a double garage, the requirement for a third parking space could be met by parking on the driveway. The HDR/iTRANS (2010) parking study for the Town of Richmond Hill recommends exempting secondary suites from parking requirements provided there is satisfactory off-street parking available in the area, a similar position to that taken in the 2008 Markham staff report. In the Markham Centre By-law 2004-196 this idea of an exemption has been extended to an outright prohibition on adding a parking space for a second suite.

Options for Second Suite Parking

It seems clear that the New Comprehensive Zoning By-law for Markham should consider exempting accessory dwelling units from any requirements for additional parking in certain areas of the City as is already the case in Markham Centre. Rather than impose a blanket provision of one additional parking space for each second suite, the New Comprehensive Zoning By-law should seek to develop conditions

or performance measures that would help ensure that satisfactory parking arrangements are in place before the approval of a second suite.

(3) Issue: Simplify the Calculation of the Places of Worship Parking Requirement?

The determination of an appropriate parking ratio for places of worship is complicated by the wide range of parking demands attached to this use due to varied faith practices at different times of the day and different days of the week. A number of municipalities, including Markham, Brampton, Mississauga and Toronto, have developed parking ratios that attempt to account for the differences between places of worship with fixed seating and those where there are no fixed seats. Places of worship with no fixed seating can accommodate more people for a given amount of “worship area” floor space. The Ontario Building Code assumes 0.75 m² per person occupancy rate for space with no fixed seats and this figure can be applied to estimate the person-capacity of the worship area in places of worship with no fixed seats. The 0.75 factor appears in By-law 28-97’s definition of “worship area *capacity*” that applies to places of worship without fixed seats.

Added to the complexity of two definitions of “worship area *capacity*” (for seated and non-seated arrangements), there is the need to consider how to treat ancillary uses associated with the place of worship. In many cases the worship floor area is less than the floor area attributable to ancillary uses. By-law 28-97 requires non-residential ancillary uses to provide parking as determined by their individual parking ratios and the sum of these requirements is then added to the greater of the two worship area calculations to arrive at the total parking requirement for the building. The Markham Centre By-law 2004-196 simplifies this requirement somewhat by applying a blended rate of 1 space/9.0 m² net floor area to all non-residential ancillary uses.

Although going through a rather elaborate process to try and take account of the difference between seated and non-seated arrangements may seem to lead to a parking requirement that more accurately reflects the parking demand for places of worship, the high variability of parking demand for this class of use may undermine this conclusion. This is borne out by the findings of “The Places of Worship Future Directions Parking Report” (August, 2013) prepared for the City of Markham by HDR Consultants. The report states that “... the parking surveys show that the parking requirements set out in the zoning by-law are on average within 5.5% of the peak parking demand observed at the six Places of Worship that were surveyed” (p, iii). The key phrase here is “on average”. As Table 9 on page 23 of the report shows, only one of the six places of worship is close to the 5.5% fit and the other five vary by as much as requiring a 68% over-supply of parking to a 105% under-supply. These findings illustrate the difficulty of applying a single parking standard, no matter how subtly crafted, to a very diverse land use type such as places of worship.

It is not clear that applying the relatively complex type of parking ratio for places of worship found in By-law 28-97 produces a better fit between actual parking demand and the required number of spaces than a more simple standard would. Also, a simple standard based on floor area might provide greater clarity across various faith groups that have different seating arrangements such as open floor seating, chairs, pews, etc. A number of by-laws have parking ratios for places of worship that are simply based on the gross floor area of the building with no distinction between worship area and the area devoted to ancillary uses (e.g. Burlington: 1 space/16.6 m²; Hamilton 1space/10.0 m²; Ottawa 1 space/10.0 m², and Vaughan 1 space/11.0 m²). These ratios are close to the typical place of assembly standards that are found in many by-laws. The recent Richmond Hill parking study (HDR/iTRANS, 2010) recommends similar parking ratios for places of worship that are based on the gross floor area of the building.

Policy 8.13.7.1 of Markham’s new Official Plan states that in considering an application for a plan of subdivision, or amendment to the zoning by-law to permit a new or expanded place of worship, Council

should be satisfied, among other things, that sufficient on-site parking will be provided and that a plan for off-site parking for special events will be in place. As the HDR (2013) study comments, it is expected that “... larger places of worship will continue to be built requiring specific controls on development to address the high intensity nature of the use and potential impacts related to traffic and noise and, in particular parking which is always a significant concern” (p. ii).

Options for Simplifying the Parking Ratio for Places of Worship

Overall it is difficult to determine whether the more complex or the more straightforward approach to defining parking standards for places of worship is the best practice, but it seems worthwhile at this time for Markham to re-assess the parking ratio found in By-law 28-97 and evaluate the options to:

- Simplify the expression, interpretation and application of the ratio by considering eliminating the distinction between seated and non-seated arrangements and by applying a blended rate, based on floor area, to all uses within the building.
- Requiring individual parking studies for places of worship above a specified threshold size.

(4) Issue: Consolidating Parking Standards for Shopping Centres and General Retail?

It has already been mentioned that the Shopping Centre parking standard is an example of a blended rate that applies to a combination of commercial uses. There may be an opportunity to further combine the Shopping Centre parking standard in By-law 28-97 with the parking requirements for retail uses in general. The current By-law provisions specify size thresholds of 2,500 m² of leasable floor area and 6,000 m² of net floor area for Shopping Centre and Retail Store uses respectively, above which the parking rate increases. For Shopping Centres the parking rate is 1 space/23.0 m² below the size threshold and 1 space/18.5 m² above it, and for Retail Store the comparable rates are 1 space/30.0 m² and 1 space/20.0 m².

The IBI Group’s study for the City of Vaughan (2010) proposes changes to the parking standards for Shopping Centre and other related classes of retail use. The Vaughan study included a utilization survey of 41 retail sites during the month of December and found that “almost 60% of all retail sites exhibit peak parking utilization below 70% (of capacity), even at the annual peak” (p. 41). These findings suggest that retail parking standards could be modestly reduced with little adverse effect. The Vaughan study also addressed the issue of the threshold size above which Shopping Centre parking requirements should increase. Upon review, it was concluded that the threshold level of 5,000 m² gross floor area is the point above which large anchor and “big box” stores begin to occupy Shopping Centres. Retail uses are, perhaps, one of the less riskier land use categories for which to consider lowering existing minimum parking requirements, since developers often voluntarily exceed existing minimum parking standards when building new retail facilities.

Options for Consolidating Retail Standards.

In light of the above discussion, it is suggested that the City of Markham consider creating a single General Retail/Shopping Centre use category with a common size-threshold of 5,000 m² of leasable floor area for Shopping Centre and 5,000 m² of net floor area for General Retail. Uses in By-law 28-97 that could be considered for inclusion in the General Retail category include Retail Store; Home Furnishings Store; Motor Vehicle Service Station; Commercial Fitness Centre, and Nursery/Garden Centre. A possible restructuring and modification of By-law 28-97’s retail parking standards might be along the lines of the following:

Use	Parking Requirement
General Retail/Shopping Centre	
<i>Net floor area of General Retail or leasable floor area of Shopping Centre equal to or less than 5,000 m²</i>	<i>1 parking space per 28.0 m² of net floor area (or leasable floor area in a Shopping Centre).</i>
<i>Net floor area of General Retail or leasable floor area of Shopping Centre greater than 5,000 m²</i>	<i>1 parking space per 22.0 m² of net floor area (or leasable floor in a Shopping Centre).</i>
<p><i>For Shopping Centre:</i></p> <p><i>Where restaurants and food courts, including associated seating areas, occupy more than 20% of the leasable floor area, the parking standard of 1 space per 9.0 m² of leasable floor area shall apply to that portion above the 20% level, and</i></p> <p><i>Where the leasable floor area exceeds 5,000 m², a minimum parking requirement of 2 parking spaces for individual units with less than 33.3 m² of leasable floor area will apply.</i></p>	

(5) Issue: Consolidating Parking Standards for Places of Assembly?

There is a large and diverse group of uses that fall into the generic category of places of assembly. Some 15 uses in By-law 28-97 could be assigned to the places of assembly category. These uses and their parking ratios are listed below:

Use	Parking Ratio	Use	Parking Ratio
Arena	1 space/6 seats	Billiard Hall	1 space/20.0 m ²
Stadium	1 spaces/6seats	Trade/Convention Centre	1 space/20.0 m ²
Theatre	1 space/6 seats	Private Club	1 space/30.0 m ²
Bowling Alley	4 spaces/lane	Library	1 space/40.0 m ²
Nightclub	1 space/7.5 m ²	Community Centre	1 space/40.0 m ²
Assembly Hall	1 space/9.0 m ²	Museum	1 space/40.0 m ²
Banquet Hall	1 space/9.0 m ²	Art Gallery	1 space/100.0 m ²
Funeral Home	1 space/13.0 m ²		

Lists of what are considered to be places of assembly vary from one municipality to another. By-law 28-97, for example, omits some uses that are often found in other zoning by-laws such as cinema, arcade, gaming establishment and dinner theatre. As can be seen from the list above, the parking standards for places of assembly can be based on floor area or other measures such as the number of seats. As in the case of places of worship, places of assembly include uses with and without fixed seating arrangements. A number of the 15 uses in the above table have the same parking standard but the development of a blended rate(s) for Places of Assembly could lead to further consolidation. As it stands, the treatment of places of assembly in By-law 28-97 is similar to that found in the zoning by-laws of other municipalities in the GTA.

Some uses in the places of assembly category have very peaked demands for parking but these peaks often occur outside the working day when there may be opportunities for shared parking with other, nearby uses. Extreme examples are provided by Toronto's downtown hockey arena (the ACC) and sports stadium (the Rogers Centre) that rely almost entirely on the availability of nearby commercial, off-site parking in the evenings and weekends. Some places of assembly, such as cinemas, bingo halls, billiard halls and bowling alleys, are found in shopping plazas and, again, are able to take advantage of opportunities for the shared use parking. There are three particular uses, nightclubs, adult entertainment establishments and gaming establishments, that typically are assigned high parking standards in most zoning by-laws.

The Markham Centre By-law 2004-196 assigns a blended rate of 1 space/30.0 m² of net floor area for Banquet Hall; Nightclub; Place of Amusement; Place of entertainment; Private Club; Recreational Establishment, and Trade/Convention Centre. Furthermore, By-law 2004-196 exempts Library; Museum; Art Gallery, and Community Centre from parking requirements.

It should be noted that there is a commitment (see the preliminary report on Proposed Amendments to Zoning By-law 28-97, dated February 21, 2012) to report on the need to develop a parking standard for arenas without seats or open benches. Currently, the parking ratio for Assembly Hall (1 space/9.0 m²) is applied to arenas without seats or benches. The report also points out that the definition of "arena" is found elsewhere in other Markham zoning by-laws under the definitions for "Assembly Hall" or "Place of Recreation". It would be advisable to have a common definition of arena that applies across the municipality.

Options for Consolidating Parking Standards for Places of Assembly

Markham's Comprehensive Zoning By-law Review should consider re-assessing the parking requirements of uses in the general Places of Assembly category to look at such options as:

- Exploring the restructuring of the parking standards for Places of Assembly to group them into more logical sub-categories such as places of entertainment, amusement and/or recreation. The Draft Markham Parking Strategy (2009) proposes a re-structuring of By-law 28-97's use list along these organizational lines.
- Evaluating the application of a blended parking rate(s) for some or all of the uses in the Places of Assembly category as in the case of the Markham Centre By-law 2004-196.
- Developing a city-wide definition of arena and developing a parking standard for arenas without seats or open benches.

(6) Issue: Two Specific Matters For Review

- a) **Stacking Lanes:** Markham's "Drive-through Facilities Design Guidelines" (2010) indicate an intention "to introduce updated (zoning) provisions to further regulate drive-through facilities" (p.3). Guidelines 21 and 22 describe the minimum number of vehicle stacking spaces for restaurants (10) and for financial institutions and pharmacies (4). Provisions for stacking lanes have become commonplace in the zoning by-laws of other GTA municipalities.

Option: It would be timely to consider adding specific drive-through regulations, particularly as they relate to the provision of stacking lanes, to the parking standards section of Markham's New Comprehensive Zoning By-law.

- b) **The Treatment of "Other" Uses:** At the end of the list of non-residential parking standards found in Table B of Markham's By-law 28-97 there is the requirement that: "Any use not specified above provide 1 parking space per 25 square metres of net floor area". Similar such provisions can be found, for example, in the zoning by-laws of Mississauga and Halton Hills but not in every GTA

municipality. Any standard for “Other” uses is necessarily arbitrary and may be difficult to defend or justify if brought into question.

Option: Consideration should be given to eliminating this requirement by looking at the following option:

- Consider adding a general provision to the New Comprehensive Zoning By-law similar to that found in the City of Toronto’s By-law 569-2013 (clause 1.20.2(14)) which states: “If a use is not listed as permitted, it is not allowed”. This would require any non-listed “Other” use to proceed by way of a zoning by-law amendment, a process by which the “Other” use would have to meet all the relevant requirements of the zoning by-law, including those related to the provision of parking spaces, in order to be accepted as a new, permitted use. Consequently, the parking requirements for “Other” uses would be looked at on a case-by-case basis to determine the appropriate parking ratio.

2.5 Viewing Parking Standards as Part of a Larger Strategy

The Draft Markham Parking Strategy (see Ex. 13, p.36)) refers to revisions of the Zoning By-law’s parking standards as one of thirteen initiatives required for a successful city-wide parking management strategy as called for in Policy 7.1.5.1 of the Official Plan. The Draft Markham Parking Strategy draws attention to two key features that may influence the scope of the Comprehensive Zoning By-law Review Project’s treatment of parking standards.

a) **Applying Adjustment Factors to Parking Ratios:** Taking a more performance-based approach to parking standards by relating the parking ratios in the zoning by-law to so-called “adjustment factors” might lead to the ratios being reduced on a site-specific or district basis if certain conditions apply. It is suggested by some (see Wilson (2013)) that these adjustment factors could be applied to earn “off-street parking credits”, which count towards a measurable reduction in the relevant parking requirements. Such adjustment factors include consideration of:

- proximity to good transit service;
- abundant off-street parking in the immediate area;
- mixed use pattern of development and a good pedestrian environment in the area;
- availability of bicycle (and motorcycle) parking in the area;
- priced on-street parking close by;
- parking cash-outs and discounted transit fares in the development;
- on-site preferential treatment given to carpool vehicles, car-share vehicles and low emission vehicles, and
- required on-site parking is “unbundled”.

The adjustment factors relating to transit access and urban form could already be accounted for in a zoning by-law that varies the parking requirements geographically by designated planning districts and double-counting would need to be avoided in these situations.

Some of the adjustment factors mentioned above may be difficult to quantify and their exact impact on a particular development’s demand for parking could be hard to measure at the time of development approval. There are other adjustment factors, such as discounted transit fares and on-site car-share facilities, which may change or disappear over time. Two examples of including adjustment factors can be found in Toronto’s Zoning By-law 569-2013 where Downtown parking requirements can be reduced when bicycle parking is provided in excess of the minimum requirement and where a limited number

of required parking spaces can be designated for the exclusive use of car-share vehicles. An earlier proposal to lower parking requirements in developments that provide dedicated car-share parking spaces was not enacted because of the concern that car-share operations may not prove permanent and only the substitution of a tenant parking space for a car-share space is permitted. The incorporation of adjustment factors will add complexity to the zoning by-law and, in some cases, may be difficult to frame in the black and white language of zoning provisions.

Options for Incorporating Adjustment Factors

The IBI Group's parking study for Vaughan (2010) acknowledged that applying adjustment factors to modify the parking requirements of zoning by-laws in Ontario is a novel concept and needs to be approached cautiously. Although supporting the concept, the study's overall conclusion was "... adjustment factors will initially be implemented through guidelines with the intent that they later be formalized in the parking by-law once tested" (p. viii). There is a general question of which planning issues are best addressed through the zoning by-law and other regulatory means, or by more flexible but less enforceable guidelines.

A number of the easier to administer or measure adjustment factors that the New Comprehensive Zoning By-law could consider applying to parking ratios in certain parts or all of the City include:

- Lower parking ratios when more than ample bicycle parking is provided.
- Lower parking ratios when dedicated car-share spaces provided.
- Lower parking ratios when close to good transit service (unless parking ratios already vary spatially on the basis of transit access).
- Lower parking ratios when there is an abundant supply of off-street parking in the immediate area.

Other factors that do not alter parking rates but which could also be considered for inclusion in the zoning by-law review include:

- Specify that a proportion of the required parking spaces must have electric outlets for vehicle recharging purposes.
- Direct that preferential parking treatment be given to the location of parking spaces for carpool and low-emissions vehicles.

b) Parking Ratios in the Context of a Parking Management Strategy: In the longer term, the revised parking ratios of the New Comprehensive Zoning By-law could be modified as part of a strategy to introduce paid on-street and off-street parking in certain areas of Markham. Currently, it is thought that the high parking requirements of most zoning by-laws are helping to sustain the culture of free and plentiful parking and are, consequently, inhibiting the development of an efficient market system for determining the supply and consumption of suburban parking.

Most parking management strategies and their related business cases rely on paid parking becoming the norm and the zoning provisions can help make this happen by reducing the minimum parking requirements and curbing an over-supply of off-street parking. There is the general view that parking is used more efficiently when provided in the form of paid-parking in centralized public parking facilities and on public streets than when attached to private developments and provided free. Public parking can be shared by land uses within the area and so reduce the amount of on-site parking required by the zoning by-law. These factors are recognized in the planned development of Markham Centre and the reduced parking standards of By-law 2004-196 are designed to help establish the conditions for paid parking throughout the area. Markham Centre is an example of the type of local area parking plan

by which the Markham Official Plan anticipates the incremental development of a city-wide parking management strategy.

Options for Lower Parking Ratios as Part of Parking Management Strategies

The parking provisions of the Markham Centre By-law 2004-196 provide a framework from which to begin achieving the move towards introducing paid public parking facilities in mixed-use growth areas. This model could be extended, over time and with local modifications, to other designated mixed-use growth centres and corridors. However, given the time this process might take, any lowering of parking ratios associated with such local area parking strategies will likely follow after the revised parking standards of the New Comprehensive Zoning By-law have been adopted. Also, as the City becomes more involved in parking management and the provision of public parking, it will need to give consideration to an appropriate organizational structure to guide and implement these activities.

2.6 Major Conclusions regarding Parking Ratios.

Without repeating all the points already made, three major conclusions can be drawn regarding the review of parking ratios:

1. Current parking ratios are relatively high, having evolved from an approach that was designed to ensure an abundant supply of “free” off-street parking. The existing parking standards are more applicable to the areas of Markham where transit service is poor but should generally be lowered in the designated mixed-use growth centres and corridors. Lower parking standards in the growth areas would support the City’s broader objectives for sustainable growth and the policies of its new Official Plan. Consequently, the revised parking standards should vary among different parts of the City as defined by the new Official Plan’s Urban Structure map and based on the broad principle that parking standards for most uses should vary inversely with levels of transit service. By-law 2004-196 for Markham Centre is an example of this type of spatial variation in parking standards.
2. As future growth in Markham is increasingly directed to designated, higher density, mixed-use growth areas, the more “change of use” issues will become a problem in the administration of parking requirements. With multi-use buildings becoming the norm, the case for consolidating parking ratios becomes stronger. Such consolidation of parking ratios could occur at a number of levels including the application of “blended” parking rates to designated planning areas or districts. The possibility of further consolidating parking standards should be explored as a major theme in the development of revised parking standards as this approach has the potential to greatly facilitate the development of the city’s targeted growth areas and is already being used to good effect in the case of Markham Centre.
3. Looking more towards the long-term future, a key challenge for Markham, as it is for all suburban municipalities, will be the introduction of paid parking for both on-street and off-street spaces in the planned development of mixed-use growth centres and corridors. As long as parking is plentiful and provided to the user at no direct cost, there remains a strong incentive to use the car. Zoning can play its part in the creation of the type of area-based parking management strategies envisaged in Policy 7.1.5.1 of the Official Plan by tightening up the supply of private off-street parking. However, these area-based parking strategies are expected to come into place incrementally over time and any lowering of parking ratios they may bring will likely come as revisions to the standards in the New Comprehensive Zoning By-law. Parking standards will continue to need to adapt to changing urban conditions and policy objectives.

2.7 Review of the Design Standards for Parking

2.7.1 Introduction

All zoning by-laws contain requirements related to the location, size, access (driveways and aisles) and use of off-street parking facilities. Typically, general design requirements are specified for parking associated with all uses, with much more specific standards identified for certain, more sensitive uses such as ground-oriented residential dwellings. As a general approach to the structuring of zoning by-laws, it is recommended in the Task 3 Discussion Paper that “parking and loading regulations dealing with rates should be located in its own section, while the location of parking (and other related matters) should be within the provisions associated with a particular zone.” (p. 114). Zone-specific parking design regulations will allow for a more tailored approach to addressing built-form matters.

The Table in Appendix A provides a sample of the parking design standards related to the size of and access to parking facilities for a number of GTA municipalities. It can be seen from the Table that the parking design provisions of Section 6.0 of Markham’s By-law 28-97 generally cover a similar range of design features as the other municipalities. A number of municipalities, such as Mississauga, Oakville and Halton Hills, include diagrams in their zoning by-laws to help in the interpretation of parking design provisions which sometimes require the use of relatively complex wording and terminology.

2.7.2 Issue: How to Address the Broader Urban Design Impacts of Parking Facilities?

Parking facilities, particularly in the form of surface parking, can negatively impact on a number of broader urban design concerns, including impacts on built-form, the quality of the streetscape, and the safety and comfort of pedestrians. Large surface parking lots can also create adverse environmental impacts such as exacerbating problems of storm water run-off and the urban heat island effect. The general parking design provisions of municipal zoning by-laws largely focus on matters of functional efficiency such as the minimum size of parking spaces and the minimum widths of parking aisles. From an urban design perspective current zoning provisions seem to reflect a conservative approach to parking regulation and written more in the spirit of preventing the worst than promoting the best.

Markham has already taken steps to address some of these shortcomings with the approval of the Extended Driveways By-law 2006-96 that amends By-law 28-97 to strengthen the provisions regarding front and exterior yard parking for ground-oriented Residential Dwellings. The principal aim of the by-law is to regulate driveway widths and ensure that the exterior appearance of the home and the character of the community will not be detrimentally altered by the excessive paving of front or exterior yards, concerns that are very much of an urban design nature. Also, factors such as minimum lot frontages can have implications for the spacing and layout of parking facilities in residential areas and these are addressed in more detail by provisions in the other relevant parent by-laws.

Other examples of the more tailored, zone-specific approach to organizing parking design provisions can be found in Toronto’s Zoning By-law 569-2013. In Toronto’s Commercial Residential Employment (CRE) zones outdoor parking spaces must be fenced if they border a Residential Zone (clause 50.10.80.1), and in Residential Apartment (RA) zones 50% of the tenant parking must be underground (clause 15.5.80.10(2)). However there is a limit to the level of design detail that can reasonably be enforced through zoning provisions. Some urban design concerns may best be handled by other means such as site plan control, other by-laws (such as Markham’s Curb Cut Standard By-law 158-93) and the development of council-approved guidelines. Guidelines, for example, allow a more flexible approach by providing design options and strategies. The City of Toronto has developed a comprehensive set of “Design Guidelines for Greening Surface Parking Lots” (Jan., 2013) with the objective “... to create surface parking lots that are not only efficient, but also safe, attractive and environmentally responsible”

(p. 1). In the “Options” section below, a number of specific parking design provisions identified in the review of other municipalities are put forward for future evaluation.

Options for Addressing Broader Urban Design Concerns

To better align the zoning by-law’s parking design standards with the City’s broader urban design objectives, consideration should be given to:

- Incorporating more specific parking design standards into the provisions of particular zones where warranted to better reflect their different urban design contexts and concerns.
- Conducting further review in the future of specific parking design standards and possible performance measures related to such issues as:
 - landscaping and screening
 - tree coverage in larger surface parking lots
 - stronger controls on the spacing of curb cuts and support of shared driveways
 - allowing a proportion of parking spaces to be reduced in size for smaller vehicles
 - requiring the use of permeable material in the construction of surface parking lots
 - mitigating the impacts of lighting for parking facilities on surrounding uses

2.7.3 Issue: Assessing Parking Design Provisions

The following discussion presents a series of features that should be assessed as options for inclusion in the New Comprehensive Zoning By-law. The discussion of these features is quite brief and, consequently, departs from the issues/options format of previous sections. The illustrations taken from other municipal zoning by-laws are presented as case examples to suggest where it might helpful to include similar visual explanatory material in Markham’s New Comprehensive Zoning By-law.

When looking at the parking design requirements of individual municipalities in relation to By-law 28-97, there are some notable differences in the way certain design features are treated. These differences will be discussed below under the headings of general provisions and provisions for ground-oriented residential dwellings.

Issues Related to General Parking Design Requirements

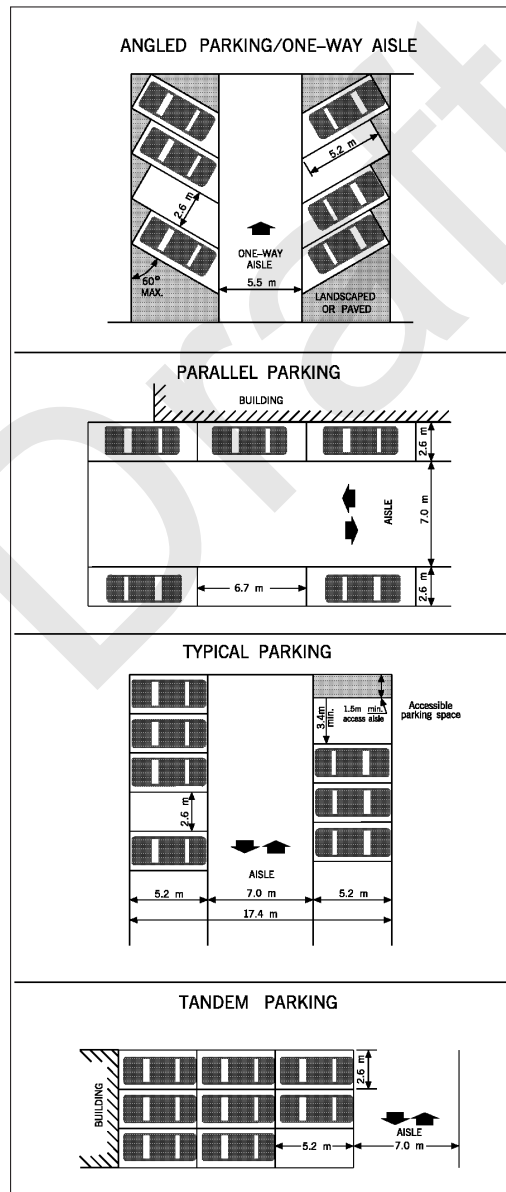
- a) **Aisle Widths** - By-law 28-97 is unusual in not specifying aisle widths for parking in enclosed or underground structures. Clause 6.2.3 of the by-law refers to the minimum required widths of driveways accessing a Parking Area or Parking Lot but aisles are not referenced. The City of Toronto’s zoning by-law defines a drive aisle as “ a vehicle passageway located within an area used for the parking or storage of 3 or more vehicles”. Most zoning by-laws specify a minimum aisle width of 6.0 metres that may be reduced in the case of one-way use and/or angled parking stalls. Figure 1 below is a table taken from the Halton Hills Zoning By-law 2010-0050 (page 5-4), is an example of aisle width specifications.

Illustration No. 8 from Mississauga Zoning By-law 0225-2007 (see below) shows how different parking arrangements can be illustrated for explanatory purposes.

Figure 1: Table 5.1 from the Halton Hills Zoning By-law 2010-0050 specifies various aisles widths.

Angle of Parking (Degrees)		Minimum Required Aisle Width (Metres)
Equal To	Less Than	
0	45	4.0
45	56	4.8
56	70	6.5
70	90	6.7

Figure 2: Illustration No. 8 from Mississauga 0225-2007 demonstrating how parking arrangements can be illustrated



Task 9: Parking and Loading Standards

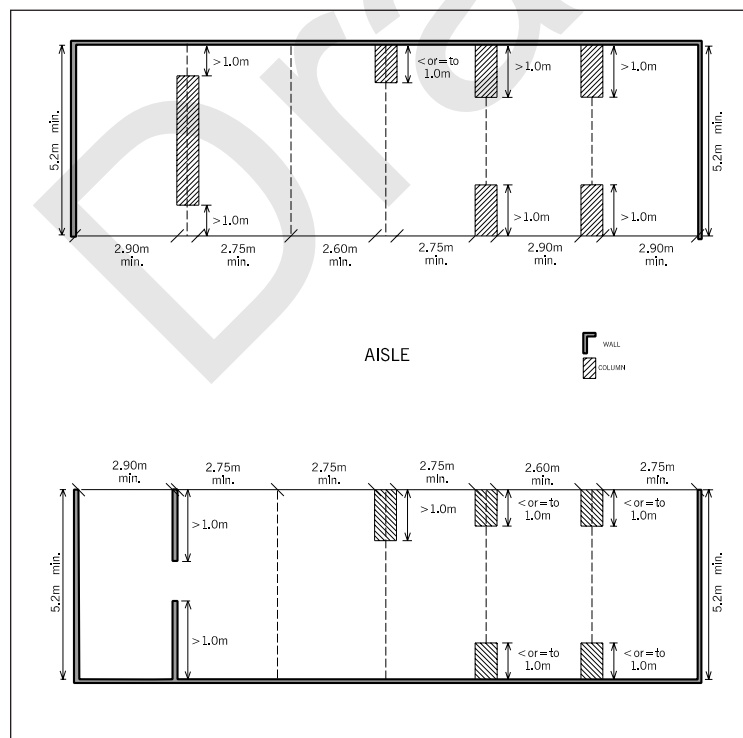
Given the anticipated increase in higher density development in Markham, enclosed or underground parking structures may become more common and provisions for minimum aisle widths and an accompanying definition of the term should be considered for inclusion in the New Comprehensive Zoning By-law.

- b) **Obstructions in Parking Spaces** - By-law 28-97 specifies the minimum size of parking spaces in enclosed or underground garages (2.6 m x 5.8 m) but does not include provisions to mitigate the impacts of obstructions such as walls, stairs, columns, bollards, fences or pipes. The zoning by-laws for Mississauga, Halton Hills, Oakville and Toronto, for example, include provisions for maintaining unobstructed parking spaces. These provisions are spelt out in considerable length and detail in clauses 5.2.10 (c), (d) and (e) of Halton Hills Zoning By-law 2010-0050 dealing with one-car, two-car and three-car plus private garages. A more concise statement can be found in clause 5.2.3(d) of Oakville's Zoning By-law 2014-014 which reads as follows:

“Where a wall, column or other obstruction is located abutting any parking space, the minimum width of the parking space shall be increased by 0.3 metres for each side that is obstructed. Obstructions within 1.15 metres of either stall end do not require an increase in parking space width, provided the obstruction projects no more than 0.15 metres into the parking space”.

The Mississauga Zoning By-law contains similar provisions regarding obstructions and illustrates these requirements as shown below.

Figure 3: Illustration No. 13, Increased Parking Widths, from the Mississauga Zoning By-law



Issues Related to Parking Design Requirements for Ground-oriented Residential Dwellings

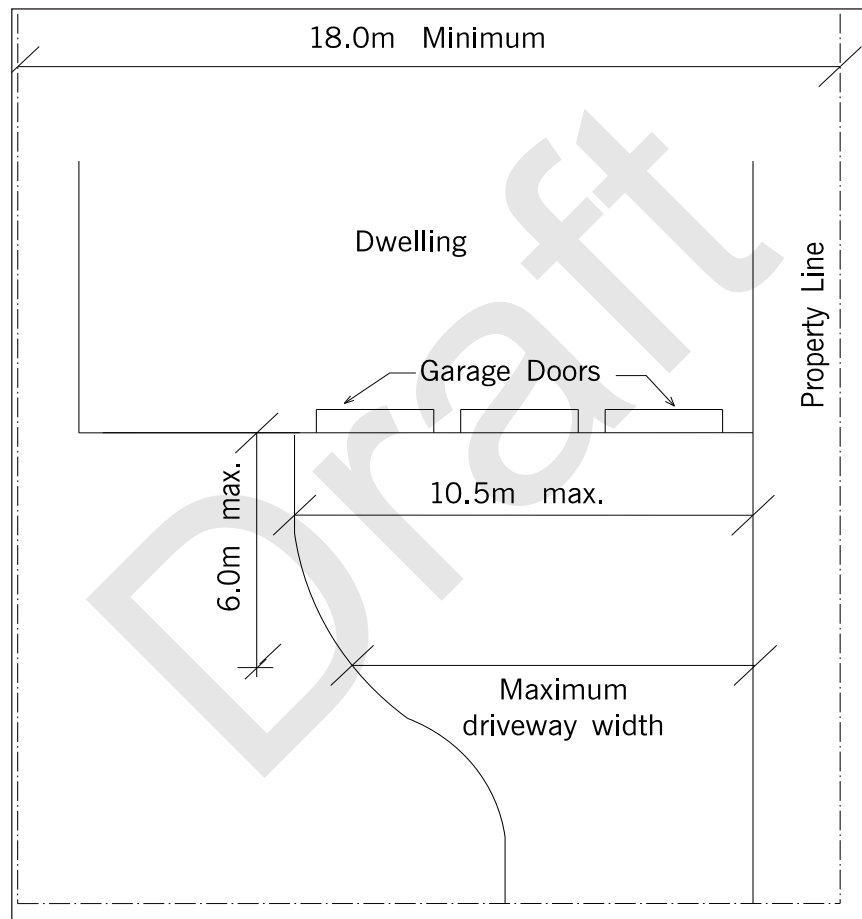
- a) **Parking Spaces in Rear Yards** - A report to the Markham Development Services Committee entitled "Preliminary Report: Proposed Amendments to Zoning By-law 28-97" (February 21, 2012) notes that "... there are currently no restrictions related to the parking of motor vehicles in the rear yard of non-lane-based residential lots" with flankage yards. This omission seems common among the zoning bylaws reviewed in this report. One notable exception is found in the City of Toronto's Zoning By-law 569-2013 where clause 10.5.80.10(7) states: "In the Residential Zone category, on a lot with a detached house, semi-detached house or a duplex, a maximum of 2 parking spaces may be located outside in the rear yard". A similar type of statement could be considered for inclusion in the New Comprehensive Zoning By-law to restrict parking in the rear yards of ground-oriented residential dwellings. It should be noted the By-law 28-97's definition of a driveway excludes this type of access from a lane which, in turn, restricts lane-based parking to parking pads of which only one per lot is permitted (clause 6.2.4.1(f)).
- b) **Corner Lots and Lane Access** - With respect to corner lots, the City of Toronto Zoning By-law 569-2013 requires that vehicle access must be from a lane if the lot abuts a lane, or from a flanking street that is not a major street or (in all other cases) from the street on which the lot fronts (see clause 10.5.80.40(3)). Oakville's Zoning By-law 2014-014 contains provisions regarding maximum distances designed to pull driveways on corner lots back as far as possible from the intersection. It might be useful to consider including such provisions for corner lots in the New Comprehensive Zoning By-law. However, it should be noted that Markham's "Curb Cut Standard By-law 158-93", requires that curb cuts on corner lots "... shall be at least 15 metres from the tangent curb line of the adjacent road intersection and no portion of such shall be located within a sight triangle". It is interesting to note that By-law 158-93 refers to sight triangles that are sometimes also referenced in zoning by-laws.
- c) **Shared Driveways** - Markham's By-law 28-97 makes no reference to shared driveways although such driveways are clearly anticipated in the City's curb cut by-law where a maximum curb cut width of 6.0 metres is prescribed for mutual driveways. The Oakville Zoning By-law 2014-014 explicitly states in clause 5.1.7 that a driveway or aisle shared across two lots is permitted in most areas. As noted above, shared driveways can be desirable from an urban design perspective as they reduce the number of points at which vehicles cross the sidewalk and lower the risk of potential vehicle/pedestrian conflicts. Consideration should be given to adding shared driveway provisions in the New Comprehensive Zoning By-law.
- d) **Private Garage Setbacks** - Provisions regarding the setback requirements for private garages on residential lots are found in a number of Markham's parent by-laws and those found in By-law 28-97 appear less comprehensive than the consolidated provisions found in other municipal by-laws. For example, clause 5.8.7(b) of Oakville's Zoning By-law 2014-014 stipulates that where access is from a lane crossing a rear lot line, the garage must be located a minimum of 0.75 metres from the rear lot line. Clause 5.8.7(a) requires that where the minimum front or flankage yard required on a lot is less than 5.5 metres, the garage must still be set back 5.5 metres from the applicable lot line. These types of setback provisions for private garages could be considered for inclusion in the New Comprehensive Zoning By-law along with the consolidation of those in the parent by-laws.
- e) **Size of Private Garages** - Limits on the maximum size of private garages are prescribed in Markham's By-law 177-96 and a number of the parent by-laws but are not directly addressed in By-law 28-97. Other municipalities also have garage size limits in their zoning by-laws. For example, Brampton limits the width of garages to no more than 60% of the width of the dwelling on lots with a width of 14.0 metres or more. In Section 5.8.6 of Oakville's Zoning By-law 2014-

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014, maximum private garage sizes are specified in terms of floor area according to three categories of lot width: for example, garages associated with semi-detached and detached dwellings on lots less than 12.0 metres wide cannot exceed a total floor area of 28.0 m². The intent in Oakville is to require residential development applications involving large garages to go through the rezoning process. The Mississauga Zoning By-law 0225-2007 specifies a maximum garage width of 10.5 metres as shown in Illustration No. 11 reproduced below.

Consideration should be given to the various methods of limiting the size of private garages when developing consolidated standards for the New Comprehensive Zoning By-law and the use of illustrations assessed.

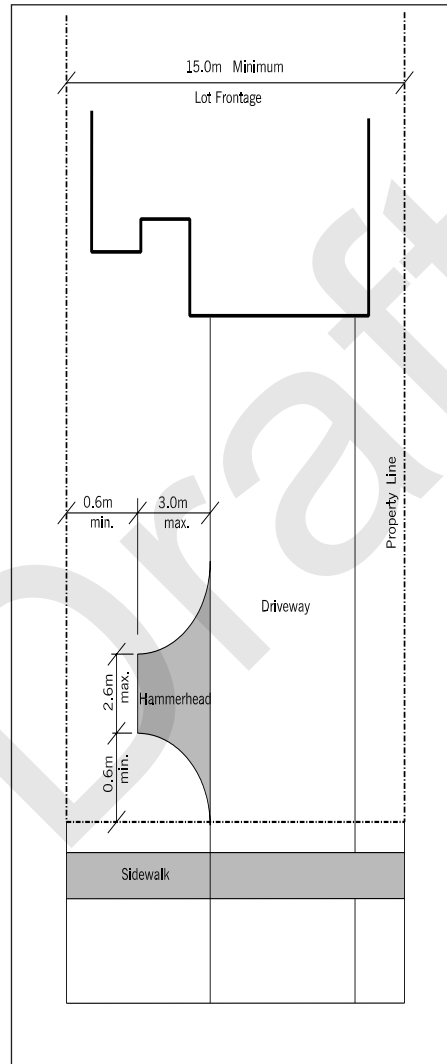
Figure 4: Illustration No. 11, Increased Driveway Width for Wide Garages, Mississauga Zoning By-law



- f) **Circular Driveways** – as a housekeeping matter, there is the need to clarify the wording and intent of By-law 28-97's provisions for circular driveways as expressed in clause 6.2.4.5(a) and (b). For lot frontages between 16.8 to 19.2 metres, sub-clause (b) restricts each driveway to a maximum width of 3.7 metres. Sub-clause (a) addresses lots with frontages greater than 19.2 metres but is less clear and seems to require each driveway to be a minimum of 3.7 metres wide and, by implication, at least as wide as the garage door. Providing an illustration(s) would be helpful in the interpretation of clause 6.2.4.5.

- g) **Provisions for “Hammerheads”** - A number of Zoning by-laws, such as those of Mississauga and Toronto, include provisions related to vehicle turnaround facilities or “hammerheads” as they are commonly known. Hammerheads are not recognized in Markham’s By-law 28-97. Clause 10.5.100.1 (7 & 8) of Toronto’s By-law 569-2013 spells out the City’s requirements for hammerheads and Mississauga’s requirements are depicted in Illustration No. 5, as reproduced below. Consideration should be given to including provisions for parking hammerheads in the development of the New Comprehensive Zoning By-law.

Figure 5: Illustration No. 5, Typical Hammerhead Configuration, Mississauga Zoning By-law



- h) **Commercial and Recreational Vehicles on Driveways** - The issue of the use of driveways and parking areas associated with ground-oriented residential dwellings by commercial and recreational vehicles is one that nearly every zoning by-law, including Markham’s, addresses. This issue is as much a matter of enforcement as it is design. As a result of concerns from residents regarding the storage and parking of commercial vehicles in residential areas, the City of Markham recently retained the services of Meridian Planning Consultants to prepare a

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report entitled “Review and Comparison of Commercial Vehicle Parking Standards for the City of Markham” (October, 2012).

The Meridian study looked at the provisions for restrictions on the parking of commercial vehicles in the zoning by-laws of Vaughan, Richmond Hill, Oakville, Mississauga and Oshawa in comparison to those contained in Section 7.1 of By-law 28-97 and the related definition of a commercial vehicle. Section 7.1 essentially prohibits the parking or storage of any commercial vehicle with gross weight in excess of 4,536 kilograms and the focus of the Meridian study was on the appropriateness of the weight limit. The study concluded that, in comparison to the other zoning by-laws that were reviewed, the provisions in By-law 28-97 “are less restrictive” (p.3). To bring By-law 28-97 more in line with the other zoning by-laws, the Meridian study recommended:

1. Expanding the definition of Commercial Motor Vehicle;
2. Dropping the weight restriction to 3,000 kg (or 2,600 kg unloaded weight);
3. Add maximum dimensions of 5.6 metres length and 2.0 metres height for commercial vehicles parked in residential areas, and
4. Parked or stored commercial motor vehicles be prohibited from encroaching into the right-of-way.

Lowering the weight limit and imposing maximum dimensions on commercial motor vehicles as recommended by the Meridian study would significantly strengthen the restrictions on the parking or storage of these vehicles in residential areas and would make Markham’s By-law more consistent with those of other GTA municipalities.

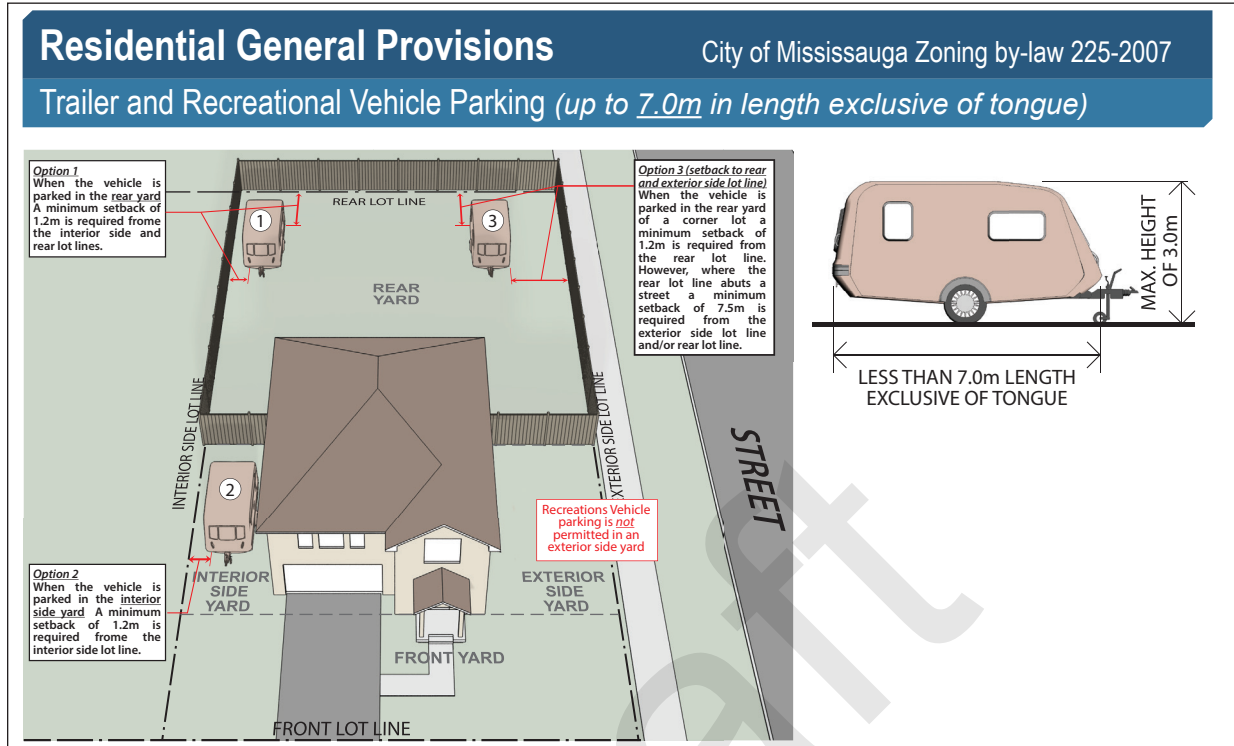
It should be noted that not all zoning by-laws restrict the parking of commercial vehicles through the imposition of a weight limit, The Halton Hills Zoning By-law 2010-0050, for example, uses lot area and setback provisions. Clause 5.2.22(a) of By-law 2010-0050 prohibits the outdoor parking or storage of any commercial motor vehicle on any residential lot that has an area less than 0.8 hectares. The City of Toronto’s Zoning By-law 569-2013, in clauses 10.5.80.10 (9 and 10), states that a parking space can only be occupied by a commercial vehicle in a Residential Zone if it is operated by an owner or tenant of the dwelling unit and it is within a wholly enclosed building. Toronto’s provisions prescribe a list of 9 types of commercial vehicles that are prohibited from using an outside parking space on a residential lot.

Weight-based restrictions can be difficult to enforce and the current zoning by-law review should consider alternative approaches, such as those of Toronto and Halton Hills, in developing provisions for inclusion in the New Comprehensive Zoning By-law. Of course, to some extent the choice of criteria by which to limit the parking of commercial vehicles will depend on how restrictive the municipality wishes to be in controlling this activity in residential areas.

The restrictions on trailers and recreational vehicles are usually expressed in terms of the length and height of these vehicles and in relation to certain setback requirements. For certain sizes of trailers and recreational vehicles, parking or storage on a residential lot may only be permitted during the summer months or for other limited periods of time. Generally, Markham’s By-law 28-97 imposes very similar restrictions on the parking or storage of trailers and recreational vehicles on residential lots as those found in other GTA zoning by-laws and Markham’s requirements do not seem in need of further review or amendment.

An example of the use of illustrations to explain restrictions on the parking of trailers and recreational vehicles is taken from Mississauga’s zoning by-law and presented below.

Figure 6: Example of Parking Restrictions for Trailer and Recreational Vehicles from Mississauga Zoning By-law



3. INTRODUCING BICYCLE PARKING STANDARDS INTO THE ZONING BY-LAW

With the increasing emphasis on planning for sustainable development and the introduction of related policies to reduce auto-dependency by increasing the attractiveness of transit, cycling and walking as alternative travel modes, the need to improve conditions for cyclists has become ever more pressing. In response to this policy direction, a number of municipalities have introduced parking requirements for bicycles into their zoning by-laws in support of these broader transportation planning objectives.

Markham has long been a leader in promoting active transportation (bicycling and walking) and other Transportation Demand Management (TDM) initiatives. Policy 7.1.4.2(h) of Markham's new Official Plan calls for "updating the zoning by-law to include bicycle parking standards and requirements for shower and change facilities in major non-residential developments". Similar calls for changes to the zoning by-law were made in the earlier Markham Transportation Strategic Plan (2011) and the Markham Draft Parking Strategy (2009). Recently, the City's Engineering Department has prepared "Draft City of Markham TDM Plan Requirements and Guidelines" (October, 2014) which include the provision of bicycle parking facilities in higher density residential, mixed-use and office/employment developments. The Draft Guidelines propose bicycle parking ratios of 0.25 spaces per unit for long-term tenant parking and 0.06 spaces per unit for short-term visitor parking in medium and high density residential developments.

The New Comprehensive Zoning By-law Project presents a timely opportunity to build on these policy directions and to advance the aims of the Draft TDM Plan Requirements and Guideline by implementing zoning requirements for the provision of safe, secure and convenient bicycle parking facilities for a range of land uses. The Table in Appendix B shows how bicycle parking standards have been introduced in the zoning by-laws of a number of municipalities in Ontario, including those found in Mississauga's Cycling Master Plan (2010).

As can be seen from Appendix B, the requirements for bicycle parking spaces relate to both the number of spaces to be provided (parking ratios) for each land use class and the form and location (design) of these spaces. Milton's Zoning By-law provides an example of expressing the required number of bicycle parking spaces as a percentage of the required number of vehicle parking spaces but the general approach is to base the ratios on some measure of floor area. Bicycle parking ratios appear to be defined largely by informed judgment rather than as the result of extensive surveys of the demand for bicycle parking. Such judgments may be partly policy-driven and related to supporting the achievement of target modal splits or similar objectives for increasing cycling activity.

The City of Toronto's Zoning By-law has the most detailed set of requirements in the GTA relating to the provision of bicycling parking facilities. Bicycle parking ratios are prescribed for 12 non-residential land use classes, although provision 230.5.10.1(3) exempts all non-residential developments with an interior floor space area of 2,000 m² or less from providing bicycle parking. Also, the bicycle parking ratios vary between the inner part of Toronto (defined as south of Lawrence Avenue between the Humber River and Victoria Park Avenue) and the rest of the City where the standards are lower. A further refinement is the specification of separate standards for short-term (visitor) bicycle parking and long-term (employee and resident) bicycle parking. In addition, a schedule of required change and shower facilities for non-residential developments is included in the zoning by-law with an upper limit of 4 facilities for each gender in developments requiring more than 180 long-term bicycle parking spaces.

Most of the zoning by-laws that require bicycle parking define minimum dimensions for a bicycle parking space (both horizontal and vertical spaces) and stipulate where on the site or in a building the bicycle parking should or should not be located. Where bicycle parking is required for apartment buildings, zoning by-laws typically state that the required bicycle parking space(s) cannot be located in a dwelling unit, on a balcony or in a storage locker. The City of Toronto's Zoning By-law requires long-term bicycle parking spaces to be located in a building and short-term spaces must be located within 30 metres of a pedestrian entrance to the building. Both the Toronto and Ottawa zoning by-laws contain provisions that allow, under certain conditions, for bicycle parking to partly off-set the need to provide vehicle parking. The City of Toronto has developed "Guidelines for the Design and Management of Bicycle Parking Facilities" (2008) to provide greater direction in the design, location and operation of bicycle parking spaces and related facilities.

Options for Consideration in the Introduction of Bicycle Parking Standards in the Zoning By-law

In looking at comparable zoning by-laws, Markham's Draft TDM Plan Requirements and the literature on bicycle parking, it is clear that there are a number of factors and issues that the City of Markham should take into consideration in developing requirements for bicycle parking facilities for inclusion in its New Comprehensive Zoning By-law, including:

- Should bicycle parking requirements apply to new developments on a city-wide basis or only for selected areas, such as the designated growth centres and corridors, where conditions are more conducive to cycling;
- Developing requirements for shower/change facilities in non-residential developments;
- Distinguishing between the bicycle parking requirements of long-term and short-term parkers;
- Determining the number of non-residential land use classes to which distinct bicycle parking requirements should apply and the role of "blended" rates in mixed use areas;
- Deciding the basis upon which to establish bicycle parking rates (e.g. by informed judgment; adapting rates from elsewhere, or policy-driven targets) and developing the appropriate definition of floor area (e.g. gross; net, or interior);

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- Requiring bicycle parking spaces for both occupants and visitors to be conveniently located in relation to the building's pedestrian entrances;
- Specifying minimum dimensions for bicycle parking spaces;
- Including exemptions for small buildings or lots (and, possibly, specific land uses);
- Allowing the sharing of bicycle parking in multi-use buildings;
- Allowing the provision of bicycle parking spaces to partly off-set or lower the requirements for vehicle parking under certain specified conditions, and
- Permitting the payment-in-lieu of bicycle parking spaces.

By requiring safe and secure bicycle parking to be provided in the right amounts in the right places through the development process, the new Zoning By-law can support the achievement of Markham's broader sustainability goals, particularly as they relate to promoting active transportation.

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4. DEVELOPING MORE DETAILED LOADING STANDARDS

Most zoning by-laws have requirements for the provision of on-site loading spaces but they are less detailed than those related to vehicle parking requirements. To some extent, this may be attributable to the fact that loading is an operational requirement and more reliance can be placed upon developers to voluntarily provide sufficient loading facilities to make their buildings functional and marketable. Zoning provisions for loading facilities are generally of a basic nature and represent more of a true “minimum requirement” than is sometimes the case with parking standards.

It is interesting to note that the former City of Scarborough had no loading requirements in its zoning by-laws and the recently approved zoning by-law for Oakville has no minimum number of required loading spaces and only stipulates the size and location of loading spaces should a developer choose to provide them. The simplest statement of loading requirements can be found in the City of Burlington’s Zoning by-law which states in clause 2.25.3 that: “At least one off-street loading space shall be provided in conjunction with every principal building, including mixed use buildings, but excluding residential buildings less than 4 storeys high.” At the other end of the spectrum, the City of Toronto has the most detailed and complex set of zoning provisions pertaining to loading facilities.

Typically, loading requirements apply to broad land use categories such as industrial, commercial and institutional, with the number of required loading spaces increasing with building size as measured by floor area. Usually, the required loading space is specified to have a standard minimum size in terms of length, width and vertical clearance or height. In the GTA, only the City of Toronto’s zoning by-law prescribes different sizes of loading space. Some, but not all, zoning by-laws require loading facilities for multi-unit residential buildings beyond a certain threshold size which is typically set at the 30 or more units level.

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In addition to stipulating the size and number of loading spaces for each land use category, most loading provisions also direct where the loading space(s) is permitted to be located on the site and, sometimes, driveway widths, maximum permitted grades and the requirement for forward entry to and exit from the loading space are also specified. Another common provision is the stipulation that, in the case of multi-use sites, the required parking is the sum of the requirements for the individual uses on the site. The City of Toronto's Zoning By-law has unique provisions for the sharing of different size loading spaces among uses in a multi-use building.

Despite being characterized by their relative simplicity, there is considerable variation in the rates at which loading spaces are required among different zoning by-laws. A part of this variation is explained by the fact that some zoning by-laws have more categories of non-residential uses than others and this finer breakdown of land use types produces different loading ratios (spaces to floor area). The provenance of loading ratios is even more difficult to trace than the origins of parking ratios. Loading ratios appear to rest less on empirical surveys of loading demand than they do on informed judgment supported by the practical experience gained through working with loading standards. It is common for zoning by-laws to exempt buildings below a minimum size from any loading requirements. For very large buildings, loading requirements are sometimes capped at a certain floor space level while in other cases a loading ratio (usually set quite high) continues to apply beyond this floor space threshold.

The following comments on Markham's loading requirements are based on the standards found in By-law 177-96, although there are other standards in the earlier parent by-laws. The loading provisions of By-law 177-96 are broadly similar to those of other comparable municipalities in Ontario. By-law 177-96 requires loading spaces to be provided for one land use class that embraces "all non-residential uses" with an exemption for buildings containing less than 300 m² of net floor area as well as three other specific land uses (day nurseries; places of worship, and public & private schools). Non-residential uses with a net floor area between 300 and 1,860 m² are required to provide one loading space and those with more than 1,860 m² of net floor area are required to provide two loading spaces. A loading space is required to have minimum dimensions of 10.0 m (length), 3.5 m (width) and 4.2 m (height). By-law 177-96 also restricts the location of loading spaces to the interior side yard or rear yard of the lot and specifies that the loading requirements for multiple uses on one lot are additive.

When looking at other municipalities in the GTA, there are some differences of note:

- a) Mississauga, Richmond Hill and Milton have loading requirements for multi-unit residential buildings. The City of Toronto requires such residential buildings with more than 30 units to provide a loading space large enough to accommodate compacted bulk lift garbage collection trucks and specifies dimensions of 13.0 m (length), 4.0 m (width) and 6.1 m (height or vertical clearance). Toronto's Zoning By-law allows this Type "G" loading space, as it is known, to be shared by other trucks servicing the building.
- b) In Mississauga and some other larger cities, such as Toronto, non-residential uses are broken down into finer categories with different schedules of loading spaces to floor space ratios. Mississauga, for example, has separate loading standards for both office and medical office uses. In addition, Toronto's Zoning By-law has separate loading requirements for: retail and restaurant uses; grocery stores and supermarkets; hotels, and manufacturing and warehouse uses.
- c) Mississauga, Vaughan and Milton, for example, specify loading requirements over a wider range of floor area sizes than is found in By-law 177-96. Mississauga requires 3 loading spaces plus 1 loading space for every 9,300 m² above 14,000 m² of gross floor area; Milton requires 3 loading spaces plus 1 loading space for every 9,300 m² above 7,400 m² of gross floor area, and

Vaughan requires 2 loading spaces plus 1 loading space for every 10,000 m² above 10,000 m² of gross floor area.

- e) The largest variations in the minimum dimensions of a standard loading space are found in the definition of length. For example, Milton, Richmond Hill, Halton Hills and Oakville require a minimum length of 12.0 m, while Mississauga, Brampton and Vaughan specify a minimum length of 9.0 m. Toronto specifies a minimum length of 17.0 m for a Type “A” loading space that is designed to accommodate long, semi-trailer trucks.
- f) Milton’s Zoning By-law specifies minimum driveway widths for trucks and also requires that trucks be able to enter and leave the loading facilities in a forward motion.
- g) The City of Toronto’s Zoning By-law defines the maximum permitted slope of a driveway leading to a loading space as 15%, except for a Type G (garbage) loading space where the maximum is 8%

A useful review of loading standards can be found in the MMM Group’s report entitled “City of Toronto Loading Standards Review” (May, 2009), prepared for the City of Toronto. Chapter 4 of this report (pages 14-24) provides a comparative summary of loading standards for some of the larger North American cities. The MMM Group’s study also included “Loading Diary” surveys undertaken by property managers over a week- long period. These surveys recorded details regarding truck arrival and departure times, truck sizes, wait times and other operational details. The survey results helped to assess the adequacy of existing loading standards and to suggest where changes to these standards might be warranted.

Options for Additional Loading Requirements

Although the existing loading provisions of By-law 177-96 are generally working well in Markham today, there are some embellishments that could be considered for inclusion in the New Comprehensive Zoning By-law:

- consolidating existing loading standards into one set of consistent requirements that apply across the City;
- introducing a loading requirement for residential buildings with 30 or more dwelling units, including provisions for garbage collection trucks;
- specifying minimum driveway widths for trucks and maximum permitted slopes;
- applying loading requirements over a wider range of non-residential floor area sizes with more steps in the range;
- possibly creating a finer breakdown of non-residential uses among which separate loading requirements schedules would apply, and
- specifying loading exemptions on the basis of small lot sizes as well as floor area.

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APPENDIX

A: Examples of Selected Parking Design Features

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Appendix A: Examples of Selected Parking Design Features

		Current Review of Parking Standards					2013 Oakville Parking Study				
		Markham	Oakville	Hamilton	Mississauga	Ottawa	Toronto	Burlington	Halton Hills	Milton	Brampton
GENERAL PROVISIONS											
DIMENSIONS OF PARKING GARAGES/PARKING LOTS	Width	2.75m (2.6m if underground)	2.7m (if private garage, 3m for single and 5.6m for two spaces).	2.6m (2.4m if parallel parking)	2.6m (2.75m if abutting a building)	Min. 2.6m and max. 2.75m. A reduction to 2.4m is permitted under certain conditions ¹ .	2.6m	2.75m	2.75m (2.6m if underground)	2.75m	2.7m
	Length	5.8m	5.7m (7m if parallel parking)	5.5m (6.7m if parallel parking; 5.5m if an end space)	5.2m (6.7m if parallel parking)	Min. 5.2m. A reduction to 4.6m is permitted under certain conditions ¹ . Min. length for parallel parking is 6.7m.	5.6m	6.0m	5.5m	5.8m	5.4m
	Aisle width	None specified	6m (if one-way travel, 4m to 5.5m if angle of parking > or <60° respectively)	6m (or 3.6m if one-way travel)	7m (5.5m if one-way travel and angle <60°)	3.5m (angle up to 40°); 4.3m (angle between 41-55°); 6.5m (angle between 56-70°); 6.7m (angle between 71-90°).	7.0m	6.0m	6.7m	6.0m	6.6m
	Area of parking space	--	--	--	--	--	--	16.5m ²	--	--	--
	Access ramps/ access driveways	3m (one-way) or 6m (two-way traffic)	3m (entrance); 3m (exit); or 5.5m (two-way).	2.7m (applies to residential parking)	2.6m	3m if single traffic lane, 6.7m if double traffic lane. Max. of 3.6m and 6.7m respectively under certain conditions ² . Vertical clearance of 2m for parking lots and according to the Building Code for			3m (one-way) or 6m (two-way traffic)		

¹ Up to 40% of the required parking spaces may be smaller in dimension if located in a lot containing more than 20 spaces. Up to 50% of the required parking spaces may be smaller in dimension where 50 or more spaces are required for a broadcasting studio, heavy industrial use, light industrial use, office, post-secondary educational institution, production studio, research and development centre and technology industry; and for an apartment dwelling, low rise, mid-rise or high rise or mixed use building containing up to 20 units. Spaces must be identified as for small cars only. Where a parking space is located abutting or near a wall, column or other similar surface that obstructs the opening of the doors of a parked vehicle or limits access to a parking space, that parking space must have a minimum width of 2.6 metres

² In the case of an apartment dwelling, low-rise, stacked dwelling, or an apartment mid-rise, or apartment high-rise, the maximum permitted width for a double traffic lane that leads to less than 20 parking spaces is 3.6m; or to 20 or more parking spaces: 6.7m (By-law 2014-289)

Task 9: Parking and Loading Standards

	Current Review of Parking Standards					2013 Oakville Parking Study				
	Markham	Oakville	Hamilton	Mississauga	Ottawa	Toronto	Burlington	Halton Hills	Milton	Brampton
					parking garages.					
Width: accessible spaces	<i>City-wide By-law: 2.6m plus 1.5m aisle (may be shared); Markham Centre By-law: 3.9m.</i>	2.7 (Type A) and 3.65 (Type B) plus 1.5m aisle (may be shared)	4.4m	4.6m						
Length: accessible spaces	5.8m	5.7m	5.5m	5.2m						
DIMENSIONS OF TANDEM PARKING	Permitted only on lots containing no more than 4 units and condominium townhouses.	Min. 2.7m x 11.7m for two spaces in tandem	--	Permitted in residential zones except RA1 to RA5	--					
PROVISIONS FOR GROUND-ORIENTED RESIDENTIAL DWELLINGS										
DIMENSIONS OF PRIVATE GARAGES	<i>By-law 177-96 (applies only to detached garages in the Urban Expansion Area):</i> Max. lot coverage: 15% if lot frontage >9.75; or 18% otherwise. Max. height: 8m if lot frontage >9.75, or 4.5m otherwise. If lot is not accessible by a lane: Max. lot coverage of 15%. Max. height: 4.5m, or 8m if rear lot line abuts a public street without vehicle access to the lot, provided that the rear wall of the garage is 1.2 to 3m from rear lot line.	Detached dwellings: max. of 28m ² if lot frontage < 12m. Max. of 45m ² if lot frontage > 12m. RL1 Zone: max. 56m ² . Semi-detached zone: max. 28m ² .	--	Max. floor area of 75m ² ; Min. unobstructed area for parking: 2.75m x5.2m x2m; Max. lot coverage: 10%; Max. height: 4.6m (sloped) or 3m (flat roof).				Min. unobstructed area: 2.9m x5.3m x2.1m; 2.9m x 6m for each space, plus 2.1m vertical clearance (single or double garage – other cases not cited here)		
DIMENSIONS OF PARKING PADS	Max. width must be the greater of: (i) 3.7m or (ii) 6.1m, plus 40% landscaping	--	--	--	--					

	Current Review of Parking Standards					2013 Oakville Parking Study				
	Markham	Oakville	Hamilton	Mississauga	Ottawa	Toronto	Burlington	Halton Hills	Milton	Brampton
(residential only)										

Required residential driveway dimensions in Markham, Oakville, Hamilton, Mississauga and Ottawa:

	Markham	Oakville	Hamilton	Mississauga	Ottawa
	Ground-oriented residential dwellings	Residential uses (in Residential or Mixed Use Zones)	Single Detached, Semi Detached and Duplex	Residential	Detached, Semi-detached, Linked-detached, Duplex, Townhouse or Stacked Dwelling
Minimum width of driveway (metres)	Equal to garage door width	3.0 (2.4 in front of interior side yard if detached garage in rear yard)	2.7m	2.7m	2.6m
Maximum width of driveway (metres)	The greater of: (i) garage door plus 2m, provided: -if lot frontage <10.1m, min. 25% soft landscaping required in front or exterior side yard; -if lot frontage >10.1m, min. 40% soft landscaping required in front or exterior side yard; or (ii) 6.1m (40% soft landscaping required in front or exterior side yard).	6m if frontage less than 12m; 50% of frontage if it is between 12 and 18m; 9m if frontage greater than 18m.	5.0 if lot has attached garage < 5m wide; the smallest of 50% of lot width or 8m if no attached garage.	The lesser of 65% of lot width or 6m, (Street town.); or 8m or 50% of lot width if no attached garage.	Max. 1. 5% of the area of the yard in which it is located or 2.6 m times the depth of the yard in which it is located.
Circular driveway regulations	If lot frontage min. 19.2m, a second 3.7m wide driveway is permitted provided: ▪ main building is setback at least 8m from street line; ▪ driveways are 7m apart. If lot frontage between 16.8m and 19.2m, a second 3.7m wide driveway is permitted provided: ▪ main building is setback 8m from the street line; ▪ driveways are at least 7m apart at the street line; ▪ each driveway is 3.7m wide or less.	Max. coverage: 50% of yard area. Max. width: 9m. Min. required separation between two driveway entrances: • 9m if the driveway has access to arterial or collector road that is within 75m of an arterial road; or, • 15m if the driveway has access to a local or collector road that is greater than 75m from an arterial road.	--	Min. lot width: 30m. Max. 2 driveways. Obs: Corner lots may have 2 driveways, one facing each street frontage.	Min. lot frontage > or equal to 22.5 m; Max. coverage: 50% of yard; The combined width of the two points of access < 8.5 m; • If lot frontage > 18m, max. driveway width may be 10.5m for portion of driveway that is within 6 m of the front garage face and which is providing direct vehicular access to the garage, if driveway does not cover more than 50% of the yard.

APPENDIX

B: Examples of Bicycle Parking Standards

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	Oakville	North Oakville	City of Toronto	Burlington	Halton Hills	Milton	Mississauga	Ottawa
	Zoning By-law 2014-014	Zoning By-law 2009-189	Link to bicycle parking rates table	Zoning By-law 2020	Zoning By-law 2010-0050	Zoning By-law 144-2003	2010 Cycling Master Plan	Zoning By-law 2008-250
Residential	1 space per dwelling or lodging unit. Long term care facility: the lesser of 5 or 0.25 per unit.	Occupant: 0.75/ dwelling unit; Visitor: 0.25/ dwelling unit. Excludes residential buildings with <20 units, townhouse units or group homes	Apartment/ mixed use: Zone 1: min. 1 space per dwelling unit, with 0.9 long-term (LT) and 0.1 short-term (ST) parking. Zone 2: min. 0.75 space/ dwelling unit, with 0.68 LT and 0.07 ST.	N/A	N/A	0.2 spaces/ dwelling (apartment) 0.1 spaces/ dwelling (retirement and long-term care facility)	0.7 spaces per unit (apartment)	0.5/ dwelling (apartment, stacked); 0.25/ dwelling (retirement home, rooming house); 0.75 (rooming house within post-secondary educational facility).
Commercial, employment, institutional	Retail: greater of 2 or 1 / 1,000m2 NFA. Service Commercial: greater of 2 or 1 / 1,000m2 (NFA). No min. required for Funeral home, Adult entertainment, Commercial self-storage. Offices: greater of 2 or 1 / 1,000m2 NFA. Employment uses: 2 plus 0.25/ 1,000m2 NFA. Institutional: greater of 2 or 1 / 500m2 (NFA)	Non-residential uses that require > 15 parking spaces: 7% of automobile parking spaces, including a min. of 5 spaces for visitors. Nursing homes: Occupant - N/A Visitor - 0.25/ dwelling to a max. of 30 spaces required	Retail & Eating establishment: ST - 3 plus 0.25-0.3/100 m2. LT - 0.13-0.2/100 m2. Office: ST - 3 plus 0.25-0.3/100 m2. LT - 0.13-0.2/100 m2. Additional provisions apply for Hospitals, medical offices, crisis care facilities, municipal shelters, personal service shops (not included here).	2 spaces plus 1 space per 1000 m2 GFA	2 spaces plus 1 space per 1000 m2 GFA	5% of required number of motor vehicle parking spaces	0.2 spaces per 100m2 GFA	1 per 250m2 (bank; convenience store; day care; office; post office; restaurant; retail food store; retail store) or 1 per 500m2 (library; municipal service centre; personal service business; retail or retail food store 8,000 m ² of GFA or greater; service or repair shop; shopping centre.
Educational uses	Private and public schools: If Elementary, 0.25 per classroom; if Secondary, 0.5 per classroom (not including any portables).		ST: 3 plus 0.1-0.06/m2; LT: 0.1-0.06/m2. See "post-secondary" below. The City of Toronto also has specific provisions for private and public schools.	1 space per 10 students and 1 space per 35 employees	1 space per 10 students and 1 space per 35 employees	N/A (see Institutional Use above)	1 per 10 students on maximum attendance	1 per 100m2 (school)
Post-Secondary School	The greater of 3 or 1 per 100m2 (NFA)		ST - 3 plus 0.18-0.3/ 100m2. LT - 0.6-1.0/100 m2 (under appeal)	1 space per 20 students	1 space per 20 students	N/A (see Institutional Use above)	0.5 spaces per 100 m2	1 per 250m2
Other	Min. # of required bicycle parking spaces shall	Max. 200 spaces required. Exemptions: Golf driving	N/A	Industrial Uses: 2 spaces plus 0.25 spaces per 1000 m2	Industrial Uses: 2 spaces plus 0.25 spaces	Max. 50 spaces shall be required on any lot.	N/A	All other non-residential uses: 1 per 1500m2

Task 9: Parking and Loading Standards

	Oakville	North Oakville	City of Toronto	Burlington	Halton Hills	Milton	Mississauga	Ottawa
	Zoning By-law 2014-014	Zoning By-law 2009-189	Link to bicycle parking rates table	Zoning By-law 2020	Zoning By-law 2010-0050	Zoning By-law 144-2003	2010 Cycling Master Plan	Zoning By-law 2008-250
	not be > 30. In a building having < 20 assisted living units, no spaces are required. Of the total # of spaces required, 25% shall be visitor spaces. In the Industrial E3 Zone, rate for main use shall apply to any floor area occupied by a business office if it occupies < 25% of total NFA. The business office ratio shall apply for all NFA used for a business office if it occupies > 25% of the total NFA.	range, funeral home, hotel, vehicle dealership & repair facility, gas bar, nursery/ garden centre, commercial self-storage and veterinary clinic.		GFA	per 1000 m2 GFA	Number may be reduced by the total number of indoor storage units provided.		
Design Standards	N/A	Must be located on the same lot as the use or building.	Horizontal space min: 1.8m long; 0.6m wide; Vertical clearance: 1.9m. Vertical position min: 0.6m wide; Min. horizontal clearance: 1.2m. If stacked parking: min. vertical clearance: 1.2m. Vertical Clearance of a Bicycle Parking Area: 2.4m if a stacked bicycle parking space; and 1.9m in all other cases. "Short-term" (ST) bicycle parking spaces must be located within 30m of a pedestrian entrance to the building. "Long-term" (LT)	Each bicycle parking space shall be 60 cm x 1.8 m in size.	N/A	Horizontal space min: 1.8m long; 0.6m wide; Vertical clearance: 1.9m. Vertical space min: 0.6m long; 0.5m wide; Min. aisle width: 1.5m. Must be located in the same lot as the use, separate from vehicle parking; Shall not be provided in a dwelling unit, balcony or commercial	Recommended dimensions: Horizontal space: 1.9m high, 0.6m wide, 1.8m long. Vertical space: 1.9m high, 0.6m wide, 1.2m long. Not exceed max. of 50% of spaces provided as vertical parking. Provide long-term parking in enclosed, secured areas. Short-term parking must be provided in highly visible locations, close to major building entrances, sheltered	Must be located on the same lot as the use or building, and must provide convenient access to main entrances. May be located in any yard. Max. 50% of the required spaces or 15 spaces, whichever is greater, may be located in a landscaped area. Dimensions: Horizontal orientation: 0.6m wide, 1.8m long. Vertical orientation: 0.5m wide, 1.5m long (by-law 2010-237). Max. 50% of spaces may be vertical. Aisle width min. 1.5m.

Task 9: Parking and Loading Standards

	Oakville	North Oakville	City of Toronto	Burlington	Halton Hills	Milton	Mississauga	Ottawa
	Zoning By-law 2014-014	Zoning By-law 2009-189	Link to bicycle parking rates table	Zoning By-law 2020	Zoning By-law 2010-0050	Zoning By-law 144-2003	2010 Cycling Master Plan	Zoning By-law 2008-250
			<p>bicycle parking spaces must be located in a building, in the same lot as the use, normally on the 1st floor (some exceptions apply). Number of change and shower facilities for each gender:</p> <ul style="list-style-type: none"> ▸ none if less than 5 required LT spaces; ▸ 1 for 5 to 60 required LT spaces; ▸ 2 for 61 to 120 required LT spaces; ▸ 3 for 121 to 180 required LT spaces; ▸ 4 for more than 180 required LT spaces. 			<p>suite; Must have a parking rack that is securely anchored to the ground, (except if locker is used); Shall not encroach into yards or landscape areas or buffers; Shall be located in proximity to the primary entrance(s). Surface should be treated with asphalt, concrete or similar.</p>	<p>wherever possible.</p>	<p>If > 4 spaces provided in a common area, each space must contain a rack anchored to the ground. If >50 spaces required, 25% must be located within a building or structure, a secure area or bicycle lockers.</p> <p>Vehicle parking required for any use may be reduced by one motor vehicle parking space for every 13m² of GFA provided as shower, change, locker rooms and other similar facilities intended for the use of bicyclists.</p>