



Final Report

Burlington City-Wide Parking Standards Review

Consolidated Report



Prepared for City of Burlington
by IBI Group
July 21, 2017

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Executive Summary

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

As the City of Burlington continues to evolve into an increasingly urban place with greater land use intensity, the City has recognized the need to review its parking standards. The primary goal of this study is to review the “Parking Requirements” contained within By-law 2020 and to provide detailed recommendations on how they should be modified to better reflect the transportation and land use realities and objectives across Burlington. This study also recommends updated parking design guidelines and parking management strategies.

The most significant recommendations of this study are to decrease the parking rates for several land uses. These recommendations are supported using findings from a city-wide parking utilization survey that was completed in 2016, and by comparing parking rates for comparable land uses in some of Burlington’s peer municipalities in Southern Ontario. Recommendations for parking design guidelines and parking management strategies are supported by a review of best practices and review of guidelines and strategies in peer municipalities.

Table 1 provides a list of land uses and their recommended parking rates. These land uses are based on the land uses that are included in the existing by-law, as well as a few new categories that warrant their own parking rates.

Table 1: Summary of changes to the parking standards

LAND USE	EXISTING PARKING STANDARD MINIMUM	CHANGE	INTENSIFICATION AREAS: MAXIMUM	INTENSIFICATION AREAS: MINIMUM	OTHER AREAS
Residential Uses					
Detached Dwelling, Semi-Detached, Duplex,	2 spaces/unit	Updated	2 spaces/unit	1 spaces/unit	2 spaces/unit
Triplex	2 spaces/unit	Added	1 spaces/unit	1 spaces/unit	2 spaces/unit
Street Townhouse, Street Triplex, Street Fourplex	2 spaces/unit	Updated	2 spaces/unit	1 spaces/unit	2 spaces/unit
Townhouse, Fourplex, Cluster Homes	O: 1 - 2 spaces/unit, V: 0.5 spaces/unit	Updated	O: 2 spaces/unit V: 0.25 spaces/unit	O: 1 space1/unit V: 0.2 spaces/unit	O: 2 spaces/unit V: 0.25 spaces/unit
Stacked Townhouse,	O: 1-2 spaces/unit V: 0-0.35 spaces/unit	Updated	O: 2 spaces/unit V: 0.25 spaces/unit	O: 1 space1/unit V: 0.2 spaces/unit	O: 1 spaces/unit V: 0.25 spaces/unit
Back-to-Back Townhouse	O: 1-2 spaces/unit V: 0-0.35 spaces/unit	Updated	O: 2 spaces/unit V: 0.25 spaces/unit	O: 1 space1/unit V: 0.2 spaces/unit	O: 2 spaces/unit V: 0.25 spaces/unit

LAND USE	EXISTING PARKING STANDARD MINIMUM	CHANGE	INTENSIFICATION AREAS: MAXIMUM	INTENSIFICATION AREAS: MINIMUM	OTHER AREAS
Apartment Building	O: 1.25-1.75 spaces/unit V: 0.35 spaces/unit	Updated	O: 1.5 spaces/unit V: 0.25 spaces/unit	O: 1 spaces/unit V: 0.25 spaces/unit	1BR: 1 space/unit 2BR: 1.25 spaces/unit 3BR: 1.5 spaces/unit V: 0.2 spaces/unit
Accessory Dwelling Unit	N/A	New	No max	1 spaces/unit	1 spaces/unit
Dwelling Units on the 2nd or 3rd floor of a commercial building	1.25 spaces/unit	Updated	1.5 space/unit	1 space/unit	1.25 spaces/unit
Bed & Breakfast Home Boarding House	1 space/room	Keep Existing	1 space/room	1 space/room	1 space/room
Retail & Service Commercial Uses					
Service Commercial Uses	4 spaces/100 m ² GFA	Keep Existing	4 spaces/100 m ² GFA	4 spaces/100 m ² GFA	4 spaces/100 m ² GFA
Retail Store	4 spaces/100 m ² GFA	Updated	3 spaces/100 m ² GFA	1.5 spaces/100 m ² GFA	3.5 spaces/100 m ² GFA
Retail Centre	5.25 spaces/100 m ² GFA	Updated	4.5 spaces/100 m ² GFA	3.5 spaces/100 m ² GFA	5 spaces/100 m ² GFA
Supermarket	10 spaces/100 m ² GFA	Updated	5.5 spaces/100 m ² GFA	4.0 spaces/100 m ² GFA	6.0 spaces/100 m ² GFA

LAND USE	EXISTING PARKING STANDARD MINIMUM	CHANGE	INTENSIFICATION AREAS: MAXIMUM	INTENSIFICATION AREAS: MINIMUM	OTHER AREAS
Fast Food Restaurant	25 spaces/100 m ² GFA or 1 space/4 persons capacity, whichever is greater	Updated	10 spaces/100 m ² GFA	5 spaces/100 m ² GFA, 0 if < 100 m ²	10 spaces/100 m ² GFA, 0 if < 100 m ²
Standard Restaurant	25 spaces/100 m ² GFA	Updated	16 spaces/100 m ² GFA	12 spaces/100 m ² GFA	18.5 spaces/100 m ² GFA
Bank, Trust Company, Credit Union	6 spaces/100 m ² GFA	Updated	4.5 spaces/100 m ² GFA	3.5 spaces/100 m ² GFA	5 spaces/100 m ² GFA
Hotel	1 space/room	Keep Existing	No max	1.0 space/room	1.0 space/room
Kennel	1 space/employee + 1 space/100 m ² GFA	Keep Existing	1 space/employee + 1 space/100 m ² GFA	1 space/employee + 1 space/100 m ² GFA	1 space/employee + 1 space/100 m ² GFA
Convention Centre, Conference Centre, Banquet Hall	10 spaces/100 m ² GFA	Updated	7.5 spaces/100 m ² GFA	5.5 spaces/100 m ² GFA	8 spaces/100 m ² GFA
Recreational & Employment Uses					
Entertainment Establishment	1 space/6 persons	Updated	10 spaces/100 m ² GFA	5 spaces/100 m ² GFA	10 spaces/100 m ² GFA
Recreational Establishment	1 space/6 persons capacity	Updated	5.5 spaces /100 m ² GFA	2.5 spaces/100 m ² GFA	5.5 spaces/100 m ² GFA
Fitness Centre	1 space/6 persons capacity	New	6 spaces/100 m ² GFA	2.5 spaces/100 m ² GFA	5.5 spaces/100 m ² GFA

LAND USE	EXISTING PARKING STANDARD MINIMUM	CHANGE	INTENSIFICATION AREAS: MAXIMUM	INTENSIFICATION AREAS: MINIMUM	OTHER AREAS
Adult Entertainment Establishment	1 space/2 persons capacity	Keep Existing	1 space/2 persons capacity	1 space/2 persons capacity	1 space/2 persons capacity
Movie Theatre	0.25 spaces/seat	Updated	Group with Entertainment Establishment		
Night Club, Dance Hall	0.275 spaces/person capacity	Updated	0.25 spaces/person capacity	0.15 spaces/person capacity	0.25 spaces/person capacity
Employment Uses					
Warehouse and Logistics	1 space/100 m ² GFA	New	No max	1.0 spaces/100 m ² GFA	1.5 spaces/100 m ² GFA
Industrial Uses	1 space/100 m ² GFA	Keep Existing	No max	1 space/100 m ² GFA	1 space/100 m ² GFA
Office: Medical	6 spaces/100 m ² GFA	Updated	No max	4.0 spaces/100 m ² GFA	6.0 spaces/100 m ² GFA
Office: Other	3.5 spaces/100 m ² GFA	Updated	2.5 spaces/100 m ² GFA	2 spaces/100 m ² GFA	3 spaces/100 m ² GFA
Home-Based Business	None required	Keep Existing	None required	None required	None required
Multi-use Business Park	3.5 spaces/100 m ² GFA	New	2.0 spaces/100 m ² GFA	1.0 spaces/100 m ² GFA	1.0 spaces/100 m ² GFA
Storage Locker	1.0 spaces/100 m ² GFA	New	No max	0.5 spaces/100 m ² GFA	0.5 spaces/100 m ² GFA
Institutional Uses					

LAND USE	EXISTING PARKING STANDARD MINIMUM	CHANGE	INTENSIFICATION AREAS: MAXIMUM	INTENSIFICATION AREAS: MINIMUM	OTHER AREAS
Cemetery	1space/employee 1 space/4 seats chapel capacity	Keep Existing	1 space/employee 1 space/4 seats chapel capacity	1 space/employee 1 space/4 seats chapel capacity	1 space/employee 1 space/4 seats chapel capacity
Community Institution	1 space/4 persons capacity	Keep Existing	1 space/4 persons capacity	1 space/4 persons capacity	1 space/4 persons capacity
Convent	1 space/2 beds	Keep Existing	1 space/2 beds	1 space/2 beds	1 space/2 beds
Monastery	1 space/2 beds	Keep Existing	1 space/2 beds	1 space/2 beds	1 space/2 beds
Correctional Facility	0.85 spaces/employee V: 0.25 spaces/resident	Keep Existing	0.85 spaces/employee V: 0.25 spaces/resident	0.85 spaces/employee V: 0.25 spaces/resident	0.85 spaces/employee V: 0.25 spaces/resident
Correctional Group Home	4 spaces	Keep Existing	4 spaces	4 spaces	4 spaces
Day Care Centre	4 spaces/100 m ² GFA	Keep Existing	4 spaces/100 m ² GFA	4 spaces/100 m ² GFA	4 spaces/100 m ² GFA
Emergency Shelter	0.85 spaces/employee V: 0.25 spaces/resident	Keep Existing	0.85 spaces/employee V: 0.25 spaces/resident	0.85 spaces/employee V: 0.25 spaces/resident	0.85 spaces/employee V: 0.25 spaces/resident
Funeral Home, Mortuary, Crematorium	4 spaces/100 m ² GFA (15 space minimum)	Keep Existing	4 spaces/100 m ² GFA (15 space minimum)	4 spaces/100 m ² GFA (15 space minimum)	4 spaces/100 m ² GFA (15 space minimum)
Group Home	2 spaces	Keep Existing	2 spaces	2 spaces	2 spaces
Home Day Care	None required	Keep Existing	None required	None required	None required

LAND USE	EXISTING PARKING STANDARD MINIMUM	CHANGE	INTENSIFICATION AREAS: MAXIMUM	INTENSIFICATION AREAS: MINIMUM	OTHER AREAS
Hospital, Health Care Facility	0.65 spaces/patient bed	Keep Existing	0.65 spaces/patient bed	0.65 spaces/patient bed	0.65 spaces/patient bed
Library, Museum, Post Office	0.75 spaces/employee + 1.5 spaces/100 m ² GFA	Keep Existing	0.75 spaces/employee + 1.5 spaces/100 m ² GFA	0.75 spaces/employee + 1.5 spaces/100 m ² GFA	0.75 spaces/employee + 1.5 spaces/100 m ² GFA
Lodge, Fraternity, Private Club	1 space/4 persons capacity	Keep Existing	1 space/4 persons capacity	1 space/4 persons capacity	1 space/4 persons capacity
Long-Term Care Facility	0.85 spaces/emp + 0.25 spaces/bed	Updated	No max	0.35 spaces/bed	0.35 spaces/bed
Place of Worship (Fixed Seating)	6 spaces/100 m ² GFA	New	7.5 spaces/100 m ² GFA	5.0 spaces/100 m ² GFA	6.0 spaces/100 m ² GFA
Place of Worship (Based on Worship Area)	6 spaces/100 m ² GFA	New	17.0 spaces/100 m ² GFA	12.0 spaces/100 m ² GFA	19.0 spaces/100 m ² GFA
Residential Social Service	0.85 spaces/employee V: 0.25 spaces/resident	Keep Existing	0.85 spaces/employee V: 0.25 spaces/resident	0.85 spaces/employee V: 0.25 spaces/resident	0.85 spaces/employee V: 0.25 spaces/resident
Retirement Home	0.85 spaces/employee Occupant: 0.5 spaces/unit V: 0.25 spaces/unit	Updated	No Max	O/E: 0.5 spaces/unit V: 0.2 spaces/unit	O/E: 0.6 spaces/unit V: 0.25 spaces/unit
Elementary School	1.5 spaces/classroom	Keep Existing	No Max	1.5 spaces/classroom	1.5 spaces/classroom

LAND USE	EXISTING PARKING STANDARD MINIMUM	CHANGE	INTENSIFICATION AREAS: MAXIMUM	INTENSIFICATION AREAS: MINIMUM	OTHER AREAS
Secondary School	4 spaces/classroom	Updated	No Max	3 spaces/classroom	3 spaces/classroom
Post-Secondary School	1 space/3 students, faculty and staff	Updated	5 spaces/classroom plus 1 space for 6 person capacity of auditoriums		
Business, Commercial, Trade Schools	1 space/3 students, faculty and staff	Updated	5.0 spaces/100 m ² GFA	0.5 spaces/100 m ² GFA	5.0 spaces/100 m ² GFA

1 Introduction

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

Historically, parking zoning standards have been used by cities to specify the amount of parking that must be provided for new developments, to ensure that sufficient off-street spaces are provided to meet the development's own parking needs. These standards have often been developed under the approach that the more parking that is provided, the better. This tends to encourage suburban auto-oriented forms of development. However, as urban areas trend towards becoming more compact, connected and walkable, the reliance on personal automobiles is likely to gradually decrease. Major investment in alternative transportation modes from all levels of government has complimented this trend and stipulated its advancement. A major component of the success of this shift is the development of robust parking standards that are context sensitive and that will balance a variety of transportation and development objectives.

As the City of Burlington continues to evolve into an increasingly urban place with greater land use intensity, the City has recognized the need to review its parking standards. The primary goal of this study is to review the "Parking Requirements" contained within By-law 2020 and to provide detailed recommendations on how they should be modified to better reflect the transportation and land use realities and objectives across Burlington.

1.1 Objectives

This study adopts a broad understanding of the role of parking standards. Context sensitive standards, and minimum and maximum parking requirements, are viewed as key parking management tools to help promote more sustainable forms of development, including:

- Supporting more efficient forms of development in terms of costs and land requirements;
- Supporting the envisioned urban structure and public transit and active transportation investments;
- Encouraging transportation alternatives to the automobile, and alternatives to the single-occupant vehicle (SOV), in particular;
- Mitigating environmental impacts from parking facilities including storm water runoff and urban heat island contributions;
- Minimizing parking spill-over into sensitive areas;
- Ensuring that adequate parking supply is provided to meet existing demand; and
- Improving the public realm by minimizing impacts associated with surface parking.

A review of best practices was undertaken, and covers a number of strategies relating to the above objectives. Our approach to reviewing Burlington's parking standards was based on the understanding that successful parking standards will:

- Be clear, easy to enforce, defensible, and based on sound technical analysis;
- Recognize differences in existing land use and support the envisioned urban structure;

- Encourage transportation alternatives to the personal automobile and support the inclusion of transportation demand management (TDM) techniques through the development of context sensitive parking requirements;
- Support efficient forms of development in terms of costs and land requirements;
- Balance the needs and concerns of a diverse set of stakeholders including City staff, developers, businesses, ratepayer groups, TDM organizations, and the general public; and
- Be able to integrate easily with the existing zoning by-law.

1.2 Organization

This report is organized in a way that chronologically documents the process for developing parking standards:

- Background Policy that has influence on the standards (Section 2).
- Review of best practices in parking standards including defining a preferred structure for parking standards in Burlington (Section 3).
- The Structure of Parking Standards (Section 4)
- Methods for setting recommended parking standards (Section 5)
- Recommended Standards (Section 6)
- Additional Considerations (Section 7)
- Design Standards (Section 8)
- Parking Management (Section 9)

2 Background

There are several existing policies, studies, and background information that identify objectives that set a strategy to guide the growth of Burlington into the future. This section reviews these policies and summarizes the key elements that will be considered in the development of the city-wide parking standards update. The following policies and studies are reviewed in this section:

- City Strategic Plan
- Burlington's Official Plan
- Burlington Transportation Plan
- Halton Region Transportation Master Plan
- Mobility Hubs Opportunities and Constraints Study
- Uptown Policy Brief
- Existing Parking Regulations
- Current Requested Parking Reductions
- Emerging Trends in Mobility
- Public and Stakeholder Opinion

2.1 Burlington's Strategic Plan

Burlington's new Strategic Plan, which was approved by council in April 2016, sets the strategic direction for Burlington for the next 25 years. The plan identifies four strategic directions for the city. They are:

1. A City that Grows
2. A City that Moves
3. A Healthier and Greener City
4. An Engaging City

Although each of these items will in some way implicate parking demand, the first two items include initiatives that imply more reliance on alternative transportation modes, denser communities, and a decrease in parking demand.

A City that Moves is clearly defined through a vision of improved public transit, the development and master planning of mobility hubs, a vision for complete streets, employment areas that are well served by transit, collaboration across all levels of government, and improved walkability and less reliance on automobiles.

A City that Grows is clearly defined through a vision of intensification in mobility hubs and the development of complete neighbourhoods.

2.2 Burlington's Official Plan

There are several strategic objectives that are outlined in Burlington's Official Plan (OP) that guide the sustainable development of the city. The plan recognizes the importance of consolidating land uses and the development of a more transit, bicycle, and walk friendly urban form.

The City of Burlington Official Plan is predicated on a mission statement that calls for the implementation of principles of sustainable development. These principles are listed below.

Guiding Principles of the Official Plan

The guiding principles that implicate decisions on parking standards include:

- *“Provide a community plan and growth strategy aimed at creating an attractive, liveable community that offers a wide range of housing, employment, transportation, and leisure opportunities for all its citizens.”*
- *“Support a healthy, clean and sustainable community based on an ecosystem approach and the implementation of the principles of Sustainable Development, by ensuring that environmental integrity and diversity, social and economic factors, and compatibility are considered in land use decisions.”*
- *“Ensure that the City's infrastructure and services are maintained or expanded at a level that is fair, realistic and affordable.”*

Functional Policies of the Official Plan

The functional policies that implicate decisions on parking standards include:

- **Travel Demand Management** - *“The City will encourage opportunities for developing travel demand management (TDM) measures to reduce single occupancy automobile use, especially during peak travel periods, such as carpooling programs, transit passes, preferential parking for carpool members, telecommuting, flex hours, intranet carpooling and fare incentives.”*
- **Reduced On-Street Parking** – *“Reduced parking ratios and/or standards and/or on-street parking ratios and/or standards may be permitted subject to evaluation by the City of the appropriateness of such standards, and implemented through the approval of development applications or other City initiatives.”*
- **Shared Parking** - *“Opportunities for the sharing of parking in mixed use developments will be considered subject to an evaluation by the City.”*
- **Promote Transit Use** – *“To promote the use of transit, and to reduce traffic and parking demands traffic congestion and air pollution, by providing increased levels of service, encouraging transit-supportive land use planning and introducing appropriate “transit priority” and Travel Demand Management (TDM) measures.”*
- **Cycling Policies** – *“The integration of cycling and transit modes shall be encouraged by requiring adequate and secure bicycle parking at major transit stops, bus terminals, GO Stations and commercial, employment and institutional developments, and the provision of bicycle racks on buses.”*

Public Realm Policies

There are also policies related to the Public Realm that have implications on parking standards.

- **Design Guidelines Policies** – *“The location, amount, position and design of parking areas shall be reviewed to minimize their potential to erode the qualities of the public streetscape, and to lessen their visual impact. City Council shall require landscaped islands and screening in the design of large parking lots.” and “Parking areas in the vicinity of the waterfront shall be designed, located and landscaped to complement the waterfront environment and to maximize the recreational and cultural open space uses of waterfront property.”*

Mixed Use Activity Areas

Mixed Use activity areas are a broad urban planning designation identified in the current official plan that will foster a more pedestrian and transit friendly urban environment through the intensification of a mixture of dense residential, employment, and retail land uses. Mixed Use Activity areas include downtown, uptown, and mixed use corridors, and all other areas that are set to host growth and redevelopment.

The official plan sets principles and objectives for these areas. Although many of these policies relate to parking through the development of an urban form that promotes alternative transportation modes, one policy directly comments on parking standards as follows:

The City may consider the use of reduced parking standards in Mixed Use Activity Areas in order to encourage greater reliance on non-automobile forms of transportation.

In 2015, a new Draft urban structure was proposed, which will be considered for inclusion in the City's new official plan in 2017. This draft urban structure identifies an expansion to the size of the Mixed Use Activity Areas. Since this draft urban structure was not approved at the time that these parking standards were developed, the Mixed Use Activity Areas will be used for the spatial stratification that is identified in this report. They will also be referred to as Intensification Areas in this report. Upon approval of this draft urban structure, these parking standards should be updated to reflect any new terminology.

2.3 Burlington Transportation Plan

A new Transportation Plan (TP) is currently under development, but the current state (existing conditions) report is complete.

The Current State Discussion Paper identifies the intent of the TP, which is to map out a transportation future that will allow Burlington to grow in places by providing multiple travel options that are convenient and safe.

The City is expected to grow by 6% between now and 2031. Burlington is approaching full build out, and so is the transportation system. This means that new growth will happen through intensification and infill.

Based on the Transportation Tomorrow Travel Survey from 2011, 89% of trips made by residents of the City of Burlington are made by automobile (73% driver and 16% passenger). . Given the City's long-term commitment to preserve the Urban/Rural Boundary, the City will be challenged with growing up and not out as it has in the past. Improving modal split is recognized as the way forward.

In recognition of current transportation conditions, and the deliberate decision to intensify, part of the way forward to a more sustainable transportation future will be the development of supportive parking standards.

2.4 Halton Region Transportation Master Plan

To support the plan's vision of a sustainable and multi-modal transportation network for Halton Region, several guiding principles were identified. These principles are focused on achieving this vision through providing a balance of transportation choices and designing healthy communities which enable walking and cycling as a viable and safe transportation choice.

One of the mode split goals of the Halton Region Transportation Master Plan, which will be echoed in the update to the Burlington TP, will be to achieve a 5% mode split for active transportation and 20% mode split for pm peak period trips by 2031.

If the vision is achieved, there will be a significant reduction in the reliance on single-occupant vehicles, which will impact parking demand. The updated parking standards should reflect this vision by reducing minimum parking supply requirements in areas with too much parking, and by developing parking standards that help achieve this vision.

2.5 Mobility Hubs Opportunities and Constraints Study

Mobility Hubs are a network of 51 priority transit and growth areas in the Greater Toronto and Hamilton Area (GTHA) as identified by the Big Move (2008). These hubs represent connection points for major local and regional rapid transit service, and are intended to attract and promote a mix of high density land uses. In Burlington, there are four mobility hubs, two of which are provincially identified, and two which are identified by the City of Burlington. The specific opportunities that they represent for redevelopment are an important part of Burlington's growth strategy.

These opportunities were identified in the Mobility Hubs Opportunities and Constraints Study in 2014. In July 2016, Council identified the Mobility Hubs as a corporate priority, through the dedication of resources to a three-phase Mobility Hubs Study. The study is simultaneously undertaking area-specific plans (ASPs) for each of Burlington's four Mobility Hubs. The Mobility Hubs Study is currently underway and is in Phase 1. Phase 3 will address implementation measures including a look at parking rates. The overall study is estimated to be complete by June 2019. The recommended parking standards in this report will be reviewed and incorporated during Phase 3 of the ASPs.

The City has recognised that the large expanses of GO Transit surface parking lots adjacent to the mobility hubs are working at cross-purposes to our efforts to intensify land use. GO Transit should reduce surface parking expansion around the hubs and consider charging for parking.

2.5.1 Burlington GO Station

Burlington GO Station is classified as an Urban Transit Node by the Metrolinx Mobility Hub Guidelines. Areas with this classification are suitable for a mix of land uses and moderate to high density development. Most of the development potential in these areas is related to infill opportunities. Burlington's new Official Plan will certainly include these mobility hubs as part of the intensification opportunities in the city.

Infill opportunities have specifically been identified in areas around the Station, which are currently occupied by low-rise and big box retail operations with an overabundance of parking. Burlington's updated parking standards should address mobility hubs with context specific standards to allow for these opportunities to become achievable.

Burlington GO Station contains 2273 parking spaces, which are required to accommodate the 70% of Burlington GO Station Passengers that rely on parking to access the station.

The Mobility Hubs Opportunities and Constraints Study identifies a long term opportunity to relocate all surface parking to structured parking within new developments located on the existing parking lot.

2.5.2 Downtown Burlington

Downtown Burlington is classified as a Historic Suburban Town Centre by the Metrolinx Mobility Hub Guidelines. These areas are smaller city centres with low-medium density development, smaller block sizes, and a mix of land uses. Downtown Burlington is also identified as one of 18 anchor mobility hubs. Anchor hubs have regional significance and have significant potential to attract new growth and development.

The report identifies infill opportunities to redevelop city owned surface parking lots at Brock Avenue/Ontario Street and Martha Street, into developments that match the historic character of the downtown.

2.5.3 Aldershot GO Station

Aldershot GO is not identified as a mobility Hub by Metrolinx, but it is recognized as a Major Transit Station Area in the Places to Grow Plan. The City of Burlington considers Aldershot GO Station to be significant in the local context.

Opportunities for infill redevelopment around this site include existing underutilized parking lots and the GO Station parking lots. The new Official Plan will identify these areas as unique planning areas and unique parking standards will be developed to reflect this.

2.5.4 Appleby GO Station

Appleby GO is not identified as a mobility Hub by Metrolinx, but it is recognized as a Major Transit Station Area in the Places to Grow Plan. The City of Burlington considers Appleby GO Station to be significant in the local context.

The City of Burlington recognizes that there are major opportunities for redevelopment as there is a significant supply of underutilized land in the area.

2.6 City's New Official Plan: Mobility Hub Work Plan

The City of Burlington is currently undergoing an important transition where by the majority of growth is being accommodated through intensification. The 2015-2040 Strategic Plan has identified a number of specific initiatives to achieve this transition, one of which is the development of mobility hubs at the City's three GO Stations and the downtown. Mobility Hubs serve as key mixed use destinations within the City, and are prime areas to direct intensification.

Through the New Official Plan, a two stage work plan was developed for mobility hubs. Stage One includes the development of strategic policy directions through the completion of the Mobility Hubs Opportunities and Constraints Study and the integration of a high level mobility hubs policy framework into the Official Plan and the Transportation Plan. The work conducted in the first stage is a key input into the new Official Plan. The goal of the work done in this stage was to:

- Revise and update Major Transit Station Area policies to also include Mobility Hub policies;
- Strengthen the concept of Mobility Hub nodes and corridor connectors between the hubs as intensification areas

Stage Two involves: technical analysis such as market review, transportation (all mobility choices plus parking), environmental constraints, servicing analysis; land use and urban design scenario development; the completion of detailed Area Specific Plans to guide development of the hubs; and preparation of an implementation plan.

In July 2016, Council directed City Staff to proceed with Mobility Hub Area Specific Planning for all four hubs. The Mobility Hub Area Specific Planning Process will enable the City to play a leadership role in developing a clear vision for the future of mobility hubs, and developing the required planning tools to set the foundation for the transformation of these areas.

2.7 Uptown Policy Brief

This is a Draft policy brief to address the Burlington's Uptown Mixed Use Centre as part of the new Official Plan. The focus of this area is a secondary urban centre to Downtown Burlington for

residents of north-east Burlington. The Draft briefing recommends that parking maximums be developed in the area.

2.8 Existing Parking Regulations

2.8.1 General Provisions

The existing general-provisions parking regulations in Burlington have traditionally been set to ensure that new developments provide adequate, or even surplus, parking for its users. Although this may be viewed as essential to the success of attracting development to the area, this method has resulted in an oversupply of free surface parking, resulting in an inefficient use of land, auto-oriented land use planning, and the support of an auto-dependant life style.

As the GTHA experiences a trend towards a more intensified urban form, other cities in the area have updated their parking standards to be reflective of this shift. Burlington recognizes this trend and that updating its parking standards are an important part of moving forward.

2.8.2 Exceptions to the General Provisions

Downtown

Burlington does not require parking for non-residential developments in the downtown area. A supply of municipal parking lots are provided as a substitute to on-site parking at downtown establishments. The municipal lots are free during certain time periods and require payment during other times. The free parking periods are identified as follows: Downtown business owners pay into a fund to pay for these parking lots.

On-street (three-hour maximum)

- 6 p.m. to 1 a.m., Monday to Friday
- Saturdays and Sundays
- Holidays
- During the month of December

Note: Overnight parking is not allowed between 1 and 6 a.m.

In municipal parking lots and garage (no time limit)

- 6 p.m. to 9 a.m., Monday to Friday
- Saturdays and Sundays
- Holidays
- During the month of December

Mixed-Use Zones

The parking standards in Zoning By-law 2020 also include separate provisions for Mixed Use Corridor Zones. In the Mixed Use Corridor Zones, a 5% reduction to the city-wide minimums for non-residential uses are applied and supply is supplemented with municipal parking lots and on-street parking.

Adjustments to the city-wide standards are also identified in the Uptown Mixed Use Corridor Zones. The adjustments apply to residential land uses, in that All Dwelling Units follow the same requirements and that visitor parking is not required.

2.8.3 Shared Parking

The existing Zoning By-law 2020 permits shared parking for mixed use developments in mixed use corridor zones. The percent of peak period values that determine the required parking supply are shown in Exhibit 2.1 below.

Exhibit 2.1: Existing Shared Parking by Land Use

MIXED USE DEVELOPMENT – PEAK PARKING OCCUPANCY BY LAND USE				
Percent of Peak Period Occupancy (Weekday)				
Type of Use	Morning	Noon	Afternoon	Evening
Office/Financial Institution	100	90	95	10
Retail/Service Commercial	80	90	90	90
Restaurant	20	100	30	100
Percent of Peak Period Occupancy (Weekend)				
Type of Use	Morning	Noon	Afternoon	Evening
Office/Financial Institution	10	10	10	10
Retail/Service Commercial	80	100	100	70
Restaurant	20	100	50	100

2.9 Current Requested Parking Reductions

Many of the zoning variances that have occurred in the past two years in Burlington can be categorized by a request for reductions in parking from what the existing by-law prescribes.

It is important to review these variances since they further identify the development trends that are occurring in Burlington and reiterate that the existing standards need to be updated to reflect these changes. A review of 7 of these variances was completed as part of the city-wide parking survey that was conducted for this study. These sites were chosen based on the relatively high reduction in parking supply that they were granted.. The 7 sites were surveyed at least 5 different times during the peak demand period of the land use. The sites were surveyed using a spot survey approach to determine parking utilization at the time of the survey.

The justifications for these parking reductions are related to the inclusion of TDM initiatives in the design of the development and other trends related to improving access to transit, improving bicycle parking provisions, and being located in transit friendly or walkable areas. They are also based on what is recognized to be a land use with a high parking requirement as set out in the current by-law.

The results of the surveys are provided in Exhibit 2.2. The information provided includes the parking that was supplied

Exhibit 2.2: Site Specific Review of Sites with Parking Reduction Variances

	ADDRESS	LAND USE	BY-LAW REQUIRED SUPPLY	PARKING SUPPLIE D	REDUCTION	MAX UTILIZATION
1	1015 Sutton Dr.	Industrial	107	96	10%	90%
2	1050 Highland St.	Residential	27	18	33%	94%
3	1831 Walker's Line	Restaurant	55	48	13%	94%
4	1960 Appleby Line	Retail	427	364	15%	74%
5	3230 Mainway	Warehouse	195	131	33%	63%
6	3245 Fairview St.	Retail Centre	98	86	12%	100%+
7	4155 Fairview St.	Retail Centre	185	166	10%	81%

Based on parking surveys of these sites, all except one site appeared to have adequate parking supply to satisfy the maximum demand that was surveyed. The one site (site #6) that didn't have adequate supply was a strip plaza style retail centre with a high density of commercial tenants (small scale retail). There was no high traffic tenant in the plaza, and no obvious reason for this lack of supply. The other retail centres that were surveyed, which did not appear to be undersupplied with parking could be better categorized as large format retail. The implications that these findings have on the recommended parking ratios are detailed in Section 7, where the recommended ratios for each land use are identified.

2.10 Emerging Trends in Mobility

There are many variables at play that are changing the way people are moving around cities. Advancements in new technologies and shifts in priorities are enabling these changes and will continue to create new paradigms in human travel. Some of these trends are listed below:

New private sector transportation services are emerging

"New mobility" technologies like connected and autonomous vehicles (CAV), and services like ride hailing applications (e.g. Uber), represent major shifts in the delivery of transportation services. These services provide another alternative and expand the arsenal of options that are available to better enable a car-free lifestyle.

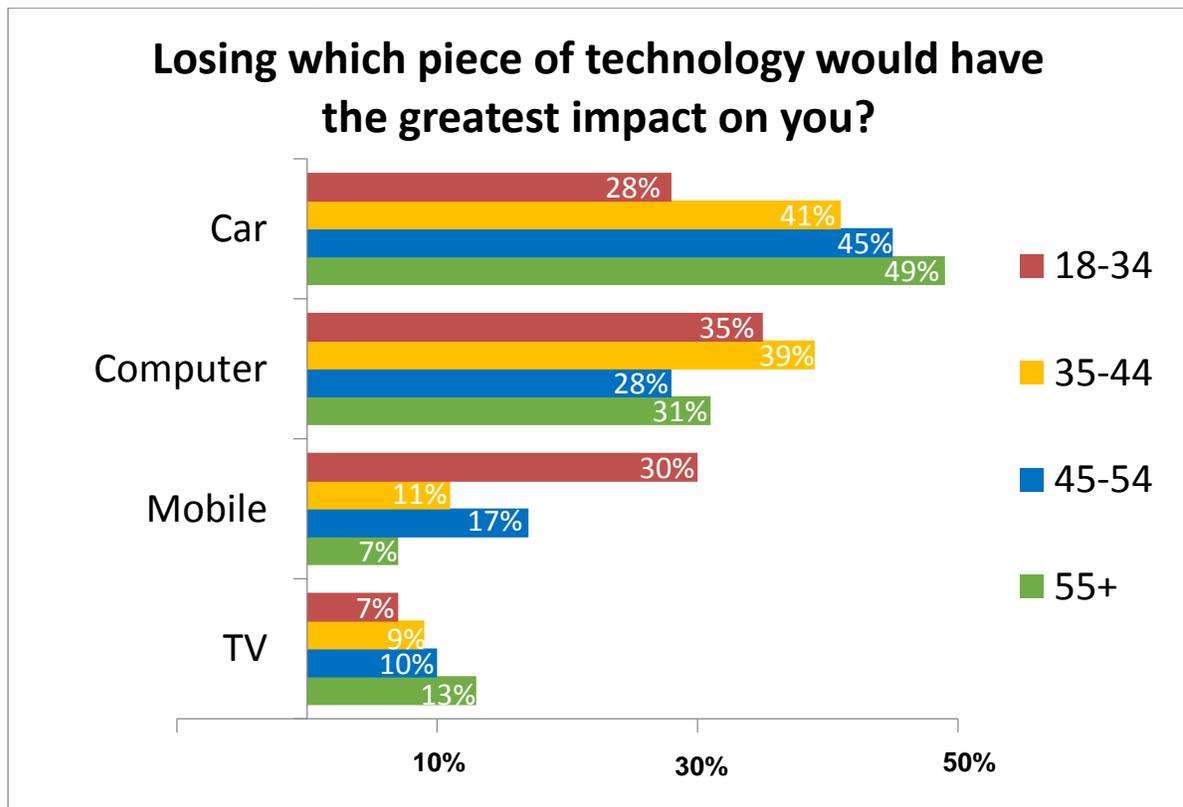
Millennials are becoming more multi-modal and less dependent on car ownership¹

There are several emerging services that add to suite of mobility options that can substitute the need for car ownership. Some of these services, such as car-share and bike-share have been available for decades, but are becoming more accessible and user friendly through web-based and smart-phone booking and payment applications. Millennials are the primary user group of

¹ American Public Transportation Association

these applications and are more reliant on their smart phones than older generations. Not only that, but millennials are more reliant on their smart phones than other pieces of technology, including a car. These findings are a results from a survey by Zipcar in 2012 asked: “losing which piece of technology would have the greatest impact on you?” Respondents answered with one of four options: Car, Computer, Mobile, and TV. The study was based on the opinions of 1,015 adults (including 303 Millennials) in December 2012². The results from the survey are shown in Exhibit 2.3. For persons in the survey aged 18-34 (Millennials), 35% identified that losing their computer would have the greatest impact on their life, followed by their mobile phone (30% of respondents), and then car (28% of respondents).

Exhibit 2.3: Technology Impact Survey



Driverless Cars are on the horizon

Some experts predict that door-to-door, on-demand ride hailing provided by fully autonomous vehicles will be an everyday travel option in major urban areas by 2025. The broad adoption of CAVs in conjunction with new private-sector business models would represent a transformation in how cities move, and would disrupt established practices in multiple industries. New mobility will likely have a tremendous influence on where we live and work, and how we interact. One of the most significant results of this shift would be the demand for parking. As people become more reliant on hailing a car for individual trips and being dropped off at or close to their destination, they would no longer require a parking spot since the vehicle would carry on to address its next task.

² https://www.slideshare.net/Zipcar_Inc/millennial-slide-share-final-16812323

As mobility choices increase, the need for parking will decrease

All of these emerging trends will lead to a transportation ecosystem that is much different than the transportation environment of today. Although it is challenging to accurately forecast the implications of all these changes, it is important to develop parking standards that are context sensitive and have the flexibility to be applicable to future contexts in order to maintain an efficient development approvals process that is supportive of sustainable development.

2.11 Public and Stakeholder Opinion

2.11.1 Stakeholder

A meeting involving stakeholders was conducted to gain insight into the general concerns and opportunities that they have regarding parking. A full list of stakeholders and representatives are included in Appendix D. The following major discussion points were raised:

- Unbundled Parking – Sometimes the supply runs out, then there is nothing left and developers sell visitor parking spaces to tenants, which causes a shortfall in visitor parking supply;
- No Visitor Parking Downtown – There have been complaints from downtown residents that their visitors cannot find parking and visitors are parking on the street or in other lots overnight and getting tickets;
- There is also a demand for service vehicle (e.g. personal care service, housekeepers, building maintenance worker vehicles) parking at downtown condo developments. Currently, service vehicles are parking in loading areas;
- Office uses generally have an oversupply of parking;
- New residential units with garage plus 1 driveway space is not enough, as garage is being used for storage, then the 1 space on the driveway is not enough and people park illegally;
- There is a need to better regulate and promote shared parking opportunities;
- Condos with a high portion of elderly people require parking for service workers (nurses, cleaning services, personal care service, housekeepers etc.);
- The downtown and orchard residential areas have allowed street parking without penalties due to the high demand and limited supply of parking in these areas; and
- Developers have noted that there is an oversupply of parking in some cases.

The specific findings from this meeting are considered throughout this report and in some cases help to form the recommended update to the parking standards.

2.11.2 Public

A public meeting was held to inform the public of the study and its purpose as well as to gain insight from the public regarding their concerns. An online public survey was also made available on the city's website.

A total of 174 surveys were conducted, 54 of which were complete, and 120 were incomplete.

Based on a general summary of the findings, the following conclusions can be made about the public's opinion of parking in Burlington:

- Retail and industrial land uses generally provide too much parking
- Visitor parking is generally in short supply

- Parking at condos, townhouses and medical offices is generally is short supply
- Half of the survey respondents indicated that the presence of high quality public transit should impact parking requirements for a development
- For the most part, people do not agree that the presence of bicycle infrastructure should impact parking requirements of a development

The summary of responses from the survey are included in Appendix A of this report.

3 Review of Best Practices

A Best Practices review was undertaken, to draw upon experiences and standards that have been well established within the industry and other municipalities. Best Practices include examples from other jurisdictions, best practice strategies for reducing parking demand, strategies for parking design, and methods for developing standards. At the end of the description of each best practice, the current application, or absence, in Burlington's existing parking standards are summarized.

3.1 Area Specific Standards

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

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

3.1.1 Current application in Burlington

Burlington currently applies area specific standards in the Downtown Mixed Use Centre Zones, in Uptown Mixed Use Centre Zones, in Mixed-Use Corridor Zones and some Orchard zones.

3.2 Reduced Parking Minimums

Reduce parking minimums to reduce the amount of parking that developers are required to provide based on local context (e.g., quality of transit service).

3.2.1 Description

Parking standards are often a blunt policy tool. As stated in a recent US Environmental Protection Agency (EPA) publication, "Generic parking standards have not kept up with the

complexity of modern mixed-use development and redevelopment.”³, and this has so far generally been the case in Burlington. The parking standards in Burlington’s zoning by-law 2020 are not sensitive to recent development trends, and thus give little consideration to transit-oriented development, infill development, or affordable housing, which often have unique parking requirements.

Ontario’s Climate Change Action Plan addresses parking by prescribing the removal of parking minimums from all municipal by-laws within the next 5 years. Recognizing that this should be phased in incrementally, this study recommends significant reductions to the current minimums, as well as the introduction of maximums.

There are many factors that influence parking demand including development type and size, development density and design, availability of transportation choices, surrounding land-use mix, off-site parking availability, and demographics (e.g., income, age, etc.). There are two main approaches to reducing parking minimum requirements to reflect local conditions. The first is to adopt unique parking standards for a specific area reflecting the land use and transportation objectives for that area. The second is to adopt modifying factors that reduce minimum parking requirements based on site-specific conditions (e.g., proximity to rapid transit, availability of good pedestrian infrastructure, adoption of TDM programs, etc.). Modifying factors must be developed with careful consideration to the factors influencing parking demand.

Litman⁴ summarizes the potential parking demand reductions that can be achieved based on a variety of site-specific factors, such as lower average income, availability of carshare vehicles, and land use mix. While the actual demand reductions should be applied with care, this list provides a good summary of the many factors affecting parking demand.

Burlington’s current parking standards include a parking maximum in Mixed Use Corridor Zones to the effect of 102% of minimum standards that is identified in the general parking provisions.

3.2.2 Current application in Burlington

Burlington currently applies reduced minimums of 5% in mixed use corridor zones and reduced minimums for residential dwellings in some of the Orchard community planning zones. In the downtown exemption area, there are no parking requirements for non-residential uses.

3.3 Parking Maximums

Maximum parking requirements set an upper limit on the amount of parking developers may provide, as specified in land use by-laws. Parking maximums may be opposed by the development community and the public. Imposing parking maximums that are too restrictive can result in parking shortages.

3.3.1 Description

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

The current practice among many commercial developers is often to provide as much parking as possible and to provide enough parking to satisfy parking demand during busy holiday shopping periods. For example, the industry standard among shopping centres is to supply sufficient

³ US Environmental Protection Agency. (2006) Parking Spaces/Community Places – Finding the Balance Through Smart Growth Solutions. Washington, DC.

⁴ Litman, T. (2006) Parking Management Best Practices. American Planning Association, Chicago, IL.

parking to meet the parking demand of customers and employees at the 20th busiest parking demand hour of the year, often occurring on Boxing Day or the days leading up to Christmas Day at shopping centres (but it could be any hour of the year). This means that parking facilities will not be fully occupied during 99 percent of operating hours and that typically over half of the available spaces will be vacant during 40 percent of the year's operating hours⁵.

Parking maximums are intended to:

- Reduce the amount of space dedicated to parking and support transit and pedestrian-oriented development;
- Provide a strong incentive for transportation demand management⁶;
- Curb practices among some industries towards parking oversupply, particularly in areas in close proximity to transit stations, where transit use may reduce parking demand;
- Potentially allow parking pricing to come into play with associated transportation demand management benefits (e.g. increased transit use); and
- Allow the City to have input on how all parking is built, which enhances its ability to help create well-designed urban areas.

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

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

There are a number of approaches to facilitate effective implementation of parking maximums:

- Maximums should be based on research regarding parking demand and involvement with key stakeholders;
- To ensure that parking maximums do not discourage development, other incentives, such as density bonuses in intensification areas may be advisable;
- Maximum standards can be phased in over time as demand reduction programs and transit improvements are provided;
- Individual developments may be allowed to exceed parking maximums if other objectives are met (e.g. sharing of commercial parking with transit park and ride, structured parking, etc.);
- Maximum limits can be set to only apply to surface parking; and
- Supplemental strategies, such as preferential parking for residents and parking enforcement may be required to minimize spill-over issues.

⁵ Urban Land Institute and International Council of Shopping Centers. (2003) Parking Requirements for Shopping Centers, 2nd Edition. Washington, D.C.

⁶ The undersupply of parking for employees is a key incentive for employers to adopt and promote workplace transportation demand management. Ample, free parking at workplaces has been cited as one of the biggest barriers to TDM in Markham (Lorenzo Mele, SmartCommute Co-ordinator, Markham, personal communication).

3.3.2 Examples

The use of parking maximums is growing in Canadian municipalities. Traditionally, maximum parking standards have been designed to limit automobile volumes entering downtown or central business areas such as in Vancouver and Toronto. However, parking maximums are being used increasingly in suburban contexts to support intensification areas.

In addition to setting a maximum parking ratio by use, maximum parking standards have been implemented in a variety of ways:

- The Land Use Bylaw Review Parking Strategy for Calgary proposes that office parking requirements be set to a minimum of 1.5 stalls per 100 square metres gross floor area, with a maximum rate of 3 stalls per 100 square metres gross floor area *in surface parking*. This specification limits the amount of surface parking, while providing some flexibility to a development to provide more parking if desired in parking structures. However, given that above ground structured parking typically costs more than three times the amount of surface parking to build, developers have a strong disincentive to build more parking.
- In Vaughan, maximum parking standards are set for Vaughan Metropolitan Centre. Both minimums and maximums are identified in this area.
- In Burlington, the current by-law sets a maximum of 102% of the identified general provision minimum for non-residential uses in Mixed Use Corridor Zones.

3.4 Transportation Demand Management

Transportation Demand Management (TDM) tools can be used in a variety of ways to decrease the demand for parking. The City's Transportation Master Plan will set goals aimed at integrating land use and transportation (including parking), encouraging mode shifts to public transit, walking and cycling, and developing a multi-modal transportation network. TDM tools can help facilitate the mode shift to sustainable modes of travel and help reduce the overall demand for parking. Some of the TDM initiatives that can be used by developers to reduce the requirement for parking are identified below.

3.4.1 Preferential Carpool Parking

Preferential carpool parking is defined as desirable parking spaces set aside for car and van pools.

3.4.1.1 Description

Preferential parking provides an incentive to ridesharing by providing reserved spaces to carpool vehicles. In addition to the TDM benefits, encouraging carpooling also reduces parking demand. Preferential parking is normally applied at off-street facilities at workplaces or institutions. The effectiveness of such a strategy will depend on the relative attractiveness of preferential parking (i.e., shortage of easily accessible and convenient all day parking). Preferential parking is most attractive in large, well-utilized lots where preferential parking spaces closer to building entrances will provide a shorter walk and potentially an enhanced sense of security and a better chance of finding a parking space. It is particularly applicable in areas where transit options are minimal, such as many workplaces in Burlington.

Monitoring is required to ensure appropriate use. Carpoolers may be required to register to be eligible for preferential spaces. Unless parking facilities are attended, a transportation or parking coordinator would need to be designated to monitor carpoolers.

3.4.1.2 Examples

Designated spaces for carpoolers are fairly common in cities implementing TDM programs. Some examples include:

- Markham Civic Centre provides preferential parking;
- In Portland, Oregon, for office uses with more than 20 required parking spaces, five spaces or five percent of the parking spaces on site, whichever is less, must be reserved for carpool use. These sites must be located close to the building entrance.

3.4.2 Bicycle Parking Requirements

Similar to vehicle parking requirements, this initiative requires parking facilities to be provided for bicycles.

3.4.2.1 Description

The provision of adequate bicycle parking and associated shower and change facilities is an important element in the promotion of bicycle use. The absence of these supportive facilities is a deterrent to more widespread bicycle travel across Burlington. More bicycle trips will typically reduce the number or growth of vehicle trips, and tends to lead to a more sustainable pattern of urban travel. As a method of promoting cycling, a number of municipalities have begun to institute minimum requirement for bicycle facilities.

A review of best practices in terms of bicycle parking requirements elsewhere revealed:

- A comprehensive bicycle parking program will provide both short-term parking to accommodate customers, visitors, couriers, etc. who will be parking for no more than one or two hours and longer-term parking for employees, students, residents, etc. who will be parking for more than two hours. Short-term parking can be provided as basic bike parking, which is typically a bike stand or rack, ideally no more than 15 metres from a building entrance and in a clearly visible area to support informal surveillance. Long-term parking requires an enhanced level of service, such as a secure, weather-protected location on a building site.
- The appropriate proportion of long-term versus short-term spaces is not uniform across uses. For example, office uses will be more heavily weighted towards long-term bike parking, while retail uses will require more short-term parking.
- Bicycle-supportive land use by-laws can also specify requirements for lockers, wash basins, and showers to ensure cyclists have adequate facilities to shower and change upon arriving at their place of work. Such requirements can be based on the number of long-term bicycle parking spaces required. For example, the City of Vancouver has mandated at least one water closet, washbasin and shower for both genders for any building that requires at least 4 long-term bicycle stalls. Alternatively, Halifax does not require shower facilities, but allows reductions in motor vehicle parking (up to 10% of the required amount) given enhanced bicycle facilities, including additional bicycle parking, sheltered bicycle parking, and the provision of showers or clothes lockers.
- Experience has shown that there should be no upper limits on bike parking supply and that bicycle parking demand is essentially proportional to the number of employees, customers, etc.
- Bike parking should not be specified as a percentage of auto spaces since one would not want to limit the number of bike spaces on the basis of auto spaces. Indeed, there may be an inverse relationship between the two in some cases.

Bicycle parking requirements are typically specified based on number of residential units or gross floor area for other uses, such as offices. Calgary specifies some bicycle requirements in terms of required automobile spaces, although this is not recommended, since areas with reduced minimum requirements, such as core areas, may actually have higher cycling rates.

3.4.2.2 Examples

A review of standards in other jurisdictions revealed that requirements for bicycle parking spaces are not common in Canadian cities, but have been established, for example, in Calgary, Vancouver, Ottawa, Kingston, Halifax, and Toronto.

Bicycle parking standards for office uses are typically in the range of 0.1 long-term spaces per 100 m² of gross floor area. Assuming a typical density for office employees of 3.9 employees per 100 m², this requirement works out to about 1 long-term space for every 40 employees. This corresponds to a long-term bicycle parking space for approximately 2.5% of employees.

3.4.2.3 Current application in Burlington

Although Burlington currently has bicycle parking requirements, they are not comprehensive or context sensitive, nor do they address additional facility elements, such as covered bicycle parking, or shower/change facilities in office spaces. This study recommends updates to the existing parking standards. While the current standards identify the required number of bicycle parking spaces, other regulations address the number of racks that are required. Section 7 of this report will recommend updates to the current standards and method of measurement. Section 8 will recommend design standards for bicycle parking.

3.4.3 LEED Transportation Credits for Parking

Leadership in Energy and Environmental Design (LEED) for Building Design and Construction is a comprehensive third party accreditation system used to measure the sustainability of a building or a development. A credit (points) system is used to measure which, if any, LEED accreditation level should be granted. The credit system uses a comprehensive list of factors, including indoor environmental quality, energy, water efficiency, and location & transportation. The location & transportation category includes credits that can be gained based on the location of the site, the surrounding density and diversity of land uses, access to quality transit, bicycle facilities, reduced parking footprint, and provisions for green vehicles.

Since these transportation credits are directly related to factors that affect parking demand, aspects of the criteria to achieve these LEED credits could be integrated into the parking standards. For example, if a given building or development has proved to achieve transportation related LEED credits, a lower parking rate could be applied. Further review of the LEED credits and how they could be integrated into the parking standards will be reviewed in the later stages of this study.

3.4.3.1 Examples

Although not a direct application of the LEED credits system, the City of Toronto Green Standard (TGS) is a two-tier set of performance measures that guide building design towards more sustainable practices which are integrated into development approvals process.

3.4.4 Shared Parking

Shared parking involves the use of one parking facility by more than one land use activity, typically taking advantage of different parking demand patterns by time of day to reduce the total amount of parking that would have been required if facilities were not shared.

3.4.4.1 Description

Shared parking ensures that parking spaces are not designated for any particular user, but operate as a pooled parking resource. This strategy can be considered on a “micro” scale within a single development, or on a “macro” scale between several developments.

The biggest benefits are realized with mixed-use developments, where uses have different peak demand times. For example, a restaurant and an office can share a parking facility with fewer total parking spaces than would otherwise be required for two separate parking facilities. As a result, shared parking encourages more efficient use of the parking supply regardless of the location of the development.

The consideration of shared parking requires some assessment of typical occupancy rates during different times of the day for each of the activities to be included in a shared parking scheme. An example of occupancy rates is included in Exhibit 3.1.

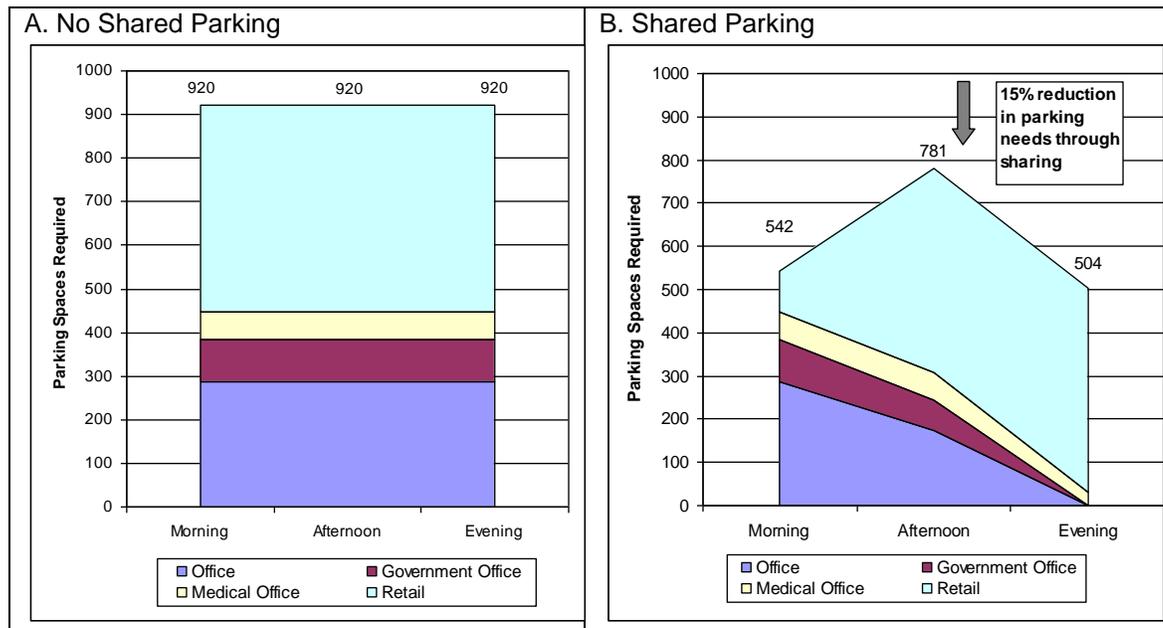
Exhibit 3.1: Typical Parking Occupancy Rates

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

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

From the above table, it can be seen that the combination of office and retail uses within the same building would lead to an overall reduction in the total number of parking spaces that would be required if the uses were considered in isolation. Differences in morning, afternoon, and evening parking demand are shown graphically for a hypothetical development with a variety of office uses and retail in Exhibit 3.2. Without shared parking, the total development would require 920 parking spaces. However, if parking was appropriately designed to be shared among uses, a max of 781 spaces would be required in the afternoon peak representing a 15% reduction in parking supply.

Exhibit 3.2: Hypothetical Mixed-Use Development: Non-Shared vs. Shared Parking



There are a number of factors that need to be considered in implementing shared parking effectively:

- A mixed use development must be planned with use types by proportion of floor area known in advance (e.g., retail, office, restaurant), so that a shared parking calculation can be conducted;
- Parking must be unreserved and designed to serve all uses;
- When a new business moves into an existing development, its parking demand profile may be different from the original use, which may reduce the potential for shared parking and lead to parking undersupply;
- The submission of a shared parking agreement between the proposed users of a shared parking facility can be required to ensure that it can be reviewed and enforcement undertaken if necessary

3.4.4.2 Examples

Provisions for shared parking are included in some form in zoning by-laws of a number of Canadian municipalities. The City of Burlington currently identifies the promotion of shared parking policy in the Official Plan and includes provisions for shared parking in mixed use corridor zones. Vancouver, Hamilton, Mississauga, and Toronto all allow reductions in required parking for mixed use developments with the potential for shared parking.

3.4.5 Peer-to-peer Shared Parking

Peer-to-peer shared parking refers to individuals sharing their private parking spaces and driveways with other members of the public who are looking for parking supply. Peer-to-peer shared parking has become more prevalent through the emergence of the shared-economy and through mobile payment and supply-demand search pairing applications.

Recent advancements in mobile technology have stipulated the development of new private services that leverage private parking supplies that are underutilized to address parking

demand. This is called the peer-to-peer parking market and several applications have gained user popularity recently, such as Rover (<http://roverparking.com/>) and JustPark (<https://www.justpark.com/>). These applications are used extensively in more urban contexts, but are starting to become more popular in suburban areas, where paid parking has been implemented as well.

This service can be effective at opening up private parking supplies that are underutilized, to address the demands of the parking market.

Although there are several benefits of these types of services from a user’s perspective, the outcomes of the mass and unregulated use of these services could result in unwanted traffic in residential neighbourhoods and unwanted competition for the use of publicly owned parking supply.

As these services push harder into the market, they will need to be studied further to understand their net effects on the community and to realize the potential to partner with these services to ultimately leverage their strengths. This parking standards review will go as far as identifying this trend, but it is beyond the scope of the study to recommend regulations or private-public partnership (P3s) for this type of service.

3.4.6 Cash in Lieu of Parking

Cash in-lieu of parking is used by many Canadian municipalities as a mechanism to address parking supply management. It is often used to facilitate development where providing parking is either too costly or difficult due to site configuration. As a parking management strategy, Cash in Lieu can be used to encourage shared parking, discourage car use, encouraging short-term parking strategies and sometimes funding transit. For some municipalities, it has been used to help downtowns intensify and re-urbanize (especially former surface lots).

Cash in-lieu policies generally focus on a specific geographic area, often a downtown or area that the municipality has targeted for intensification. These policies require developers to pay cash as an alternative to providing the minimum number of parking spaces required in the zoning by-law. Payments are determined by the municipality and are established to offset the initial municipal capital cost of constructing a municipal parking facility. Developers pay the funds in lieu of providing a pre-determined number of spots; this varies by project, by-law and municipality. These funds are placed in a reserve fund, and are normally used for the acquisition and construction of parking facilities.

A high level review of Canadian municipalities with Cash in Lieu policies, presented in Exhibit 3.3, shows a significant discrepancy in costs collected by the various municipalities. This is due in part to the methodologies used by each municipality to calculate the charges, and the policy context. In addition, this charge is not usually intended to fund the replacement cost.

Exhibit 3.3: Price of Parking Space in Various Municipalities

MUNICIPALITY	PRICE PER SPOT
Calgary	\$19,606
Toronto	\$2,500, \$5,000 or \$5,000 plus
Vancouver (downtown and heritage districts)	\$20,200
Kitchener	\$20,746
London	\$10,600

Costs of parking can heavily depend on the value of the land for other uses. On average an underground parking space costs approximately \$40,000 per unit to construct. Above ground spaces can cost on average \$12,000. This is only for capital construction costs, operational

costs are additional. Considering the Cash in Lieu attributed to each spot, it can be difficult to achieve a reserve fund that could fund the construction of a parking facility. High growth areas with strong cash-in-lieu policies which developers can justify will result in the largest payments, but this can be difficult to estimate over the long-term.

Some municipalities have cited high administrative costs of these programs as a deterrent, as an example, the City of Calgary is considering concluding the cash-in-lieu of parking program in 2017. The City of Ottawa has recently repealed its program, instead using minor variances of zoning by-law amendments to facilitate the reduction of parking.

Burlington generally does not charge cash in lieu of parking. Instead, all business properties (commercial and industrial) in the downtown are charged a levy (added to their city, region and education taxes) on their tax bill. The 2016 parking tax levy rate for a commercial property was equivalent to \$117.77 per \$100,000 of current value assessment. The total levy raised is \$304,200 in 2016 from the business properties in the downtown parking boundary.

3.4.7 Unbundled Parking

In North America, it is common practice for a parking space (or two) to come standard with the rental or purchase of an apartment or condominium unit. This can lead to an oversupply of residential parking supply in a given building since some tenants do not own vehicles.

Making the purchase or rent of a parking space an option for owners or tenants of a condominium development is one way of maximizing the utility of residential parking supply.

There are several ways that unbundled parking can be facilitated. They include⁷:

- Creating a market place where tenants/owners can list the availability of their unused parking spaces for rent by other tenants.
- Offer discounts to renters who choose not to take on a parking space
- In condominiums, the condominium association can take on ownership of the building's parking supply, which is then leased out to occupants, separate from the deed.

3.5 Phased/Adaptive Approach

Burlington is expected to experience significant growth and transformation over the next few decades. This transformation will also be paralleled by significant change in technology and emerging mobility trends, which are outlined in Section 2.9.

While the proposed parking standards may seem acceptable today, there may be significant change to the demand in the near future. But like all urban transformation, the process is extremely gradual. As such, it is reasonable to adopt a phased approach to parking standards that will be easily adaptable to the context of the day. Although it is beyond the scope of this study to suggest different parking standards for different future time periods, adopting best practices, like the adoption of parking maximums and the application of parking reductions can help achieve standards that are more context sensitive and adaptive.

3.6 Design Standards

Given the extensive area developers in Burlington devote to parking, its design can have a profound impact on the City's environment, both visually and functionally. The primary objectives of parking design standards include:

⁷ <http://www.mapc.org/resources/parking-toolkit/strategies-topic/unbundled-parking>

- Mitigate urban heat island effect;
- Integrate parking lots as best as possible with existing or planned urban context;
- Enhance/maintain green spaces;
- Improve public realm safety, comfort, connectivity, and aesthetics;
- Manage storm-water run-off;
- Encourage use of recycled and environmentally sensitive materials;
- Design for those with disabilities;
- Recommendations for the design and application of electric vehicle charging spaces; and
- Snow and salt management.

There is no universally ideal solution to designing parking. Rather, the issue often requires careful site-by-site consideration that links with the City's broader urban design strategies. As referenced in this document, the Official Plan identifies that "*City Council shall require landscaped islands and screening in the design of large parking lots.*" While the existing Zoning By-law 2020 addresses the inclusion of landscape areas in large parking lots in certain areas, there is still a lot of room for improvement and the development of parking design guidelines will be an important tool for developers to use to design parking lots with more sustainable practices in mind. A summary of best practice parking design elements that will be considered in the development of new standards are included below:

- **Location and Layout** - Parking design should strive to provide safe and convenient pedestrian circulation while minimizing the impact on the adjacent public realm and maximizing space for landscaping.
- **Landscaping** - Landscaping should respect the features and needs of the natural landscape in maximizing aesthetic comfort, shading, and space for storm water management, with careful consideration of all four seasons.
- **Stormwater Management** - Parking surfaces should minimize the use of impervious surface and create space for low impact storm water absorption and re-use. This includes special consideration for the top floor of parking structures.
- **Lighting** - Building exteriors should be well-lit, as efficiently as possible, to create the feeling of a safe and comfortable pedestrian environment. As such, the aesthetic and design value of lighting elements is at least as important as their lighting function or ease of maintenance.
- **Accessible Parking** - As much as possible, features accommodating persons with disabilities should be integrated into the central functioning of the main access routes, and not added secondarily as an afterthought.
- **Bicycle Circulation and Parking** - Convenient short- and long-term bicycle parking should be provided, which is both secure and protects from harsh weather.

4 The Structure of Parking Standards

There are several ways to structure parking standards within a By-law. This section provides an overview of structure typologies that can be considered for the updated standards.

4.1 Types of Structures for Parking Standards

Parking standards are often a blunt policy tool. As stated in a recent US Environmental Protection Agency (EPA) publication, “Generic parking standards have not kept up with the complexity of modern mixed-use development and redevelopment.”⁸, and, aside from a few exceptions, this has so far been the case for the most part in Burlington. In addition, most parking standards in Burlington do not provide special considerations. There are many options to improve the existing parking standards to encourage more sustainable development patterns and corresponding travel behaviour, thus reinforcing the City’s quality of life goals. Four broad approaches are outlined below. Combinations of all these approaches are often used in the structure of standards.

4.1.1 Generic Structure

Since the existing parking standards already have a significant variety of land uses and some stratification based on policy area, in essence, the existing structure would be maintained with slight modifications to the current minimum parking supply, the addition of parking maximums, and adjustments to the measurement units for a given standard. The advantages of this approach are its simplicity to implement and potential acceptability given its similarity to the current standards. Assuming many of the existing inconsistencies are resolved, the standards would be relatively straightforward to enforce and would require few internal administrative changes.

4.1.2 Structure based on Adjustment Factors

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

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

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

- Los Angeles grants a reduction of 0.5 spaces per affordable housing unit, with further reductions if the units are within 1,500 feet of high-order transit;
- Portland, Oregon removes minimum parking requirements for sites located within 500 feet of a transit street with at least 20-minute peak hour service;

⁸ US Environmental Protection Agency. (2006) Parking Spaces/Community Places – Finding the Balance Through Smart Growth Solutions. Washington, DC.

- For offices within 400m of a light-rail station, Pasadena, California, applies a maximum parking standard equivalent to 75% of the minimum standard in other areas;
- The office zoning in Montgomery County, Maryland allows a 15 % reduction to the minimum parking requirements if businesses participate in the “Share-A-Ride” program. Participation involves designating a transit co-coordinator and reserving at least 20% of parking for carpools. Other ways to qualify include subsidizing transit passes for employees⁹.
- South San Francisco has enacted a citywide Transportation Demand Management (TDM) Ordinance, which allows reduced parking requirements for projects meeting TDM requirements. The ordinance applies to all non-residential developments that expect to generate 100 or more average daily trips, or to projects seeking a floor area ratio (FAR) bonus. Parking reductions are not fixed, but are subject to case-by-case review and depend on the number and extent of the TDM strategies implemented (e.g., parking for carpools and vanpools, transit subsidies, guaranteed ride home, parking charges for employee spaces, etc.).

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

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

4.1.3 Area Stratification Structure

Sub-regions within the city would be defined and grouped, with each group having its own parking requirements. For some land uses, there may be little variation across these identified regions, while others may vary dramatically. Broadly, a zone-based approach allows the parking requirements to address the specific needs in particular areas of the city, which may stem from long term transportation and land use planning goals.

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

4.1.4 Form-Based Structure

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

As this approach is prescriptive in declaring what a city’s built form should look like, as opposed to detailing what is not allowed, it can be effectively integrated with the city’s planning visions

⁹ Smith, T. (1983) Flexible Parking Requirements. American Planning Association. Planning Advisory Services Report #377. Chicago, IL.

and similarly, easy for developers to predict what would be required of their projects. Such codes also tend to be comprehensible to a broader audience since they directly reference the built form. Form-based codes are thus easier to understand, enforce, and represent graphically.

In terms of parking requirements, the minimum and/or maximum standards might be specifically defined for various building envelope or street section characterizations, but across broad land-use categories (such as those used in the SmartCode: residential, lodging, office, retail, civic, and other¹⁰). Given the nature of form-based standards, parking requirements would also likely include details related to their design. It would be very challenging, however, to integrate a form-based approach to parking standards within a traditional zoning by-law, as presently exists within the City of Burlington, and the resulting by-law would be quite complicated.

4.2 Defining a Parking Structure for Burlington

Burlington Zoning By-law 2020 currently uses a combination of general provisions (Generic Standards), area stratification, and some reduction factors. The structure for the updated standards will follow Burlington's existing structure, with some slight modifications, which are defined below. This structure is a hybrid structure which takes advantage of the benefits of the various structure types described in Section 4.1

4.2.1 Adjusting Existing Land Use Categories

One of the updates to the existing structure will include reconciling the existing land use categories. There are opportunities to introduce new categories, as well as opportunities to group separate categories into the same standard. The justification for these adjustments is based on results from the parking survey that was conducted as part of this study. The full list of categories and suggested changes can be found in Appendix E.

4.2.2 Updating the Area Stratification

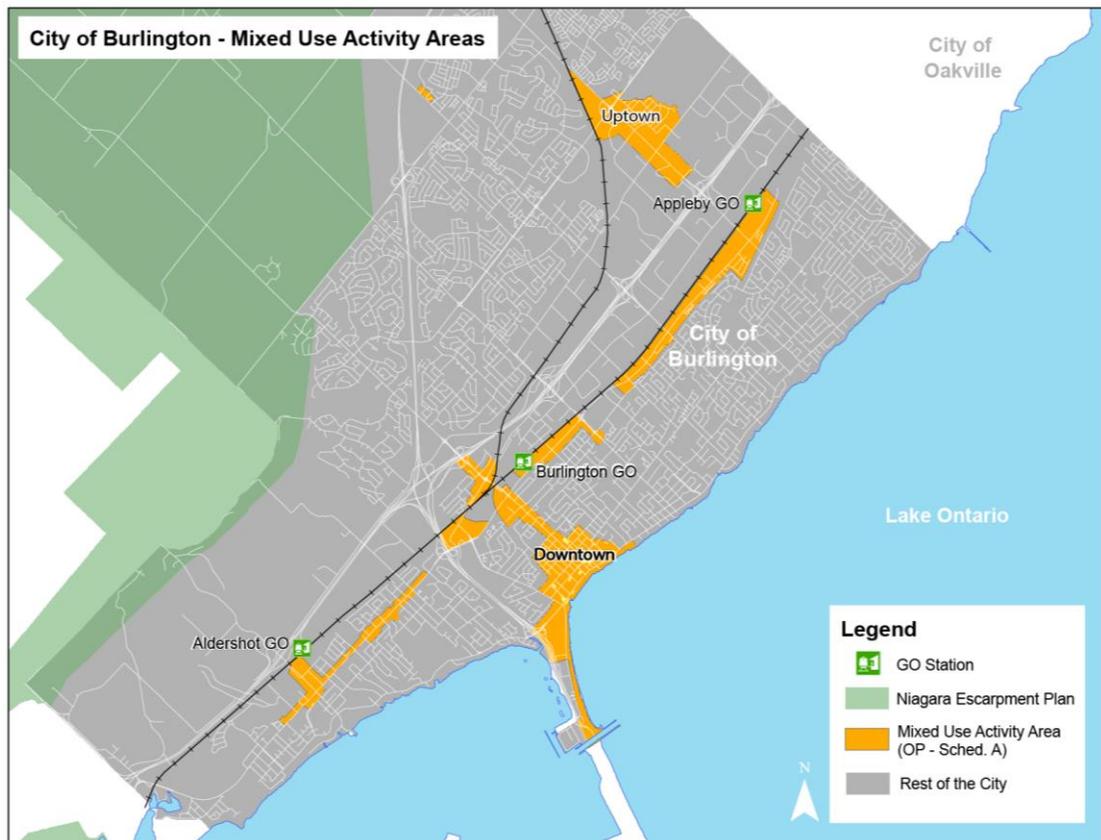
As identified in the Background Section of this report, there are several special planning areas in Burlington which have a different set of city building objectives. Burlington currently applies area specific standards in the Downtown Mixed Use Centre Zones, in Uptown Mixed Use Centre Zones, and in Mixed-Use Corridor Zones.

These reductions are somewhat inconsistent and there is an opportunity to apply them to a greater and more generic growth area.

The Mixed Use Activity Areas are a special policy area, which are identified in Schedule A of the Official Plan. These areas will undergo redevelopment which will profile a mixture of land uses, intensification, and a transit and pedestrian oriented urban form. The draft urban structure, which will be considered for inclusion in the update of the City's official plan includes an expansion of these areas and therefore should be considered as an update to the Mixed Use Activity areas for the purpose of area stratification of the parking standards. The existing Mixed Use Activity Areas are mapped in Exhibit 4.1. For the purpose of this document, the expanded Mixed Use Activity Area will be referred to "Intensification Areas."

¹⁰ Duany, Sorlien, & Wright (2007) SmartCode Version 9.0.

Exhibit 4.1: Mixed Use Activity Areas



Intensification Areas

For the purpose of these parking standards, which were written prior to the new Official Plan, the term Intensification Areas is used. This area will be represented by all intensification related land uses that will be designated in the new official plan.

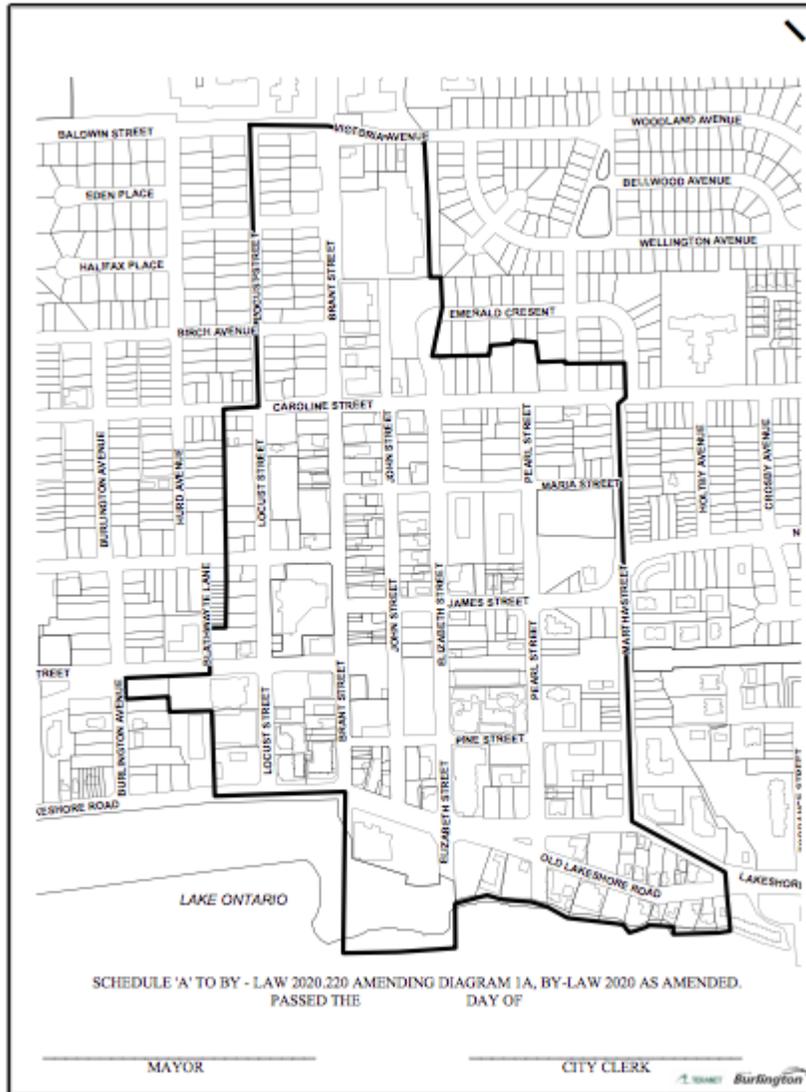
Other Areas

These "Other Areas" are areas that are not included in Intensification areas, for which parking standards not included in the Intensification Areas will be applied, and are referred to as Other Areas in the tables later in this document.

Downtown Exemption Area

The downtown exemption area should be maintained in the updated parking standards. This area is illustrated in Exhibit 4.2.

Exhibit 4.2: Downtown Exemption Area



4.2.3 Expanding the Application of Maximums

The only mention of parking maximums in Burlington's existing by-law is the application of a 102% cap on the parking minimum for non-residential uses in Mixed Use Corridor Zones.

Parking maximums are an effective compliment to parking minimums, as they provide a recommended parking supply but restrict an oversupply.

Part of the design guidelines for these Mixed Use Activity Areas recommends a higher standard of design for parking and the promotion of structured parking to facilitate a more compact urban form. The Uptown Mixed Use Area, which is within the Mixed Use Activity Areas, recommends the establishment of parking maximums in the Uptown Policy Brief (2014).

Burlington's updated standards will contain more provisions for parking maximums in the Intensification Areas.

4.2.4 Adding Additional Adjustment Factors

The addition of more site specific adjustment factors that are reflective of TDM principles should be adopted in Burlington's updated parking standards. These would include carpool parking, car-share parking, and will be discussed in greater detail in Section 7.

5 Methods for Setting Recommended Parking Standards

There are several tools and methods for setting parking standards that will satisfy the needs of the local context. These methods are described in this section. None of these tools would be solely used by themselves, but rather, they would complement one another and help arrive at practical and defensible parking standards.

5.1 Build Upon Existing Parking Standards

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

5.2 Empirical Surveys

Empirical parking surveys are a major component of this study. A spot survey approach was adopted to determine parking supply and peak parking occupancy at 77 sites across 30 different land uses in Burlington. Empirical surveys are necessary to enable an understanding of parking requirements for a given use.

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

5.2.1 Survey Methodology

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

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

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

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

5.2.2 Spot Surveys

Spot surveys were conducted by two surveyors in May and September of 2016. Surveyors visited sites at or near the expected time of peak parking demand for each land use. Peak demand periods were based on the peak that is identified in ITE 4th Edition Parking Generation (2010), and was confirmed and updated using Google's "Popular times" application, which is

based on historical visits to a particular place. The following data items were collected during each survey:

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

The sites selected for the spot surveys were based on areas of interest identified by the City.

5.2.3 Survey Limitations

The spot survey approach was adopted to allow data collection over a large study area, with a variety of different land use categories, and several locational characteristics of interest. There are several limitations to this approach, however, which should be identified. First, since the candidate sites generally needed to be stand-alone buildings, the survey tried to avoid areas with extensive shared and street parking. Thus, the effects of shared parking and any related modifications to parking standards that may be involved in cases with extensive shared parking, will need to be addressed outside of the survey.

Secondly, even with stand-alone sites, there is still no way to be certain that the observed parking occupancy is all for the site of interest. A retail customer, for example, may park in the lot of a nearby office building. The only way to determine the amount of observed parking associated with a site is to survey each customer/employee regarding their mode of transportation and their parking location. Such surveys are infeasible given the large study scope.

Thirdly, the survey could not assess building occupancy rate, particularly for office buildings. All buildings were assumed to be 100 percent occupancy unless the surveyor noticed obvious vacancy during their site visit. This may lead to an underestimation of peak parking occupancy in some cases. However, this will likely only have a minor effect on results, since the GTA has one of the lowest office building vacancy rates in North America. In addition, since buildings are rarely fully occupied, it may be prudent to implicitly account for a small amount of vacancy in the office parking standards.

Finally, spot surveys only measure parking occupancy, which typically refers to the demand for free parking. Understanding actual parking demand, which varies with price, requires more detailed assessment, such as Willingness-to-Pay surveys.

5.2.4 Site Specific Review

A site specific review was conducted for properties that have adopted parking reductions as part of a variance to the parking requirement. The results of this site specific review are included in the recommended parking standards and are a component of the justification for developing standards for the land uses that were included in the site specific review. A summary of the entire site specific review is provided in Appendix C.

5.3 First Principles

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

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

General Office Parking Demand Ratio	=	Employee Density	X	Auto Driver Mode Split
(Spaces/100 m ²)		(employees/100 m ²)		(%)

Employee absenteeism (due to illness, working from home, or otherwise) and visitor parking demand also affects office parking demand, but these are generally assumed to cancel each other out. Calculations for sample scenarios are shown in Exhibit 5.1 representing a good transit service future scenario based on cited targets of increases in transit and active transportation mode splits. Auto Driver mode split is representative of the portion of trips that have a driver. This does not include the portion of trips that are completed as an auto passenger. This metric is directly indicative of parking demand.

Exhibit 5.1: First Principles Calculation of Office Parking Demand Ratio by Scenario

Scenario	Employee Density (# employees/100m ²)	Auto Driver Mode Split (%)	Parking Demand Ratio (spaces/100 m ²)
Burlington 2031 (mature state from TMP)	3.9	62%	2.42
Current Burlington	3.9	77%	3.00

Based on 2011 data from the GTA Transportation Tomorrow Survey (TTS), 77% of AM peak period trips that end in Burlington are by auto driver. This tool for setting recommended standards is only applied to the employment land uses.

5.4 Policy-Based

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

Of course, if a policy-based justification is used to develop lower minimum parking standards or maximum standards, good alternatives to the private vehicle should be in place or in development to ensure a successful outcome. In addition to the quality of non-auto modes, area-

wide parking management strategies can also be very effective in making the best use of a limited parking supply¹¹.

In developing city-wide parking standards for Burlington, it is particularly important to consider policy-based objectives for Intensification Areas, which include mobility hubs, and the uptown mixed-use policy area.

5.5 Peer Review

One common approach is to review and compare parking standards from other jurisdictions or from published sources (e.g., Institute of Transportation Engineers (ITE) *Parking Generation*, Urban Land Institute (ULI) *Shared Parking*, etc.).

Parking standards in other (comparable) jurisdictions can provide a useful benchmark for Burlington's standards to compare to. The requirements across jurisdictions and within a given jurisdiction can vary considerably depending on the urban context and the city building objectives of a certain area. Each of the land uses that are covered in this document are compared to standards of the same land use in other jurisdictions. This peer review helps form the recommended updates to the existing standards that are a significant part of this document.

With the exception of Oakville, the standards in the peer jurisdictions are in GFA and calculated the same way as Burlington's standards. The rates in Oakville's by-law are presented in Net Floor Area and were converted from net to gross using a 10% deduction for comparison purposes.

The peer jurisdictions that were selected for this study are municipalities that are located in southern Ontario and have similar urban development patterns and drive-alone mode splits (Driver MS) as Burlington (Driver MS = 73%). The peer jurisdictions that were selected are:

- Markham (Driver MS = 67%)
- Vaughan (Driver MS = 69%)
- Guelph (Driver MS = 72%)
- Oakville (Driver MS = 70%)
- Kitchener (Region of Waterloo Driver MS = 71%)
- Hamilton (Driver MS = 67%)
- Mississauga (Driver MS = 65%)

5.6 Defined Approach

As identified in this section, there are a number of methods that can be applied to develop parking requirements for Burlington.

Although Peer Review can be an effective approach, there are limitations with relying exclusively on this approach as conditions that are unique to Burlington's context would not adequately be captured. Therefore, conducting parking surveys is important in order to help determine actual parking requirements that are unique to Burlington. However, there are also limitations to solely relying on parking surveys. For mixed use sites, it is difficult to accurately survey and apportion parking accumulation to specific land uses. Moreover, surveyed parking at one or several sites may not be representative of parking demand at another location given differences in site characteristics (e.g., surrounding density, transit service, etc.) and the popularity of the establishment.

¹¹ Litman, T. 2006. *Parking Management Best Practices*. American Planning Association. Chicago, IL.

Thus, while empirical parking supply and occupancy surveys are an important aspect of the study, multiple approaches for assessing and developing parking standards are adopted. A comprehensive approach involves assessing existing standards in Burlington and other jurisdictions, conducting parking surveys, estimating parking demand directly from first principles, and considering policy objectives. The framework for determining new parking standards is shown in Exhibit 5.2

Exhibit 5.2: Method for Setting Recommendations



The recommended standards will include minimums for all areas outside of Intensification Areas (“other areas”), and include maximums and minimums for Intensification Areas in most cases. Generally, the minimums in other areas will be based on an update to the existing parking minimum, justified by Peer Review and observed rates from the spot surveys.

6 Proposed Parking Standards

This section of the report provides recommendations for updates to Burlington's parking standards. It can be assumed that for any land use that is not discussed in this section, that the existing standard should be maintained.

6.1 Residential Uses

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

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

6.1.1 General Issues and Observations

- There is consideration to allow permit parking on street in cases where the number of cars in a dwelling exceed its parking capacity
- People with just one driveway space have been expanding their driveways into their front lawns to allow for additional capacity. People are using their garages for storage.
- In the online public survey that was conducted as part of this study, visitor parking was identified as being in under-supplied, especially downtown.
- In the online public survey that was conducted as part of this study, townhouse parking and condo parking were considered to be a land uses that have too few parking spaces.
- There is also a demand for service vehicle parking at downtown condo developments. Currently, service vehicles are parking in loading areas.

6.1.2 Review of Housing Price Impact on Parking Requirements

Research

There is not a lot of research completed on the impact of housing prices on parking requirements, and most of the following comments will be based upon a high level review of the high density housing market, trends in parking construction and marketing, and anecdotal experiences in the Greater Toronto Area (GTA) market. The separation of unit purchases and parking stalls (unbundled parking) in high density residential units is a strong indication that there is a substantial change in parking demand in newer units.

The GTHA's residential market is being impacted by Provincial policies which have placed limits on the greenfield land supply and set intensification targets in major cities which are encouraging higher density development. Encouraged by the higher cost of residential land, many developers

and purchasers will look to provide fewer parking spaces in order to make units more affordable. This has been enriched by policies working to encourage residential intensification around transit hubs.

A review of average price per square foot across Toronto and the western-GTA demonstrates that price per square foot for high density (condo) units is considerably higher in Toronto and Mississauga. This is in part due to the higher cost of residential land in Toronto and Mississauga, desirability, proximity to employment and a context of higher density development.

Larger units, including those with more than two bedrooms have traditionally required more than one parking spots as there is a high person per unit assumption for these units. Therefore it is not necessarily the cost of the units, though larger units will be more expensive, but the total area and bedrooms that would drive parking demand.

Based on the City of Burlington Development Charges Background Study (2014), Freehold and stacked townhomes, which are increasing in market share, are forecasted to have greater persons per unit than apartments, and lower persons per unit than single detached homes and semis. This is highlighted in Exhibit 6.1 and will potentially result in less parking demand. Ground-related units, and larger apartment units are more expensive than smaller units, and will potentially need more parking, but this is due to occupancy, rather than price.

Exhibit 6.1: Persons Per Unit by Structural Type

STRUCTURAL TYPE	PERSONS PER UNIT
Singles & Semis	3.28
Multiples (inc. towns and duplex)	2.35
Apartments	1.46
<i>One bedroom or less</i>	1.21
<i>Two Bedrooms or more</i>	1.63

Source: City of Burlington Development Charges Background Study 2014 Schedule 4

There are other factors beyond price which will impact parking demand for certain developments, in particular proximity to transit may impact parking demand. At the same time, units in close proximity to high order transit may also command higher prices per square foot, due to desirability. Other factors such as on site car-share services has also anecdotally impacted the demand for parking in well-located developments.

As for low income housing, there has been limited new supply in the GTA market, and the high cost of residential land and development charges can impact the financial feasibility of developing this form of housing. Often, more recent projects have been part of a larger re-development, which uses the construction of market housing to subsidize the affordable components. Redevelopment or infill also allows the developer to realize savings on the land costs.

Parking rates can vary in affordable or low-income housing can vary. On one hand, the jobs often associated with tenants in low income housing may not be transit-accessible, and they therefore might need to buy a car. On the other hand, a few municipalities have had lower parking requirements, such that savings on building parking would be turned into savings on construction and the price of the units. The City of Markham has recognized that the parking requirements for apartments can act as a barrier to the development of affordable housing. The City is looking into better understanding parking requirements for renters and lower-income residents in order to match the parking supply to the actual demand, and ultimately make affordable housing more affordable to construct.

Metro Vancouver has used reduced parking rates to encourage non-market housing. This, along with other reductions such as lowered or waived development charges, can make lower-income housing more feasible for developers. These are mechanisms that municipalities can use to lower the cost of developing rental and/or low-income housing. In Vancouver, 10 out of 18 Metro municipalities indicated support of reduced parking requirements in areas in close proximity to good transit, areas suitable for affordable housing, or both. Six out of these municipalities have adopted policies for reduced parking requirements for affordable housing. (What Works: Affordable Housing Initiatives in Metro Vancouver Municipalities, November 2012)

Conclusions

An increased modal shift, introduction of car-sharing and new mobility options, combined with the high cost of underground parking should lead to less parking demand, especially if parking is unbundled from the purchase or rental of units. Unbundling of parking is an important step in encouraging these lifestyle choices that reduce the reliance on car ownership and decrease parking demand. These factors will impact parking demand far more than the cost associated with the individual unit. It is therefore not recommended that housing price influence parking requirements for residential uses.

6.1.3 Detached/Semi-Detached/Duplex/Triplex

Zoning By-law Definition: A detached unit is a single dwelling unit which is not joined to any other dwelling, while a semi-detached is a building divided vertically into two dwelling units. A duplex is a building divided horizontally into two dwelling units, while a triplex is three dwelling units.

Parking Characteristics: Parking is provided off-street, in a private driveway, a private garage, or both. Due to the nature of the parking supply locations (private driveway or garage), it would be logical that any parking requirements be a whole number.

Existing Requirements

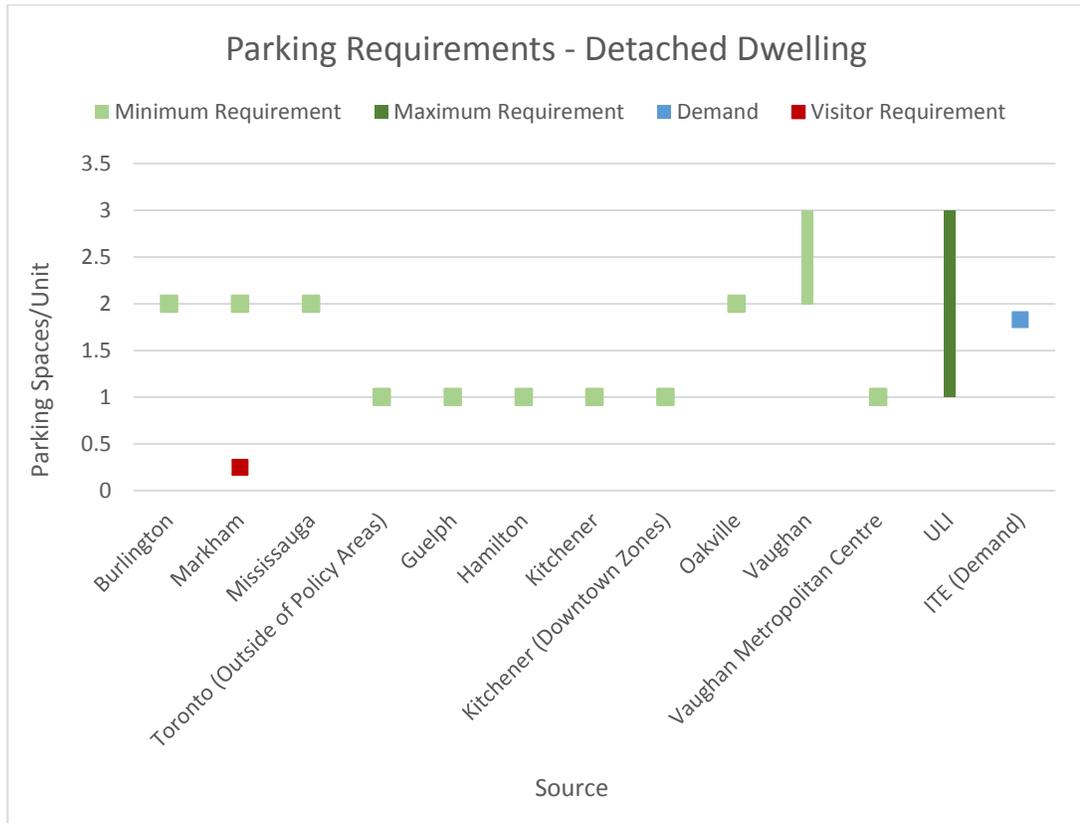
The general parking provisions for this land use are:

- 2.0 parking spaces per dwelling unit, one of which may be provided in an attached or detached garage
- Dwelling on a parcel of tied land fronting onto a common element condominium road: 1.5 spaces per unit, where 1 space shall be located on the parcel of tied land and 0.5 spaces for visitor parking shall be located within the common element condominium block which contains the condominium roadway.

Peer Review

Standards for single family detached units, semi-detached units, and duplex/triplex dwellings across other jurisdictions typically range from 1.0 to 2.0 parking spaces per unit. Requirements vary based on location and type of dwelling. Burlington's standards compare to requirements in other jurisdictions and to the average demand cited by ITE and ranges identified by ULI. This comparison is summarized in Exhibit 6.2. Some jurisdictions, such as Mississauga, have separate standards for multiplex units and detached dwellings. In Mississauga, a detached dwelling requires 2.0 spaces, where as a duplex or triplex require 1.25 spaces/unit. The average demand in ITE for dwellings with three or more units is also lower, with a demand of 1.4 spaces/unit instead of 1.83.

Exhibit 6.2: Peer Review – Detached Dwelling



Observed Parking Demand

No surveys were conducted for this land use.

Recommendations

The existing general provisions for this land use should be maintained, but a new separate standard for triplex dwellings should be introduced. For the Other Areas of Burlington, the Uptown Mixed Use Zones requirements should be converted to be based on spaces per unit, and they should be applicable to the Intensification Areas. Based on best practices and the peer comparison, the Intensification Areas should have a minimum and a maximum range, as summarized in Exhibit 6.3. Note that in execution, 2.0 parking spaces will likely be provided, due to a garage and a driveway typically both being provided.

Exhibit 6.3: Recommendations – Detached/Semi-Detached/Duplex/Triplex (spaces/unit)

Land use	Existing rate	MAX OBSERVED RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum*	Minimum*	Minimum*
Detached/Semi-Detached/Duplex	2.0	N/A	1.83	2.0	1.0	2.0
Standard Triplex	1.0-2.0	N/A	1.4	2.0	1.33	1.33

*These recommendations are based on the assumption that a garage may be counted towards the supply and that space in a driveway that leads to a garage be counted as one space.

6.1.4 Street Townhouse, Street Triplex, Street Fourplex

Zoning By-law Definition: A street townhouse is defined as a building containing not less than 2 and not more than 8 dwelling units and is separated from each adjoining unit by a common or party wall above grade. A street triplex is a version of a street townhouse, containing 3 dwelling units. A street fourplex is a version of the street townhouse, containing 4 dwelling units.

Parking Characteristics: Parking is provided off-street, in a private driveway, a private garage, or both. Due to the nature of the parking supply locations (private driveway or garage), it would be logical that any parking requirements be a whole number.

Existing Requirements

The existing requirements for this land use in Burlington By-law 2020 are 2.0 spaces per unit with the exception of dwellings in the Uptown Mixed Use Centre Zones, where the following requirements are outlined:

Uptown Mixed Use Centre Zones:

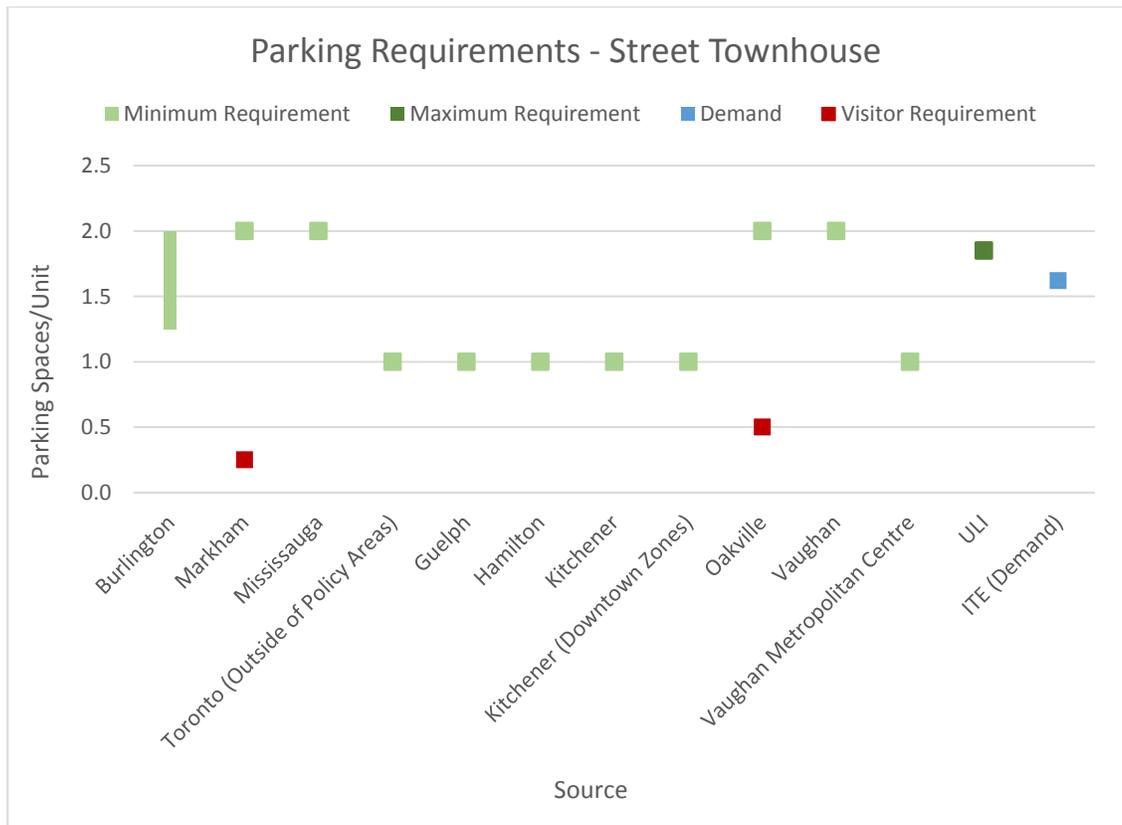
- 1.25 spaces per one-bedroom unit; 1.5 spaces per two-bedroom unit; 1.75 spaces per three or more bedrooms.

Peer Review

The current general provisions that require 2.0 spaces per unit (outside of the Uptown Mixed Use Centre Zones) for this land use are consistent with requirements of its suburban peers – Markham, Mississauga, and Vaughan. In more dense urban contexts (Toronto, Hamilton, and Vaughan Metropolitan Centre), the requirements drops to 1.0 space per unit.

In ITE, the average surveyed demand 1.62 spaces per unit and the maximum requirement outlined by ULI is 1.85 spaces per unit. These values are consistent with Burlington’s standards in the Uptown Mixed Use Centre Zone. The review of peer jurisdictions is summarized in Exhibit 6.4.

Exhibit 6.4: Peer Review – Street Townhouses



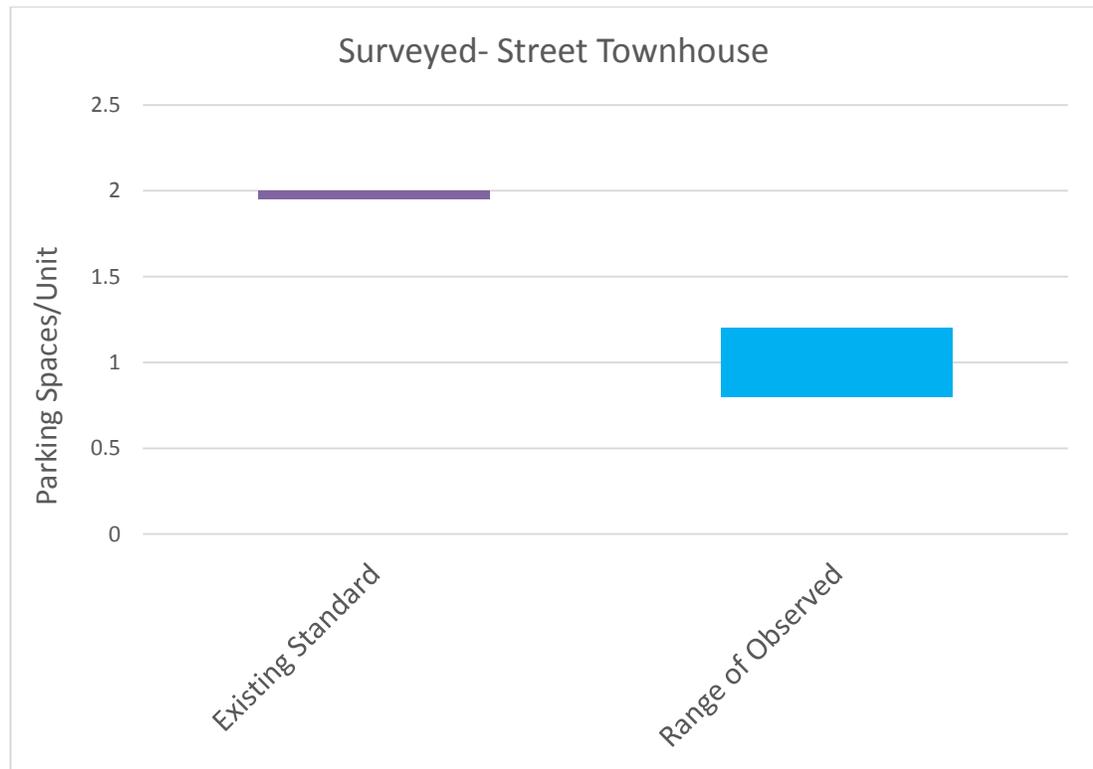
Observed Parking Demand

A total of 8 spot surveys were completed at three different Street Townhouse Complexes at various times within the peak parking demand period for residential land uses (Weekday 20:00-23:00).

Garage occupancy was not considered for any of these spot surveys since the contents of a closed garage could not be determined. The observed occupancy is therefore based on the observed demand in driveways. The recommended rates are based on the assumption that driveways and garage spaces can be included in the required supply.

The range of observed parking demand (in driveways) across all the surveys are compared to the existing requirement in Exhibit 6.5 below.

Exhibit 6.5: Observed Demand for Street Townhouses



*Observed rates do not include garage – supply and demand based on driveways

Recommendations

Based on the observed demand, providing 1.0 driveway space per unit is pushing the lower limit of what the standard should be for this land use in a suburban context.

The existing general provisions for this land use should be maintained for the Other Areas of Burlington, while the Uptown Mixed Use Zones requirements should be converted to be based on spaces per unit, and they should be applicable to the Intensification Areas. Based on best practices and the peer review, the Intensification Areas should have a minimum and a maximum range. Based on the results of the surveys and a review of the peer jurisdictions, Burlington’s Other Areas should adopt the current standard, as highlighted in Exhibit 6.6.

Exhibit 6.6: Recommendations – Street Townhouse, Street Triplex, Street Fourplex (Spaces/Unit)

LAND USE	EXISTING RATE	MAX OBSERVED RATE	ITE AVERAGE DEMAND	Intensification Areas		Burlington – other areas
				Maximum*	Minimum*	Minimum*
Street Townhouse, Street Triplex, Street Fourplex	1.0 – 2.0	1.2 (in Driveways)	1.62	2.0	1.0	2.0

*These recommendations are based on the assumption that a garage may be counted towards the supply and that space in a driveway that leads to a garage be counted as one space.

6.1.5 Back to back and stacked townhouse dwellings

Zoning By-law Definition: A back to back townhouse is defined as a residential building containing a minimum of 4 and a maximum of 16 units, having attached units separated by a common or party wall above grade, including a common or party rear wall without a rear yard setback, and whereby each unit has an independent entrance to the unit from the outside accessed through the front elevation or exterior side elevation of the dwelling unit.

Parking Characteristics: Parking is provided off-street, in a driveway, a garage (above or below ground), or both, as well as centrally located (surface) parking spaces between dwelling units.

Existing Requirements

The existing general parking provisions for this land use in Burlington's Zoning By-law 2020 are as follows:

Without exclusive-use garage

- 1.25 per one-bedroom
- 1.50 per two-bedroom
- 1.75 per three or more-bedroom
- 0.35 visitor

With exclusive-use garage:

- 2.0 spaces per unit
- 0.35 visitor spaces

Uptown Mixed Use Centre Zones:

1.25 spaces per one-bedroom unit;

1.5 spaces per two-bedroom unit;

1.75 spaces per three or more bedrooms.

Visitor parking not required

Peer Review

The current general provisions (outside of the Uptown Mixed Use Centre Zones) in Burlington for this land use are consistent with requirements of its suburban peers – Markham, Mississauga, and Vaughan.

Comparing the peer review of Back-to-back townhouses and stacked townhouses, in Exhibit 6.7 and Exhibit 6.8, respectively, reveals that municipalities do not require separate requirements for these dwelling types.

In ITE, the average surveyed demand 1.28 spaces per unit and the maximum requirement outlined by ULI is 1.85 spaces per unit. These values are consistent with Burlington's standards in the Uptown Mixed Use Centre Zone.

Exhibit 6.7: Parking Requirements – Back to Back Townhouse

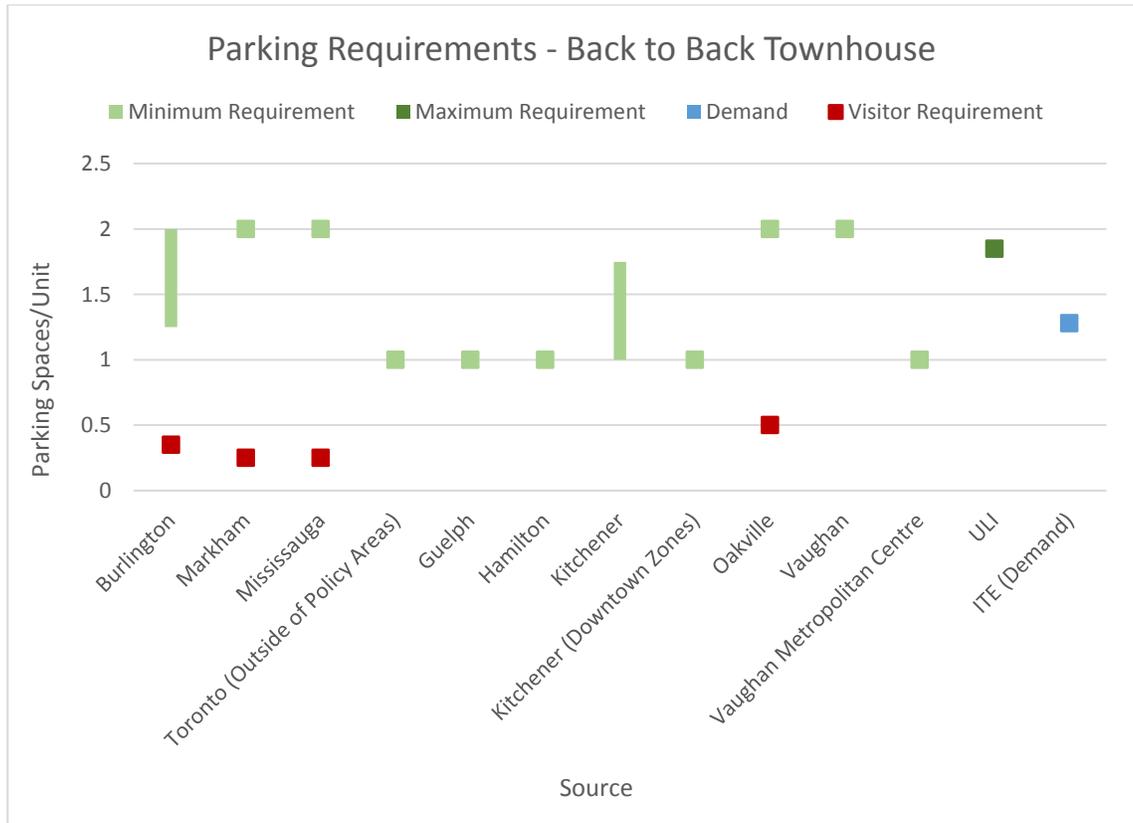
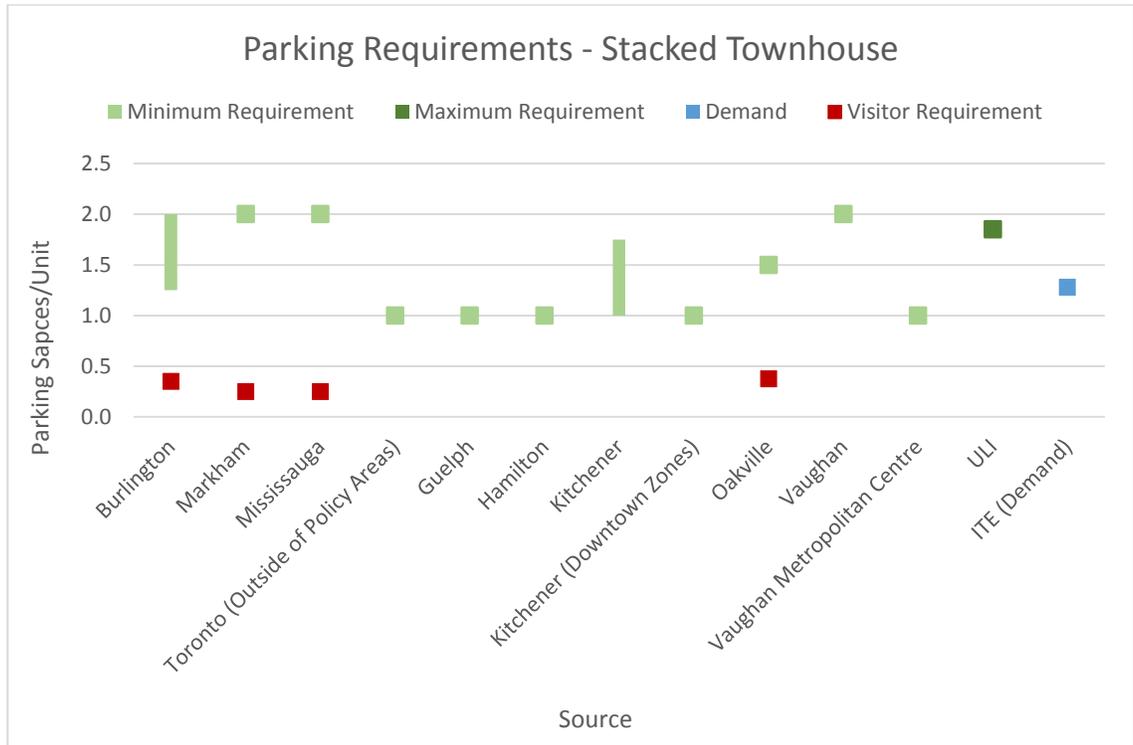


Exhibit 6.8: Parking Requirements – Stacked Townhouse



Observed Parking Demand

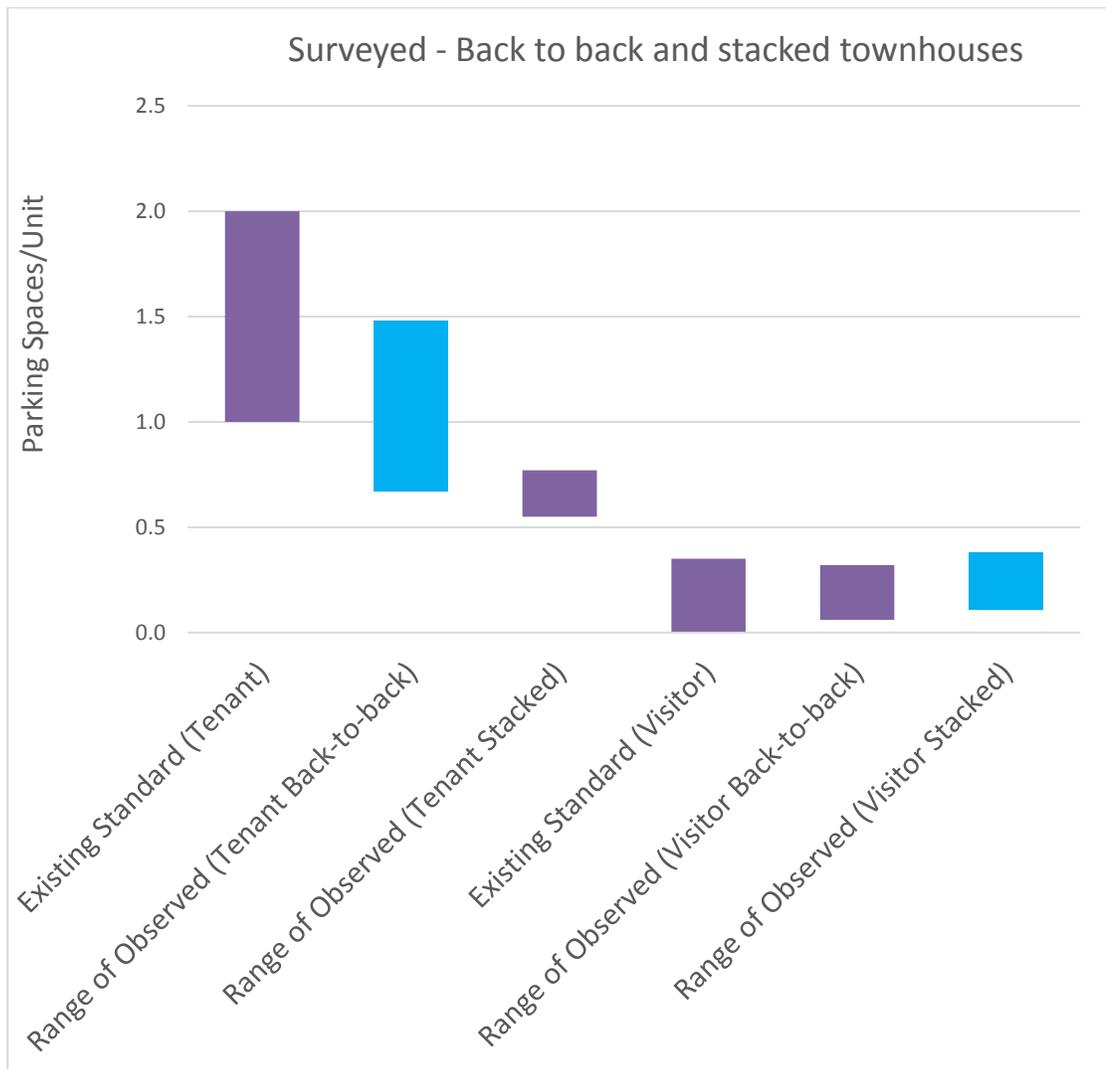
Spot surveys were conducted for back-to-back townhouses and stacked townhouses to determine if there is a difference in demand between the two uses and if the existing requirements provide too few or too many parking spaces. Two of the surveys that were conducted for the back to back townhouses suggest a significant demand for parking in the reserved spaces that were not included as driveways. Aside from these two surveys, the observed demand within the driveways of the two dwelling types was similar.

In all cases, the observed rates suggest the existing requirement provides adequate supply.

The range of observed parking demand (in driveways) across all the surveys are compared to the existing requirement in Exhibit 6.9.

Garage occupancy was not considered for any of these spot surveys since the contents of a closed garage could not be determined. The observed occupancy is therefore based on the observed demand in driveways. The recommended rates are based on the assumption that driveways and garage spaces can be included in the required supply.

Exhibit 6.9: Observed demand for back to back and stacked townhouses



Recommendations

It is recommended that back to back townhouses and stacked townhouses be separated and include separate standards as a result of the observed differences in demand and the anecdotal differences in demand of the two dwelling types.

It is recommended that the requirements for the Uptown Mixed Use Centre zones apply a reduced minimum and maintain a visitor requirement of 0.20 spaces/unit, and for this to be applied to all Intensification Areas. Furthermore, requirements should be converted to be based on spaces per unit. It is recommended that the existing general provisions for back to back townhouses be maintained for the Other Areas of Burlington, but that visitor requirements be reduced to 0.25 spaces/unit. It is recommended that stacked townhouses in Other Areas of Burlington be reduced to 1.0 spaces/unit and 0.25 visitor spaces/unit.

Although not recommended to be mandatory, it should be encouraged that stacked townhouses consider underground parking where feasible and financially justified.

A summary of the recommendations is provided in Exhibit 6.10.

Exhibit 6.10: Recommendations – Back to back and stacked townhouses (Spaces/Unit)

LAND USE	EXISTING RATE	MAX OBSERVED RATE (DRIVEWAYS)	ITE AVERAGE DEMAND	Intensification Areas		Burlington – other areas
				Maximum*	Minimum*	Minimum*
Back-to-back townhouses	O: 1.0 - 2.0 V: 0 - 0.35	O: 0.77 V: 0.06-0.35	O:1.28	O: 2.0 V: 0.25	O: 1.0 V: 0.20	O: 2.0 V: 0.25
Stacked townhouses	O: 1.0 - 2.0 V: 0 - 0.35	O: 1.48 V: 0.06-0.35	O:1.28	O: 2.0 V: 0.25	O: 1.0 V: 0.20	O: 1.0 V: 0.25

*These recommendations are based on the assumption that a garage may be counted towards the supply and that space in a driveway that leads to a garage be counted as one space.

Note: V=Visitor, O=Occupant

6.1.6 Townhouse Dwelling, Fourplex Dwelling, Cluster Homes

Zoning By-law Definition: A townhouse dwelling is defined as a residential building containing not more than 16 dwelling units with attached units being separated by a common or party wall, provided that individual units shall have at least one separate outside entrance.

Parking Characteristics: Parking is provided off-street, in a driveway, a garage, or both, as well as centrally located (surface) parking spaces between dwelling units.

Existing Requirements

The existing requirements for this land use in Burlington By-law 2020 are 2 spaces per unit, plus 0.5 visitor spaces/unit with the exception of dwellings in the Uptown Mixed Use Centre Zones, where the following requirements are outlined:

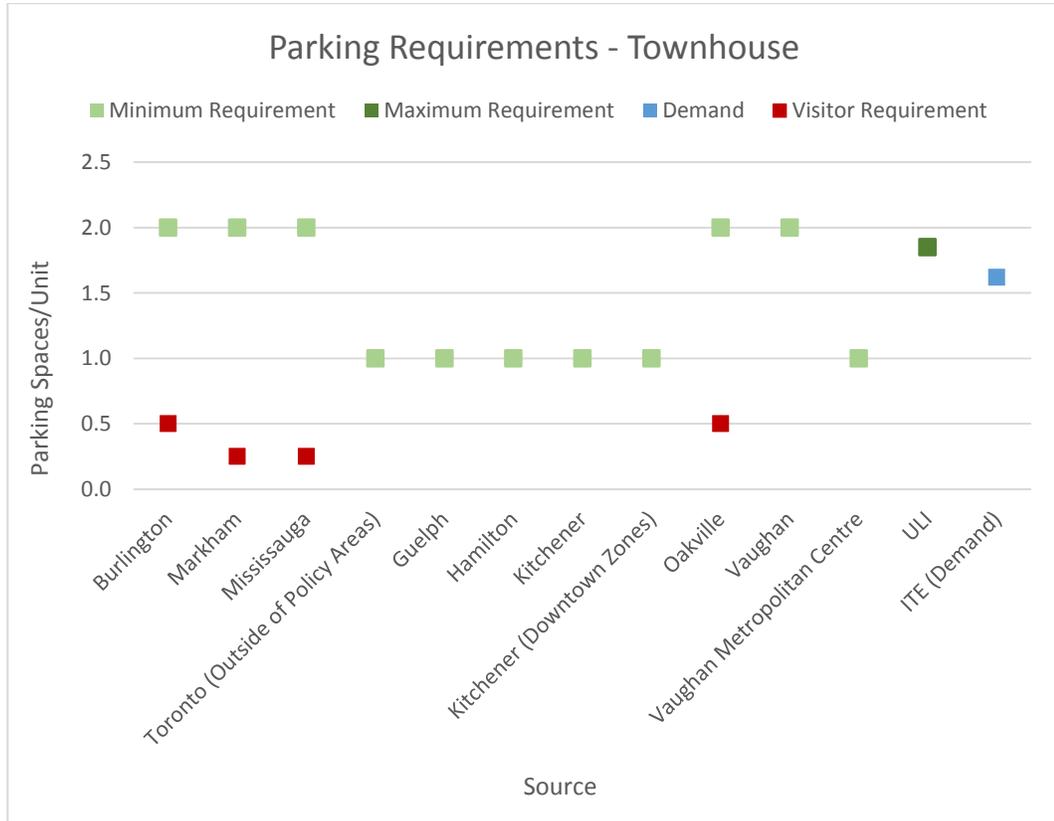
Uptown Mixed Use Centre Zones:

1.25 spaces per one-bedroom unit; 1.5 spaces per two-bedroom unit; 1.75 spaces per three or more bedrooms and no requirements for visitor parking

Peer Review

Parking requirements in peer jurisdictions range from 1.0 to 2.0 spaces per unit for standard townhouse dwellings and the average demand observed by ITE was 1.62 spaces/unit. The peer review is summarized in Exhibit 6.11. In Burlington, Markham, and Mississauga, visitor parking is also required for these types of dwellings, whereas the other municipalities do not require visitor parking.

Exhibit 6.11: Parking Requirements – Townhouse



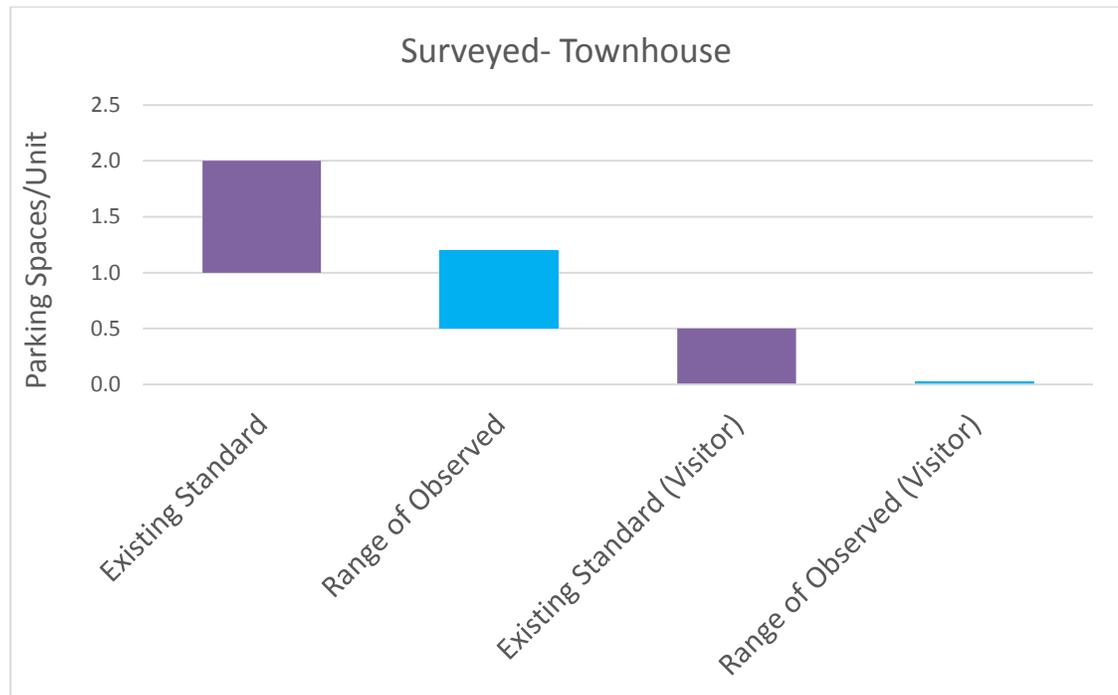
Observed Parking Demand

A total of 14 spot surveys were conducted at two different locations during the peak parking demand period (Weekdays between 20:00 and 23:00)

The maximum observed demand from the spot surveys was 1.2 spaces/ unit and the maximum observed visitor demand was 0.03 spaces/unit. This is shown in Exhibit 6.12. This low visitor parking rate is representative of only the two sample townhouse complexes that were surveyed. At the time of the surveys, few visitors were parked in the visitor parking locations. As a result, this observed visitor parking rate was given a lower weighting in the formulation of the recommended rate for visitor parking in these land uses.

Garage occupancy was not considered for any of these spot surveys since the contents of a closed garage could not be determined. The observed occupancy is based on the observed demand in driveways. The recommended rates are based on the assumption that driveways and garage spaces can be included in the required supply.

Exhibit 6.12: Observed Demand for Townhouse



Recommendations

It is recommended that any requirements for the Uptown Mixed Use Centre zone be applied to entirety of the Intensification Areas. Similar to the previous townhouse residential land uses, for the townhouse, Fourplex, and cluster homes, it is recommended to keep the by-law based on parking spaces per unit. It is also recommended to have a minimum and a maximum for the Intensification Areas, with the minimum having a lower rate than the Other Areas of Burlington. A summary is presented in Exhibit 6.13.

Exhibit 6.13: Recommendations – Townhouse, Fourplex, Cluster Homes (Spaces/Unit)

LAND USE	EXISTING RATE	MAX OBSERVED RATE	ITE AVERAGE DEMAND	Intensification Areas		Burlington – other areas
				Maximum	Minimum	Minimum
Townhouse, fourplex, cluster homes	O: 1.0 - 2.0 V: 0 - 0.5	O: 1.2 V: 0.03	O: 1.28	O: 2.0 V: 0.25	O: 1.0 V: 0.20	O: 2.0 V: 0.25

*These recommendations are based on the assumption that a garage may be counted towards the supply and that space in a driveway that leads to a garage be counted as one space.

Note: V=Visitor, O=Occupant BR = Bedroom

6.1.7 Apartment Buildings

Zoning By-law Definition: Apartment buildings are defined as buildings consisting of more than four dwelling units, which units have a common entrance from the street level and where the occupants have the right to use in common, halls, stairs, yards and accessory buildings.

Parking Characteristics: Parking is provided off-street, in a surface, structure, or underground parking lot.

Existing Requirements

General provisions:

- 1.25 occupant space per one-bedroom unit
- 1.50 occupant spaces per two bedroom unit
- 1.75 occupant spaces per three-or more bedroom unit
- 0.35 visitor spaces/unit

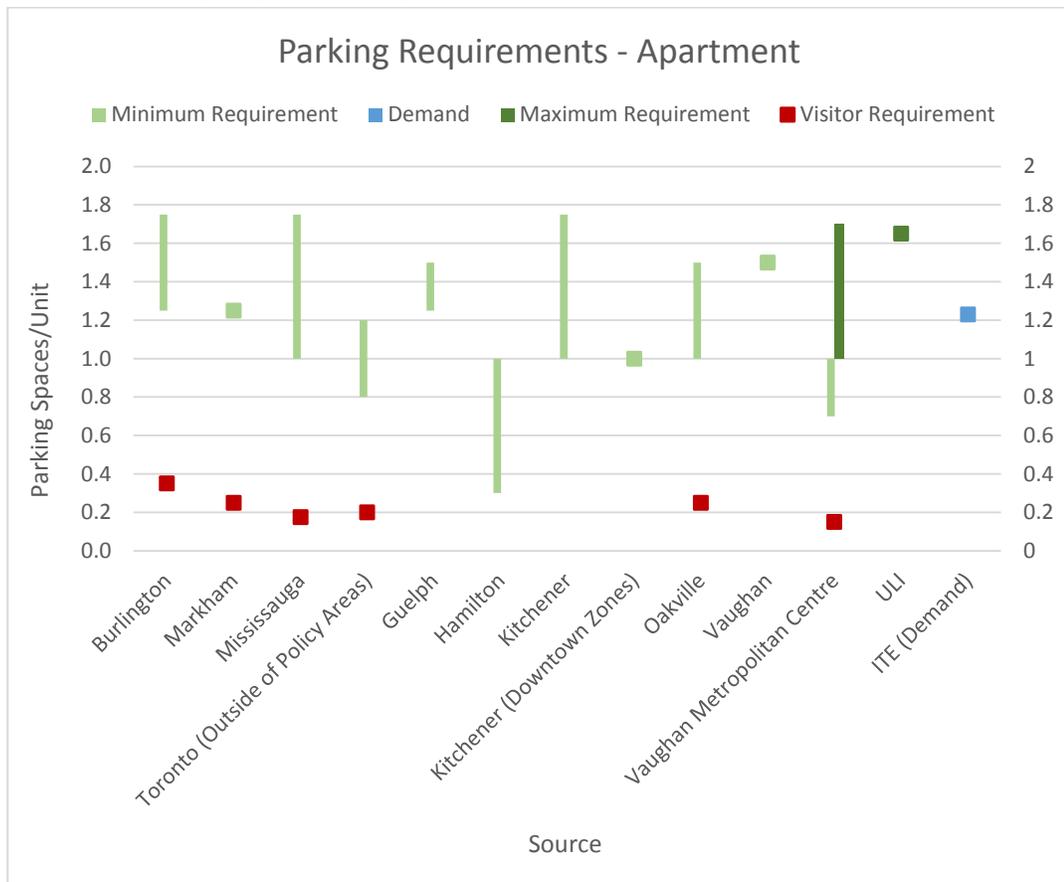
Downtown Mixed Use Centre Zones:

- 1.25 spaces/unit, no visitor requirements

Peer Review

The occupant parking requirements for apartment buildings in peer jurisdictions range from less than 0.5 spaces/unit to as many as 1.75 spaces/unit. The average demand observed by ITE was 1.21 spaces/unit. The parking requirements for visitor spaces in apartment buildings ranges from 0.25 visitor spaces/unit to 0 in some cases. The peer review is summarized in Exhibit 6.14.

Exhibit 6.14: Parking Requirements – Apartment



An additional comparison, broken down by bedroom for the various municipalities, is shown in Exhibit 6.15.

Exhibit 6.15: Minimum and Maximum Parking Requirements By Bedroom Size for Various Municipalities

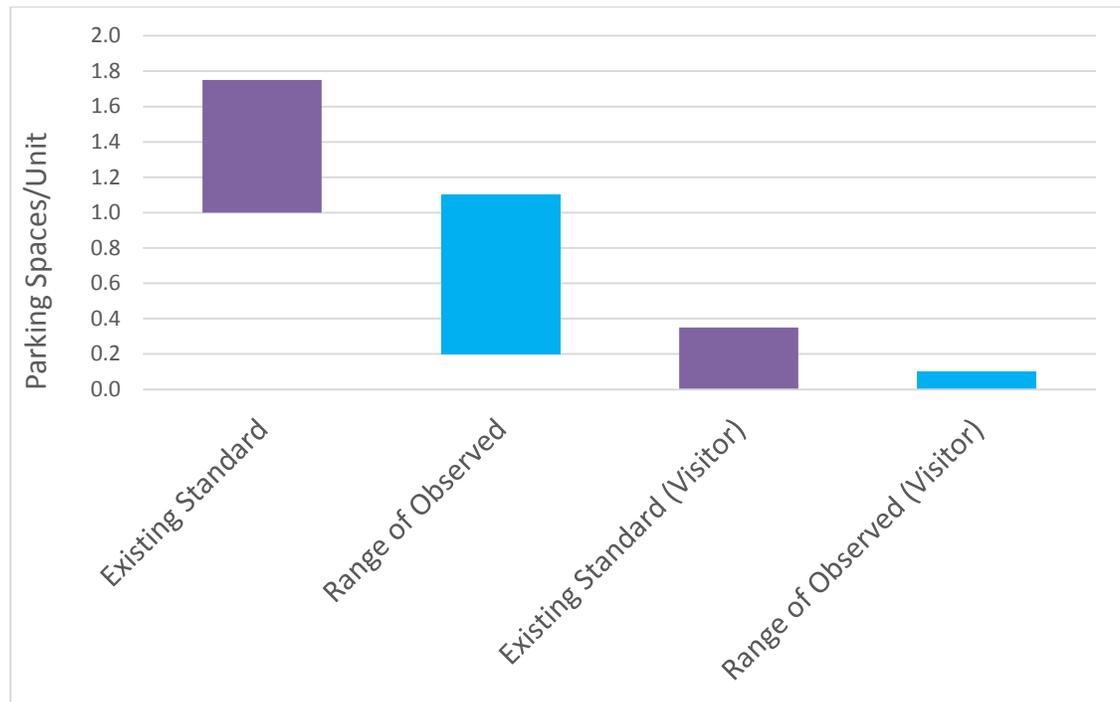
SOURCE	MINIMUM AND [MAXIMUM] PARKING REQUIREMENT (SPACES / UNIT)				
	Bachelor	1 Bedroom	2 Bedroom	3 Bedroom+	Visitor
Burlington	1.25	1.25	1.50	1.75	0.35
Markham	1.25	1.25	1.25	1.25	0.25
Mississauga	1.00	1.25	1.40	1.75	0.20
Toronto (Downtown PA1)	0.30 [0.40]	0.50 [0.70]	0.80 [1.20]	1.00 [1.50]	0.10
Toronto (Outside of Policy Areas)	0.80	0.90	1.00	1.20	0.20
Guelph	First 20 units: 1.5 spaces/unit Each unit in excess of 20: 1.25 spaces/unit				-
Hamilton	GFA < 50 m2: 0.30 Otherwise: 1.00				-
Kitchener	3-5 units total: 1 space/unit 6-12 units total: 1.5 spaces/unit 13-60 units total: 1.75 space/unit 61+ units total: 1.5 space/unit				6-60 units: 15% of req. parking 61+ units: 20% of req. parking
Kitchener (Downton Zones)	1.00	1.00	1.00	1.00	
Vaughan	1.50	1.50	1.50	1.50	0.25
Vaughan Metropolitan Centre	0.70 [1.00]	0.70 [1.00]	0.90 [1.30]	1.00 [1.70]	0.15

Exhibit 6.15 demonstrates the range of minimum and maximum rates for the various municipalities, some of which have rates for bachelor apartments as low as 0.30 spaces/unit and as high as 1.5 spaces per unit.

Observed Parking Demand

A total of 16 spot surveys were conducted at three different locations during the peak parking demand period (Weekdays between 20:00 and 23:00). The maximum observed parking demand from the spot surveys was 1.1 spaces/unit, with a maximum observed visitor demand of 0.1 spaces/unit. The observations are summarized in Exhibit 6.16.

Exhibit 6.16: Observed Demand for Apartments



Site Specific Review

An apartment building that included 18 parking spaces instead of the required 27 spaces was surveyed as part of the site specific review.

The maximum observed utilization of the site was 94%, which equates to a parking demand rate of 0.63 parking spots/unit. The site was not located adjacent quality public transit, it did not have a carshare, and had a walkscore of 37%, which suggests that it is not accommodating for active transportation or transit trips. It was, however, located adjacent to a public park, which had a large parking lot for use by park patrons. Overnight parking is not permitted at the park, but may have been used if there was any overflow during day time hours.

In cases where parking supply is reduced compared to the by-law requirement, it should be based on the condition that high quality public transit is provided adjacent the property, or that the property is accommodating to active transportation and is located in a walkable area. The presence of a community car share parking spot would also provide grounds for a parking reduction at an apartment. Further discussion around off-site parking opportunities is included in Section 9: Parking Management Strategies.

Recommendations

- Change the existing general provisions that are based on spaces/unit, and convert to space for certain bedroom units for Mixed Used Activity Areas;
- Establish a minimum of 1.0 spaces per unit in Intensification Areas, and a maximum of 1.5 spaces per unit in these areas;
- Reduce the existing general provisions by 0.25 spaces/unit for each bedroom category for Other Areas of Burlington;

- Apply a visitor parking requirement of 0.25 spaces/unit in Intensification Areas, and 0.25 spaces/unit in Other Areas, but maintain that visitor parking can be shared with other uses in Intensification Areas, due to the differing peak periods of demand; and
- Provide 1.0 parking spaces that is designated for maintenance vehicles that are servicing the site for every 75 units. Service vehicles must obtain a visitor (service vehicle) parking permit. These spaces should also be the same dimensions as an accessible parking space to allow for unloading and loading of equipment and to accommodate the larger service vehicles.

A summary of the recommendations is provided in Exhibit 6.17.

Exhibit 6.17: Recommendations – Apartment Building (spaces/nits)

LAND USE	EXISTING RATE (SPACES/UNIT)	MAX OBSERVED RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Apartment	1 BR: 1.25 2 BR: 1.50 3 BR: 1.75 O: downtown is 1.25 V: 0 - 0.35	O: 1.1 V: 0.1	O: 1.2	O (all): 1.5 V: 0.25	O (all): 1.0 V: 0.25	Bachelor / 1 BR: 1.0 2 BR: 1.25 3 BR: 1.50 V: 0.20
In addition to the required parking supply noted above, 1.0 parking space for every 75 units should also be added to the supply and reserved as “maintenance vehicle parking.” These spaces should only be available to the vehicles of building maintenance crews. In cases where visitor permits can be obtained, service parking permits should also be issued under the condition that works need to be completed in the building.						

Note: V=Visitor, O=Occupant BR = Bedroom

6.1.8 Long term care facility

Zoning By-law Definition: A long term care facility is a residence which provides care to meet the physical, emotional, social, spiritual and personal needs of persons.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

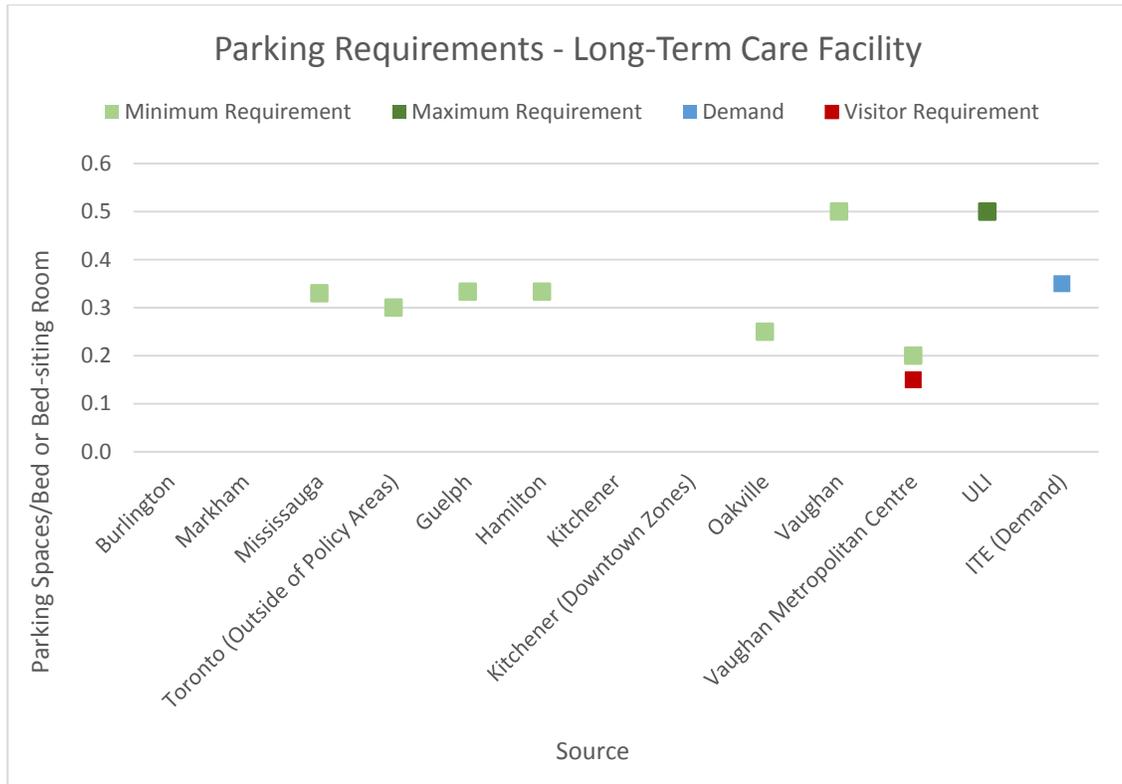
Existing Requirements

0.85 spaces per employee, plus 0.25 spaces/bed.

Peer Review

Peer jurisdictions primarily use number of beds as the metric for parking requirements for long-term care facilities. It is therefore difficult to directly compare Burlington to its peers. The peer summary in Exhibit 6.18 only includes comparisons to municipalities that use a spaces/bed measuring rate. Based on a spaces/bed metric, peers tend to range around 0.3-0.35 spaces/bed. The demand observed by ITE was 0.35 spaces/bed.

Exhibit 6.18: Peer Review – Long Term Care Facility

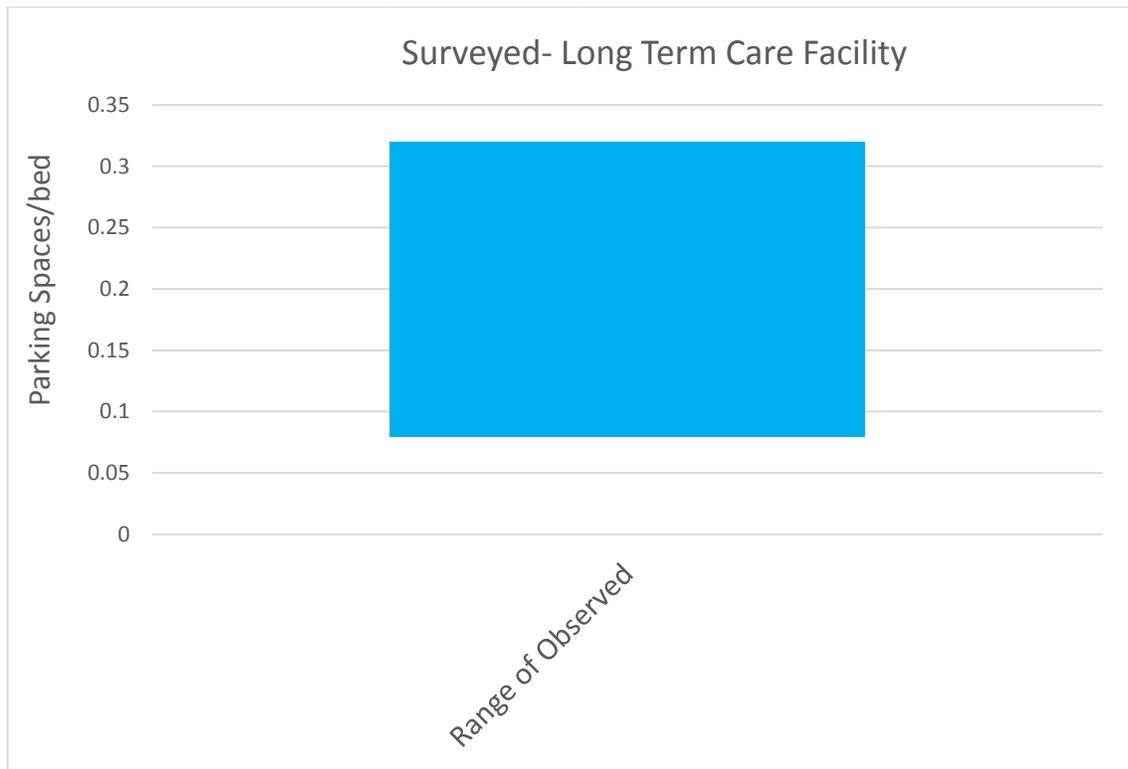


Observed Parking Demand

A total of 18 spot surveys were conducted at three different locations during the peak parking demand period (Weekdays between 20:00 and 23:00).

The maximum observed parking demand for this land use was 0.32 spaces/bed, as seen in Exhibit 6.19. This is comparable to the requirements in peer jurisdictions and the average demand observed by ITE. The number of employees at each surveyed site was unknown.

Exhibit 6.19 Observed Demand – Long Term Care Facility



Recommendations

It is recommended that the rate be changed from employees plus beds to just the number of spaces/bed, because a simple standard based on spaces/bed is easier to measure and comprehend. Measuring per employee is challenging since requirements would vary by time of day and by level of care. A rate of 0.35 spaces/bed would be adequate to satisfy the observed demand, it would be in line with the average observed demand by ITE, and it would match several of the requirements from peer jurisdictions. A maximum rate is not suggested, in part to account for the change to spaces per employee, but also because it is not anticipated that an oversupply of these spaces is an issue. The recommended rate is based on peer review and ITE average demand, which includes visitor demand but is not differentiated as its own supply. A summary is provided in Exhibit 6.20.

Exhibit 6.20: Recommendations: Long Term Care Facility (Spaces/bed)

LAND USE	MAX OBSERVED RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
			Maximum	Minimum	Minimum
Long Term Care Facility	0.32	0.35	No max	0.35	0.35

6.1.9 Retirement Home

Zoning By-law Definition: A retirement home is a residential facility or part thereof which may be a rest home but does not include a nursing home, home for the aged, or group home, in which, for hire or gain, lodging is supplied in at least 10 retirement dwelling units

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

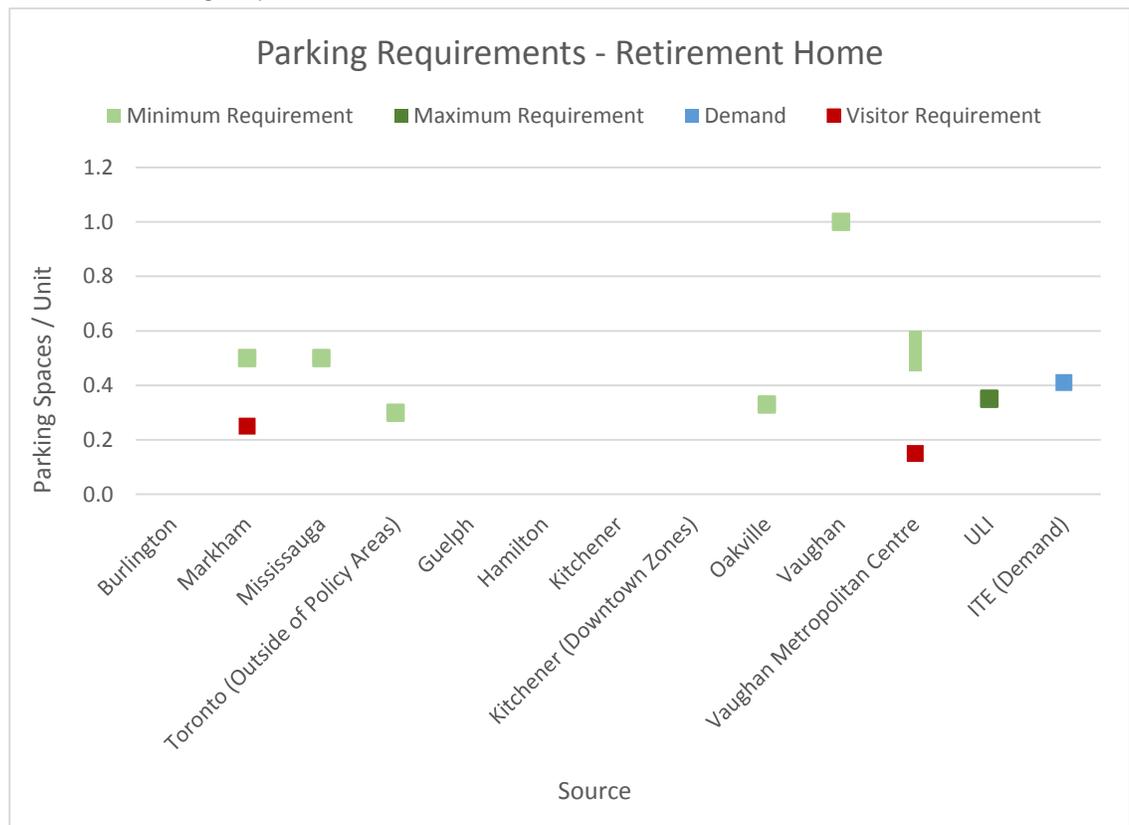
Existing Requirements

0.85 spaces per employee, plus 0.5 occupant spaces per unit, plus 0.25 visitor spaces per unit

Peer Review

Retirement homes in peer jurisdictions are often use a common measuring unit of number of spaces/unit. Only the jurisdictions that use the parking spaces/unit were included in the peer review in Exhibit 6.21.

Exhibit 6.21: Parking Requirements – Retirement Home

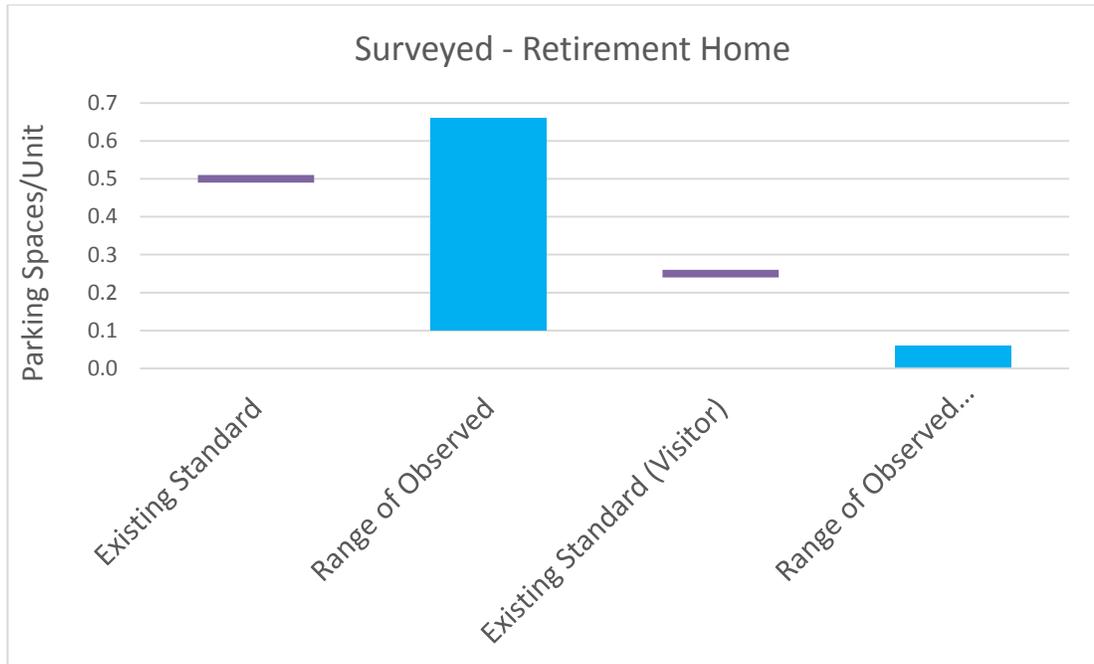


Observed Parking Demand

A total of 19 spot surveys were conducted at three different locations during the peak parking demand period (Weekdays between 20:00 and 23:00).

The surveyed parking demand for retirement homes ranged from 0.10 to 0.56 parking spaces/unit and the visitor demand ranged from 0 to 0.06 spaces/unit. Note that the graph, presented in Exhibit 6.22, doesn't show the employee parking requirement (measured in spaces/employee).

Exhibit 6.22: Observed Demand for Retirement Home



NOTE: graph doesn't show the employee parking requirement (measured in spaces/employee)

Recommendations

It is recommended that the standard be measured in spaces/unit for similar reasons noted in the long term care facility recommendations. In Other Areas of Burlington, the standard should require 0.60 spaces/unit and 0.25 visitor spaces/unit to satisfy the surveyed demand, and to be comparable to the peer review findings. However, a lower standard should be provided in Intensification Areas. A summary is provided in Exhibit 6.23.

Similar to the recommendation for apartments, additional parking should be set aside for service vehicles. While these spaces would be dedicated strictly for building maintenance vehicles at apartments, additional spaces should be provided at retirement homes to allow for other types of service vehicles, such as cleaning and health care services given the higher prevalence of these service in retirement homes. It is recommended that 1.0 parking space for every 50 units be added to the parking supply that are designated for service vehicles. Service vehicles must obtain a visitor (service vehicle) parking permit.

Exhibit 6.23: Recommendations – Retirement Home (spaces/unit)

LAND USE	MAX OBSERVED RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
			Maximum	Minimum	Minimum
Retirement Home	O/E: 0.56 V: 0.06	O/E: 0.41	No max	O/E: 0.50 V: 0.20	O/E: 0.60 V: 0.25
In addition to the required parking supply noted above, 1.0 parking space for every 50 units should also be added to the supply and reserved as “service vehicle parking.” These spaces should only be available to the vehicles of building maintenance crews and other service workers, such as cleaning or health care services. In cases where visitor permits can be obtained, service parking permits should also be issued under the condition that works need to be completed in the building.					

Note: V=Visitor, O/E=Occupant or Employee

6.1.10 Dwelling Units above Commercial Buildings

Zoning By-law Definition: Dwelling units above commercial buildings are defined as a self-contained room or suite of rooms located in a building or structure (in this case, a commercial building).

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing requirements

1.25 spaces/unit

Peer Review

No peer review was conducted for this land use, due to the lack of available data.

Observed Parking Demand

No surveys were conducted for this land use

Recommendations

It is recommended that the existing minimum of 1.25 spaces/unit be maintained for all areas and that a maximum rate of 1.5 spaces/unit be introduced in Intensification Areas. This is summarized in Exhibit 6.24.

Exhibit 6.24: Recommendations – Dwelling Units above Commercial Buildings (spaces/unit)

LAND USE	EXISTING RATE	MAX OBSERVED RATE	PEER COMPARISON	Intensification Areas		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Dwelling Units above Commercial Buildings	1.25	N/A	N/A	1.5	1.25	1.25

6.1.11 Accessory residential unit in a single detached dwelling

Zoning By-law Definition: An accessory residential unit is defined as a self-contained dwelling unit created through converting part of, or adding on to, one existing detached dwelling unit.

Parking Characteristics: Parking is provided off-street on a driveway or in a surface parking lot.

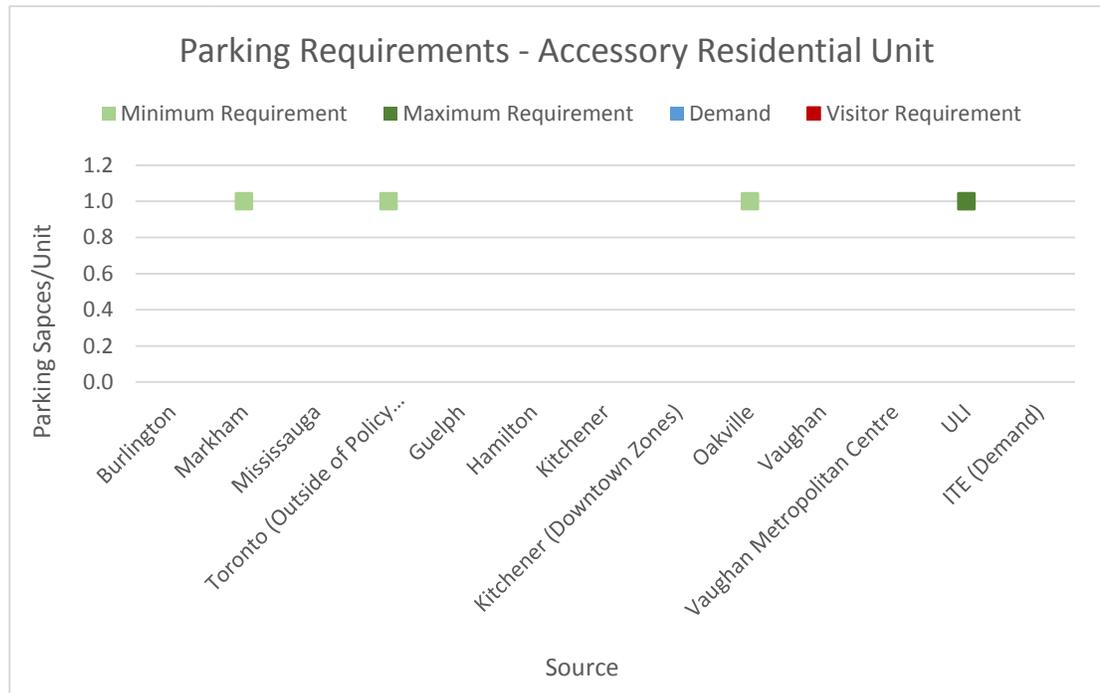
Existing Requirements

The current by-law requires 1 space for accessory dwelling units and providing this in tandem with the supply for the primary unit is not permitted. This requirement is applied in most cases, except for an on major arterial roads, collector roads and a number of roads that are identified in Table 2.3.1.1 of the existing by-law which require 2 spaces per accessory dwelling unit.

Peer Review

The peer review of this land use reveal that the jurisdictions that do provide provisions for this land use require 1.0 parking space/unit, as shown in Exhibit 6.25.

Exhibit 6.25: Parking Requirements – Accessory Residential Unit



Observed Parking Demand

No surveys were conducted for this land use, due to the lack of available data.

Recommendations

It is recommended that the current provisions that require 2 spaces per accessory dwelling unit be removed from the by-law.

It is also recommended that this land use be added to the general provisions in the by-law update and that a minimum of 1.0 space /unit be required in Burlington – Other Areas and that Intensification Areas adopt a maximum of 1.0 space/unit and a minimum of 0 spaces.

In cases where 2 or more spaces are provided adjacent to one another (where one space does not block the other), one space may be dedicated to the accessory unit, thus eliminating the need to obtain additional parking spaces to allow for this type of land use.

Exhibit 6.26: Recommendations – Accessory Residential Unit (spaces/unit)

LAND USE	EXISTING RATE	MAX OBSERVED RATE	PEER COMPARISON	Intensification Areas		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Accessory Residential Unit	N/A	N/A	N/A	1.0	0	1.0
In cases where 2 or more spaces are provided adjacent to each other, one space may be dedicated to the new accessory unit, thus eliminating the need to obtain additional parking spaces to allow for this type of land use.						

6.2 Retail: Retail Centre, Supermarket, Retail Store

6.2.1 General Issues and Observations

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

- Minimum parking requirements are currently used throughout the by-law. Parking Minimums facilitate parking oversupply and contribute to the auto-oriented urban form that many mid-sized cities face today. Ontario’s Climate Change Action Plan addresses parking by prescribing the removal of parking minimums from all municipal by-laws within the next 5 years.
- In the public survey that was conducted as part of this study, big box stores, malls, and retail plazas were all identified as land uses that have too much parking;
- Consistent parking minimums are applied to all developments of a certain land use across the city with the exception of the Downtown Parking Exemption Area. Best practices suggest that parking standards should be stratified based on the various urban contexts that exist within a municipality;
- Reducing requirements provides more flexibility to developers to provide less parking if lower demand is expected, supporting more compact development, and incurring lower development costs. This is also beneficial to the City of Burlington, as it provides more room for development and less space for parking lots;
- Retail customers are particularly more inclined to use a personal vehicle when they are making multiple stops or when they are purchasing large or heavy items (e.g., electronics, large grocery shop, etc.); and
- The type of retail use affects parking demand. Some uses currently have lower parking requirements due to the smaller proportion of floor area dedicated to customers (e.g., home improvement store, dry cleaners), while others, such as grocery stores and shopping centres, and have larger parking requirements reflecting higher customer densities and the propensity of these customers to use private vehicles.

6.2.2 Retail Centre

Zoning By-law Definition: A retail centre is defined as a combination of two or more retail, service commercial, recreation or office uses, in one or more buildings, on one or more parcels of land, designated as an integrated, planned development having common off-street parking and driveways.

Parking Characteristics: Parking is provided off-street, in a surface, parking structure, or underground parking lot.

Existing Requirements

The existing general provisions for retail centres require a minimum of 5.25 spaces per 100 m² GFA.

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required supply and shared parking can be applied.

Peer Review

For retail centres, minimum parking requirements across the peer jurisdictions are typically in the range of 3.0 to 5.0 spaces per 100 m² GFA.

A comparison of Burlington's minimum standards to 5 other jurisdictions in the GTHA are provided below. In the cases of Markham, Mississauga, and Hamilton, a range of parking minimums is provided. In the case of Vaughan Metropolitan Centre and Toronto (downtown), both maximum and minimum standards are provided. The peer review is summarized in Exhibit 6.27.

Exhibit 6.27: Retail Centre Peer Review



The minimum parking requirements for a retail centre in Burlington are on the high side compared to peer jurisdictions and compared to the industry standards from ULI, and ITE. Burlington’s standards are also fixed and are applied to all areas of the City (with the exception of the Downtown Parking Exemption Area and the 5% reduction in Mixed Use Corridor Zones). In Markham, Mississauga, Toronto, and Vaughan, the standards vary depending on location and/or size of the retail centre. These observations will be considered in the recommendations portion of this section.

Many retail centres include restaurants as part of their mix of land uses. As noted in the discussion on restaurants in Section 6.6, restaurants have a high parking demand per area compared to retail uses. As such, there is a potential for restaurants within Retail Centres to be under supplied. Some municipalities within the peer review have adopted special provisions, or exceptions to their requirement for retail centre parking when there is a high concentration of restaurants on the site.

In Vaughan Metropolitan Centre, for example, commercial uses in a multi-unit building where the combined gross floor area devoted to Eating Establishments exceeds twenty percent (20%) of the total gross floor area of the building, parking shall be provided at the individual Eating Establishment ratio for the gross floor area in excess of twenty percent (20%).

In Kitchener, where restaurants occupy 30% or more of the GFA of the plaza complex, that portion must apply the restaurant parking ratio.

Observed Parking Demand

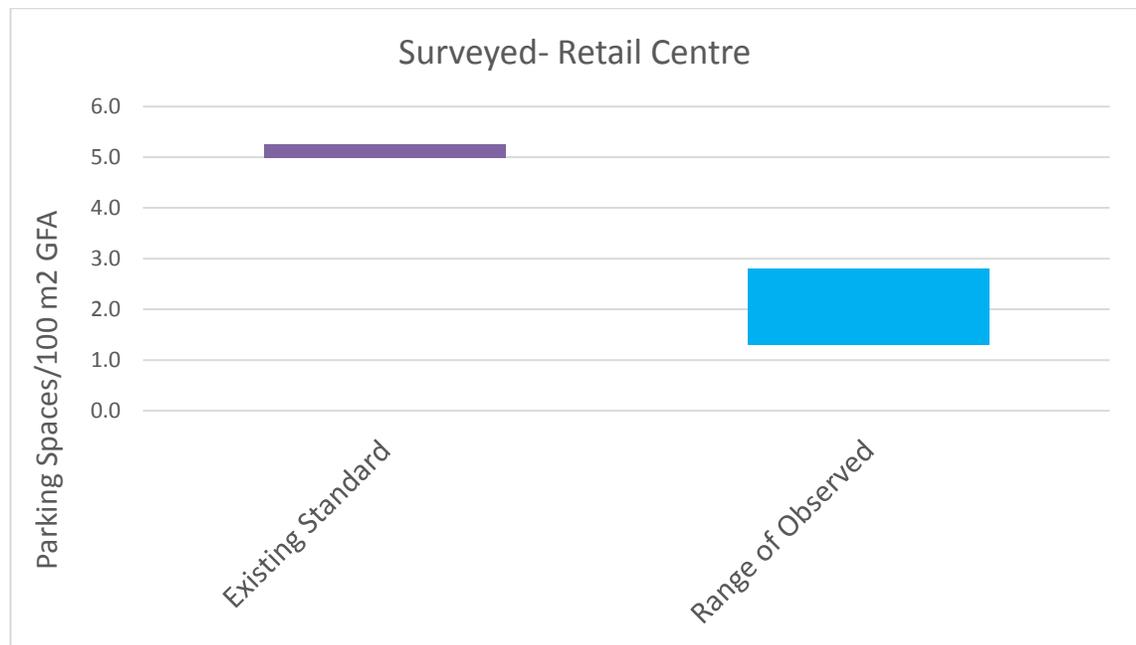
Three retail centres were surveyed 2-4 times using a spot survey approach. The surveys were conducted in May 2016 during the weekly peak periods (Weekday – 17:00-19:00, Weekend 13:00-15:00) as defined by the typical peak periods for the shopping centre land use in the ITE 4th Generation Parking Generation Manual, and was confirmed and updated using Google’s “Popular times” application, which is based on historical visits to a particular place.

The maximum utilization that was observed for a retail centre was 62% and the average was 32%. This means that at the busiest time, the retail centre parking spaces were only 62% occupied, while the average was 32% (meaning on average, 68% of parking spaces were available).

The maximum observed demand, when converted into a parking rate was 2.9 spaces/100 m² GFA and the average was 1.4 spaces/100 m² GFA. This is considerably lower than the existing requirement of 5.25 spaces/100 m² GFA. This comparison is summarized in Exhibit 6.28

In addition to the peer review, the results of the survey also suggest that Retail Centres in Burlington provide an oversupply of parking. These results will be considered in the recommendations portion of this section.

Exhibit 6.28: Observed Demand for Retail Centre



Site Specific Review

As part of the site specific review, 4 different retail centres were surveyed that were permitted fewer parking spaces than what the by-law required. In each case, the survey results indicated no significant supply constraints. With the exception of one site, the utilization ranged from 24% to 81%, indicating adequate supply. The exceptional site (3245 Fairview Road) contained an additional 25 parking spaces at the rear of the building, which were not included in the official supply count. These spaces were occupied and therefore included in the demand counted by the surveyor. With these spaces included in the demand, the demand exceeded 100% utilization and the demand ratio exceeded that of that by-law requirement.

The exception aside, the reduction to the other mixed use centres was effective, in that no shortage was observed. A full summary table of the site specific review is included in Appendix C.

Recommendations

The recommended standards for Retail Centres in Burlington are based on reductions to the current parking minimums, stratified requirements based on land use type, as well as the adoption of parking maximums in the Intensification Areas.

The reduction from the current standards is justified by a comparison to peer jurisdictions, best practices from ITE and ULI, and by the results of the observed rates from the surveys. The recommended rates are summarized in Exhibit 6.29. The downtown exemption area should be maintained. In cases where restaurants represent 30% or more of the GFA of a retail centre, the restaurant parking ratio should be applied to the relative portion of the development.

Exhibit 6.29: Recommendations – Retail Centre (Spaces/100 m² GFA)

LAND USE	EXISTING RATE (MIN)	MAX OBSERVED RATE	PEER MEDIAN RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
					Maximum	Minimum	Minimum
Retail Centre	5.25	2.8	5.0	5.02	4.5	3.5	5.0
In cases where restaurants represent 30% or more of the GFA of a retail centre, the restaurant parking ratio should be applied to the relative portion of the development.							

6.2.3 Supermarket

Zoning By-law Definition: A retail establishment with a floor area greater than 1800 m², engaged primarily in the sale of a general line of food, such as canned, dry and frozen foods; fresh fruits and vegetables; fresh and prepared meats, fish, poultry, dairy products, baked products and snack foods; and which also retails a range of non-food products, such as household paper products, toiletries and non-prescription drugs, and in which a minimum of 51% of the total sales floor area of the establishment is devoted to the sale of food.

Parking Characteristics: Parking is provided off-street, in a surface parking lot, or potentially underground in the future.

Existing Requirements

The existing general provisions for supermarkets require a minimum of 10 spaces per 100 m² GFA.

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required supply and shared parking can be applied.

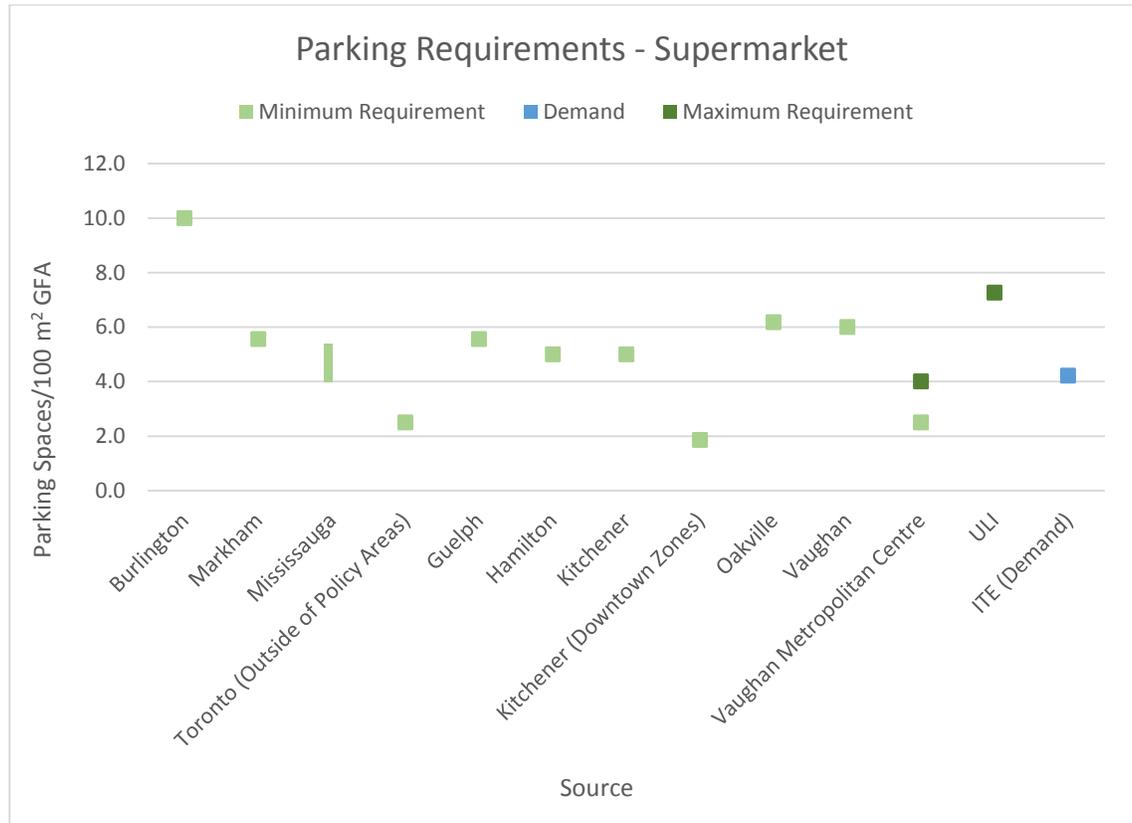
Peer Review

For supermarkets, parking requirements across jurisdictions in ITE are typically in the range similar to that of retail centres (3.0 to 5.0 spaces per 100 m² GFA). Standards often increase with increasing GFA of the establishment.

The American Planning Association and Urban Land Institute also recommend rates between 3.5 and 5.5 spaces per 100 m² GFA.

A comparison of Burlington’s standards to 5 other jurisdictions in the GTHA are provided in Exhibit 6.30 below.

Exhibit 6.30: Supermarket Peer Review



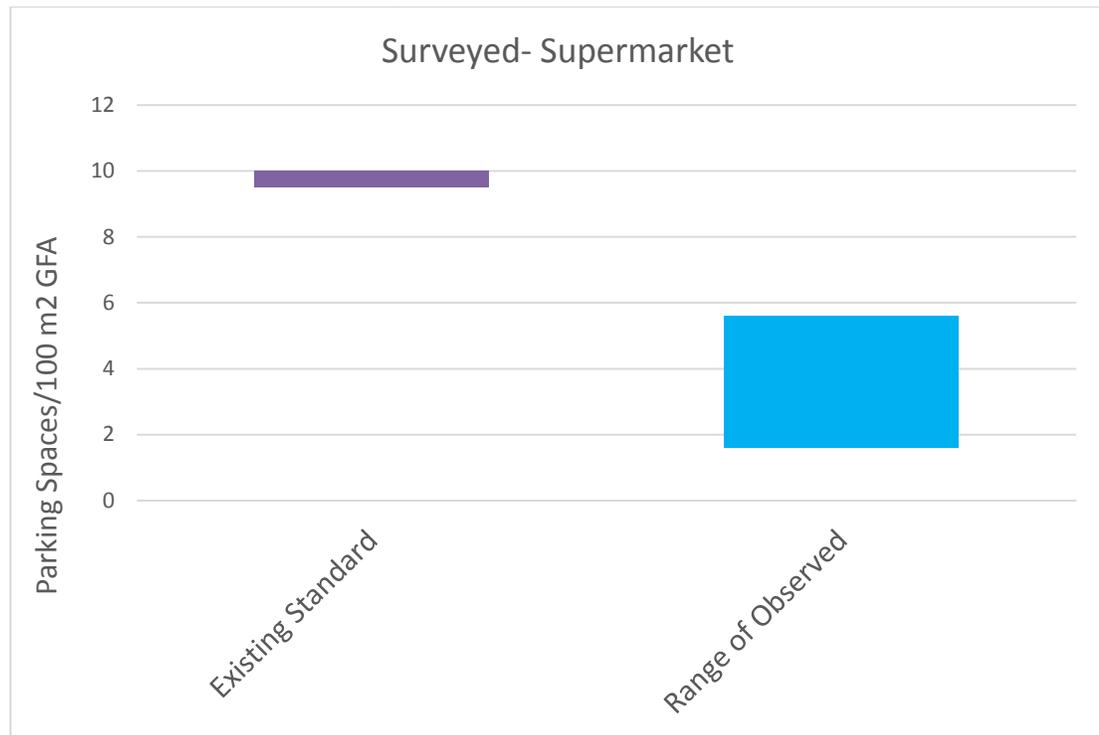
The minimum parking requirements for supermarket in Burlington are considerably higher than the requirements in peer jurisdictions and compared to the industry standards from APA, ULI, and ITE. Burlington’s standards are also fixed and are applied to all areas of the City (with the exception of the Downtown Parking Exemption Area and Mixed Use Corridor Zones). In Mississauga, Toronto, and Vaughan, the standards vary depending on location and/or size of the retail centre. In Vaughan Metropolitan Centre and Toronto, maximums are also identified.

Survey Results

A spot survey approach was used to survey 4 different supermarkets 2-4 times in May 2016 during the weekly peak periods ((Weekday – 17:00-19:00, Weekend 13:00-15:00). The weekly peak period was defined by the typical peak periods for the supermarket land use in the ITE 4th Generation Parking Generation Manual and was confirmed and updated by Google’s “Popular times” application, which is based on historical visits to a place.

The maximum observed demand, when converted into a parking rate was 5.6 spaces/100 m² GFA and the average was 3.4 spaces/100 m² GFA. This is considerably lower than the existing requirement of 10.0 spaces/100 m² GFA. A summary is shown in Exhibit 6.31.

Exhibit 6.31: Observed Demand for Supermarket



Recommendations

The recommended standards for supermarket uses (inclusive of only stand-alone supermarkets) in Burlington are based on reductions to the current parking minimums, stratified requirements based on land use type, as well as the adoption of parking maximums in the Intensification Areas.

The reduction from the current standards is justified by a comparison to peer jurisdictions, best practices from ITE and ULI, and by the results of the observed rates from the surveys. The recommended rates are summarized in Exhibit 6.32. The downtown exemption area should be maintained.

Exhibit 6.32: Recommendations – Supermarkets (Spaces/100 m² GFA)

LAND USE	EXISTING RATE (MIN)	MAX OBSERVED RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Supermarket	10.0	5.6	4.22	5.5	4.0	6.0

6.2.4 Retail Store

Zoning By-law Definition: A retail store is defined as a building or part of a building where merchandise is offered or kept for sale directly to the public at retail, including department stores

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

The existing general provisions for retail centres require a minimum of 4.0 spaces per 100 m² GFA.

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required supply and shared parking can be applied.

Peer Review

For retail stores, parking requirements across jurisdictions in ITE are typically in the range similar to that of retail centres (3.0 to 5.0 spaces per 100 m² GFA). Standards often increase with increasing GFA of the establishment.

The American Planning Association and Urban Land Institute also recommend rates between 3.0 and 6.0 spaces per 100 m² GFA.

A comparison of Burlington’s standards to 5 other jurisdictions in the GTHA are provided in Exhibit 6.33 below.

Exhibit 6.33: Retail Store Peer Review



The minimum parking requirements for a retail store in Burlington are comparable to peer jurisdictions.

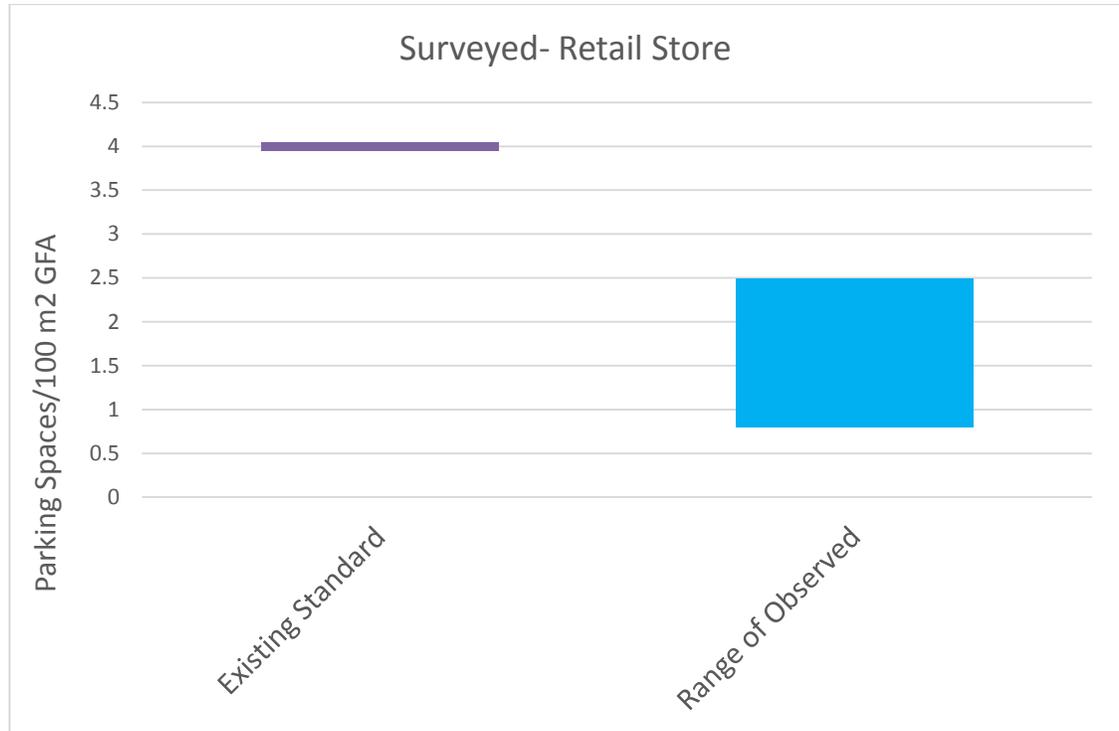
Observed Demand

A spot survey approach was used to survey 2 different retail stores 5-11 times in May 2016 during the weekly peak periods (Weekday – 17:00-19:00, Weekend 13:00-15:00). The weekly peak period was defined by the typical peak periods for the retail store land use in the ITE 4th Generation Parking Generation Manual and was confirmed and updated by Google’s “Popular

times” application, which is based on historical visits to a place. 2 different retail stores were surveyed during their weekly peak periods. One was surveyed 11 times and the other was surveyed 5 times.

The maximum utilization observed was 71% and the average utilization observed was 57%. The maximum observed demand, when converted into a parking rate was 2.5 spaces/100 m² GFA and the average was 2.1 spaces/100 m² GFA. This is considerably lower than the existing requirement of 4.0 spaces/100 m² GFA. This comparison is summarized in Exhibit 6.34.

Exhibit 6.34: Observed Demand for Retail Store



Recommended Standard – Retail Store

The recommended standards for Retail Stores in Burlington are based on reductions to the current parking minimums, stratified requirements based on land use type, as well as the adoption of parking maximums in the Intensification Areas.

The reduction from the current standards is justified by a comparison to peer jurisdictions, best practices from ITE and ULI, and by the results of the observed rates from the surveys. The recommended rates are summarized in Exhibit 6.35. The downtown exemption area should be maintained.

Exhibit 6.35: Recommendations – Retail Store (spaces / 100 m²)

LAND USE	EXISTING RATE (MIN)	MAX OBSERVED RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Retail Store	4.0	2.5	4.83	3.0	1.5	3.5

6.3 Entertainment Uses

General Issues and Observations

- Parking requirements for stadiums, arenas, and theatres are typically based on the number of seats or person capacity;
- The existing requirement for places of entertainment (11 spaces per 100 m²) is difficult to relate to expected parking demand based on the range of capacity and occupancy patterns across these uses;

6.3.1 Movie Theatre

Zoning By-law Definition: A movie theatre is grouped under Entertainment Establishment, and is defined as any place devoted to commercial showing of films.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

The general parking provisions require 1 space per 4 seats (0.167 spaces/seat).

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required supply and shared parking can be applied.

Peer Review

Many peer jurisdictions merge the requirements of movie theatres into a general standard for entertainment uses and many of them use a spaces/GFA metric.

The average demand from ITE is 0.3 spaces per seat or 14.74 spaces/100 m² GFA. The conversion from spaces per seat to spaces/100 m² GFA is therefore assumed to be a multiplier of 49.1 (14.74/0.3=49.1). Applying this multiplier to Burlington's current requirement results in a standard of 8.2 spaces/100 m² GFA. This value is comparable to requirements for Entertainment uses in peer jurisdictions that are based on GFA.

The peer review for movie theatres is grouped into the peer review of entertainment establishments to reflect the recommendation of merging the uses. This peer review is provided in the section below.

Recommendation

It is recommended that the parking standards for movie theatres be grouped into the requirements for entertainment establishments.

6.3.1 Entertainment Establishment

Zoning By-law Definition: An entertainment establishment is defined as any place devoted to the presentation of live entertainment and performances or for the commercial showing of films, including such facilities as movie theatre, dinner theatre, supper club, cabaret, but shall not include a Night Club, Adult Entertainment Establishment, Gaming Establishment or Video Game & Pinball Machine Arcade.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

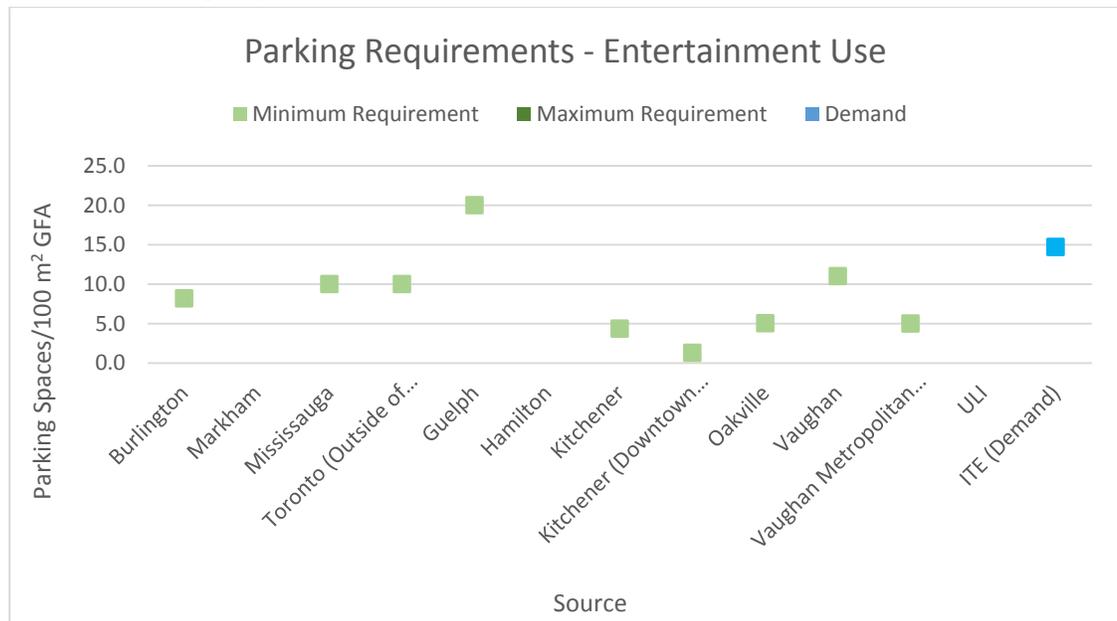
The existing general provision for entertainment establishments is 1 space/6 person capacity.

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required supply and shared parking can be applied.

Peer Review

Peer jurisdictions typically apply a requirement based on GFA for this land use, not person capacity. A review is provided in Exhibit 6.36. Typically, requirements range from 5.0 to 20.0 spaces/100 m² GFA. The movie theatre requirement for Burlington was converted using an ITE conversion factor as described in the section above. The resulting value of 8.2 spaces/100 m² GFA is included in Exhibit 6.37.

Exhibit 6.36: Parking Requirements – Entertainment Establishment



Observed

Adequate survey data is not available for this land use.

Recommendations

It is recommended that a GFA unit of measurement be adopted for this land use to be consistent with standards in peer jurisdictions. It is also recommended that the movie theatre land use be grouped into this requirement.

A standard of 10 spaces/100 m² GFA should be applied to be consistent with requirements in peer jurisdictions. In Intensification Areas, a 5.0 spaces per 100 m² of GFA minimum should be applied. A summary is provided in Exhibit 6.37. The downtown exemption area should be maintained.

Exhibit 6.37: Recommendation – Entertainment Establishment – (spaces/100 m² GFA)

LAND USE	RANGE OF PEERS	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
		Maximum	Minimum	Minimum
Entertainment Establishment	5.0 - 20.0	10.0	5.0	10.0

6.3.2 Dance Club

Zoning By-law Definition: An establishment or part thereof, whose principal function is the provision of music, pre-recorded or live music, for dancing by club patrons, having a minimum dance floor area of 10 m², and where food and/or beverages may be served, but shall not include an Adult Entertainment Establishment.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

Dance clubs currently require 1.1 spaces per 4 person capacity (0.275 spaces/person capacity).

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required supply and shared parking can be applied.

Peer Review

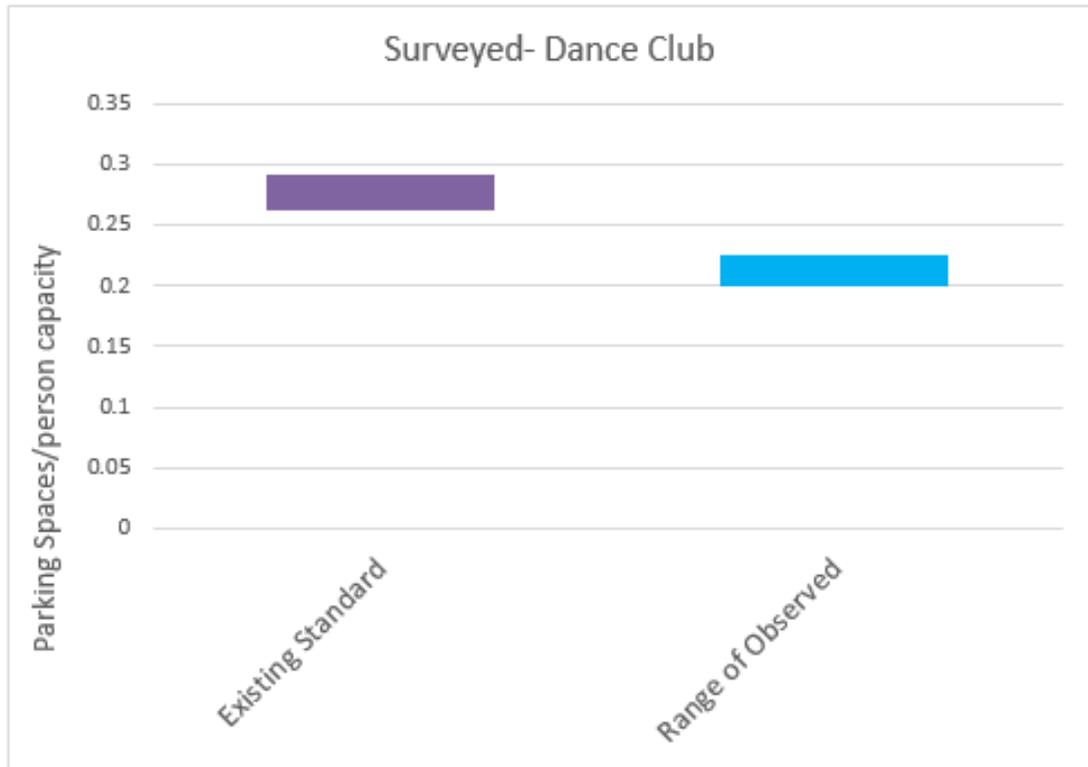
A peer review of dance clubs was not conducted since few jurisdictions provide a standard that is specific to dance clubs.

Observed

One dance club was surveyed at 4 different times during the peak parking demand period (Saturday from 23:00 to 1:00)

The maximum surveyed parking demand was 0.9 spaces/4 person capacity (0.225 spaces/person capacity). The details are shown in Exhibit 6.38.

Exhibit 6.38: Observed Demand for Dance Club



Recommendations

It is recommended that the existing general provision standard be maintained for Other Areas of Burlington, and that a reduced minimum and a maximum be applied to Intensification Areas. The recommendations are provided in Exhibit 6.39. The downtown exemption area should be maintained.

Exhibit 6.39: Recommendations – Dance Club (Spaces/person capacity)

LAND USE	EXISTING RATE (MIN)	OBSERVED MAX	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
			Maximum	Minimum	Minimum
Dance Club	0.275	0.225	0.25	0.15	0.275

6.4 Recreational Uses

6.4.1 General Issues and Observations

- There is currently no specific requirement for health clubs. They would likely be grouped under recreational establishments, which require 1 space per 6 person capacity
- Health clubs often have multiple uses (e.g. pools, fitness rooms, gyms) which may make it difficult to determine the person capacity or cause parking demand to vary between clubs based on the facilities they offer.

- New fitness clubs are large and can be quite popular with high densities of people in peak times

6.4.2 Recreational Establishment

Zoning By-law Definition: A recreational establishment is defined as a place designed and equipped for the consumer to actively participate in the conduct of sports and other leisure time activities, but does not include a Night Club, Adult Entertainment Parlour, Video Game & Pinball Machine Arcade or Gaming Establishment, and does not include overnight accommodation.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

The existing requirements are based on person capacity, and requires 1 space per 6 person capacity.

Peer Review

A review of other municipalities shows that the rate is measured in spaces per 100 m², but others, such as Burlington, use spaces/person capacity. Using the conversion rate identified in Section 6.4.1, the 6 persons/space equates to a parking rate of 8.2 spaces per 100 m² GFA.

For the rates per 100 m², the range is from 1.0 spaces to 10.0 spaces, with approximately 4.0 being the median. A comparison is provided in Exhibit 6.40 (for spaces per 100 m² GFA) and Exhibit 6.41 (for spaces per person capacity).

Exhibit 6.40: Parking Requirements – Recreational Use (spaces/100 m² GFA)

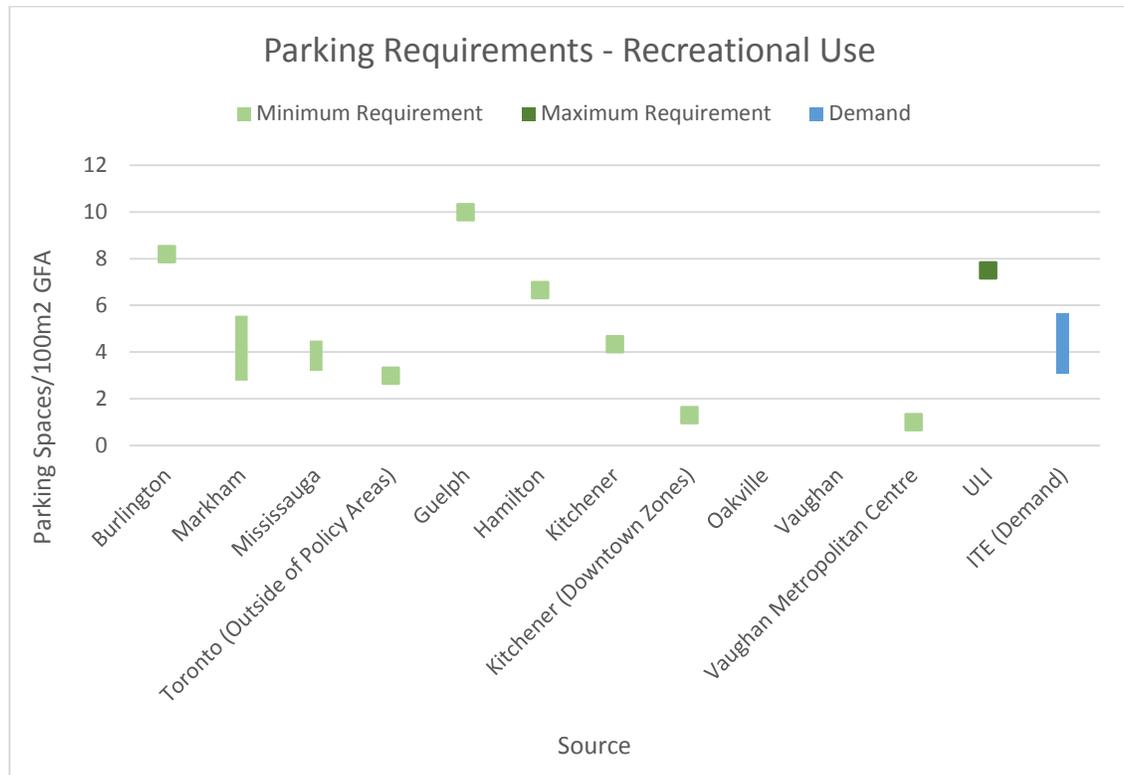
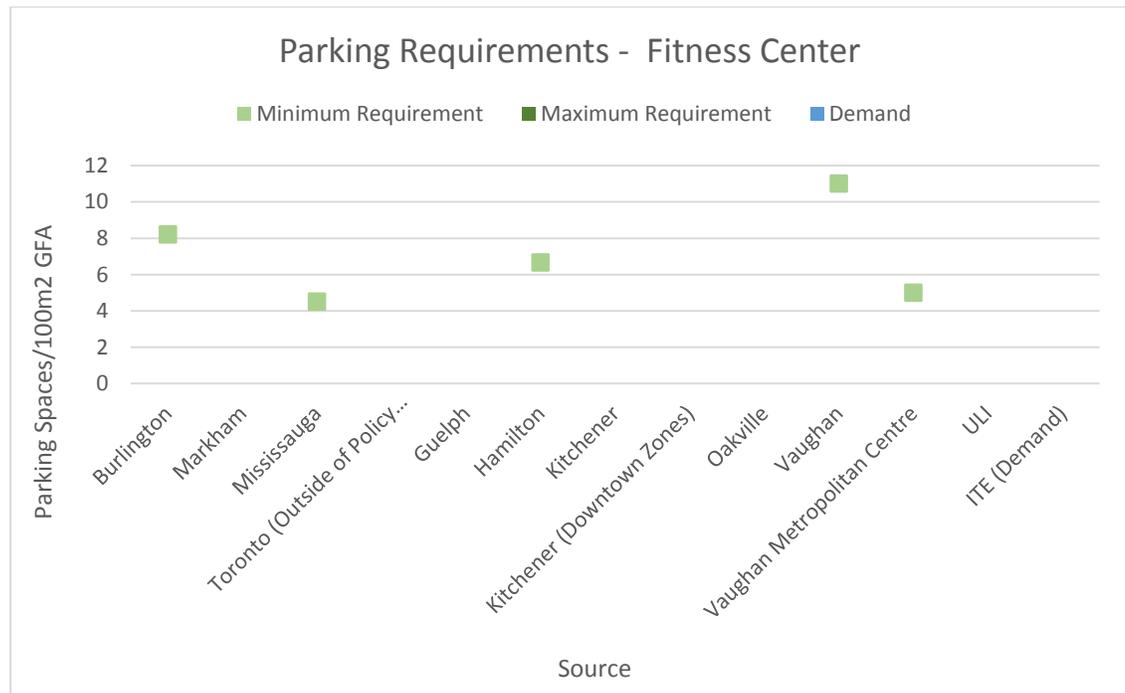


Exhibit 6.41: Parking Requirements – Recreational Use (spaces/person capacity)



Part of this peer review involved looking at rates for fitness clubs, since fitness clubs were identified as having different parking needs than other recreational uses. Given that fitness clubs are currently grouped with recreational facilities but have been recognized to have different parking demands than other recreational facilities, a peer review was conducted for fitness clubs which is provided in Exhibit 6.42. A review of ITE parking demand is also provided below, which shows that the average peak period parking demand for fitness clubs is 5.7 spaces per 100 m² GFA.

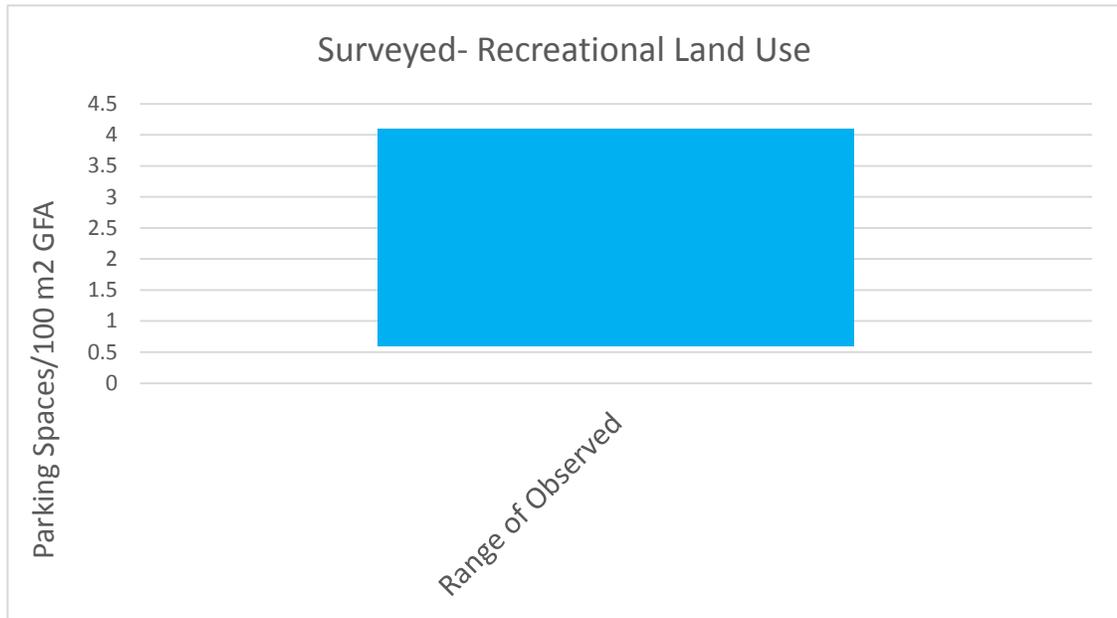
Exhibit 6.42 Peer Review – Fitness Centre



Observed

The spots surveys captured the parking demand of two types of recreational land uses (a bowling alley and a hockey rink) during their peak demand periods on Saturday afternoon-evening. Given that the common practices for measuring parking requirements for recreation uses is based on the GFA, the observed rates are presented in GFA. The maximum observed demand for recreational uses was 4.1 spaces/100 m² GFA. This demand aligns with the average observed demand from ITE and the rates provided in Markham, Mississauga, and Kitchener. The details are shown in Exhibit 6.43. Based on person capacity, hockey arenas were observing high parking occupancy, but with a transition to GFA calculation, applying the recreation GFA rate provides adequate capacity. As an example, the arena that was surveyed had high occupancy. However, if parking supply was based on GFA, there would be significantly more supply required.

Exhibit 6.43: Surveyed – Recreational Establishment



Recommendations

It is recommended that the existing general provision standard for recreational land uses be changed to spaces/GFA and that a minimum for Other Areas of Burlington be 5.5 spaces/100 m² GFA to match peer jurisdictions and to match the observed demand. This should also be applied as the maximum in Intensification Areas to prevent over-supply. It is also recommended that fitness clubs be separated as a new land use with its own parking requirement. The recommended standard for fitness club is based on results from the peer review and ITE average demand. Regarding hockey arenas, the recreational establishment land use in GFA is suitable for the parking demands observed for an arena. Converting hockey arenas to a GFA standard will effectively increase the parking requirement compared to what it is today given that hockey arenas have a relatively low person capacity for their GFA. These recommendations are summarized in Exhibit 6.44 and Exhibit 6.45.

Exhibit 6.44: Recommendations – Recreational Establishment (Spaces/100 m² GFA)

LAND USE	EXISTING RATE (MIN)	OBSERVED MAX	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
			Maximum	Minimum	Minimum
Recreational Establishment	8.2 (converted)	4.1	5.5	2.5	5.5

Exhibit 6.45 Recommendations – Fitness Centre (Spaces/100 m² GFA)

LAND USE	EXISTING RATE (MIN)	ITE AVG. DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
			Maximum	Minimum	Minimum
Fitness Centre	8.2 (converted)	5.7	6.0	2.5	5.5

6.5 Employment Uses

6.5.1 General Issues and Observations

Parking for employment land uses serves employees as well as visitors, such as contractors, couriers, and clients. Parking demand for employment lands is subject to a variety of considerations outlined below:

- Even in suburban communities, most employees have other options besides driving alone, such as carpooling, taking transit, walking or cycling;
- In the online public survey that was conducted as part of this study, Industrial Buildings were one of the main land uses that respondents identified as having too much parking.
- In the online public survey that was conducted as part of this study, medical office buildings were one of the main land uses that respondents identified as having not enough parking.
- Trips to and from an office typically have low baggage requirements, which make non-auto options more feasible;
- The employee density (i.e. the number of employees per unit floor area) may vary widely between offices (e.g. a call centre with high employee density vs. a law firm with low employee density);
- Not all employees are at work on any given day due to illness, vacation, meetings, etc.; although the percentage would vary by type of business, previous studies have generally adopted a figure of 10%. This may be growing as telecommuting is becoming more accepted by employers.
- Some employees require a car for work due to mobility challenges, shift work, off-site meetings, etc.;
- Visitor activity (e.g. clients, contractors, etc.) may vary between offices, affecting parking demand; and
- Whether an employer grants employees parking space for free can significantly influence parking demand.
- Based on trends in office development, a high parking supply is often provided for marketing purposes and therefore there is lower risk in going with a reduced minimum.

6.5.2 Office

Zoning By-law Definition: An office is defined as a building or part of a building where administrative and clerical functions are carried out in the management of a business, profession, organization or public administration.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

The existing general provisions for office uses require a minimum of 3.5 spaces per 100 m² GFA.

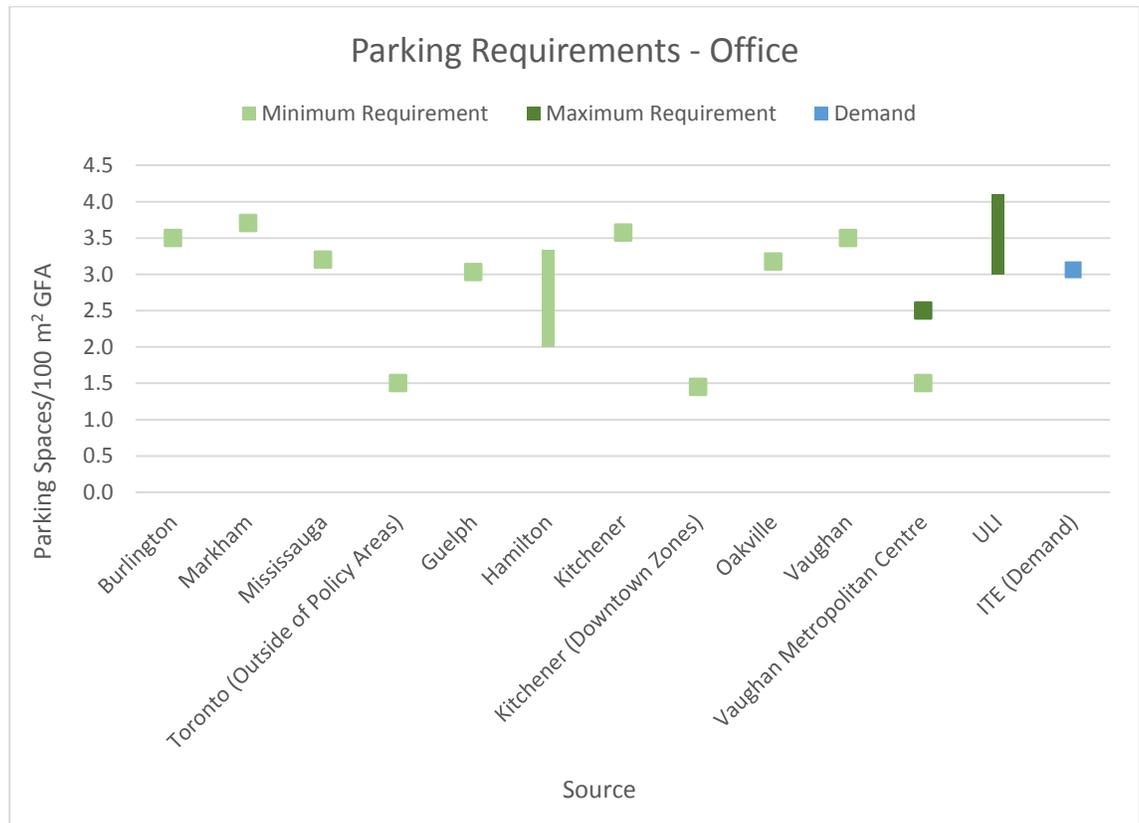
This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required supply and shared parking can be applied.

Peer Review

Standards for office uses across other jurisdictions typically range from 1.5 to 4 parking spaces per 100 m² GFA, as seen in Exhibit 6.46.

Burlington’s current standards of 3.5 are slightly higher than the requirements in peer jurisdictions and the average demands observed by ITE (3.0).

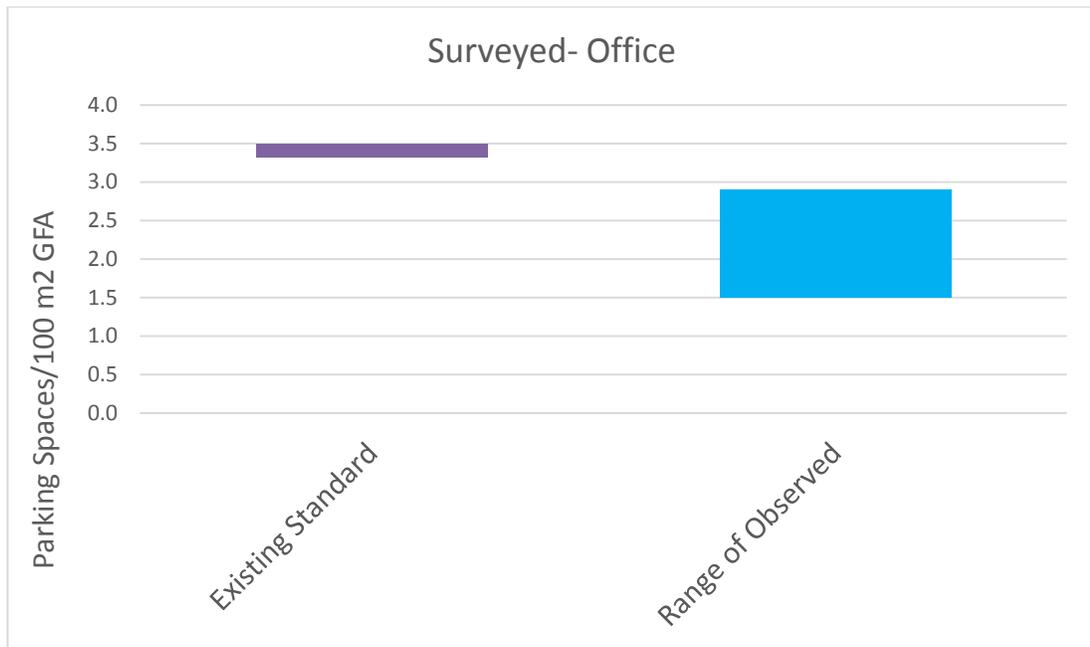
Exhibit 6.46: Parking Requirements - Office



Observed - Office

A total of 15 spot surveys were conducted at 4 different locations during the peak demand period (Weekdays between 9:30-11:30 and 13:30 and 16:00). The observed demand from these surveys range from 1.5 to 2.9, which is in line with demand calculated through the application of first principles. Exhibit 6.47 shows a summary of the observed demand and existing by-law.

Exhibit 6.47: Observed Demand for Office



Observed – Multi-Unit Business Park

Multi-unit business parks were also surveyed to determine if they should be separated out with their own parking requirements. Three multi-unit business parks were surveyed. Two were plaza-style business parks with individual ground floor entries for each unit and one was an office tower with multiple tenants in a single building. The results from the survey suggest that the office tower type had an average demand of 2.7 spaces/100m², which is comparable to the office land use. The other two types of business parks, however, had a lower parking demand. The average demand observed at these two sites was 0.9 spaces/100m², which is more comparable to the industrial land use.

First Principles

As described in Section 5 of this report, first principles calculations, using auto driver mode split and an assumed employee density, can help determine parking demand for employment related land uses. Based on Burlington’s city wide mode split for trips ending in Burlington in the AM peak period and an assumed employee density rate, a parking demand ratio of 3.0 spaces/100 m² is calculated. This is less than the current requirement that is identified in the general parking provisions.

If Intensification Areas become the multi-modal areas that are envisioned, we can assume a lower auto-mode split compared to the existing mode split in Burlington. For the purposes of discussion, if a 62% auto driver mode split in these areas are realized, a parking supply ratio of 2.42 spaces/100 m² would be calculated. The auto driver mode split refers to the portion of all trips that require a driver, and are therefore not inclusive of auto passengers. The auto driver mode split is directly related to parking demand. The results of these calculations are shown in Exhibit 6.48.

Exhibit 6.48: First Principles Ratio for Office Uses

Area	Employee Density	Auto Driver Mode Split	First Principles Ratio
	(# employees/100 m ²)	(%)	(spaces/100 m ²)
All of Burlington (Current)	3.9	77%	3.00
Future Scenario (TMP Targets)	3.9	62%	2.42
Future Scenario (Aggressive mode shift)	3.9	50%	1.95

Recommendations – Office and Multi-Unit Business Parks

The recommendations for parking requirements for the office land use should be based on first principles and observed demand. This results in a lower rate for Intensification Areas, as office developments in mixed use areas will drive the overall mode split targets of the City. A lower rate for Other Areas of Burlington is also recommended. The downtown exemption area should be maintained for the general office land use. Exhibit 6.49 provides a summary of the recommendations.

Given the observed difference in demand for plaza-style business parks, with separate entrances for each ground unit, a separate parking requirement should be introduced that is representative of the lower demand per area compared to the office land use but a higher demand than industrial uses. A rate of 2.0 spaces/100 m² GFA is suggested for multi-unit business parks in Burlington Other Areas to reflect the increasing range of tenants that are being hosted in these business parks.

Since it is recommended that multi-unit business parks be added to the list of land uses in the by-law, the following description is recommended:

Multi-Unit Business Park: A parcel of land where several office, light industrial or commercial service businesses are grouped together on a single lot, with a common parking area. Although not mandatory, each business in these business parks tend to have their own ground-floor entrance.

Exhibit 6.49: Recommendations – Office (spaces / 100 m² GFA)

LAND USE	EXISTING RATE	FIRST PRINCIPLES	MAXIMUM OBSERVED DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
General Office	3.5	1.95 – 3.00	2.90	2.5	2.0	3.0
Multi-Unit Business Park (<30% space used for general office)	3.5	1.95 – 3.00	1.2*	2.0	1.0	2.0
Multi-Unit Business Park (>30% space used for general office)	3.5	1.95 – 3.00	1.2*	2.5	2.0	3.0

6.5.3 Medical Offices

6.5.3.1 General Issues and Observations

Medical office parking serves employees (i.e. doctors, support staff, etc.) as well as patients and other visitors, such as contractors, couriers, and clients. Parking demand for medical office employees is affected by many of the key factors outlined for the general office use; however, the large number of patients/clients affect parking demand sufficiently for medical offices to warrant their own classification in the parking by-law. In addition to the general determinants of parking demand (discussed earlier), parking demand for medical offices is subject to a variety of additional considerations outlined below:

- Medical offices have significantly more visitors than general office buildings due to the large number of clients/patients who make many short-term visits over the course of the day;
- There is an overlap between people in the waiting room and people still seeing the doctor that leads to more people on-site;
- Accessory uses such as labs and diagnostic facilities or labs increase demand;
- Many patients are elderly, disabled, or ill and are thus more likely to use a private vehicle over transit or active modes of transportation. Furthermore, offsite patient parking may be undesirable due to mobility limitations;
- In many cases, patients may not be familiar with available transit options or offsite parking options as they are infrequent visitors;
- Medical offices typically have a significantly lower employee density than the general office use due to the floor area dedicated to patients (e.g., waiting rooms, etc.);
- Most employees have other options besides driving including taking transit, walking, cycling, carpooling or walking from nearby parking;
- Employees are familiar with the available parking supply and can thus find available spaces quickly and use all available spaces; and
- Some types of employees require a car during work or because of disability, shift work, off-site meetings, etc.

Zoning By-law Definition: A medical office is defined as a building, structure or part thereof, other than a hospital, used for consultation, examination or therapeutic treatment by a physician, dentist, drugless practitioner or health professional licenced by the Province of Ontario and, may include accessory medical uses such as, laboratories, facilities for medical, diagnostic and dental purposes, a drug and optical dispensary and a medical supply and equipment store, provided that all such uses have access only from the interior of the building.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

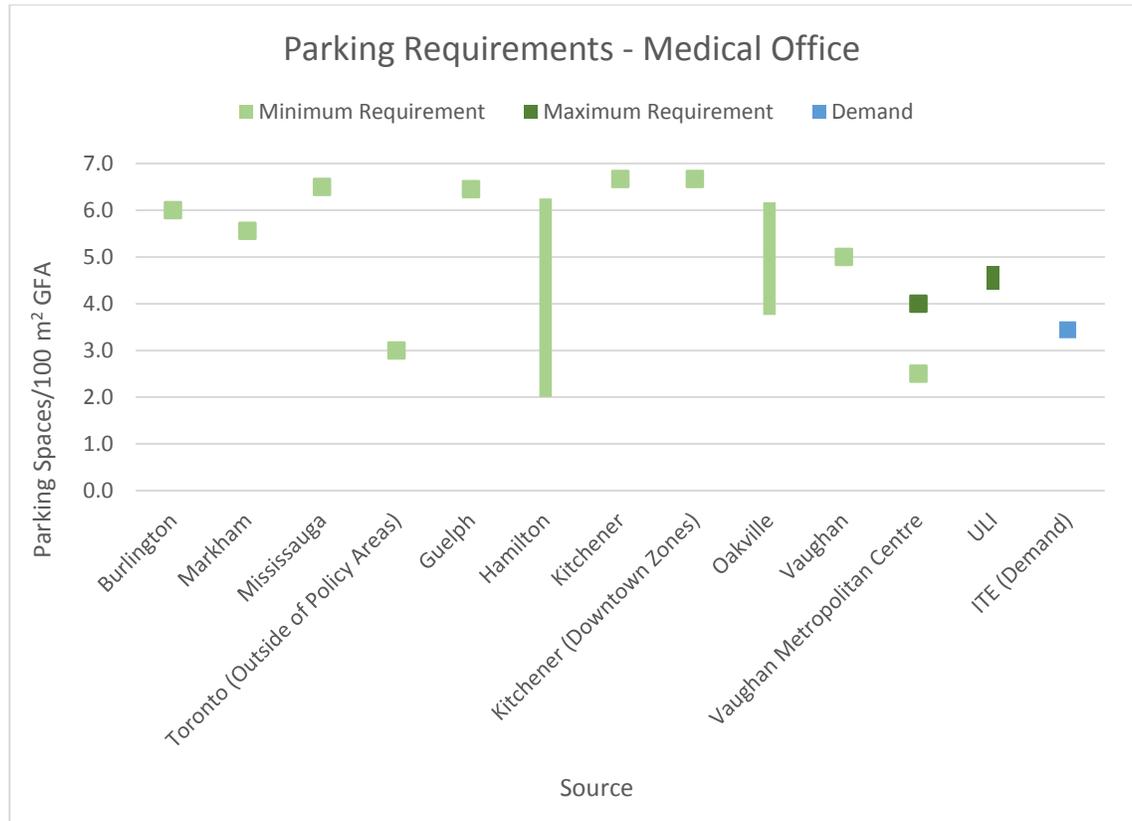
The existing general provisions for office uses require a minimum of 6.0 spaces per 100 m² GFA.

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required minimum supply and shared parking can be applied.

Peer Review

Burlington’s minimum standards for this land are slightly lower than some of its peers and slightly higher than others. On average the rate used in Vaughan, Markham, Mississauga, Guelph and Kitchener is 6.0. The rates across the peer municipalities are shown in Exhibit 6.50.

Exhibit 6.50: Parking Requirements – Medical Office



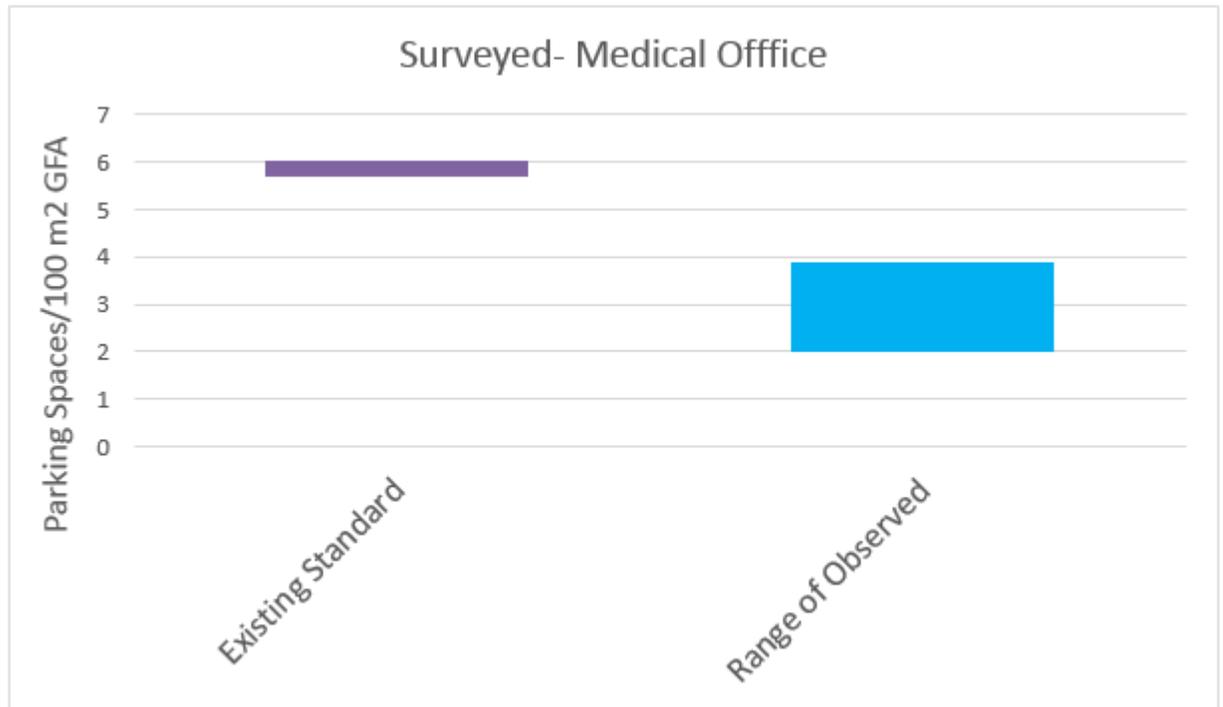
Observed

A total of 9 spot surveys were conducted at 2 different locations during the peak demand period (Weekdays between 9:30-11:30 and 13:30 and 16:00).

The maximum observed demand from the surveys was 3.9 spaces/100 m² GFA. This is compared to the existing parking requirement in Exhibit 6.51.

The parking utilization for medical offices ranges from 25% to 95%.

Exhibit 6.51: Observed Demand for Medical Office



Recommendations

In the online public survey, this land use was identified as having too few parking spaces. The peer review suggests that Burlington’s existing standard is lower than some of its suburban peers. It is recommended that the general provisions for this land use be maintained at 6 spaces/100 m² GFA and a reduced minimum should be applied to Intensification Areas. A summary is provided in Exhibit 6.52.

Exhibit 6.52: Recommendations – Medical Office (spaces/100 m² of GFA)

LAND USE	EXISTING RATE	RANGE OF PEERS	MAXIMUM OBSERVED DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Medical Office	6.0	5.0 - 6.66	3.9	No max	4.0	6.0

6.5.4 Industrial Uses

There are several types of industrial uses that are aggregated under a common “Industrial Uses” category in the existing by-law. It is recommended that this category be maintained, but that the land uses below be developed into separate categories, each with their own standards.

Zoning By-law Definition: An industrial use is defined as assembling, fabricating, manufacturing, processing, warehousing and distribution uses, repair activities, communications, utilities, transportation, storage, service trades and construction uses.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

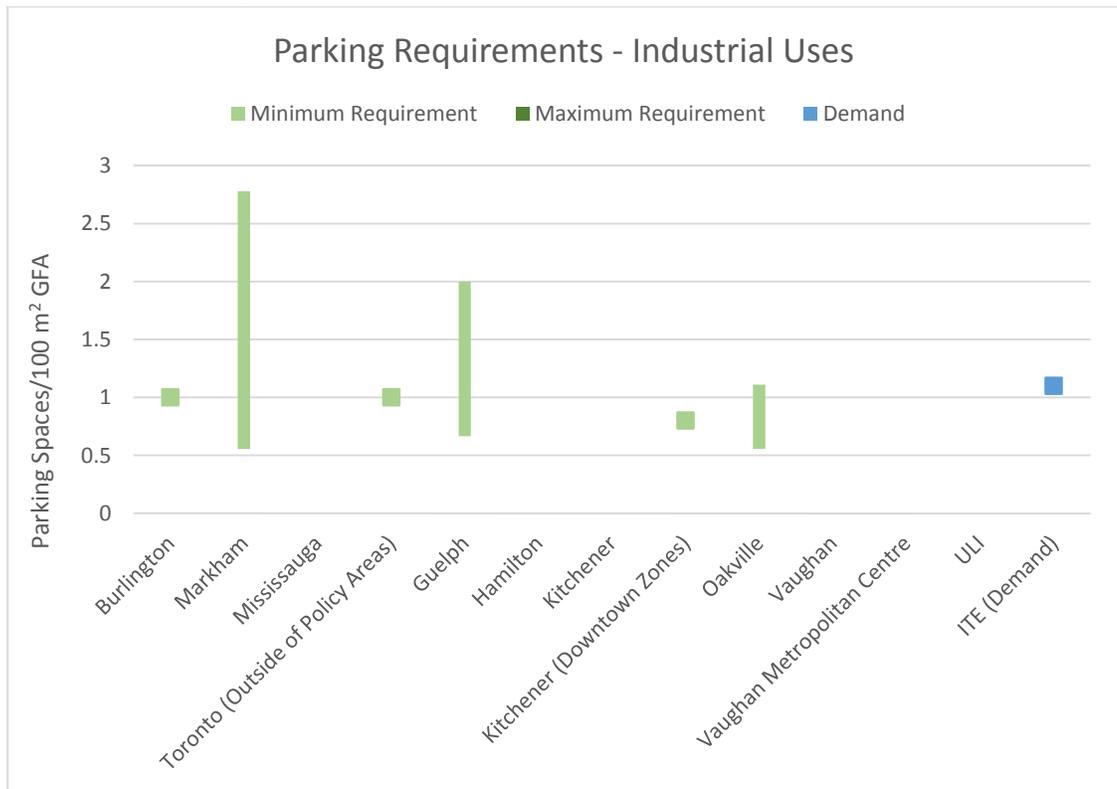
Existing Requirements

This use is currently requires 1.0 space/100 m² GFA.

Peer Review

The standards for industrial land uses in peer jurisdictions and the average demand observed by ITE are consistent with Burlington’s current standard. These Peer Review are either based on requirements for manufacturing uses, or for general industrial uses. In Markham, Guelph, and Oakville, standards vary depending on the size of the establishment. For Guelph, Kitchener, and Oakville, the standards show below, in Exhibit 6.53 are for manufacturing uses.

Exhibit 6.53 : Peer Comparison of Industrial Uses



Observed

Surveys were conducted for two types of industrial land uses that are defined below (Warehouse & logistics, and Storage Locker facilities). The surveys suggest that there are difference demands for these uses than the current requirement for industrial uses and that they should have separate standards.

Site Specific Review

A site specific review of two industrial uses was conducted. One location allowed for a 10% reduction in parking supply, while the other site allowed a 30% reduction. The maximum observed utilization of these sites was 90% and 63% respectively. The site specific review further exemplifies the variability of parking requirement depending on the activity taking place at the site.

Recommendation

The requirements for parking within what is now defined as an industrial land use is variable, depending on the type of industrial activity that takes place. In terms of manufacturing, even greater variability can be expected as certain industrial and manufacturing processes become more automated. As this occurs, much of the floor space that was once dedicated for employee work space is being replaced by robotic equipment.

Given the uncertainty and variability across the industrial land use category, it is recommended that parking for industrial uses be based on three land use types:

1. General Industrial Uses (Including manufacturing)
2. Warehouse and Logistics
3. Storage Locker Facilities

Warehousing and Logistics and Storage locker facilities are discussed in further detail below.

The general industrial use will include manufacturing. Based on the requirements observed in peer jurisdictions, requirements for general industrial uses should maintain the existing requirement for industrial uses to match the average demand referenced in ITE and the current adequacy of parking space at general industrial land uses in Burlington. The recommended rates for the general industrial land use are identified in Exhibit 6.54.

Exhibit 6.54: Recommendations – General Industrial (spaces/100 m² GFA)

LAND USE	EXISTING RATE	AVERAGE ITE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
			Maximum	Minimum	Minimum
General Industrial	1.0	1.1	No max	1.0	1.0

6.5.5 Warehouse & Logistics

Zoning By-law Definition: A warehouse is a commercial building for the storage of goods and forms part of the logistics of supply chain management that plans and controls the efficient flow and storage of these goods.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

This use is currently included in the Industrial land use and requires 1.0 space/100 m² GFA.

Peer Review

A peer review of standards for warehouse and logistics buildings was conducted. Burlington’s standards are similar to that of its peers, as seen in Exhibit 6.55.

Exhibit 6.55: Parking Requirements – Warehouse & Logistics Building



Observed

A total of 8 spot surveys were conducted at two different locations during the peak parking demand period for the land use (Weekdays between 9:30-11:30 and 13:30 and 16:00).

The maximum observed parking rate from the surveys revealed a demand of 1.9 spaces/100 m² GFA. The demand is summarized in Exhibit 6.56.

Exhibit 6.56: Observed Demand for Warehouse and Logistics Uses



Recommendation

It is recommended that Warehousing and Logistics land uses be independent of the parking standard for industrial uses. Based on the observed parking demand for this land use, a minimum parking requirement of 1.5 spaces/100 m² GFA should be applied to Other Areas of Burlington, while a lower rate should be applied to Intensification Areas. A summary is provided in Exhibit 6.57.

Exhibit 6.57: Recommendations – Warehouse and Logistics (spaces/100 m² GFA)

LAND USE	EXISTING RATE	RANGE OF PEERS	MAXIMUM OBSERVED DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Warehouse and Logistics	1.0	0.5-2.5	1.9	No max	1.0	1.5

6.5.6 Storage Locker

Zoning By-law Definition: A storage locker is not listed under the definitions in the by-law. However, it is a facility where one stores items for the short or long term, often in individual storage units for which you can drive right up to the storage locker.

Parking Characteristics: Parking is provided on-site, generally in surface parking lots.

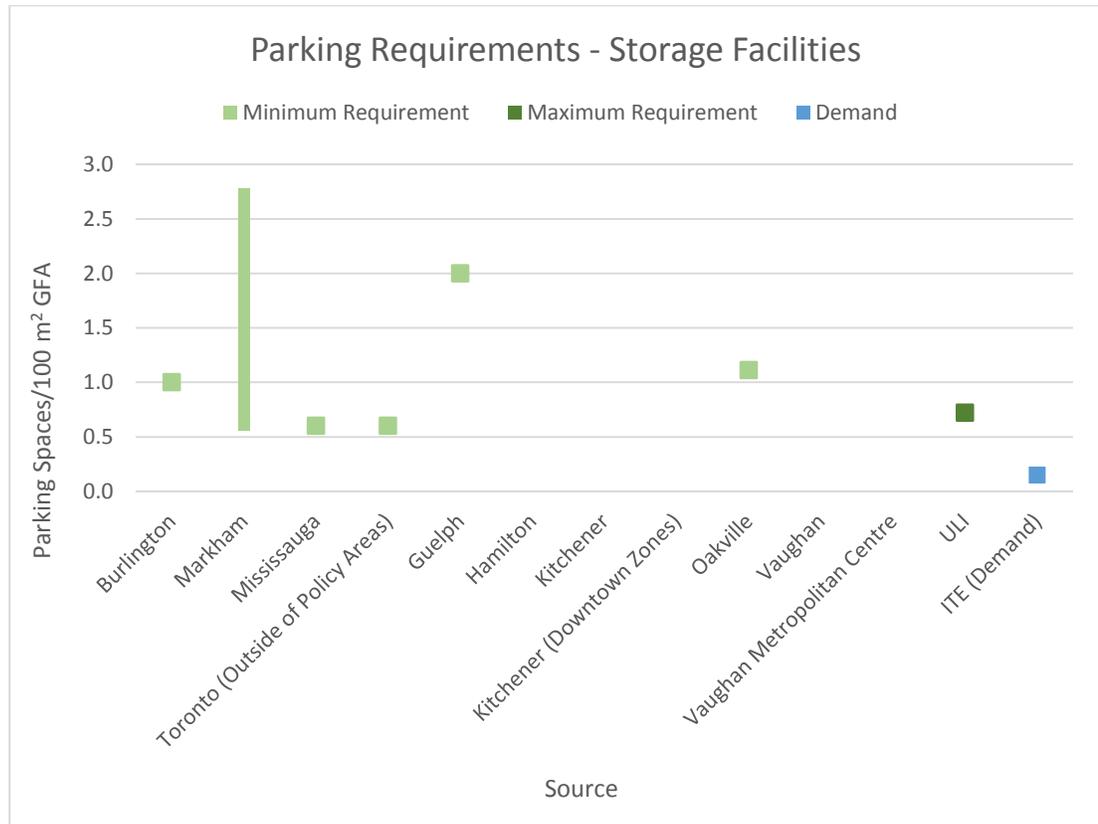
Existing Requirements

Storage lockers are currently grouped under Industrial Uses and require 1.0 space/100 m² GFA.

Peer Review

A peer review of storage locker facilities shows a range between 0.5 and 2.5 spaces/100 m² GFA and the average demand observed by ITE was 0.15 spaces/100 m² GFA. Burlington’s existing standard of 1 space/100 m² GFA is in line with the standards observed in other areas. A summary is provided in Exhibit 6.58.

Exhibit 6.58: Parking Requirements – Storage Facilities

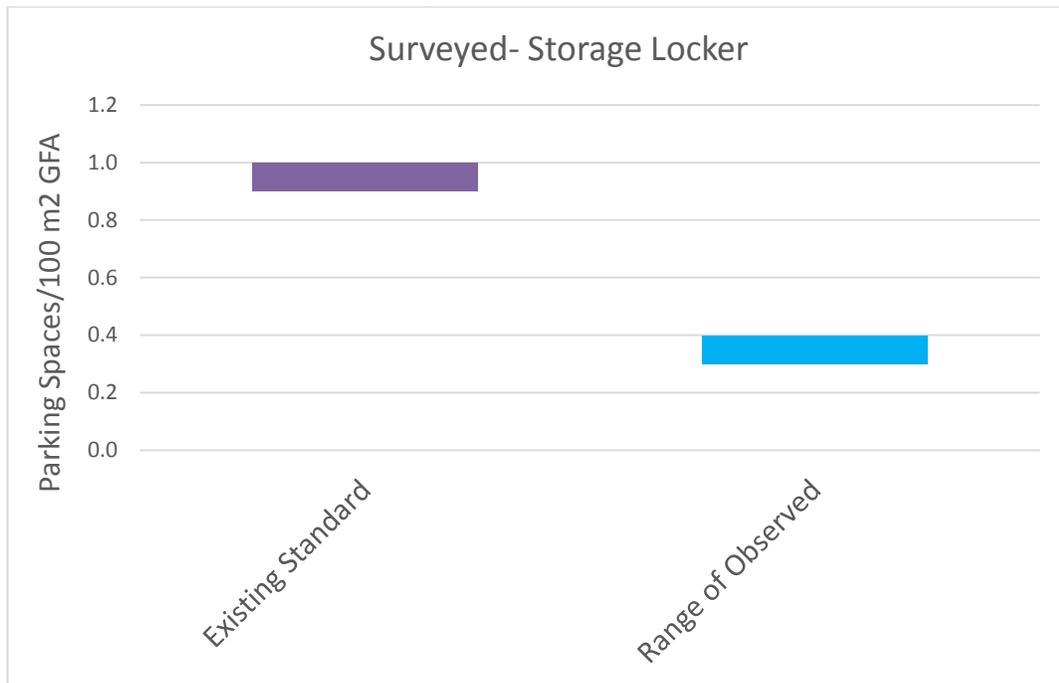


Observed

A total of 9 spot surveys were conducted at one location during the peak parking demand period for the land use (Weekdays between 9:30-11:30 and 13:30 and 16:00).

Surveys conducted for this land use were based on supply and demand for parking outside of the gated area. Many of the spaces on the inside of the gated area are dedicated for vehicle storage and access to the storage lockers. The maximum observed demand in the public parking areas of these facilities was 0.4 spaces/100 m² GFA, as summarized in Exhibit 6.59.

Exhibit 6.59: Observed Demand for Storage Locker



Recommendation

Recently there have been a number of variances to allow for a reduced parking requirement for storage locker facilities. These variances reflect the lower parking requirement for these land uses compared to other industrial uses, which is further justified by the parking survey results.

It is therefore recommended that storage locker land uses be independent of the parking standard for industrial uses. Based on the observed parking demand for this land use, a minimum parking requirement of 0.5 spaces/100 m² GFA should be applied outside of the gated area. Considering the high propensity to drive to storage lockers (given the need to pick up or drop off large items), it is not recommended that the requirements be stratified by land use. A summary is provided in Exhibit 6.60.

Exhibit 6.60: Recommendations – Storage Lockers (spaces/100 m² GFA)

LAND USE	EXISTING RATE	ITE AVERAGE DEMAND	MAXIMUM OBSERVED DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Storage Lockers	1.0	0.15	0.4	No Max	0.5	0.5

This is based on the requirement for spaces outside of the gated area (for employees and customers not entering the gated area)

6.6 Restaurant

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

- Parking demand is highly correlated to sales, even more than retail establishments. This is likely due to the fact that there is less variation in spending per customer in a restaurant than in a retail establishment;
- The type of restaurant (e.g. family restaurant vs. fine dining restaurant) and the customer base (e.g. office employees vs. families) will affect the daily and weekly parking demand profile;
- Restaurant parking demand is inversely related to customer turnover. More upscale restaurants are typically characterized by more leisurely dining, and thus lower turnover, which means these establishments will have higher parking demand than their fast-food counterparts (all else being equal). Dedicated take-out and drive-through restaurants will have even lower parking demand than family restaurants;
- Parking demand increases with seat density;
- Parking demand is inversely related to the average size of dining parties, since party size is highly correlated to auto occupancy;
- Employees account for approximately 15% of parking demand at casual restaurants and most employees have other options besides driving alone including carpooling, being dropped off, or taking transit; and
- Trips to and from a restaurant typically have low baggage requirements, which makes non-auto options more attractive.
- Restaurants are often located within Retail Centres, where the retail centre parking rate is applied to the entire centre. Since Retail Centres have a much lower parking demand per area than restaurants, Retail centres with a high portion of restaurants as land uses can have a shortage of parking supply.

6.6.1 Standard Restaurant

Zoning By-law Definition: A standard restaurant is defined as any eating establishment located in a building or structure or part thereof where food and beverages are prepared and served for consumption on the premises, but does not include Fast Food Restaurant or Convenience Restaurant.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

The existing general provisions for places of standard restaurants require a minimum of 1 space/4 person capacity. This is the equivalent of about 25 spaces/100 m² GFA.

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required minimum supply and shared parking can be applied.

Peer Review

Burlington's requirement for parking at standard restaurants is considerably higher than the requirements in peer jurisdictions and the demand observed by ITE, as summarized in Exhibit 6.61.

Exhibit 6.61: Peer Review – Standard Restaurant

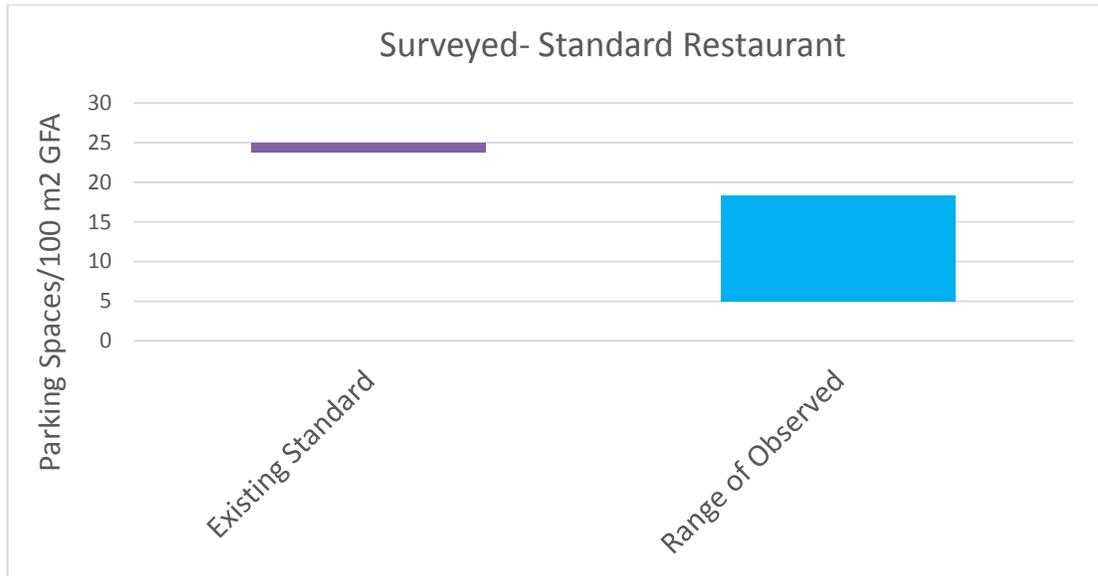


Observed

A total of 11 spot surveys were conducted at three different locations during the peak parking demand period for the land use (Weekends between 18:00 and 20:00).

The maximum observed parking demand at the restaurants that were surveyed was 18.4 spaces/ 100 m² GFA, as seen in Exhibit 6.62.

Exhibit 6.62: Observed Demand for Standard Restaurant



Recommendation

It is recommended that the parking requirement for standard restaurants be reduced to be more consistent with requirements in peer jurisdictions, ITE average demand, and to reflect the observed demand from the surveys. Provisions should also include requirements in GFA, as opposed to just spaces/person capacity.

Given that Intensification Areas are targeted for residential intensification, it is likely that as the area grows out, there will be a higher portion of people that can walk to restaurants in the area. The requirement in Intensification Areas should therefore be reduced. A summary is provided in Exhibit 6.63.

Exhibit 6.63: Recommendations – Standard Restaurant (Spaces/100 m² GFA)

LAND USE	EXISTING RATE (MIN)	MAX OBSERVED RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Standard Restaurant	1 space / 4 persons (approx. 25 spaces / 100 m ²)	18.4	17.54	16.0	12.0	18.5

6.6.2 Fast Food Restaurant

Zoning By-law Definition: A fast food restaurant is defined as any eating establishment located in a building or structure or part thereof having a floor area in excess of 100 m², with or without seating accommodation, where food and beverages are prepared and served for consumption on or off the premises and whereby customers attend a service counter.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

The existing general provisions for fast food restaurants require a minimum of 1 space/4 person capacity or approximately 25.0 spaces/100 m² GFA.

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required minimum supply and shared parking can be applied.

Peer Review

The requirement in peer jurisdictions generally ranges from under 5 spaces/100 m² GFA to over 15 spaces/100 m² GFA. The average demand observed by ITE was 13.34 spaces/100 m² GFA. This is considerably lower than the current requirement in Burlington, which can be seen in Exhibit 6.64.

Exhibit 6.64: Peer Review – Fast Food Restaurant

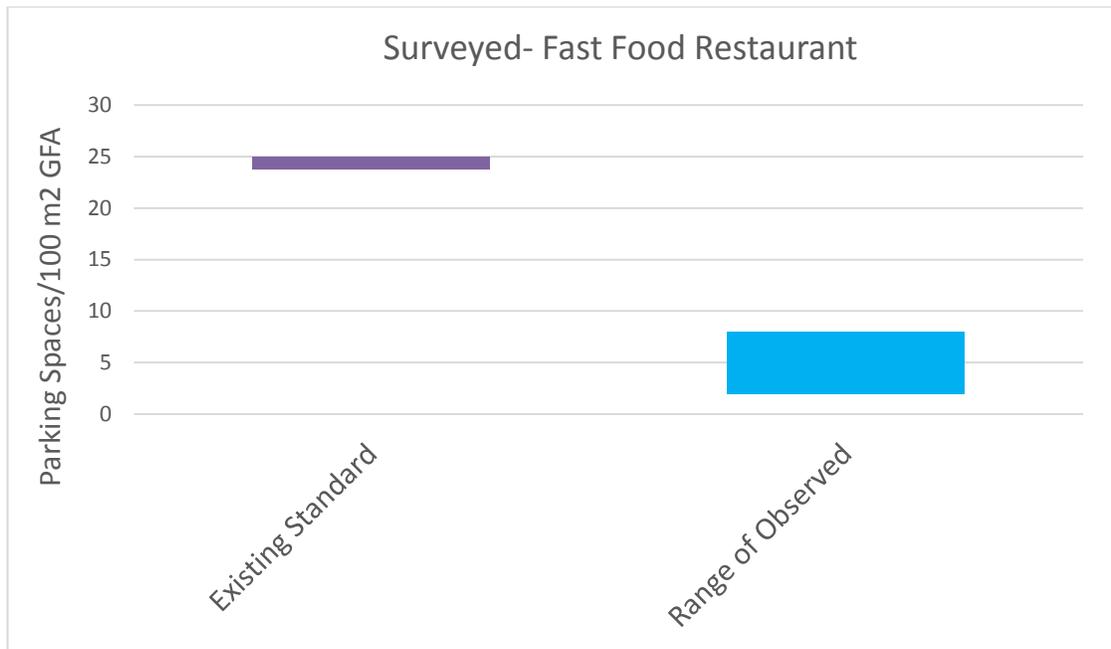


Observed

A total of 16 spot surveys were conducted at two different locations during the peak parking demand period for the land use (Weekdays between 12:00 and 13:00).

The maximum observed parking demand at the restaurants that were surveyed was 8.0 spaces/100 m² GFA. The summary of the surveyed results is provided in Exhibit 6.65.

Exhibit 6.65: Observed Demand for Fast Food Restaurant



Recommendations

It is recommended that the parking requirement for fast food restaurants be reduced to 10 spaces/100 m² GFA to be more consistent with requirements in peer jurisdictions and ITE demand, and to reflect the observed demand from the surveys.

Additional considerations should be given to the size of the restaurant. Smaller establishments are typically located on small parcels and are more likely to be on main avenues; therefore, high parking standards may be prohibitive to development in these locations. Additionally, smaller, local establishments may have smaller parking requirements due to the primary local client base who are more likely to use non-auto modes of transportation. A summary of the recommendations is shown in Exhibit 6.66.

Exhibit 6.66: Recommendation – Fast Food Restaurant (Parking Spaces/100 m² GFA)

LAND USE	EXISTING RATE (MIN)	MAX OBSERVED RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Fast food Restaurant	1 space / 4 persons (approx. 25 spaces / 100 m ²)	8.0	13.34	10.0	5.0	10.0

6.6.3 Outdoor Patios

Zoning By-law Definition: An outdoor patio is defined as an outdoor area associated with a permitted restaurant use, located on the same lot as the restaurant, is used on a seasonal basis only and which shall provide tables and seating for patrons to be served meals and/or

refreshments for consumption on the premises. Patio seating shall not exceed 50% of the capacity of the restaurant. An outdoor patio shall be used exclusively for dining and shall not include any recreational or entertainment use or activity.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

The existing general provision for patios is 1 space per 4 person capacity.

Peer Review

No peer review was conducted for this use, since few jurisdictions had matching land uses, and the ones that did used GFA as the unit of measurement.

Observed

No surveys were conducted for this land use that are representative of a true peak demand period, when a restaurant with a patio is full.

Recommended

- Patios are seasonal; therefore, extra parking goes unused for majority of the year.
- Seasons with high patio activity coincide with time of the year with higher rates of active transportation
- In addition, people will be more willing to walk further from public parking lots or their home.

It is recommended that the standard for outdoor patios be removed from the by-law.

6.6.4 Bank/Financial Institution

Zoning By-law Definition: A bank/financial institution is not specifically listed in the definitions portion of the by-law, but is generally understood to be a building for which customers can undertake their financial dealings with the institution, such as depositing or withdrawing money.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Traditionally, banks operated with a regional market, with one branch serving a large geographical area. In recent years, there appears to be a movement away from bank regionalization, to development in mixed use areas, with smaller branches. This trend is noticeable in both the parking surveys, and the peer review of parking rates.

Existing Requirements

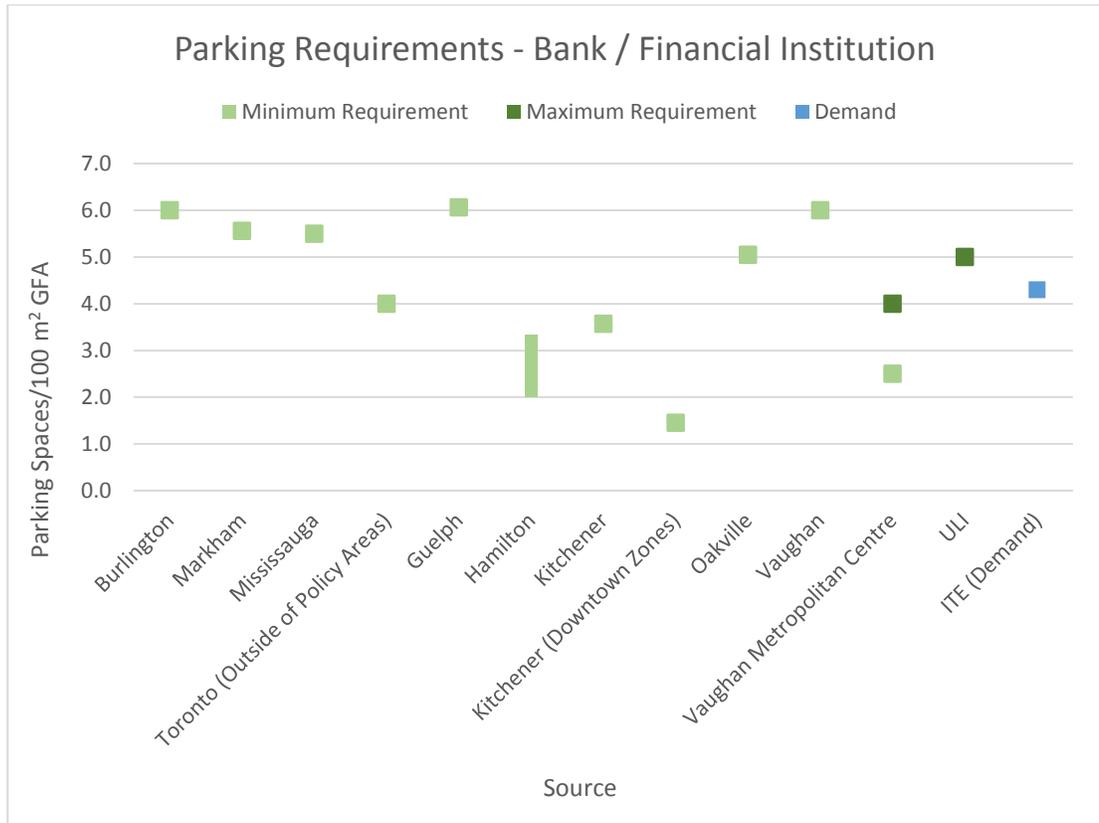
The existing general provisions for banks require a minimum of 6.0 spaces/100 m² GFA.

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required minimum supply and shared parking can be applied.

Peer Review

Compared to peer jurisdictions and to demand observed by ITE, Burlington's parking requirement for banks is on the higher end of the range of rates. A summary can be found in Exhibit 6.67.

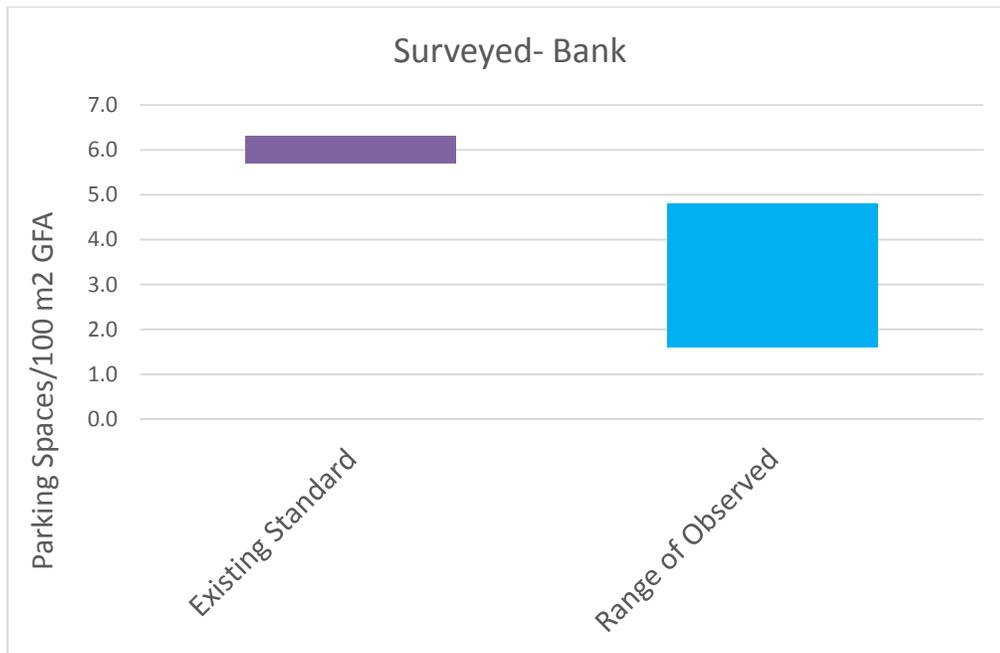
Exhibit 6.67: Peer Review – Bank/Financial Institution



Observed

Surveys were conducted at three different stand-alone banks at various periods during peak demand periods. A total of 14 spot surveys were completed at three different locations during the peak parking demand period for the land use (Weekdays between 12:00 and 13:00). The maximum observed rate surveyed was 4.8 spaces/100 m² GFA. Compared to the existing standard for banks, the observed rate justifies a reduction. A summary is provided in Exhibit 6.68.

Exhibit 6.68: Surveyed Demand - Bank



Recommendations

It is recommended that the minimum parking standard for Banks be reduced to 5.0 spaces/100 m² GFA in Other Areas of Burlington to reflect the results from the spot surveys. In Intensification Areas, a minimum and maximum should be applied, as per best practices and peer reviews. A summary of the recommendations is in Exhibit 6.69.

Exhibit 6.69: Recommendation – Bank (Parking Spaces/100 m² GFA)

LAND USE	EXISTING RATE (MIN)	MAX OBSERVED RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Bank	6.0	4.8	4.3	4.5	3.5	5.0

6.7 Places of Assembly/Places of Worship

6.7.1 General Issues and Observations

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

- Places of worship may contain a number of uses (e.g., worship spaces, banquet halls, offices, daycares, etc.) that may or may not generate parking demand at the same time;
- Worship schedules vary by faith and denomination. For example, while Christian churches typically have their weekly peak hours on Sunday, Muslim mosques typically have their weekly peak on Friday afternoon;

- Many places of worship (Buddhism, Hinduism, Islam and Sikhism) do not use fixed seating in their worship areas, which makes it difficult to establish a worship capacity for the purposes of parking analysis and setting parking requirements;
- Places of worship tend to experience a very high parking demand several times a year during particular festivals or holidays, which tend to be double that of regular services, but may be up to 2.5 to 5 times the number at regular services¹²;
- Since many worshippers arrive as a family, there is a high level of ridesharing among worshippers;
- There is often a high potential for shared parking between places of worship and nearby or adjoining schools or other uses; and
- Places of worship are often located in residential areas, which typically provide ample on-street parking that can serve worshippers during peak demands; however, parking spillover may be a nuisance to local residents.

6.7.2 Place of Worship

Zoning By-law Definition: A place of worship is defined as a parcel of land, building or structure or part thereof adapted or used for the assembly of persons, for civic, political, religious, educational or social purposes.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

Existing Requirements

The existing general provisions for places of worship require a minimum of 6.0 spaces per 100 m² GFA.

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required minimum supply and shared parking can be applied.

Peer Review

There is considerable variation in the parking requirements for places of worship across peer jurisdictions. The unit for which parking demand is measured also varies considerably and includes measures based on total GFA, spaces per seat, spaces per building capacity, or size of the worship area (sanctuary). The average demand observed by ITE based on total GFA is 9.01 spaces/100 m² GFA. Exhibit 6.70 compares standards in peer jurisdictions that apply a total GFA measure, Exhibit 6.71 compares jurisdictions that apply the GFAs of worship areas, and Exhibit 6.72 compares jurisdictions that apply a spaces per seat measurement.

¹² Macaulay Shiomi Howson Ltd. for the Town of Markham, *Places of Worship Study: Background Issues & Options Report*, June 2002

Exhibit 6.70: Peer Review – Places of Worship based on total GFA

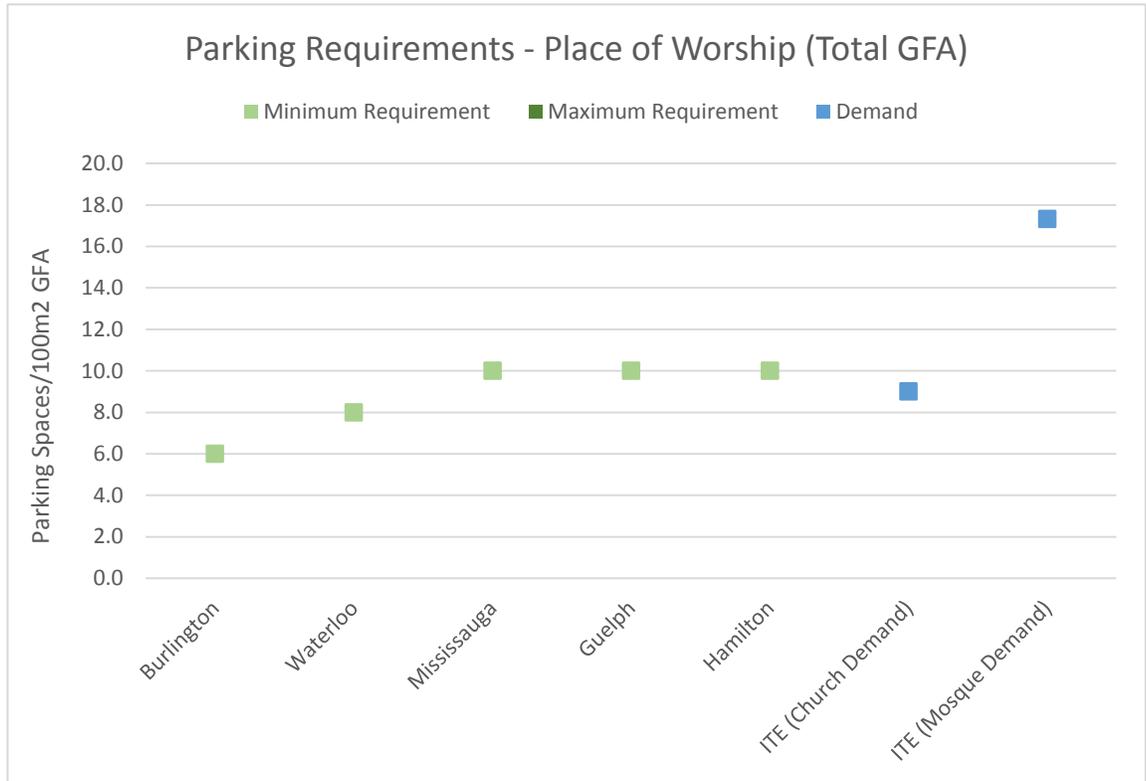


Exhibit 6.71: Peer Review – Places of worship based on GFA of worship area

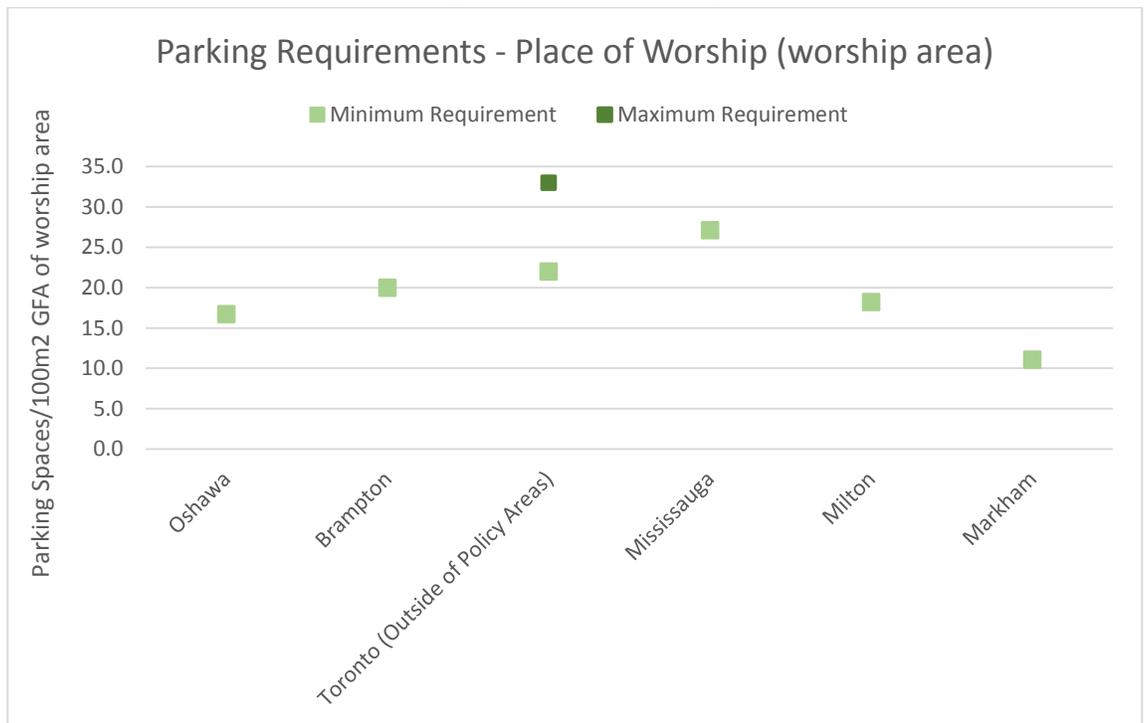
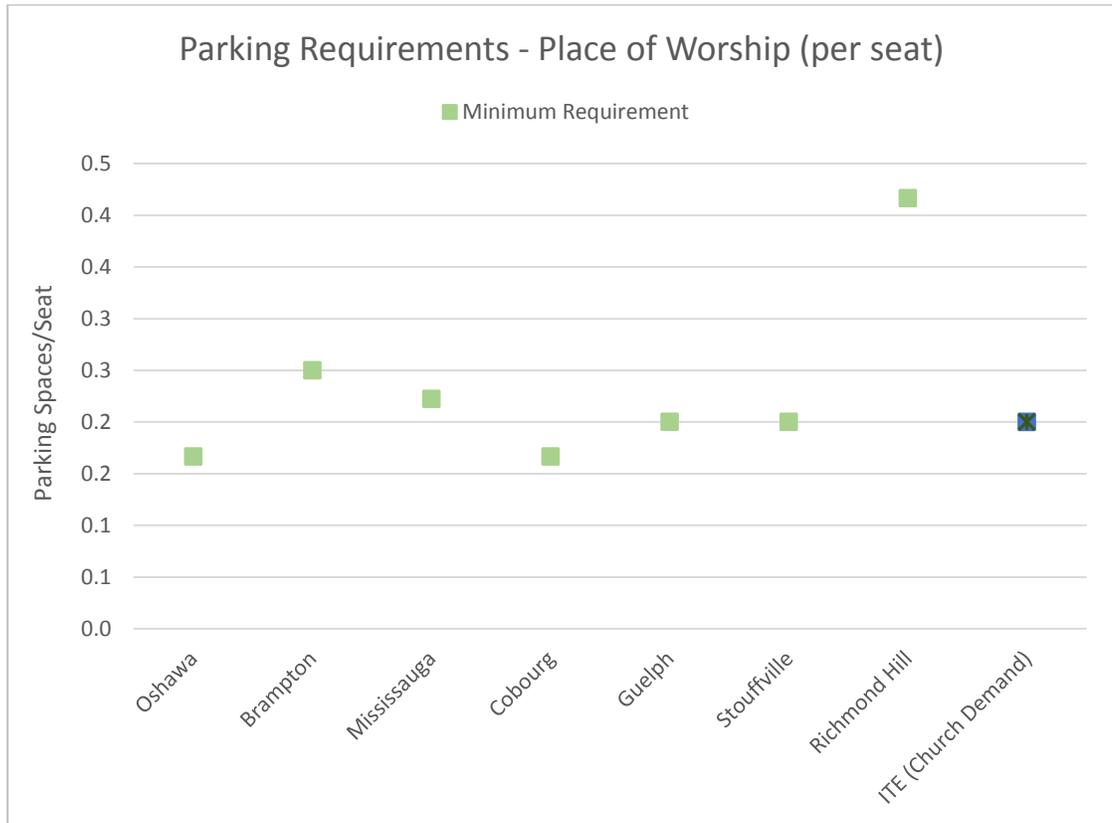


Exhibit 6.72: Peer Review – Places of worship based on number of seats

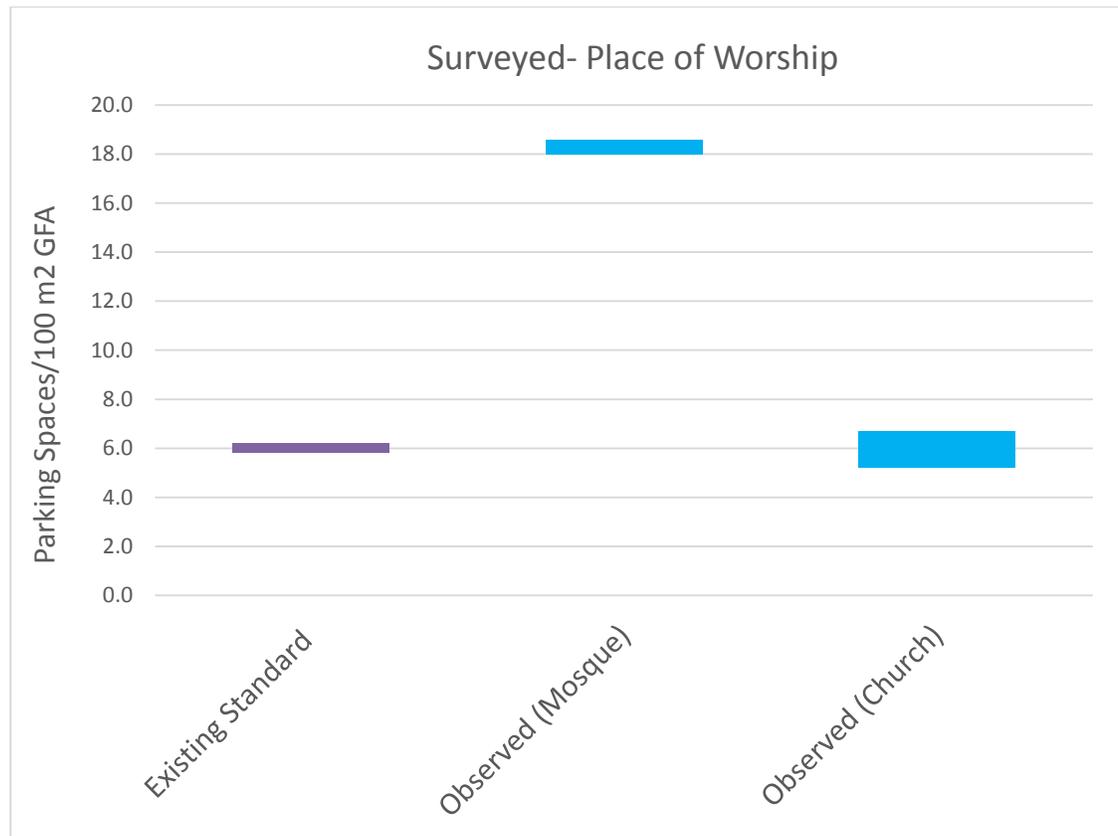


Based on the review of other jurisdictions that apply the spaces per total GFA measurements and the demand observed by ITE, Burlington currently has a lower standard than other jurisdictions.

Observed

Three places of worship were surveyed (two churches and one mosque) during their peak demand periods. The churches were surveyed during Sunday morning mass, and the Mosque was surveyed during Friday noon prayer. The surveys from the mosque suggest a significantly higher parking demand for this specific site. This observation also matches the difference in demand observed by ITE’s review of mosques and churches. This difference in demand can partially be explained by the accessory uses in addition to the worship areas that the surveyed churches included, such as a classrooms and recreational/assembly areas, for which the surveyed mosque did not include. Exhibit 6.73 compares the observed parking demand of the mosque, churches, and the existing ratio that applies to all places of worship.

Exhibit 6.73: Observed Demand for Place of Worship



Recommendation

The findings of the parking surveys indicated that the place of worship land use experiences parking demands that far exceed the current by-law rate, therefore some increase in the standards is justified. However, it is important to note that the by-law rate is intended to ensure that an appropriate amount of parking is provided across all the majority of developments in a particular category. Parking by-law requirements also seek to reflect balanced parking supply needs with competing matters such as urban design, heat island effect and storm-water run-off, which increase with the size of parking area.

Additionally, some places of worship contain multiple uses. For example, the worship area might be on one floor, while there may also be classroom or educational facilities elsewhere on the site. In these instances, the maximum of the two uses should be calculated and then selected, as it would typically be the governing of the uses.

It should be noted that places of worship can provide excellent opportunities for shared parking. In Intensification Areas, churches could supply off-site parking options for other land uses, as long as the peak periods have limited overlap.

Based on the differences in demand that were observed in the survey, it is recommended that two different measuring units be adopted (based on total GFA and based on number of seats) and that the higher value resulting from these equations is applied.

The recommended rates for each methods is provided in Exhibit 6.74.

Exhibit 6.74: Recommendation – Places of Worship (The higher of the two measurements)

LAND USE	EXISTING RATE (MIN)	MAX OBSERVED RATE	ITE AVERAGE DEMAND	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Place of Worship based on # of seats or prayer spaces in the worship area (spaces/seat)	N/A	N/A	0.2	0.2	0.15	0.2
Place of Worship based on GFA of the building (spaces/100 m ² GFA)	6.0	6.7	9.01	7.5	5.0	6.0

6.7.3 Hotel

Zoning By-law Definition: A hotel is defined as a building or group of buildings providing lodging accommodation to the general public and may include ancillary services such as restaurant, meeting facilities, recreation facilities, conventions and banquet facilities.

Parking Characteristics: Parking is provided off-street, in a surface, structured, or underground parking lot.

Existing Requirements

The existing general provisions for hotels require a minimum of 1.0 space per guest room/suite.

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required minimum supply and shared parking can be applied.

Peer Review

A peer review of other jurisdictions showed a range of ranges, from 0.2 (downtown Toronto) to 0.6 to just over 1.2 spaces required per room. A summary is shown in Exhibit 6.75.

Exhibit 6.75: Peer Review – Hotel

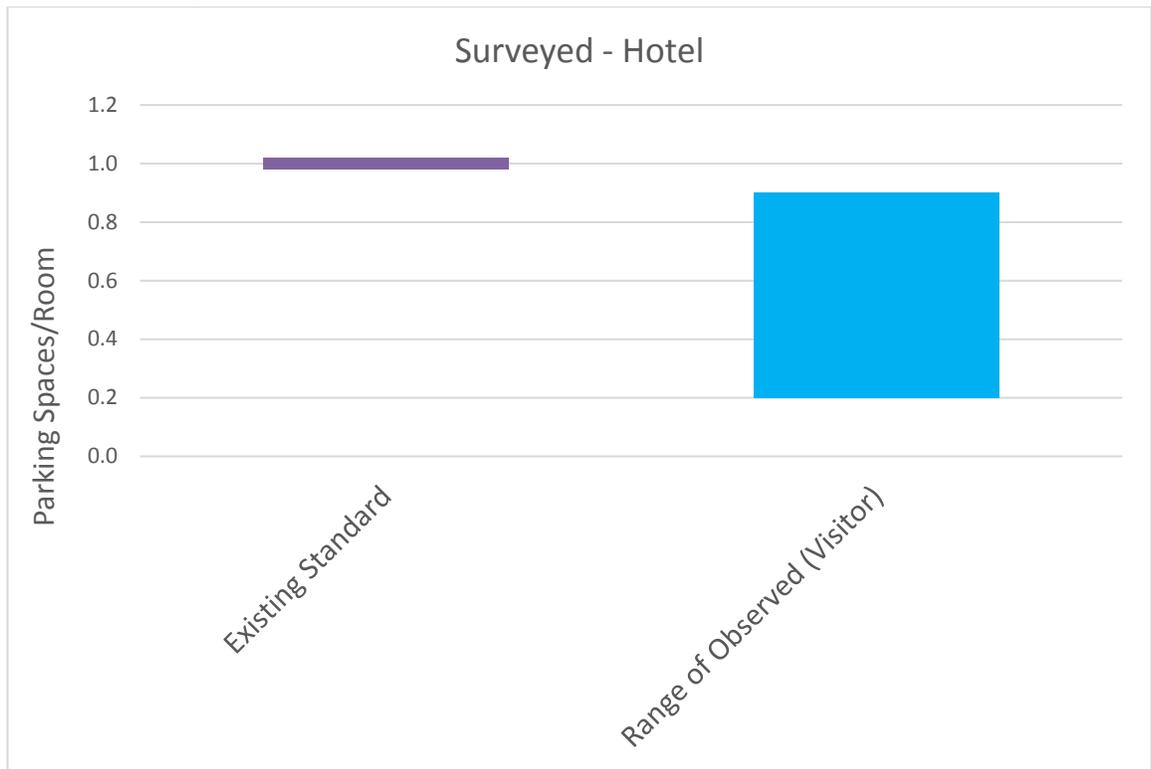


Observed

A total of 40 spot surveys were conducted at three different hotels during the peak parking demand period (Weekends and Weekdays between 23:00 and 00:00).

The maximum observed rate was 0.9 spaces/room. Although the observed rates were surveyed during peak occupancy times of the day, the hotel may not have been at full occupancy during these times.

Exhibit 6.76: Surveyed - Hotel



Recommendation

The existing standards should be maintained.

Exhibit 6.77: Recommendation – Hotel (Parking Spaces/Room)

LAND USE	EXISTING RATE	MAX OBSERVED RATE	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
			Maximum	Minimum	Minimum
Hotel	1.0	0.9	No max	1.0	1.0

6.7.4 Conference Centre/Banquet Hall

Zoning By-law Definition: A banquet hall is defined as a building or part of a building used for the purpose of catering to banquets, weddings, receptions or similar functions for which food and beverages are prepared and served on the premises and may include a caterer service.

Parking Characteristics: Parking is provided off-street, in a surface, structured, or underground parking lot.

Existing Requirements

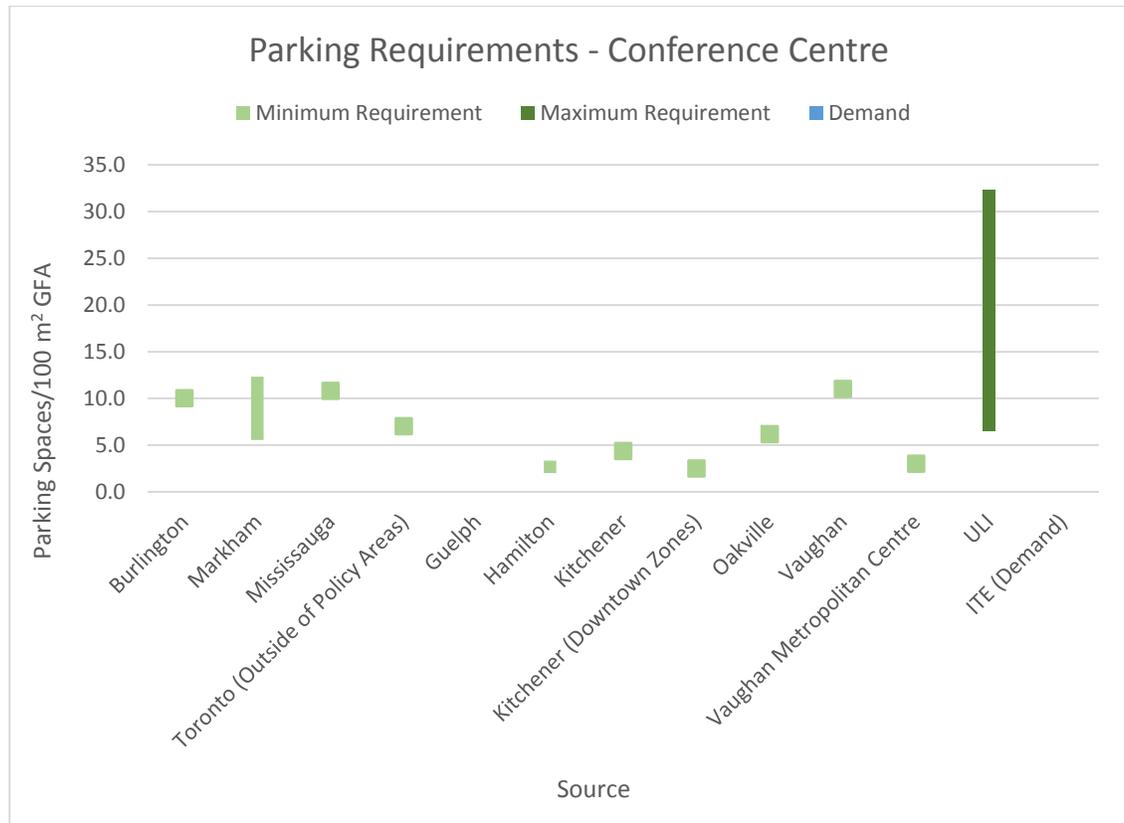
The existing general provisions for conference centres and banquet halls require a minimum of 10 spaces/100 m² GFA

This general provision is applied across the City, with the exception of the Downtown Exemption Zone, where there are no requirements, and in Mixed Use Corridor Zones, where a 5% reduction to the required minimum supply and shared parking can be applied.

Peer Review

The parking requirements for conference centres across peer jurisdictions range from less than 5 spaces/100 m² GFA to over 10 spaces/100 m² GFA. At 10 spaces/100 m² GFA, Burlington’s requirements are on the high side compared to its peers, as seen in Exhibit 6.78.

Exhibit 6.78: Peer Review – Conference Centre



Observed

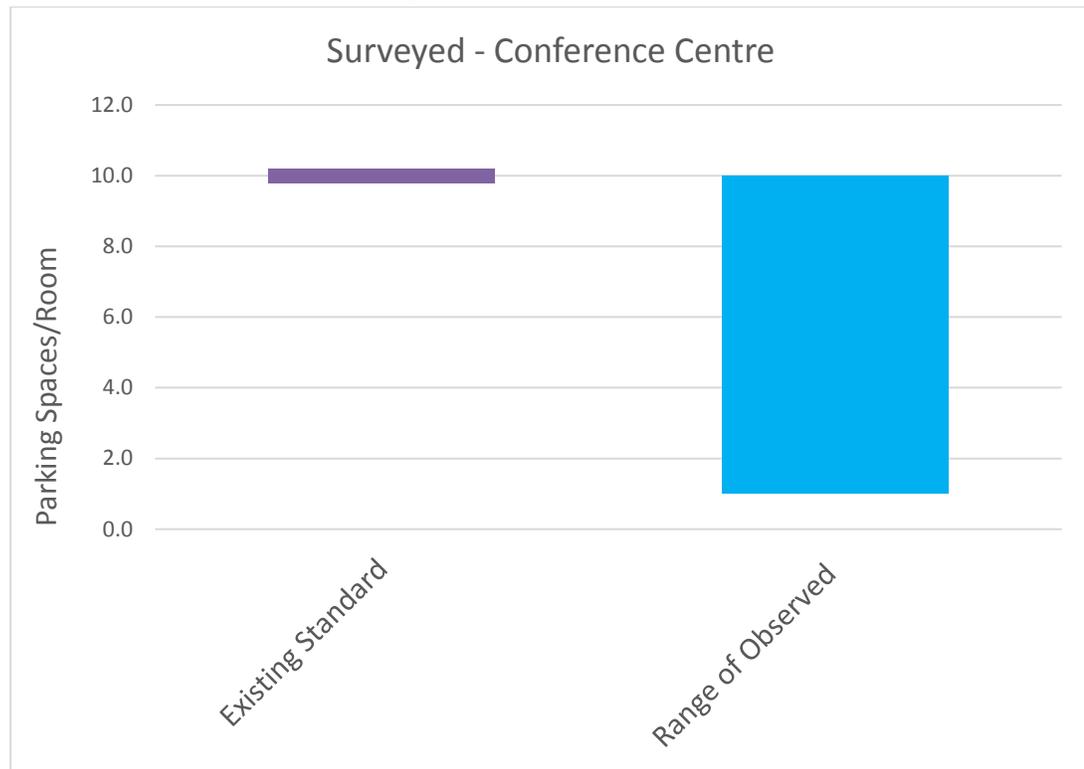
A total of 7 spot surveys were conducted at two different locations during the peak parking demand period (Weekdays between 9:30 and 11:30, and 13:30 and 15:30).

Although none of these seemed to capture a true peak conference event, the conference centre was surveyed during a site specific parking survey in 2015. The survey used an automatic traffic recorder and turning movement counts into and out of the convention centre for three straight days to determine parking occupancy. Given the robust nature of this study, a peak parking event for the convention centre was observed and is therefore suitable to reference in this study.

The maximum observed parking demand from the study was 238 vehicles. With a supply of 240 spaces, this equates to a utilization of 99%. The supply is in line with the existing requirement of 10 spaces/100 m² GFA.

Given that the observed demand was greater than 99% utilization, it is likely that side streets observed some of the spill-over demand.

Exhibit 6.79: Conference Centre - Surveyed



©

Recommendation

Based on the observed rates, it could be argued that a higher standard is required for this land use. However, the current standard is generally consistent with the higher end of the range in peer jurisdictions. The recommended approach is to maintain the existing standard for Burlington –Other Areas under the assumption that large conference centres and banquet halls would require a site specific parking study.

In Intensification Areas, the minimum should be reduced to 5.5 spaces/100 m² on the basis of urban design and higher potential for transit access. A summary of the recommendations is provided in Exhibit 6.80.

Exhibit 6.80: Recommendations – Conference Centre (Spaces/100 m² GFA)

LAND USE	EXISTIN G RATE (MIN)	MAX OBSERV ED RATE	RANGE OF PEER RATES	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
				Maximum	Minimum	Minimum
Conference Centre/Banquet Hall	10.0	10.0	3.0 - 11.0	7.5	5.5	10.0

6.8 Institutional

6.8.1 Elementary School

Zoning By-law Definition: An elementary school is not listed in the definitions portion of the by-law, but is mentioned elsewhere as a place of learning including accessory buildings. It is recognized that this is generally for people in kindergarten through grade 6 or 8.

Parking Characteristics: Parking is provided off-street, in a surface parking lot.

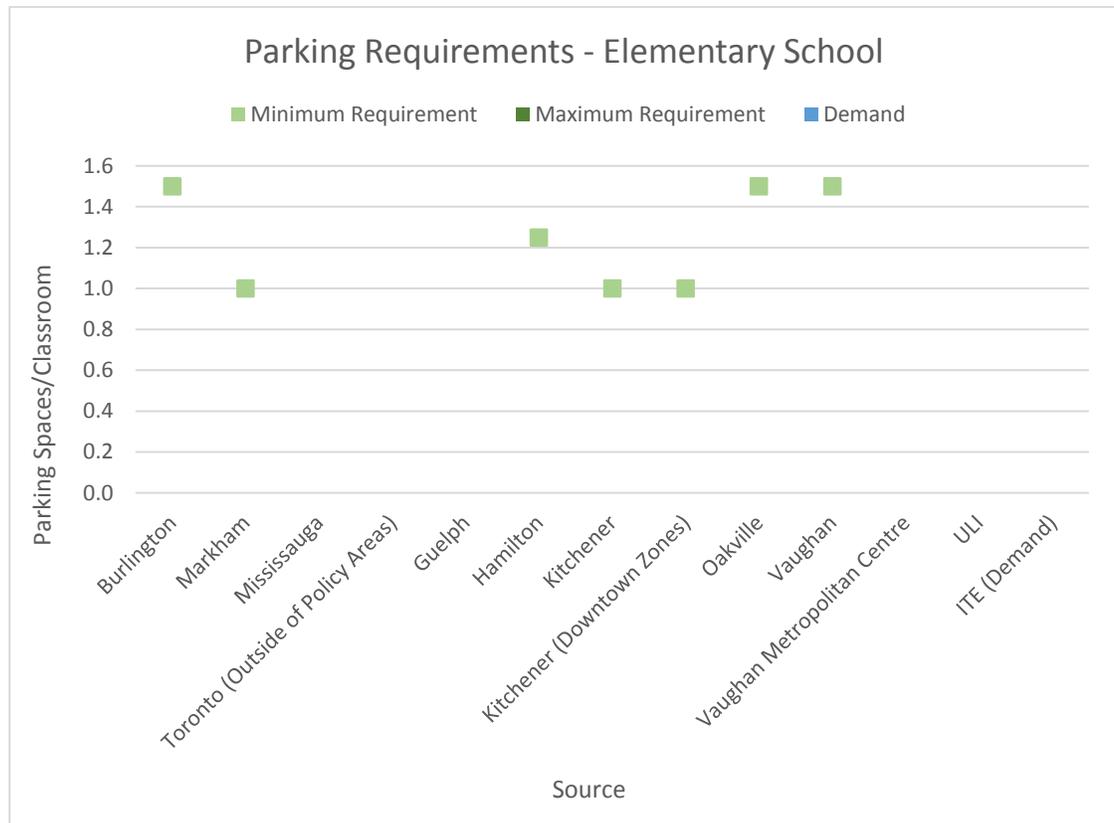
Existing

The existing parking requirement for elementary schools is 1.5 spaces per classroom.

Peer Review

The parking requirements for elementary schools across peer jurisdictions does not vary significantly and requirements range from 1.0 spaces/classroom to 1.5 spaces/classroom. The peer review is summarized in Exhibit 6.81.

Exhibit 6.81: Peer Review – Elementary School

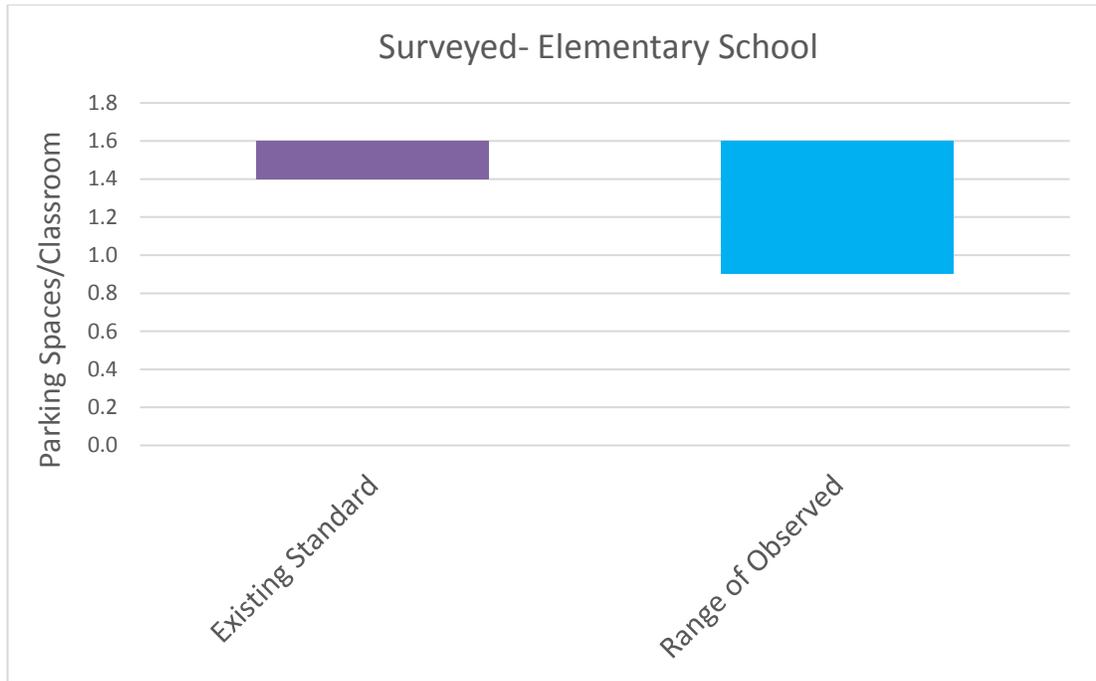


Observed

A total of 9 spot surveys were conducted at three elementary schools during the peak parking demand period for the land use (Weekdays between 9:30-11:30).

The observed demands from the parking surveys ranged from 0.9 spaces/classroom to 1.6 spaces/classroom, as shown in Exhibit 6.82.

Exhibit 6.82: Surveyed – Elementary School



Recommendation

It is recommended that the existing parking requirement for elementary schools be maintained. A maximum rate is not suggested, as it is not anticipated that an oversupply of these spaces is an issue.

Exhibit 6.83: Recommendations – Elementary School (spaces/classroom)

LAND USE	EXISTING RATE	MAX OBSERVED RATE	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
			Maximum	Minimum	Minimum
Elementary School	1.5	1.6	No max	1.5	1.5

6.8.2 Secondary School

Zoning By-law Definition: A secondary school is not listed in the definitions portion of the by-law, but is mentioned elsewhere as a place of learning including accessory buildings. It is recognized that this is generally for people who have completed elementary school.

Parking Characteristics: Parking is provided off-street, in a surface parking lot.

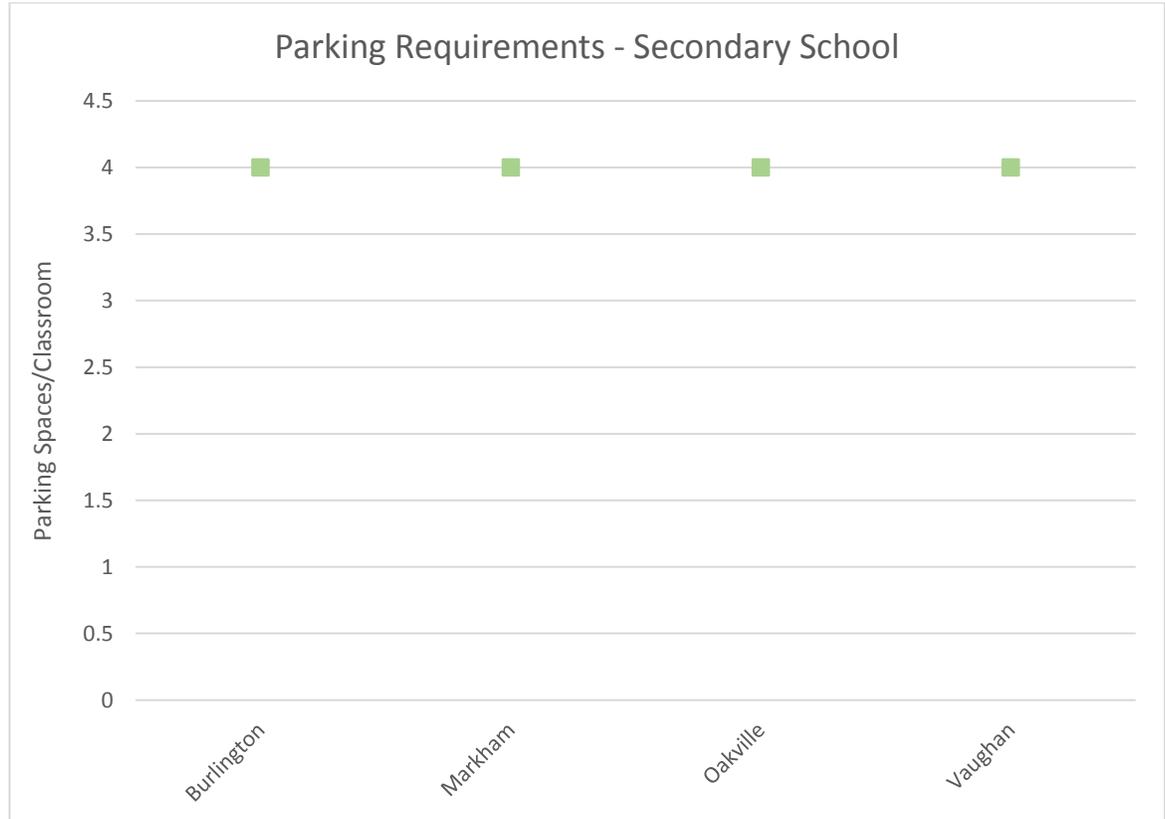
Existing

The existing parking requirement for secondary schools is 4 spaces per classroom.

Peer Review

The parking requirements for secondary schools across 3 peer jurisdictions were reviewed. Since other jurisdictions use other metrics, only Oakville, Markham, and Vaughan were used for this comparison. The peer review is summarized in Exhibit 6.84.

Exhibit 6.84: Peer Review – Secondary Schools

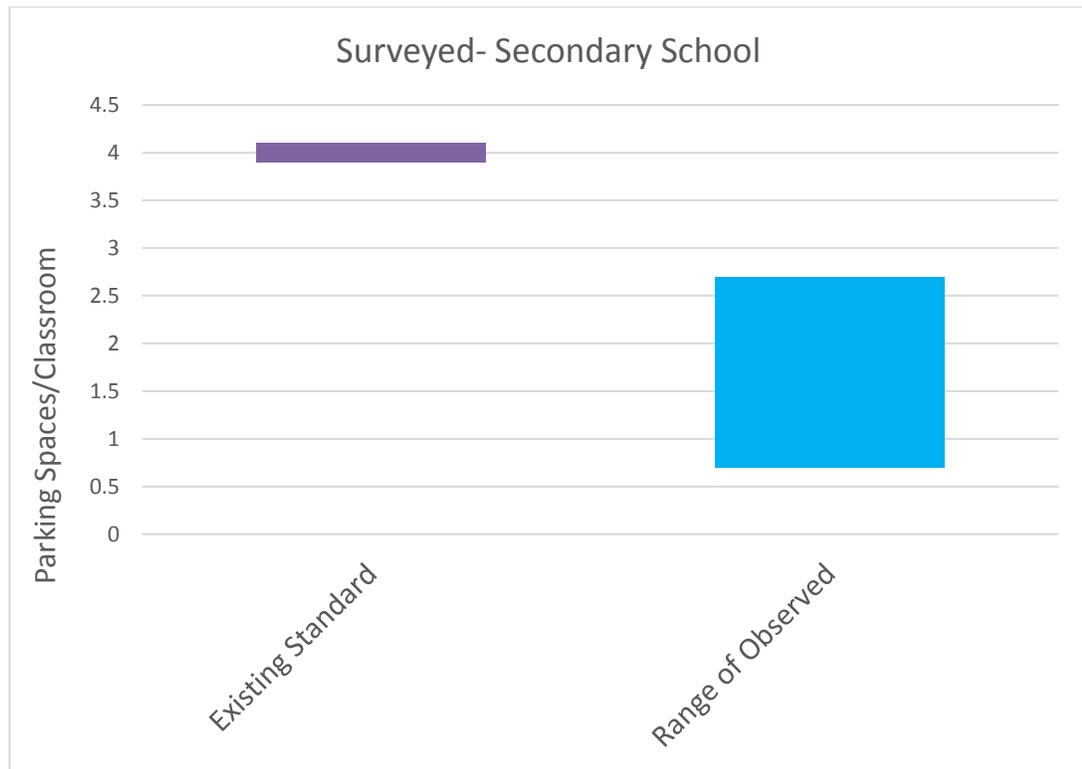


Observed

A total of 11 spot surveys were conducted at three locations during the peak parking demand period for the land use (Weekdays between 9:30-11:30).

The observed demands from the parking surveys ranged from 0.7 spaces/classroom to 2.7 spaces/classroom as shown in Exhibit 6.85.

Exhibit 6.85: Surveyed – Secondary School



Recommendation

It is recommended that the existing parking requirement for secondary schools be reduced to reflect the demands observed in the parking survey.

Exhibit 6.86: Recommendations – Secondary School (spaces/classroom)

LAND USE	EXISTING RATE	MAX OBSERVED RATE	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
			Maximum	Minimum	Minimum
Secondary School	4.0	2.7	No max	3.0	3.0

6.8.3 Post-Secondary School

Zoning By-law Definition: A post-secondary school is not listed in the definitions portion of the by-law, but is mentioned elsewhere as a place of learning including accessory buildings. It is recognized that this is for people who have completed secondary school.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

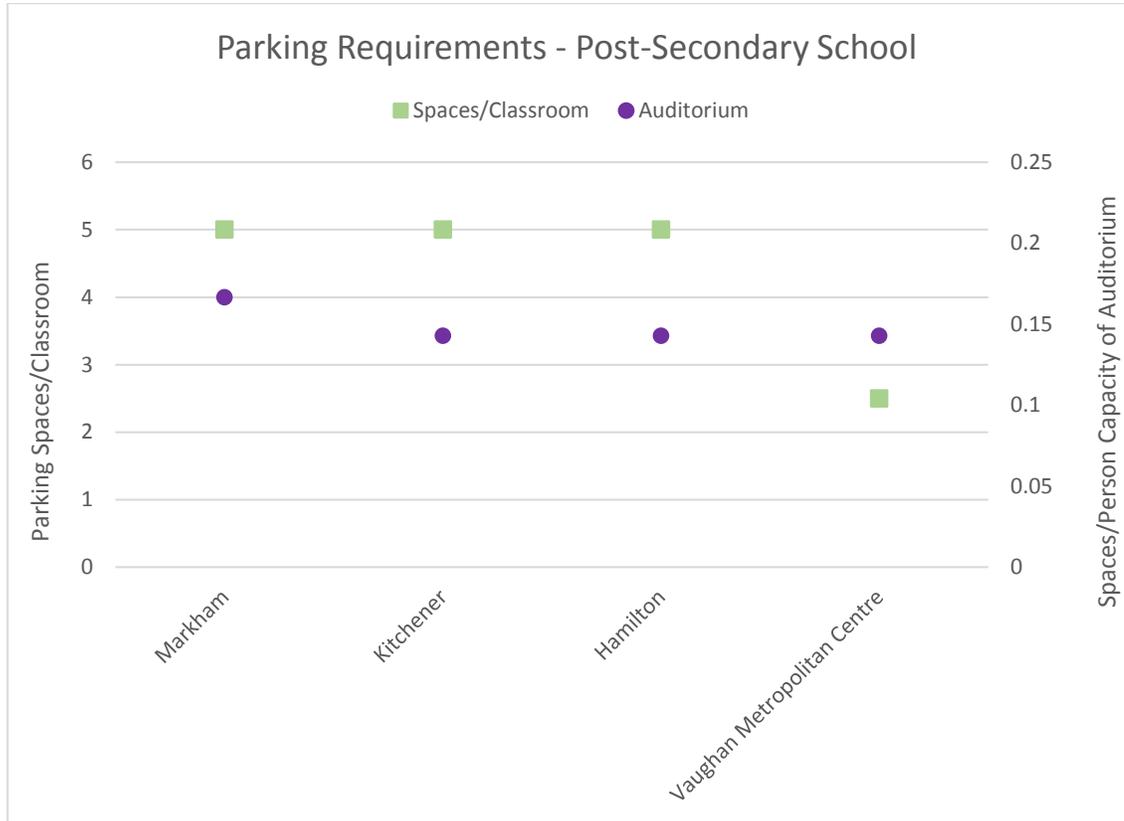
Existing Requirements

The existing parking requirement for post-secondary schools is 1 space per 3 student, faculty, and staff.

Peer Review

The requirements for parking at post-secondary institutions in peer municipalities tend to use a variety of different units. The most common unit that used is the number of spaces/classroom plus additional spaces for areas dedicated to arenas/auditoriums/theatres. Markham, Kitchener, Hamilton, and Vaughan Metropolitan Centre use these units. The standards for these municipalities are summarized in Exhibit 6.87.

Exhibit 6.87: Peer Review – Secondary School



Given that Burlington’s standard for this land use is not shared by any of the peer jurisdictions that were reviewed, there are no relevant Peer Review for which conclusions can be drawn.

The recommended parking ratio from the Urban Land Institute for the post-secondary land use is that the ratio should be context sensitive to the specific needs of the subject institution. Given the variable demands and size of these institutions, this is a rational approach.

Observed

No surveys were conducted for this land use.

Recommendation

It is recommended that the existing parking requirement for post-secondary schools be changed to the same units that were commonly used in peer jurisdictions. The adoption of 5 spaces/classroom plus 1 space for 6 person capacity of auditoriums, which is used in peer jurisdictions should be considered. However, if any significant post-secondary development is

planned in Burlington, an independent parking study be developed so that the unique context and needs of the institution in question be considered.

6.8.4 Business, Commercial, Trade School

Zoning By-law Definition: A business, commercial, and trade school is not listed in the definitions portion of the by-law, but is mentioned elsewhere as a place of learning including accessory buildings, for specific business or trade classes.

Parking Characteristics: Parking is provided off-street, in a surface or underground parking lot.

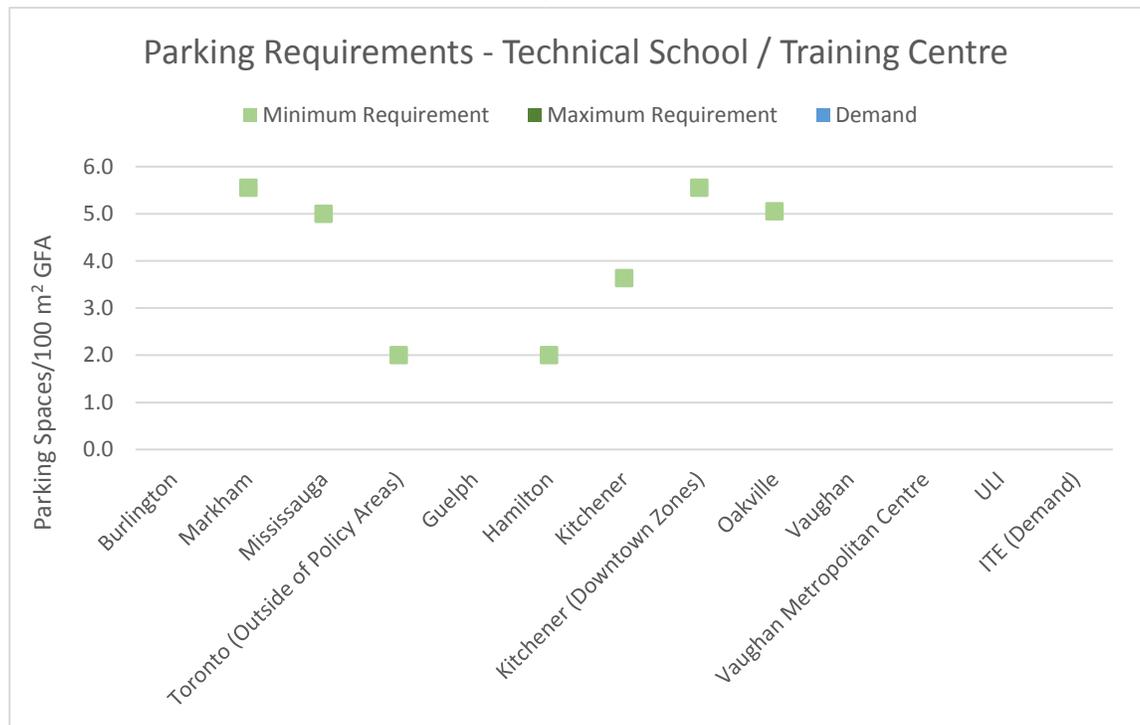
Existing

The existing parking requirement for Business, Commercial, or Trade Schools is 1 space per 3 student, faculty, and staff.

Peer Review

There is considerable variation in the parking requirements for this land use across peer jurisdictions in terms of requirements and in terms of the unit of measurement. As seen in Exhibit 6.88, the common unit of measurement in peer jurisdictions is to use GFA.

Exhibit 6.88: Peer Review – Technical School/Training Centre



Observed

No surveys were conducted for this land use.

Recommendation

It is recommended that the existing parking requirement for business, commercial, or trade schools be updated to use GFA as the unit of measurement to match common practice in peer

jurisdictions. The minimum of 5.0 spaces/100m² GFA is the average rate used in Markham, Kitchener, and Oakville and is recommended for a maximum rate in Intensification Areas and a minimum in other areas. A minimum of 0.5 spaces/100m² GFA is recommend for Intensification Areas to encourage car pooling, active transportation modes, and transit.

Exhibit 6.89: Recommendations – Technical School (spaces/100m² GFA)

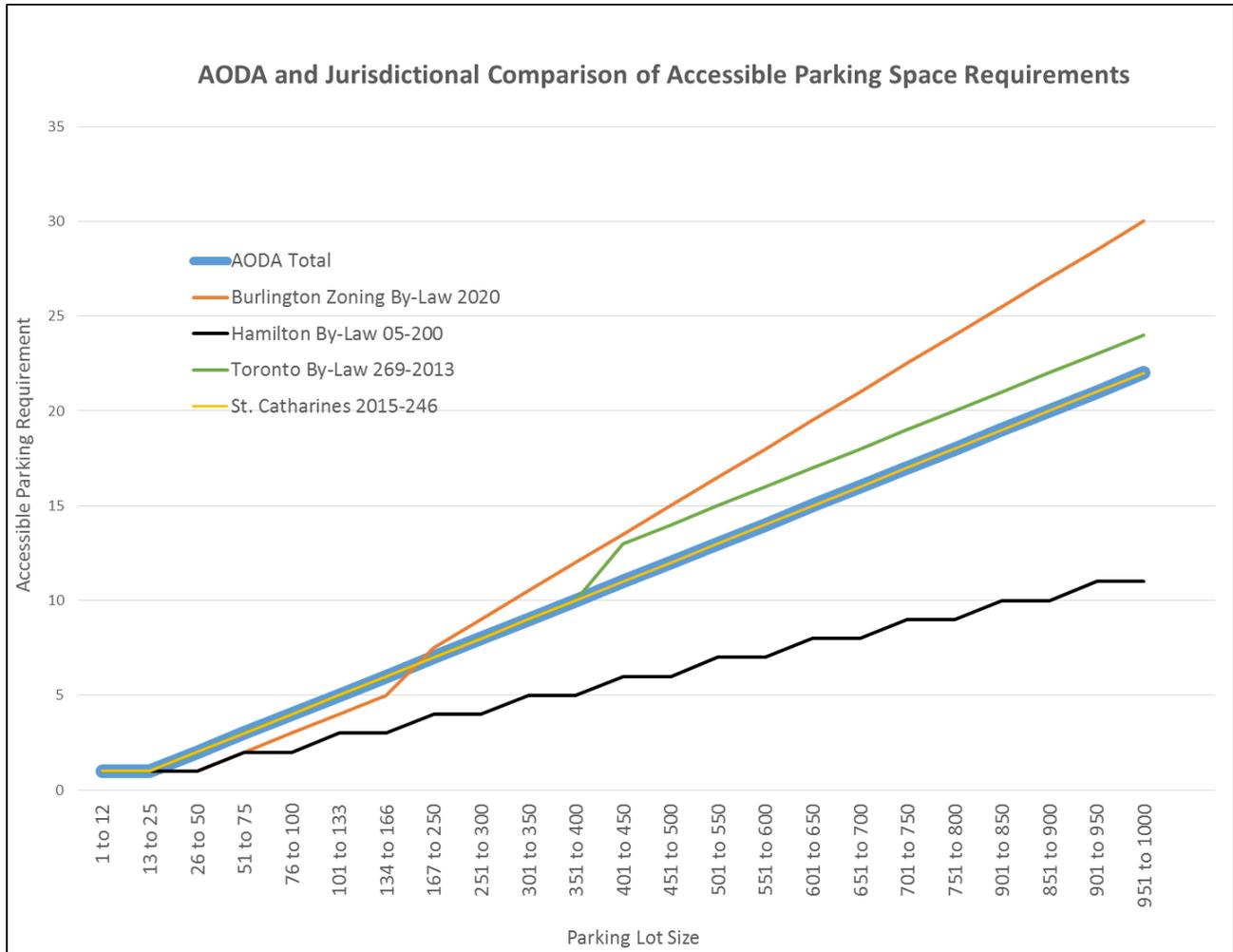
Land use	Existing rate	MAX OBSERVED RATE	INTENSIFICATION AREAS		BURLINGTON – OTHER AREAS
			Maximum	Minimum	Minimum
Technical School	1.0/study, staff, faculty	NA	5.0	0.5	5.0

7 Additional Considerations

7.1 Accessible Parking

A review was completed to compare Burlington’s current accessible parking requirements to AODA guidelines, and three other municipalities (Hamilton, St. Catharines, and Toronto). This comparison is summarized in Exhibit 7.1.

Exhibit 7.1: Comparison of Burlington’s Accessible Parking Standards



Based on the review, Burlington’s current accessible parking standards require more accessible parking in larger parking lots and less accessible parking for smaller parking lots compared to AODA guidelines, and standards in St. Catharines and Toronto.

It is recommended that Burlington’s accessible parking standards be amended to match the requirements outlined in the AODA guidelines. These standards are outlined in Exhibit 7.2.

Exhibit 7.2: AODA Guidelines

Parking Lot Size	Accessible Spaces Requirement					Jurisdictional Comparison			
	AODA Type A (van)	AODA Type B	AODA Total	Burlington Zoning By-Law 2020	Burlington Compared to AODA	Hamilton By-Law 05-200	St. Catharines 2015-246	Toronto By-Law 269-2013	Difference
1 to 12	1	0	1	1	=AODA	1	1	1	Burlington requires more accessible parking than Hamilton but less than Toronto. St. Catharines matches AODA
13 to 25	0	1	1	1		1	1	1	
26 to 50	1	1	2	1	<AODA	1	2	2	
51 to 75	1	2	3	2		2	3	3	
76 to 100	2	2	4	3		2	4	4	
101 to 133	2	3	5	4		3	5	5	
134 to 166	3	3	6	5		3	6	6	
167 to 250	3	4	7	8	>AODA	4	7	7	
251 to 300	4	4	8	9		4	8	8	
301 to 350	4	5	9	11		5	9	9	
351 to 400	5	5	10	12		5	10	10	
401 to 450	5	6	11	14		6	11	13	
451 to 500	6	6	12	15		6	12	14	
501 to 550	6	7	13	17		7	13	15	
551 to 600	7	7	14	18		7	14	16	
601 to 650	7	8	15	20		8	15	17	
651 to 700	8	8	16	21		8	16	18	
701 to 750	8	9	17	23	9	17	19		
751 to 800	9	9	18	24	9	18	20		
901 to 850	9	10	19	26	10	19	21		
851 to 900	10	10	20	27	10	20	22		
901 to 950	10	11	21	29	11	21	23		
951 to 1000	11	11	22	30	11	22	24		

7.2 Bicycle Parking Standards

7.2.1 Existing Standards

The existing standards for bicycle parking state the following:

Required Bicycle Parking Per Use

Retail, Retail Centre, Service Commercial Office, Institutional: 2 spaces plus 1 space / 1000 m² GFA

Industrial: 2 spaces plus 0.25 spaces / 1000 m² GFA

Elementary & Secondary School: 1 space / 10 students & 1 space / 35 employees

Post-Secondary School: 1 space / 20 students

a) Each bicycle parking space shall be 60 cm x 1.8 m in size.

7.2.2 Peer Review

Bicycle parking is an essential component of a comprehensive active transportation network. To effectively implement adequate parking that is both abundant and effectively designed is an important part of ensuring a quality user experience.

As mentioned in the best practices section of this report, it is a best practice for municipalities to require both short term and long term bike parking depending on the land use. The inclusion of other end-of-trip facilities, such as showers, change rooms, and lockers is also an important element of encouraging cycling to a destination. In Vaughan and Toronto, both long term and short term bicycle parking standards are required for certain land uses. The amount of both types of parking for various land uses in Vaughan and Toronto is provided in Exhibit 7.3. In Hamilton, bicycle parking must be 5% of the required vehicle parking for all land uses.

Exhibit 7.3: Peer Comparison of bicycle parking requirements

LAND USE	VAUGHAN METROPOLITAN CENTRE		TORONTO (OUTSIDE OF DOWNTOWN)	
	Short –term	Long-term	Short-term	Long-term
Commercial uses including restaurants	Greater of 0.15 spaces/100m ² GFA or 6 spaces	0.10 spaces/100m ² GFA	3 spaces plus 0.25 spaces/100m ² GFA	0.13 spaces/100m ² GFA
General Office	Greater of 0.10 spaces/100m ² GFA or 6 spaces	0.13 spaces/100m ² GFA	3 spaces plus 0.15 spaces/100m ² GFA	0.13 spaces/100m ² GFA
Medical Office	Greater of 0.10 spaces/100m ² GFA or 6 spaces	0.10 spaces/100m ² GFA	3 spaces plus 0.10 spaces/100m ² GFA	0.10 spaces/100m ² GFA
Multi-unit Residential	Greater of 0.10 spaces/100m ² GFA or 6 spaces	0.50 spaces per unit for buildings with greater than 10 units	0.07 spaces/dwelling unit	0.68 spaces/dwelling unit
Institutional Uses	0.40 spaces/100m ² GFA	0.50 spaces/100m ² GFA	3 spaces plus 2.0 spaces/100m ² GFA	0.60 spaces/100m ² GFA
Shower and Change Facilities	For every 30 long-term bicycle parking spaces required 1 male and 1 female shower and change facility shall be provided.		Shower and change facilities must be provided for each gender at the following rate: (A) none if less than 5 required "long-term" bicycle parking spaces ; (B) 1 for 5 to 60 required "long-term" bicycle parking spaces ; (C) 2 for 61 to 120 required "long-term" bicycle parking spaces ; (D) 3 for 121 to 180 required "long-term" bicycle parking spaces ; and (E) 4 for more than 180 required "long-term" bicycle parking spaces .	

7.2.3 Recommendations

It is recommended that the following changes be made:

- That all land uses be required to provide bicycle parking
- In Intensification Areas, showers for cyclists should be required for employment land uses
- Provisions for long term as well as short term parking should be included in the standards for employment, residential, and school uses. All other uses will require short term parking.
- Design of parking facilities follow the guidelines for bicycle parking design outlined in the
- These peak occupancy periods should be applied the same way that the current by-law applies the peak demand period chart to determine marking supply for a mixed uses.

- Design Guidelines Section of this report.

The implications of the above recommendations are summarized for each land use in Exhibit 7.4.

Exhibit 7.4: Recommended Bicycle Parking Standards

LAND USE	EXISTING (ALL AREAS)	INTENSIFICATION AREAS	OTHER AREAS
Residential – Apartments	0	.5 long term bicycle parking spaces per unit .05 short term bicycle parking spaces per unit	
Retail	2 spaces + 1 space/1000 m ² GFA	3 short term spaces + 1 space/1000 m ² GFA 2 long term spaces plus 1 space/1000 m ² GFA	2 short term spaces + 1 space/1000 m ² GFA
Industrial	2 spaces plus 0.25 spaces/1000 m ² GFA	2 short term spaces + 1 space/1000 m ² GFA 2 long term spaces + 0.5 space/1000 m ² GFA	2 short term spaces + 1 space/1000 m ² GFA
Entertainment	0	2 short term spaces + 1 space/1000 m ² GFA 2 long term spaces plus 1 space/1000 m ² GFA	2 short term spaces + 1 space/1000 m ² GFA
Recreational	0	4 short term spaces + 1 space/1000 m ² GFA	2 short term spaces + 1 space/1000 m ² GFA
Employment Uses	2 spaces + 1 space/1000 m ² GFA	2 short term spaces + 1 space/1000 m ² GFA 2 long term spaces plus 1.0 space/1000 m ² GFA For every 30 long-term bicycle parking spaces required 1 male and 1 female shower and change facility shall be provided.	2 short term spaces + 1 space/1000 m ² GFA 1 space/1000 m ² GFA
Restaurants	2 spaces + 1 space/1000 m ² GFA	3 short term spaces + 1 space/1000 m ² GFA 2 long term spaces plus 1 space/1000 m ² GFA	2 short term spaces + 1 space/1000 m ² GFA
Places of Assembly	0	3 short term spaces + 1 space/1000 m ² GFA	2 short term spaces + 1 space/1000 m ² GFA

LAND USE	EXISTING (ALL AREAS)	INTENSIFICATION AREAS	OTHER AREAS
		2 long term spaces plus 1 space/1000 m ² GFA	
Places of Worship	0	3 short term spaces + 1 space/1000 m ² GFA	2 short term spaces + 1 space/1000 m ² GFA
Post-Secondary School	1 space/20 students	1 space/10 students	1 space/10 students
Elementary and Secondary School	1 space/10 students & 1 space/35 employees	1 space/8 students & 1 space/25 employees	1 space/8 students & 1 space/35 employees
Business, Commercial, Trade Schools	1 space/20 students	1 space/10 students	1 space/20 students

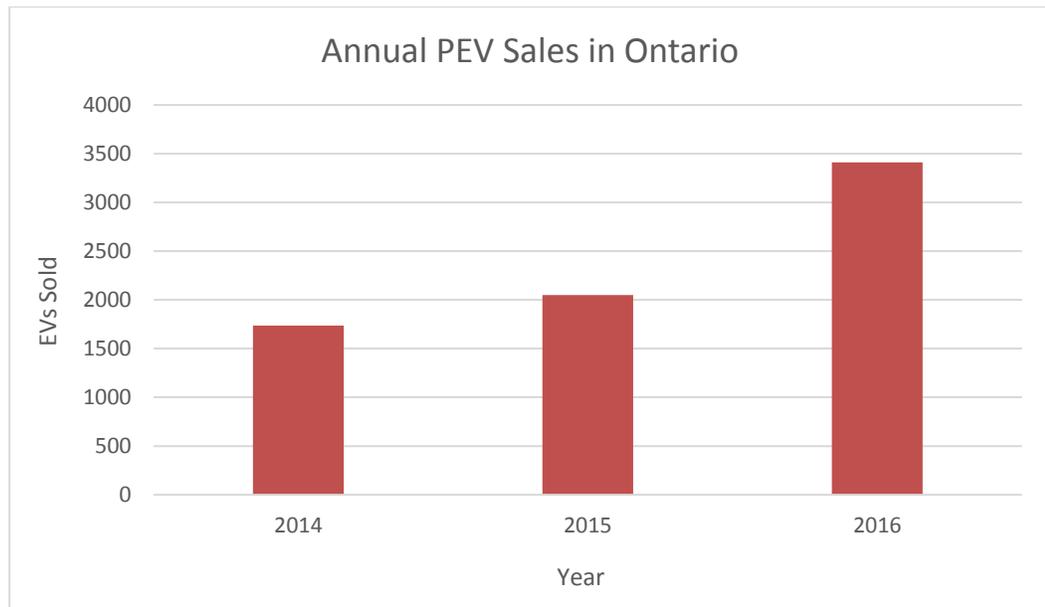
7.3 Electric Vehicle Parking

7.3.1 Overview

The technology for plug-in electric vehicles (PEVs) has been improving rapidly over the past few years and the sale of PEVs has followed suit as the portion of PEVs that are sold in Canada have been increasing significantly. Although Quebec is the province with the greatest amount of PEVs on the roads, Ontario has been the province with the highest growth in sales between 2015 and 2016, where sales increased by 67%¹³. The trend over the past 3 summarized in Exhibit 7.5.

¹³ <http://www.fleetcarma.com/ev-sales-canada-2016-final/>

Exhibit 7.5: Annual EV Sales in Canada¹⁴



One of the major hurdles to this continued growth, however, is the presence of a robust network of EV charging stations. One way that municipalities can contribute to improving this network is by introducing EV charging stations to the requirements of their parking standards. Examples of how municipalities have incorporated EV parking standards into their by-laws are provided in the peer review section below.

7.3.2 Peer Review

There are limited examples of Canadian municipalities that have incorporated a required amount of EV charging stations within their parking standards. Based on a review of existing policies, Vancouver seems to have the most comprehensive requirement for the inclusion of EV parking spaces within their municipal Building Bylaw 9419.

To accommodate EVs in new apartment buildings, condos, townhouses, and other buildings with a minimum of three homes, Council has made the following revisions to the City's building bylaw:

- Parking stalls - 20% of the parking stalls in every building must include a receptacle for charging cars.
- Electrical room - The electrical room must include enough space to install any equipment necessary to provide charging for all residents in the future.

Outside of North America, there have been greater efforts made to include provisions for EVs within development and parking standards.

In London, England, "20 per cent of all spaces must be for electric vehicles with an additional 20 per cent passive provision for electric vehicles in the future."

In Warrington, England, "5% of spaces to be covered by electric vehicle charging point or enabled for simple retro-fitting at a later date."

In Durham, England, "Where development providing accommodation (hotels etc.) is permitted, we are proposing 1 electric parking space per 30 -100 spaces in order to provide visitors with the infrastructure to charge vehicles overnight away from home."

¹⁴ <http://www.fleetcarma.com/ev-sales-canada-2016-final/>

7.3.3 Recommendations

As the numbers of EVs grow every year, there will be a continuing need to incorporate charging stations into various municipal and provincial policies to ensure a robust network that reduces the barriers to EVs becoming a practical choice for consumers. Burlington can start by incorporating EV charging requirements in the following situations:

- Hotels: One Level 2 Electric Car Parking Space for every 50 parking spaces (inclusive of required supply). Non-EV vehicles are not permitted to park in these spaces
- Multi-Unit Residential Developments: 30% of the required parking supply in every building must include roughed in provisions to allow for Level 2 Charging Station installation. The electrical room must include enough space to install any equipment necessary to provide charging for all residents in the future. 20% of visitor parking must include a Level 2 charging station.
- Employment Land Uses: 10% of parking stalls must include Level 2 charging station receptacles and another 20% must include roughed in provisions to allow for easy installation of Level 2 Charging stations in the future.
- Institutional Land Uses: 10% of parking stalls must include Level 2 Charging Station Receptacles and another 20% must include roughed in provisions to allow for easy installation of Level 2 Charging stations in the future.
- All other land uses (with the exception of residential uses that have not yet been stated) should include roughed in provisions on 10% of parking spaces to allow the easy installation of Level 2 charging stations in the future

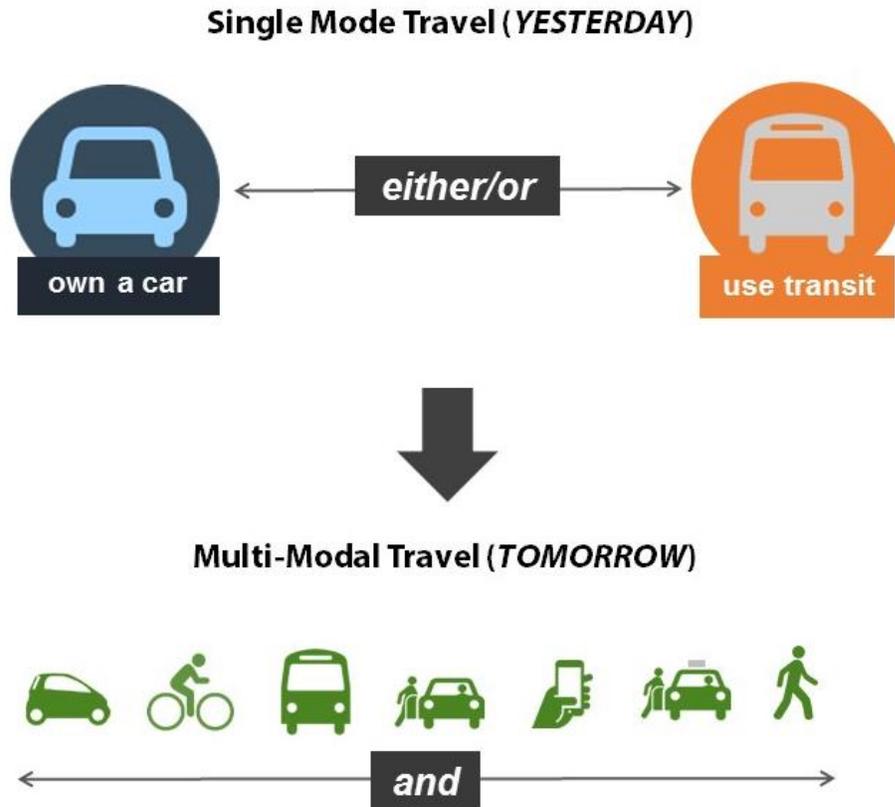
7.4 Community Car Share

7.4.1 Overview

Car share is a form of car rental service that allows subscribers of the service to access cars in the vicinity that are part of a car sharing network for short periods of time (for as short as 30 minutes at a time and allows for rentals by the day).

Car share is one of the many transportation options that are available to the multi-modal transportation user that contribute to the suite of transportation-as-a-service products that offer alternatives to car ownership. While we used to think about mode choice as either you own a car and drive, or you take transit, the idea of multi-modality is becoming a more realistic and user friendly lifestyle. This is made possible by smart phone applications that have created a marketplace for these services where users can pay for and book these services from their smart phones. The concept of the multi-modal user is illustrated in Exhibit 7-5 below.

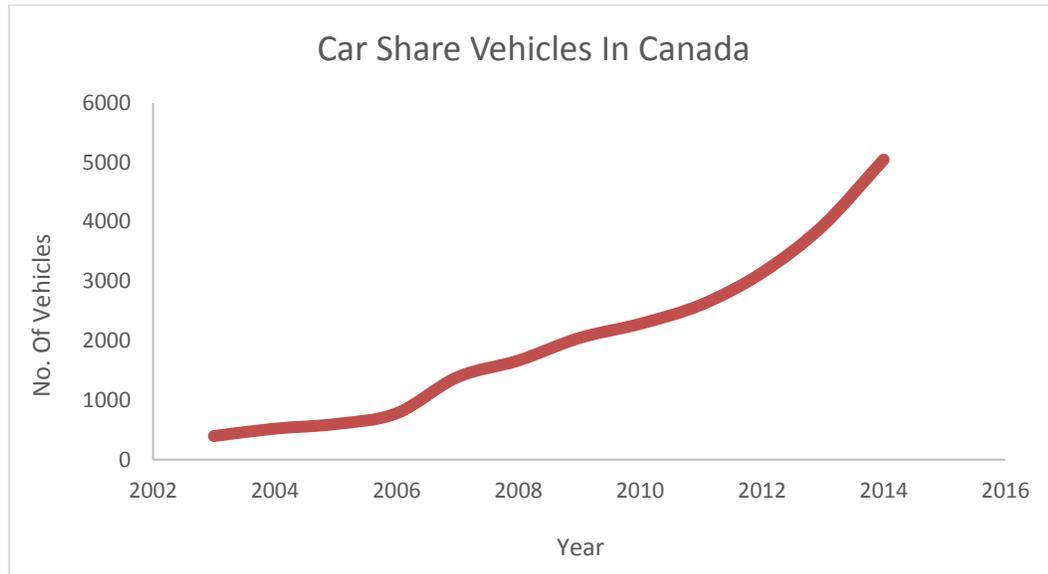
Exhibit 7.6: The Multi-Modal User



The rise in popularity of car sharing has been an important piece of the puzzle in the emergence of multi-modality and the transportation-as-a-service concept. There has been a trend in the increased use of car sharing as the number of car share vehicles of increased continually in Canada over the past decade. This trend is illustrated in Exhibit 7.6.

In combination with the emergence of several other mode options, car sharing has been effective in reducing car ownership, especially in areas where other multi-modal transportation options are available. In recognizing the limited availability of car share services in Burlington today, it is likely that as Burlington works towards improving alternative transportation options and citizens become more multi-modal, the demand for car share services will emerge.

Exhibit 7.7: Rise of Car Sharing in Canada¹⁵



It is recognized that parking standards can play an important role in attracting car share suppliers to an area by allowing parking reductions to developers that can attract a car share supplier to their property.

As part of the parking standards review for the City of Toronto, IBI Group completed a comprehensive examination of the potential options and impacts of car share programs on parking standards. This study involved a review of best practices in other jurisdictions and the impacts of car sharing on auto ownership in other jurisdictions. The study also involved a stakeholder review, including interviews with car share providers to determine the factors that influence the financial sustainability of particular car share vehicles.

One of the significant findings from this study was that lack of appropriate, publicly accessible parking as an ongoing challenge, especially as both operators continue to expand their services. A parking reduction for car sharing would certainly be an incentive to provide car share parking and help ease the difficulties car share operators experience in securing dedicated parking spaces.

To help encourage developers to attract car share services to their property, parking reductions can be incorporated into the by-law. The specific reductions that should be permitted for each land use category is summarized in the TDM section below.

7.4.2 Peer Review

In 2009, The City of Toronto conducted a study to review the impacts of carshare spaces on parking supply. The recommendations for reduced parking requirement are detailed in Exhibit 7.8.

¹⁵ <http://www.autorentalnews.com/channel/rental-operations/article/story/2015/03/carsharing-state-of-the-market-and-growth-potential.aspx>

Exhibit 7.8 Car Share Parking Reduction Recommendations

Car Share Parking Reduction Recommendation		
Size of the Development - (Number of residential units)	Maximum Allowable Reduction	Car Share Spaces required to achieve Reduction
Less than 30	1	1
30-44	2	1
45-59	3	1
60-74	4	1
75-89	5	2
90-104	6	2
105-119	7	2
120-134	8	2
135	9	3
195	13	4
255	17	5
315	21	6
375	25	7

The report also provided a number of implementation considerations that should be considered. Two of these measures that should be carried forward in Burlington are:

- Securing the Agreement – The developer must show an agreement with a recognized carshare provider at the time of zoning approval and the agreement should be in place for at least 3 years.
- Location and Design – The car share space should be easily accessible to the public - not inside a private garage.

7.4.3 Recommendations

For employment, residential, and institutional land uses, a reduction should be applied and calculated as described in Exhibit 7.8. The provision of these reductions should be awarded during the development review phase of a new project and also be awarded during any re-zoning application. Implementation of the reduction should include the following considerations:

- Securing the Agreement – The developer must show an agreement with a recognized carshare provider at the time of zoning approval and the agreement should be in place for at least 3 years.
- Location and Design – The car share space should be easily accessible to the public - not inside a private garage.
- Provisions of Car – In some cases a car share vehicle should be provided by the developer as part of the project TDM measures.

The calculation of the reduction should be based on the reduction to supply conversion chart shown in Exhibit 7.8.

It should also be noted that these provisions are intended to be guidelines for parking reductions and not necessarily included in the by-law.

7.5 Transportation Demand Management (TDM)

Further reductions to parking standards may be justified by implementing the measures outlined in Exhibit 7.9. These reductions should be at the discretion of development staff as to which are appropriate for the given context. The reduction values provided are based on best practices from other municipalities in the region. For some sites and development, it may be appropriate to permit multiple reduction measures, particularly if it is located in an Intensification Area, while others may only justify one or none.

Exhibit 7.9: TDM Measures

Transportation Demand Management				
Land Use	Unbundled Parking	Shuttle Services	CarShare Parking	Carpool Parking
Residential	Reduce residential parking requirement (tenant) by 5% if parking sold/leased separately from unit for multi-unit residential and senior citizens dwellings	Reduce tenant parking requirement by 15% for Senior Citizens Dwelling providing shuttle services to residents	See Exhibit 7.8	
Employment			See Exhibit 7.8	If > 20 off-street spaces required, lesser of 5 spaces or 5% of total spaces must be reserved for carpool use.
Institutional				

7.6 Shared Parking

7.6.1 Existing Standards

The existing provisions for shared parking in Burlington are applied to mixed use developments and are based on the peak parking demands of Office/Financial Institutions, Retail/Service Commercial, and Restaurants. The existing shared parking provisions for Mixed-Use Corridor Zones are shown in Exhibit 7.10.

Exhibit 7.10: Existing Shared Parking Provisions for Mixed-Use Corridor Zones

Percent of Peak Period Occupancy (Weekday)				
Type of Use	Morning	Noon	Afternoon	Evening
Office/Financial Institution	100	90	95	10
Retail/Service Commercial	80	90	90	90
Restaurant	20	100	30	100
Percent of Peak Period Occupancy (Weekend)				
Type of Use	Morning	Noon	Afternoon	Evening
Office/Financial Institution	10	10	10	10
Retail	80	100	100	70
Restaurant	20	100	50	100

7.6.2 Recommendations

There are several other land uses that are excluded from the existing provisions that should be included. Opportunities for shared parking should also be considered in all areas of the city. The recommended land uses and peak occupancy periods for several additional land uses are provided in Exhibit 7.11. These recommendations are suggested by the Victoria Transport Policy Institute and ITE Parking Management Report.

Exhibit 7.11 : Recommended Shared Parking Provisions

Land Uses	Weekday		Weekday	Weekend		Weekend
	Daytime	Evening	Overnight	Daytime	Evening	Overnight
Residential	60%	100%	100%	80%	100%	100%
Office/Industrial	100%	20%	5%	5%	5%	5%
Retail	90%	80%	5%	100%	70%	5%
Hotel	70%	100%	100%	70%	100%	100%
Restaurant	70%	100%	10%	70%	100%	20%
Movie Theatre	40%	80%	10%	80%	100%	10%
Entertainment	40%	100%	10%	80%	100%	50%
Conference/ Convention	100%	100%	5%	100%	100%	5%
Institutional	100%	20%	5%	10%	10%	5%
Place of worship	10%	5%	5%	100%	50%	5% ¹⁶

These peak occupancy periods should be applied the same way that the current by-law applies the peak demand period chart to determine marking supply for a mixed uses.

¹⁶ Adapted from ITE Parking Management Report, prepared by Todd Litman for the ITE Parking Council and Planners Press, Draft Report, August 2003 (Unpublished)

8 Design Guidelines

Burlington's existing parking design standards, which are limited to what is outlined in both the By-law 2020 and the Site Plan Application Guidelines were compared to best practice design principles and a review of design guidelines in peer jurisdictions. Gaps in the existing design provisions, in terms of accessory design features, were also identified. A best practices review was completed to recommend the inclusion of these accessory design features in the update of the existing standards.

The design guideline features that are reviewed in this document are listed below - four of them are new items that do not currently exist in the Burlington Bylaw and will be considered for inclusion in the existing By-law or as part of the design guidelines that form the recommendations in this report. Provisions for the remaining items are currently in the by-law and will be reviewed and updates will be recommended. The design elements are:

1. Parking stall dimensions;
2. Aisle width;
3. Vehicular and pedestrian circulation;
4. Underground design considerations (obstructions);
5. Bicycle, scooter and skateboard parking;
6. Barrier free access;
7. Lighting;
8. Landscaping;
9. Identification and enforcement of visitor parking (**potentially new**);
10. Transit facilities within or adjacent to parking lots (**potentially new**);
11. Permeable pavement issues and incentives (**potentially new**); and
12. Compact car parking (**potentially new**).

8.1 Existing Design Standards

The Zoning By-law No. 2020 provides the general parking provisions for the City of Burlington. A review of the By-law was conducted to determine the existing standards regarding the design elements listed in Section 1 above.

The items that are currently addressed in the existing standards will be reviewed in this section and compared to best practices in design principles and a review of other jurisdictions in Section 3. Burlington's existing design guidelines are identified in Exhibit 8.1.

Guidelines for the items that are not currently included in the design guidelines will be explored in a review of best practices in Section 3 of this document.

Exhibit 8.1: Existing Design Guidelines

Parking Design Requirement	Zoning By-law No. 2020 and Site Plan Application Guidelines
Parking Stall Dimensions	<ul style="list-style-type: none"> The dimensions of a parking space shall have a minimum width of 2.75 m and a minimum area of 16.5 m² (minimum length of 6m) The minimum area of a parking space may include walkways for residential uses only
Aisle Width	<ul style="list-style-type: none"> Not mentioned. However, aisle width is to be a minimum of 6m wide, as outlined in the site plan application guidelines
Vehicular and Pedestrian Circulation	<ul style="list-style-type: none"> In mixed use corridor zones, a 3.0 m wide walkway shall be provided from the street connecting the sidewalk to the principal access of the building
Underground Design Considerations (obstructions)	<ul style="list-style-type: none"> The minimum internal dimensions for a private garage are 6.0 m depth x 3.0m width x 2.0 m height Any part of an enclosed parking structure that projects 1.6 m or more above grade shall be subject to the yard requirements of the zone designation Entrance and exit ramps to below-grade and above-grade parking structures or buildings shall be set back 7.5 m from a street line Below grade parking structures shall not extend into a required landscape buffer and shall be set back 3.0 m from all other property lines and street lines
Bicycle, Scooter and Skateboard Parking	<ul style="list-style-type: none"> Each bicycle parking space shall be 0.60 m x 1.8 m in size
Barrier Free Access	<ul style="list-style-type: none"> Accessible Parking spaces require the minimum 2.75 m width of a standard stall plus a 2.0 m accessible parking pathway (4.75 m total width)
Lighting	<ul style="list-style-type: none"> Where parking facilities are illuminated by lighting fixtures of standards, they shall be arranged so that light from the fixture is shielded and/or directed away from residential dwellings
Landscaping	<ul style="list-style-type: none"> For employment, commercial, and uptown mixed-use zones, parking areas shall be separated from adjoining parking areas by a 3.0 m landscape area. A landscape area separating parking areas within a comprehensive development may contain a 2.0 m wide walkway which runs parallel to and within the landscape area provided that the landscape area has a minimum width of 4.5 m.

8.2 Review, Comparisons, and Recommended Changes to the Existing Design Standards

This section provides a comparison of Burlington's existing parking design guidelines in By-law 2020 to best practices in design principles, and a review of peer jurisdictions. The municipalities in the comparison include the Town of Oakville, the City of Hamilton, the City of St. Catharines, the City of Vaughan, and the City of Toronto.

The intent of this comparison is to help inform potential updates to Burlington's existing guidelines where applicable or to inform the development of stand-alone design guidelines for design elements that require more explicit and context sensitive guidance. These recommendations are also included in this section of the report.

8.2.1 Parking Stall Dimensions

The minimum parking stall dimensions that currently exist in the Burlington By-law 2020 were reviewed and compared to those in 28 peer jurisdictions, as well as from best practices in literature related to the subject. The recommendations for updating Burlington's parking stall dimensions are based on a combination of requirements from peer jurisdictions and the approaches that are identified in literature.

8.2.1.1 Existing Standards

Burlington By-law 2020

The existing parking stall dimensions in Burlington By-law 2020 require a minimum width of 2.75 m and a minimum area of 16.5 m² (equating to a length of 6.0 m for a width of 2.75 m). The by-law does not provide guidance on aisle widths, obstruction allowances, or type of parking space (structured vs. surface). It does provide specific guidance on dimensions for parking within a private garage, which is assumed to be applicable to garages attached to residential uses as opposed to parking structures. Dimensions for parallel parking are not referenced in the Burlington By-law 2020 but are considered as part of this review.

Exhibit 8.2: Existing General Provisions – Parking Space Dimensions

<p>2.26 GENERAL PARKING PROVISIONS</p> <p>(1) Parking Space Size & Accessibility</p> <p>(a) Each parking space shall have a minimum width of 2.75 m and a minimum area of 16.5 m² and be readily accessible without obstructions at all times for parking and removal of a motor vehicle without the necessity of moving any other vehicle or obstruction. The minimum area of a parking space may include walkways for residential uses only.</p> <p>The minimum internal dimensions for a private garage are 6.0m depth x 3.0m width x 2.0m height. The minimum internal dimensions for unobstructed area in the private garage are 5.5m depth x 3.0m width x 2.0m height. One step is permitted in the unobstructed area.</p> <p>(b) Accessibility shall not apply to a parking space in a garage which is for the exclusive use of a dwelling unit, provided the driveway serving the garage has a minimum length of 5.5 metres.</p> <p>Accessibility is not required for 20% of the required occupant parking in townhouse, back-to-back townhouse, stacked townhouse, maisonette, fourplex, and apartment buildings.</p>

Site Plan Application Guidelines

Although aisle widths, parallel parking, and obstruction allowances are not included in Burlington By-law 2020, Burlington's Site Plan Application Guidelines do include recommendations for these elements. The guidelines recommend that a 6.0 m aisle width be applied in addition to the By-law's parking dimensions. In situations where the parking space is limited on one or both

sides, the stall width should be increased by 0.30 m for each obstructed side. For parallel parking spaces, 2.75 m wide by 7.2 m long is recommended.

As these are guidelines, they are not as enforceable as the by-law requirements. However, they are considered the current reference for Burlington for the purpose of comparison to peers as presented below.

8.2.1.2 Peer Review

Minimum Stall Dimensions

Parking stall dimensions vary within municipalities in Ontario. Typically, parking space dimensions are specified based on minimum length and width of the parking space, in addition to aisle widths. Some jurisdictions include more detailed recommendations to reflect the type of space (e.g. perpendicular, parallel, angled, tandem), number of parking spaces required overall, whether the parking space is in a structure or surface lot, and for specific types of developments.

As part of this study a review of practices in other jurisdictions across Ontario was conducted. The initial scan examined basic parking space dimensions (minimum parking stall dimensions, including aisle widths) from 28 Ontario jurisdictions. Exhibit 8.3 compares Burlington's dimensions to a summary of the findings across the 28 jurisdictions.

Exhibit 8.3: Summarized Jurisdictional Review

MEASURE	BURLINGTON (BY-LAW 2020 AND SITE PLAN GUIDELINES)	SUMMARY OF 28 ONTARIO JURISDICTIONS		
		Minimum	Maximum	Median
Width (m)	2.75	2.60	2.90	2.70
Length (m)	6.00	5.20	6.00	5.73
Area (m ²)	16.50	13.52	16.50	15.90
Aisle Width (m)	6.00	5.50	7.30	6.00
Width in a structure (m)	3.00	2.60	3.00	2.70
Additional Width for each obstruction (m)	0.30	0.20 (of those that require it)	0.50	0.30 (of those that require it)
Module (m)	33.00	30.16	35.48	32.43

Compared to the 28 other jurisdictions, Burlington’s parking stall width (2.75 m) is slightly above the median (2.70 m), but the drive aisle width is below the median. The lowest observed width was 2.60 m, which is used by several jurisdictions. Burlington’s current standard parking space length (6.0 m) is close to the median of 5.73 m. Exhibit 8.4 shows a medium sized pick-up truck parked in a 2.6 m parking space. As one can observe, the space between the truck and the cars adjacent to the truck is narrow and could pose some access issues.

Exhibit 8.4: Medium sized Pick-up truck in a 2.6 m wide parking stall



Another method of specifying parking space dimensions is based on the size of the parking module, since parking stall widths are affected by the width of the drive aisle. If a stall has a relatively narrow width, a wider drive aisle is usually needed to make up for the lack of area to

facilitate a maneuver. To gauge a true comparison of the total area that is required for parking, it is therefore prudent to compare area modules (Stall Length + Aisle Width)*Stall Width. An illustration of this metric is provided in Exhibit 8.5. To calculate this metric for Burlington, the aisle widths from the Site Plan Application Guidelines were used in combination with the stall width and lengths from Burlington By-law 2020 to calculate the module. When comparing this metric, Burlington’s requirement of 33.0 m² is 0.55 m² greater than the median of the 28 other jurisdictions.

Exhibit 8.5: Sample Module

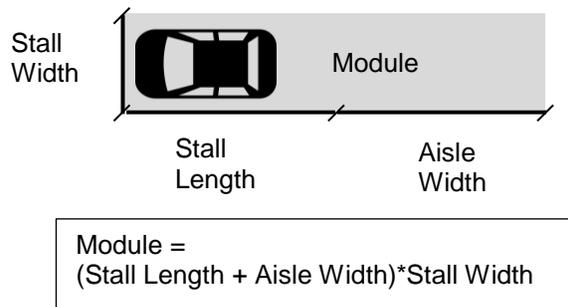


Exhibit 8.6 provides a comparison Burlington’s effect of module area against five jurisdictions. In all cases, Burlington’s parking area module is higher than its peers. This is a result of Burlington having wider stall widths, longer stall lengths, but not necessarily a narrower aisle width. This demonstrates that Burlington’s area for parking could be changed through reductions to the stall widths and lengths to be more comparable to surrounding municipalities, but that the existing aisles width is suitable.

Exhibit 8.6: Specific Peer Review

	BURLINGTON	MISSISSAUGA	OAKVILLE	HAMILTON	OSHAWA	TORONTO
Width (m)	2.75	2.60	2.70	2.60	2.60	2.60
Length (m)	6.00	5.20	5.70	6.00	5.40	5.60
Standard Area of stall (m ²)	16.50	13.52	15.39	14.30	14.04	14.56
Aisle Width (m)	6.00	7.00	6.00	5.50	6.50	6.00
Module Area (m²)	33.00	31.72	31.59	31.05	30.94	30.16
Width in a structure (m)	3.00	2.60	3.00	2.70	2.60	2.60

	BURLINGTON	MISSISSAUGA	OAKVILLE	HAMILTON	OSHAWA	TORONTO
Additional Width for each obstruction (m)	0.30	N/A	0.30	N/A	0.40	0.30
Parallel Parking Provisions	W = 2.75 L = 7.2	W = 2.6 L = 6.7	W = 2.7 L = 7.0	W = 2.4 L = 6.7	N/A	W = 2.6 L = 6.7

Parallel Parking

Parallel parking requires different dimensions than perpendicular spaces and most of the peer jurisdictions include provisions for parallel parking dimensions within their by-laws. When comparing these peer requirements to Burlington’s Site Plan Application Guidelines, Burlington requires more space for parallel parking than its peers. Exhibit 8.6 compares Burlington’s guidelines to its peer jurisdictions.

8.2.1.3 Other Guidance

As seen in many of the local By-laws in the peer review, parking stall dimensions tend to adopt a “one-size-fits-all” approach and do not consider any external factors that may account for user needs of a specific urban context. Best practices, as identified by ITE’s Transportation and Land Development and the Urban Land Institute’s Dimensions of Parking, parking standards should be variable to address user needs and urban context. An example would be to adopt larger dimensions in high stress situations (e.g. hospitals, medical clinics) and areas with frequent parking turnover (e.g. retail). Area needs should also be considered based on location and policy objectives. For example, smaller dimensions could be used in downtown areas to encourage compact development, whereas larger dimensions are more appropriate for suburban or rural communities.

Exhibit 8.7 shows the recommended minimum widths and lengths for parking stalls depending on turnover as identified by the Urban Land Institute.

Exhibit 8.7 Minimum parking stall width by area need from the Urban Land Institute

Area Need	Minimum Width (m)	Minimum Length (m)
Low Turnover ¹	2.51 - 2.59	5.5
Low to Moderate Turnover ²	2.59 - 2.66	5.5
Moderate to High Turnover ³	2.66 - 2.74	5.5

Source: The Dimensions of Parking (5th Edition), Urban Land Institute and National Parking Association, 2010, 61

1. Includes employees, students, etc.
2. Includes offices, long-term airport parking, regional retail centres, etc.
3. Includes medical facilities, community retail, etc.

8.2.1.4 Conclusions and Preliminary Recommendations for Burlington

In general, Burlington’s parking space dimensions are within the typical range of other jurisdictions.

It is recommended that the existing standard parking space width and length be maintained. It is also recommended that the By-law adopt the recommended aisle width of 6.0 m from the Site Plan Application Guidelines.

The above dimensions would apply to all areas and uses.

The existing recommendations from the Site Plan Application Guidelines of an additional 0.3 m of width added to each side of a stall with an adjacent obstruction should also become a requirement within the by-law.

In summary, the following observations can be made about the recommended parking dimensions:

1. The existing minimum stall width and length should be maintained
2. The parking aisle width and obstruction allowance from the Site Plan Application Guidelines should be incorporated into the by-law;
3. The parallel parking recommendations from the Site Plan Application Guidelines should be incorporated into the by-law and reduced to be in line with the requirements from peer jurisdictions.

8.2.2 Vehicular and Pedestrian Circulation

Parking lots are prone to pedestrian and vehicle interaction. As such, design can play a role in minimizing the conflicts between pedestrians and vehicles to make parking lots safer for pedestrians and more convenient for vehicles.

8.2.2.1 Existing Standard

The current standards pertaining to vehicular and pedestrian circulation in Burlington is limited to the following:

In mixed use corridor zones, a 3m wide walkway shall be provided from the street connecting the sidewalk to the principal access of the building.

Given the extent to which design provisions could be advised for vehicular and pedestrian circulation, it is recommended that further guidance be provided in the form of a design guideline, which is outlined in this report.

8.2.2.2 Best Practices

Vehicular and pedestrian circulation is an essential component to parking facilities, as the planning of these can maximize the safety of both movements. Parking facilities should be designed so that the main travel paths of vehicles and pedestrians do not often cross, and if they do, they cross in a safe and visible manner. Wayfinding and signage is a key component to this circulation as it ensures that vehicles and pedestrians know where to go, and decreases the risk of accidents.

Vehicular circulation should be direct and continuous within a parking lot. Turn around spaces or dead ends within a parking area should be avoided as it can cause driver confusion and unsafe turnaround movements.

For safe pedestrian movements, the main paths should be located on the outside of the parking area to minimize conflicts with vehicular movements. At areas where pedestrian travel paths cross vehicular travel paths, the *City of Vaughan Parking Design Standard* recommends to

elevate crossings. This would advocate for pedestrian safety while also acting as a traffic calming measure.

Burlington’s existing design guidelines require that in mixed use corridor zones, a 3.0m wide walkway shall be provided from the street connecting the sidewalk to the principal access of the building.

8.2.2.3 Peer Review

The extent to which pedestrian and vehicle circulation is provided in peer by-laws is limited. However, Vaughan and Toronto provide clear guidance on this design element within their stand-alone design guidelines document. The peer review is provided in Exhibit 8.8.

Exhibit 8.8 Vehicular and Pedestrian Circulation Peer Review

Vehicular and Pedestrian Circulation	
City of Vaughan	City of Toronto ¹⁷
<p>The City of Vaughan design guidelines includes an extensive provisions on design guidance for pedestrian and vehicular circulation. Some of the noteworthy policies include:</p> <p>Provide at least one direct pedestrian route between the public sidewalk and every main building entrance that is uninterrupted by surface parking and driveways;</p> <p>Where pedestrian routes cross street access driveways and other major drive aisles, crossings are to be distinctly paved and marked with unobstructed sight lines for both pedestrians and vehicles;</p> <p>Provide elevated crossings with rolled curbs, chicanes and bump outs at major internal intersections to calm vehicular traffic and promote pedestrian safety. Crosswalks should be elevated to the level of the connecting pedestrian walkway¹⁸</p>	<p>The city of Toronto design guidelines includes an extensive provisions on design guidance for pedestrian and vehicular circulation. Some of the noteworthy policies include:</p> <p>Define street access driveways and internal vehicle routes with curbed landscaped areas, tree planting and lighting. Explore opportunities to include public art.</p> <p>All pedestrian routes within a parking lot should include:</p> <ul style="list-style-type: none"> • a barrier-free pathway, with a minimum clear width of 1.7m (wider pathways are encouraged and may be required depending on parking lot use); • shade trees (or a shade structure) along one or both sides of the pathway; • pedestrian-scale lighting to illuminate and define the route; and • a clear division from vehicular areas, with a change in grade, soft landscaping and a change in surface material

8.2.2.4 Recommendation

It is recommended that Burlington incorporate additional design provisions for vehicular and pedestrian circulation in the form of a design guidelines to complement its existing standards and to align with the design guidelines in Vaughan and Toronto. These design guidelines should include the following:

¹⁷ https://www1.toronto.ca/city_of_toronto/city_planning/urban_design/files/pdf/greening_p-lot_guidelines_jan2013.pdf

¹⁸ https://www.vaughan.ca/projects/policy_planning_projects/city_wide_parking_standards_review/General%20Documents/Draft%20Web%20Version%20Parking%20Design%20Guidelines%20Oct%202021.pdf

- Provide a safe, interconnected pedestrian network within and adjacent to parking lots to connect building entrances, parking spaces, public sidewalks, transit stops and other pedestrian destinations;
- Provide at least one direct pedestrian route between the public sidewalk and every main building entrance that is uninterrupted by surface parking and driveways;
- Pathways should be distinctly paved and barrier-free, well-lit with pedestrian-scaled lighting and include benches, bicycle rings, and trash receptacles at nodal points, as determined at site plan design stage;
- The width and configuration of pedestrian routes should consider anticipated pedestrian traffic flow and the spatial requirements for accessory uses such as shopping carts, strollers, bicycles and mobility aids;
- Where pedestrian routes cross street access driveways and other major drive aisles, crossings are to be distinctly paved and marked with unobstructed sight lines for both pedestrians and vehicles; and
- Main internal pedestrian routes should be enhanced with 3.0 meter wide landscape areas on one or both sides, where feasible. Deciduous tree canopy should be complimented with low understory plantings ensure an eye-level window to promote safety through natural surveillance.
- For surface lots, snow storage areas should be located away from public streets and other areas where motorist/pedestrian sight distance and continuous landscape screening are essential. Where overflow parking or bio-retention areas are provided, these areas may also be used for snow storage.

8.2.3 Special considerations for School Site Design

Students traveling to school by private car need to be dropped off and picked up safely at designated location within or near the school site, where they do not interfere with school buses and endanger students walking or cycling to school.

Parent drop-off and pick-up facilities on the school site can include:

- On-street laybys
- Exclusive on-site loops, for parent drop offs and pick-up only
- Shared on-site loops, also used by school buses
- Loops within the school parking lot

Shared loops and loops within school parking lots are usually only found on constrained school sites, where space is insufficient for separate facilities.

The choice of type of facility to accommodate parent drop-offs and pick-ups depends largely on the site size. In a denser, more urban environment where buildings are set close to the street and a school site might be smaller than average, a layby along the school's street frontage is preferable.

On constrained school sites, where there is not enough room to accommodate an exclusive loop for parent drop-offs and pick-ups, potential compromises include allowing drop-offs within the school parking lot or within the bus loop.

The dimensions of the drop-off and pick-up layby or loop must be sufficient to accommodate expected vehicle volumes and avoid spillover onto the street and, consequently, impacts on school bus movements and on the safety of children arriving by walking or cycling. The suggested minimum curb length for a layby or loop is 30 m for smaller elementary schools.

A high volume of parent cars dropping-off or picking-up students can contribute to creating traffic congestion and conflicts between vehicles, pedestrians, and cyclists. Conflicts tend to occur within school driveways, where vehicles cross paths with school-bound pedestrians and cyclists. Drop-offs and pick-ups on the street rather than in a loop within the school site is a way to avoid creating this type of conflict.

8.2.4 Underground Design Considerations (obstructions)

Underground parking garages have other design considerations due to the presence of support beams and pillars. These are addressed below.

8.2.4.1 Existing Standard

Burlington's existing standards pertaining to underground parking design are the following:

- The minimum internal dimensions for a private garage are 6.0 m depth x 3.0m width x 2.0 m height
- Any part of an enclosed parking structure that projects 1.6 m or more above grade shall be subject to the yard requirements of the zone designation
- Entrance and exit ramps to below-grade and above-grade parking structures or buildings shall be set back 7.5 m from a street line
- Maximum ramp grade is 12%; ramps with grades 8% or more will require heating coils
- Ramps with grades under 8% will be evaluated for each circumstance to determine if heating coils are required
- Below grade parking structures shall not extend into a required landscape buffer and shall be set back 3 m from all other property lines and street lines

The section will only focus on considerations for obstructions, which is the first item in the list above.

8.2.4.2 Best Practice

The Urban Land Institute Dimensions of Parking 5th Edition recommends that spaces be widened by 25 centimeters when adjacent to columns, walls, and other obstructions.

8.2.4.3 Peer Review

The City of Burlington has specific underground design considerations for parking stall dimensions, increasing the width by 30 cm, which most likely accounts for obstructions. However by increasing the width of all parking spaces, this accounts to fewer parking spaces overall as there are only a few spaces that will have obstructions. Other municipalities consider larger width if only if there is an obstruction present, and if it is present on one or both sides. This detail ensures that extra room is provided only when there are obstructions in the door opening clearance, and not for all spaces. Exhibit 8.9 provides a review of two other municipalities that include underground obstructions within their parking design standards – Oakville and St. Catharines.

Exhibit 8.9: Obstruction Considerations

Underground Design Considerations (obstructions)	
Town of Oakville	City of St. Catharines
<ul style="list-style-type: none"> • Where a wall, column, or other obstruction is located within a parking space, the minimum width of the parking space shall be increased by 0.3m for each side that is obstructed • Obstructions within 1.5m of either stall end do not require an increase in parking space width, provided the obstruction projects no more than 0.15m into the parking space 	<ul style="list-style-type: none"> • For a standard parking space obstructed on two sides, the minimum dimensions are a width of 3.5m and a length of 5.2m • For a standard parking space obstructed on one side, the minimum dimensions are a width of 3m and a length of 5.2m

8.2.4.4 Recommendation

Design standards for underground parking should maintain the same dimensions as surface parking stalls, but require a 30 cm increase in stall width when adjacent any obstructions, including, but not limited to columns, bike racks, and walls.

8.2.5 Bicycle Parking

8.2.5.1 Existing Standard

The existing standard for bicycle parking design is limited to that provision that each bicycle parking space shall be 60cm x 1.8m in size.

8.2.5.2 Best Practice

Travel Demand Management (TDM) strategies are becoming a major focus in transportation as it helps reduce vehicle trips generated, thereby reducing the impact on the existing road network. The City of Burlington has identified several TDM strategies as part of the Transportation Master Plan (TMP), one of which is Bike Month. To support cycling initiatives, the proper infrastructure needs to be implemented throughout the city. This can be done through dedicated spaces for short and long term bicycle parking in parking areas.

Short-term bike parking allows for publicly available bike racks located in easy to access locations. It does not protect bicycles from vandalism or theft, and can be sheltered or unsheltered depending on the site location. There are various rack design options to choose from, some of which are public art, or can include public art. Short-term parking should be included in parking areas in order to provide a safe location to park a bike for their intended use. It can also provide “overflow” bike parking during major events. Short-term parking should be incorporated at or near the main entrance of every building and a larger supply provided near the commercial spaces.

Long-term bike parking is restricted access bike storage that is built into residential and workplace developments. It provides a weather-protected, limited access location to store a bike at ground-level or in a parking garage in order to make it easy and convenient to access a bike while protecting it from theft and the weather. For parking garage, long term storage can be designated in the form of bike cages with secured access.

Parking areas should also consider space for a public bikeshare system in their design. Whether this public system is a temporary or permanent fixture, the City should be contacted to determine if a dedicated space to this system is necessary.

The same approach for short and long term bike parking can be used for scooter and skateboard parking.

These facilities should be installed in locations where it minimizes vehicular and pedestrian conflicts.

8.2.5.3 Peer Review

All municipalities in this study are found to consider only bicycle parking and do not mention scooter or skateboarding parking. In regards to the City of Burlington, the By-law addresses the required size of the bicycle parking space. Meanwhile, other municipalities have considered the minimum number of bicycle parking spaces and have addressed long and short term, bicycle parking as cycling has become a more popular mode of transportation. With the increase of cycling supported infrastructure seen in the GTA, bicycle parking by-laws should consider short and long term parking, shower facilities, and increasing the minimum number of required bicycle parking spaces. The details of standards from the peer review are provided in Exhibit 8.10.

Exhibit 8.10: Peer review of bicycle parking

Bicycle, scooter, and skateboard parking		
City of Toronto	City of Vaughan	City of St. Catharines
<ul style="list-style-type: none"> • Provide at least 0.6m clearance between parked bicycles and adjacent walls, poles, landscaping, street furniture, drive aisles and pedestrian clearways and at least 1.5 m clearance from vehicle parking spaces. (refer to Chapter 9 Bicycle Parking, in the Toronto Bike Plan for more information) • Locate short- and long-term bicycle parking in highly visible, well-lit, accessible and weather protected areas. Incorporate way-finding signage as appropriate. 	<p>Install curb cut ramp adjacent to any bicycle parking area;</p> <ul style="list-style-type: none"> • Bicycle racks should be made out of a durable and strong material and be permanently anchored to the ground; • Incorporate way-finding signage as appropriate; and provide at least 1m clearance between parked bicycles and adjacent walls, poles, Landscaping, street furniture, drive aisles and pedestrian clear ways and at least 1.5 m clearance from vehicle parking spaces. 	<ul style="list-style-type: none"> • Bicycle parking spaces must be located on the same lot as the use for which it is provided and shall be located at a principal entrance of a building • The minimum dimensions of a bicycle parking space is 1.8 m in length and 0.3 m in width

8.2.5.4 Recommendation

Design provisions for bicycle parking within the By-law should incorporate elements from best practice and peer jurisdictions to improve the provisions for bike parking in the city. It is recommended that design standards in the By-law be updated to adopt long term and short term bicycle parking.

Long term bicycle parking is intended to include design elements that enable the safe storage of bicycles over a long time period, including protection from weather and discouragement of theft. These standards should be required for residential, retail, commercial, and employment land uses and should include the following design elements:

- Each bicycle parking space shall be 60 cm x 1.8 m in size;
- Bicycle parking spaces must be located on the same lot as the use for which it is provided and shall be located within 10.0 m of a principle entrance of the building;
- Racks should be located to either be sheltered by the building, or be sheltered by an independent structure;
- In cases where the building's parking is located underground, bicycle parking should also be located underground and located within 10.0 m of the entrance to the building. Bicycle parking in these cases should also be provided above ground, for visitor access, within 10.0 m of the principle entrance to the building;
- Curb cut ramps adjacent to any bicycle parking area to allow for improved accessibility;
- Bicycle racks should be made out of a durable and strong material and be permanently anchored to the ground; and
- Provide at least 1.0 m clearance between parked bicycles and adjacent walls, poles, landscaping, street furniture, drive aisles and pedestrian clear ways and at least 1.5 m clearance from vehicle parking spaces.

Short term bicycle parking is intended to be for temporary parking needs and does not include provisions for protection from weather. Short term bicycle parking should be required for all other land uses and adhere to the following design standards:

- Each bicycle parking space shall be 60 cm x 1.8m in size
- Curb cut ramps adjacent to any bicycle parking area to allow for improved accessibility
- Bicycle racks should be made out of a durable and strong material and be permanently anchored to the ground;
- Provide at least 1m clearance between parked bicycles and adjacent walls, poles, landscaping, street furniture, drive aisles and pedestrian clear ways and at least 1.5 m clearance from vehicle parking spaces.

8.2.6 Barrier Free Access

8.2.6.1 Existing Standard

Accessible Parking spaces require the minimum 2.75 m width of a standard stall plus a 2.0 m accessible parking pathway (4.75 m total width)

8.2.6.2 Best Practice – AODA

The Accessibility for Ontarians with Disabilities Act requires identifying requirements for barrier free parking spaces in terms of number of spaces, types of spaces the size of those spaces, as well as the size of the access aisles.

1. Type A, a wider parking space which has a minimum width of 3,400 mm and signage that identifies the space as “van accessible”.
2. Type B, a standard parking space which has a minimum width of 2,400 mm. O. Reg. 413/12, s. 6.

Access aisles may be shared by two parking spaces for the use of persons with disabilities in an off-street parking facility and must meet the following requirements:

1. They must have a minimum width of 1,500 mm.
2. They must extend the full length of the parking space.
3. They must be marked with high tonal contrast diagonal lines, which discourages parking in them, where the surface is asphalt, concrete or some other hard surface.

8.2.6.3 Peer Review

The barrier free access standards were compared to standards the peer jurisdictions and is summarized in Exhibit 8.11.

Exhibit 8.11: Peer review of accessible parking standards

Barrier Free Access (Accessible Parking)			
City of Burlington	City of Toronto	City of Hamilton	City of St. Catharines
Width = 4.75 m Length = not defined	Width=3.9 m Length= 5.6 m	Width =4.4 m Length=5.5m	Width =4.9 m Length=5.2m

8.2.6.4 Recommendation

It is recommended that the By-law adopt the AODA accessible parking design guidelines that are described in section 3.5.2.

They are:

- Type A, a wider parking space which has a minimum width of 3.4 m and signage that identifies the space as “van accessible”.
- Type B, a standard parking space which has a minimum width of 2.4 m. O. Reg. 413/12, s. 6.

Access aisles may be shared by two parking spaces for the use of persons with disabilities in an off-street parking facility and must meet the following requirements:

- They must have a minimum width of 1.5 m.
- They must extend the full length of the parking space.
- They must be marked with high tonal contrast diagonal lines, which discourages parking in them, where the surface is asphalt, concrete or some other hard surface.

In addition to the details listed above, accessible parking stalls should be located in the following locations:

- Accessible stalls should be the parking stalls that are located the closest to the front entrance of a building or elevator
- Accessible stalls when located in a parking garage should be located on a portion of the garage that has a flat floor.

8.2.7 Landscaping

8.2.7.1 Existing Standards

The existing provisions within By-law 2020 states the following:

For employment, commercial, and uptown mixed-use zones, parking areas shall be separated from adjoining parking areas by a 3.0m landscape area. A landscape area separating parking areas within a comprehensive development may contain a 2.0m wide walkway which runs parallel to and within the landscape area provided that the landscape area has a minimum width of 4.5m.

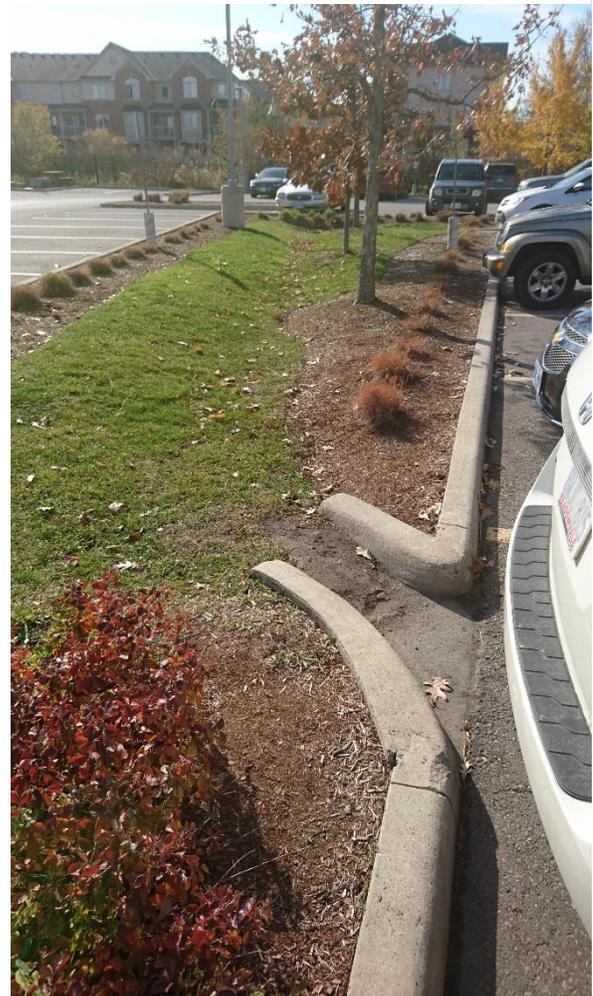
8.2.7.2 Best Practice

Landscaping is an effective way to increase the aesthetics of a parking facility, provides an opportunity for storm water management, and reduces the ambient heat produced by extensive areas of paved surfaces (urban heat island). Moving from dated designs where parking lots used to be a rectangular asphalt plot with painted lines, landscaping can be used to create an enjoyable user experience by providing shade and colourful vegetation near pedestrian walkways and that can help mitigate flood risk, improve water quality, and lessen the burden on storm water infrastructure. However, the landscaping of a parking facility should be designed so that it does not cause any sight line issues for drivers, especially at site accesses.

When designing a parking area, if possible, the existing vegetation, trees, and other plant life should be retained and should be harmonized into the future landscaping. This allows for the landscaping to be distributed throughout the parking area.

An example of best practice application of Low Impact Development in Burlington is at the Mountain Equipment Co-op (MEC) retail store. Exhibit 8.12 exemplifies how landscaping at this location can help mitigate runoff.

Exhibit 8.12: Runoff Mitigation: MEC Parking Lot, Burlington



8.2.7.3 Peer Review

Landscaping is generally not included in municipal By-laws in regards to parking lots as it is not considered necessary, but is an additional benefit, which is often advised through design guidelines. The landscaping of parking lots is only included in the By-laws of Burlington and St. Catharines in regards to walkways and the separation of parking areas to other uses. The City of Toronto and City of Vaughan do not include landscaping provisions within their by-laws, but

have extensive recommendations for landscaping within parking lot design through their design guidelines. The *City of Vaughan Parking Design Guidelines* recommends that the landscaping of a parking area should have a minimum coverage area of 15% of the overall site. A summary of the peer review is provided in Exhibit 8.13.

Exhibit 8.13: Peer Review of Landscaping Design Provisions

Landscaping		
City of Toronto	City of Vaughan	City of St. Catharines
<ul style="list-style-type: none"> Not included in By-law – only in design guidelines: <p>http://www1.toronto.ca/city_of_toronto/city_planning/urban_design/files/pdf/greening_p-lot_guidelines_jan2013.pdf</p>	<ul style="list-style-type: none"> Not included in By-law – only in design guidelines: <p>https://www.vaughan.ca/projects/policy_planning_projects/city_wide_parking_standards_review/General%20Documents/Draft%20Web%20Version%20Parking%20Design%20Guidelines%20Oct%202021.pdf</p>	<ul style="list-style-type: none"> A landscape buffer shall be provided between the edge of any parking area A minimum landscaped open space equal to 10% of the parking area shall be required within all parking areas with 100 or more parking spaces

8.2.7.4 Recommendation

To improve the aesthetics, storm water management, and reduce storm water impacts of parking areas, landscaping should be included in the design guidelines to supplement the provisions within the By-law. While site application guidelines will require rainwater limitations that can be achieved through other LID measures, the measures recommended in this report are intended to be used as a tool to help achieve run-off objectives through parking lot design:

- Whenever structures such as walls or fences are used to create a screen, plants should be located on the side visible from the surrounding streets, sidewalks, parks or other public properties;
- Retain and protect existing trees, vegetation, natural slopes, and soils and integrate them into the overall landscape plan;
- Limit the use of retaining walls, particularly along street frontages, parks, ravines and other areas of the public realm. Where retaining walls cannot be avoided, minimize the overall height or provide low terraces, use durable attractive materials, and incorporate intensive soft landscaping;
- Apply a cross-grade for paved surfaces as low as 1.5% to encourage slower stormwater flow;
- Slope surfaces to direct stormwater toward landscaping, bio-retention areas or other water collection areas as identified on the site;
- Avoid planting invasive species near ravines and other natural areas and avoid monocultures which can be susceptible to disease;
- Incorporate a variety of deciduous and coniferous trees and shrubs for year-round interest, texture, shape and seasonal colour;
- Where possible, collect rainwater from rooftops and other surfaces for plant irrigation;
- Lots should have a coordinated appearance with the existing or planned streetscape treatment;

- Distribute shade tree planting such that no parking space is more than 30m from a tree;
- At least 15% of site area within parking lot perimeter should be occupied by landscaping, with preference for preservation of existing trees, native species, maximizing tree canopy, and species resilient to drought, salt, weather exposure and compacted soils;
- Trees should be planted at least 1.5m from curbs, sidewalks, driveways and other hard surfaces to buffer from stress caused by salt, snow piling, vehicle overhang and compacted soils;
- Trees should be planted with access to at least 30m³ (at 0.9m depth) of good quality soil;
- Provide a landscaped area at least 3.0m in width between surface parking and all property lines;
- Provide continuous landscaped medians every 3 (or fewer) banks of parking. A “bank” of parking consists of 2 parking rows and a drive aisle. Medians should have a landscaped area at least 3.0m in width; and
- Include landscaped islands at the beginning and end of each parking row, which include at least 1 high-branching deciduous shade tree.
- Permeable pavers should be used when the context justifies it (more details regarding permeable pavement and LID measures are included in Section 8.3.3).

8.2.8 Lighting

8.2.8.1 Existing Standards

The existing standards in Burlington state: Where parking facilities are illuminated by lighting fixtures or standards, they shall be arranged so that light from the fixture is shielded and/or directed away from residential dwellings.

These existing standards are in place to protect surrounding residents from light pollution, but they do not support the provisions of lighting for safety and pedestrian comfort.

8.2.8.2 Best Practice

To ensure the safety and visibility of pedestrians and vehicles in parking design, lighting is a key consideration for the parking design guidelines. The lighting of parking facilities is not covered in any of the municipalities we reviewed, with the exception of the City of Burlington stating that it should be shielded from residential buildings. Without any guidelines, parking facilities may be provided with scarce lighting that allows for minimum visibility and can leave users feeling unsafe.

Lighting in parking garages have several benefits, including:

- *Increased visibility of pedestrians, vehicles, and any objects or obstructions.* With proper lighting, vehicles and pedestrians should have no problem with the visibility of objects, obstructions, or other pedestrians and vehicles. Objects and obstructions includes curbs, steps, and islands in parking facilities. With increased visibility, there should be a decrease of accidents within the parking facility.
- *Increased efficiency of wayfinding and signage.* Appropriate illumination of signage increases the efficiency of pedestrian circulation in parking facilities, known as pedestrian-scaled lighting.

- *Increased safety* as proper lighting also acts as a crime deterrent as it has been found that users feel safer and more comfortable. It also allows for greater visibility across larger distances.
- Energy efficient and off-grid power generation are also design considerations when evaluating lighting opportunities.

8.2.8.3 Peer Review

A peer review of lighting requirements in other municipal by-laws revealed that few by-laws have provision for lighting. The design guidelines in Toronto and Vaughan, however, have extensive provisions for lighting which are shown in Exhibit 8.14.

Exhibit 8.14 Peer Review of Lighting Design Provisions

Lighting	
City of Toronto	City of Vaughan
<ul style="list-style-type: none"> • Provide a comprehensive Lighting Plan for the parking lot site. Lighting should create an identity for the parking lot, enhance adjacent streets and pedestrian environments and be appropriate to the location, context and scale of the areas being lit. • Select different luminaries with a coordinated appearance to light pedestrian pathways, parking spaces, drive aisles, building and site entrances and other relevant parking lot features. • Balance the need for safety and security with the reduction of energy consumption and light pollution: <ul style="list-style-type: none"> • ensure all parking spaces and circulation routes are well-lit • install lighting that is appropriately scaled to its purpose, i.e. avoid “over lighting” • • direct light downward and avoid light overspill on adjacent properties, streets and open spaces • use energy-efficient fixtures and bulbs • Incorporate opportunities for off-grid power generation, e.g. solar, wind, etc. • d. Provide pedestrian-scaled lighting, such as bollards or lower-scale pole fixtures along pedestrian routes. • e. Consider lighting elements for their aesthetic and design value, not simply their lighting function or ease of maintenance. • f. Coordinate the location of lighting with pedestrian clearways, tree planting and other landscaping. 	<ul style="list-style-type: none"> • Lighting should be designed to be aesthetically integrated with the architecture, landscape and streetscape lighting should be designed to ensure that loading and servicing areas do not create potential hiding places or blind spots; • Install lighting that is appropriately scaled to its purpose, i.e. avoid “over lighting”; • Direct light downward and inward and avoid light overspill on adjacent properties; • Use energy-efficient fixtures and bulbs; • Incorporate opportunities for off-grid power generation, e.g. solar; and • Provide pedestrian-scaled lighting, such as bollards or smaller scale pole fixtures along pedestrian routes. •

8.2.8.4 Recommendations

It is recommended that provisions for lighting be included as a design guideline to supplement the by-law. The design guidelines should include the following:

- Lighting should be designed to be aesthetically integrated with the architecture. Landscape and streetscape lighting should be designed to ensure that loading and servicing areas do not create potential hiding places or blind spots;
- Lighting should be appropriately scaled to its purpose, i.e. avoid “over lighting”;
- Direct light downward and inward and avoid light overspill on adjacent properties;
- Use energy-efficient fixtures and bulbs;
- Incorporate opportunities for off-grid power generation, e.g. solar powered lighting; and
- Provide pedestrian-scaled lighting, such as bollards or smaller scale pole fixtures along pedestrian routes.

8.3 Review of New Design Elements

The design elements that are not currently in the existing parking design standards for Burlington are considered in this section.

There are several sources that serve as best practices for parking design. *The Dimensions of Parking* (5th Edition) by the Urban Land Institute and the National Parking Association is well known for its comprehensive research on several aspects of parking, including those listed in this study and is used as the main reference for the information below.

The *City of Vaughan Parking Design Standards* is a recently completed study that include best practices on several aspects of parking, with its main objective to positively influence the functionality and aesthetics of parking areas. It is used as the secondary source for this best practices review.

8.3.1 Identification and Enforcement of Visitor Parking

The identification and enforcement of visitor parking is a challenging task as there are several approaches to this task that result in a varying degree of cost and effectiveness. Private parking lots are available to employees, tenants, and owners; however, visitor spaces are required either from compliance to the municipal by-law or from the needs from a business or office.

In residential areas, the enforcement of visitor parking is dependent on the owner as they are responsible to call either a towing company or local municipal enforcement. However, these measures result in varying effectiveness and reliability. A different approach has been used with visitor parking, especially in newer condominiums, where owners and tenants are given a certain number of visitor passes a month that they are allowed to distribute to their guests. This ensures that visitors are identified by attendants or security guards who either checks cameras or walk through the parking area, which also allowing all residents to have a fair chance at visitor parking.

For commercial and industrial areas, visitor parking is usually required by external business partners or clients. These areas can also have shared lots where several businesses use the lots for their employees. To identify and enforce visitor parking, the following options can be considered: permit parking and gated entrances.

Permit parking is generally used when several businesses share a parking lot. Each business can issue parking permit to their employees to be displayed on their vehicle, as businesses can lease a certain number of parking spaces. Several spaces can be designed as ‘visitor’. Visitors

who enter these lots must obtain a visitor permit through the reception of the business they are visiting which must be placed somewhere visible on the vehicle. Permit parking is accompanied by an attendant on duty, who circulates the parking area several times throughout the day to ensure that the proper permits are displayed.

Gated entrances are another way to identify and enforce visitor parking. Employees can be issued a pass that is swiped upon entrance to be let in, whereas visitors must take a ticket. This ticket can either require payment or can act as identification of a visitor.

8.3.2 Transit Facilities within or adjacent to parking lots

In their transit supportive guidelines, the Ministry of Transportation of Ontario (MTO) provides recommendations for designing parking to be supportive of pedestrians and transit users. Many of the recommendations are related to the position of parking relative to the streetscape and the provision of pedestrian flows between parking lots and transit facilities. These are addressed in the recommended design guidelines for vehicle and pedestrian circulation:

- Provide a safe, interconnected pedestrian network within and adjacent to parking lots to connect building entrances, parking spaces, public sidewalks, transit stops and other pedestrian destinations

8.3.3 Permeable Pavement Issues and Incentives

The Ministry of Environment and Climate Change is scheduled to release a document by the end of 2016 (not yet released as of May 2017) that will require municipalities to adopt policies that require developments to have increased on-site storm water infiltration. This will require developers to implement additional Low Impact Development (LID) measures to achieve the targets for infiltration.

Permeable paving is one of several types of Low Impact Development (LID) measures that can be applied to parking areas to reduce the impact of storm water runoff on waterways and on storm water infrastructure.

Depending on the context of the development, one or many types of LID might be suitable to achieve the required stormwater runoff mitigation. Larger lots may require a combination of interventions, while smaller lots might be able to mitigate runoff through landscaping.

Although permeable pavements are costlier than non-permeable pavements, in situations where landscaping may be limited by site size restrictions, permeable pavers can be a space efficient alternative.

It is not recommended that permeable pavement guidelines be provided within the design guidelines. However, once LID measures are adjusted and targets are set, it is recommended that permeable pavement be considered as one of the LID measures at the disposal of developers to achieve infiltration targets.

8.3.4 Compact Parking Provisions

Compact parking spaces are narrower than standard spaces and are an effective way to reduce the parking footprint while adhering to minimum parking supply requirement. Several municipalities in North America have adopted compact parking provisions that state the allowable amount of compact parking for a lot and the design guidelines for compact parking spaces.

The maximum allowable portion of a parking lot than can be dedicated to compact parking spaces typically ranges from 10-15% and the widths of these spaces ranges from 2.3 to 2.5 meters.

It is recommended that Burlington introduce the following compact parking provisions:

- A maximum of 15% of a required parking supply to be dedicated to compact parking and that those spaces be identified as compact parking spaces through signage or pavement markings.
- Compact spaces should maintain the same design standard as the recommended dimensions for a general parking space (not in an urban area) but the width should be reduced by 20 centimeters, resulting in a width of 2.5 m.

8.3.5 Underground Design Considerations (Ramp Slope)

In the Dimensions of Parking 5th Edition by the Urban Land Institute a maximum grade for non-parking ramps should be 12.5 % and when grades exceed 10%, a transition slope of 6% should be included to prevent bottoming out.

8.3.6 Underground Design Considerations (Future-proofing)

There is a growing understanding that the advent of autonomous ride-hailing services has a significant potential to reduce parking demand as these services become prevalent. Although the timeline for these impacts is not projected to occur for another 20-30 years¹⁹, the design of structured parking today should consider this future reality. While surface parking can adapt to changes in demand, by converting to infill and other land uses, parking structures are less adaptive and require a much higher initial capital investment to construct, making the risk of oversupply compared to surface parking much greater.

Best practices in contemporary parking structure design are focused on adaptability to future uses. This is a proactive way of future proofing the investment in these structures. Some examples of design elements that can be considered to ensure a more adaptable future include:

- Flat floors
- Higher ceiling heights
- Roughed in electric (provided through the recommended electric vehicle charging provision)

Although it is not recommended that these design elements become mandatory, they should be included in the parking design guidelines to consider and for builders to be aware of.

¹⁹ <http://www.vtpi.org/avip.pdf>

9 Parking Management Strategies

A best practices review was conducted for parking management strategies that have been used effectively in other medium-sized municipalities in Ontario. The municipalities considered were Guelph, Kitchener, Waterloo, Oakville, Vaughan, and Markham. Research was also conducted based on the Victoria Transport Policy Institute and ULI, among other sources.

9.1 Residential On-Street Parking

9.1.1 Existing Policy

Vehicles are prohibited from parking on residential streets between the hours of 1-6AM or for longer than 5 hours. In order to allow for special circumstances, residents and visitors are able to request a free parking exemption that allows them to park between 1-6AM or beyond the 5-hour limit for up to 15 days per calendar year per license plate. In designated residential areas, there is a Neighbourhood On-Street Parking Program (NOSPP) that allows residents to park between 1-6AM any day of the week, and in certain areas can exceed the 5-hour limit.

Effective September 1, 2016, residents of the Alton community are able to obtain a parking permit for \$30/month or \$350/year that allows them to park overnight and for up to 48 hours in the same spot within the residential area. In order to qualify for the permit, residents and visitors must demonstrate that the extra vehicle cannot fit in their driveway or garage and provide proof that the vehicle is registered to their address. Any resident living on an existing NOSPP street will be grandfathered into the permit program by receiving a free permit for the duration of ownership. New residents will have to apply through the new permit process. Permit holders will be able to park on the street even during snow removal, this decision will be monitored initially and if issues arise modifications may be made.

9.1.1 Peer Review

A summary of the policies implemented by peer municipalities is provided in Exhibit 9.1.

Exhibit 9.1: Residential On-Street Parking Regulations – Peer Review

MUNICIPALITY	ON-STREET PARKING PERMIT?	MAXIMUM PARKING TIME LIMIT	OVERNIGHT PARKING RESTRICTION PERIOD	PARKING EXEMPTION LIMIT
Burlington	All day \$35/mth; \$350/yr	5 Hours	1AM-6AM	15 / Year
Guelph	No	-	2AM-6AM (December - March)	12 / Year
Kitchener	No	3 Hours ¹	2:30AM-6:00AM (December - March)	No Limit
Waterloo	No	3 Hours	2:30AM-6:00AM	15 / Year
Oakville	Overnight \$50/month	3 Hours	2AM-6AM ²	15 / Year
Vaughan	Proposed \$56.50/month	3 Hours	2AM-6AM	5 / Month
Markham	Overnight \$30-70/month	1-4 Hours	2:30AM-6AM	5 / Year

¹ Limit doesn't apply from 11PM-6PM in April through November

² Applies between November 15 to April 15 south of Dundas Street, all year north of Dundas Street

Guelph

Guelph has city wide residential on-street parking that is available for everyone to use at all times (up to 48 hours) between April and November. During other months parking is not permitted between the hours of 2-6AM, but residents and their guests can apply online for a parking exemption similar to Burlington's. Guelph's exemption is granted to two vehicles for up to two days, at a limit of 12 exemptions per year.

There doesn't appear to be a maximum parking time limit or permits required for residential on-street parking.

Kitchener

Kitchener has a 3-hour parking limit for on-street parking spaces, but from 11PM-6AM in April through November the 3-hour limit does not apply. There is also a parking restriction between the hours of 2:30-6AM from December through to March.

Waterloo

Waterloo has a 3-hour parking limit for on-street parking spaces and no on-street parking from 2:30-6AM. Residents and visitors can get an exemption for up to 15 times/year. Permits are not available for extended duration on-street parking.

Oakville

Oakville has a 3-hour parking limit for on-street parking spaces, and an overnight parking restriction between 2-6AM year round if the street is north of Dundas Street, or between November 15-April 15 if south of Dundas Street. Residents and guests can obtain a Temporary Parking Permit that allows them to park for more than the 3-hour limit or overnight, up to 15 times per year.

In areas north of Dundas Street, an overnight parking permit is available for residents to purchase for \$50/month. Vehicles with a can park on-street between 6PM-6AM for more than 3 hours; outside of those hours the 3-hour maximum applies. It can be associated with up to 4 vehicles, but it can only be used for 1 vehicle at a time. Permit holders can remain parked on-street during snow removal.

Vaughan

Vaughan has a 3-hour parking limit for on-street parking spaces and no on-street parking from 2-6AM. Visitors (but not residents) can get an exemption for up to 5 times/month. In 2015, the City of Vaughan proposed a residential on-street paid permit program costing a monthly fee of \$56.50; the policy is currently being drafted and finalized.

Markham

Markham has a night parking restriction between 2:30-6AM. Exemptions can be obtained online at a limit of 5 times/year. There is an overnight paid permit program that costs \$30/month. The maximum time a vehicle can be parked varies between 1-4 hours, depending on the street. During snow clearing operations, on-street parking is not permitted, and exemptions will not be granted.

9.1.2 Recommendation

Continue with the recently implemented on-street permit program and monitor the effectiveness in terms of adherence and permit uptake.

9.2 Overflow Residential Parking

9.2.1 Existing Policy

Annual permit holders are allowed to park in Orchard Community Park and Lampman Park any time between November to March, and from 11PM-7AM during April to October. Permit holders can also request to park in other park lots pending review and approval from Roads & Parks Maintenance Staff.

9.2.2 Peer Review

A large number of Ontario municipalities were researched, but no municipalities permitted residents to park in neighbourhood parks during off-peak periods. Calls were made out to the Parks and Recreation departments of Mississauga, Guelph and Oakville; they all stated that the park lots are meant for park users and the parking lots are closed outside of park hours. All municipalities have a temporary overnight parking permit/exemption, and some also have a resident pay permit program as discussed in Section 9.1. None of the municipalities provide further residential parking provisions, which suggests that there is not significant demand for any additional parking spaces.

Research by the Victoria Transport Policy shows that residents are willing to walk outside up to 250 metres to get to their place of residence. Oakville and Hamilton state that the maximum distance from the parking facility to the lot requiring parking is 300 metres.

Allowing parking in municipal park parking lots would fall on the burden the city to continually maintain these lots in the winter. These lots are also used for snow storage during the winter. Therefore, parking in city parks should not be considered a viable alternate parking supply for undersupplied residential developments.

9.3 Private Property Parking Enforcement

9.3.1 Existing Policy

Property owners can request Parking By-Law Enforcement Officers to enter private property and enforce parking offences. In order to gain access to this program, the property owner is required to complete a registration process that involves developing a Parking Management Plan with the City, install the required restrictive and permissive signage and undergo a site inspection. Once the property obtains approval, anyone on the list of authorized persons designated by the property owner is able to call for enforcement and have the issue resolved. The property owner is required to renew the authorization documents every 2 years.

During the stakeholder consultation component of this study, city staff became more aware of situations where condominiums are converting visitor parking in to resident parking, resulting in a lack of visitor parking in some cases.

9.3.2 Peer Review

Guelph

Guelph has a Private Parking Agent program whereby a business owner can appoint a Private Parking Agent who will have the authority to issue Parking Infraction Notices on designated properties belonging to the owner. Prior to being able to issue Infraction Notices, the Agent must fill out an application, attend training, write an examination and ensure the property of interest is properly signed to indicate parking restrictions.

Waterloo

Waterloo has a similar program to Guelph, called the Private Property Enforcement Officer.

Toronto

The City of Toronto has licensed several private companies to issue City issued tickets. The companies have to attend training, and have designated areas where they can issue the tickets. The City handed out licenses to aid the parking officers who have to look after City lots, on-street parking as well as private lots.

9.3.3 Recommendations

An updated by-law should restrict the ability for condominium boards to convert a required visitor parking supply into tenant parking. The recommendations from the apartment section of this study to include a mandatory supply of visitor parking would support this, and this visitor supply should not be converted to tenant parking.

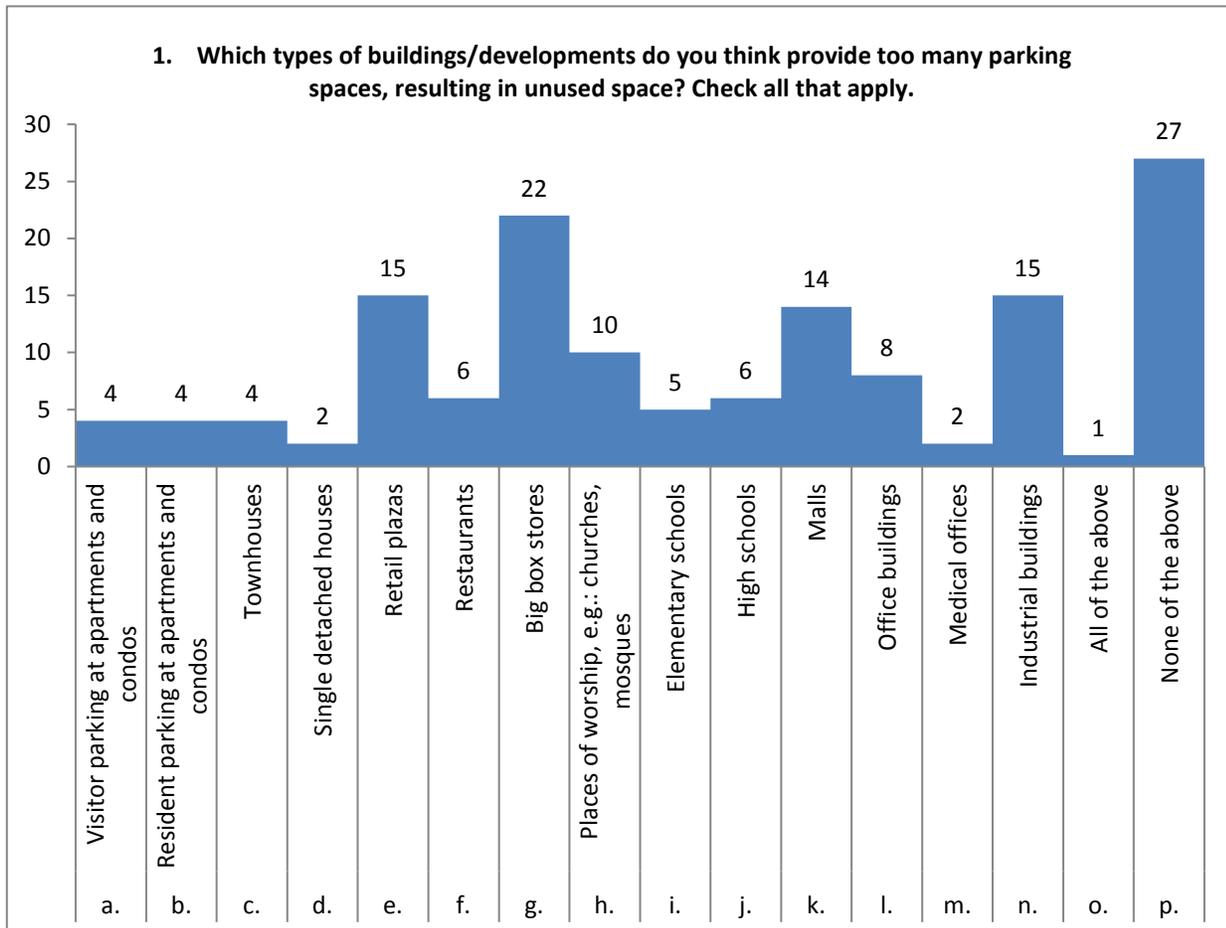
Appendix A – Online Survey Results

BURLINGTON CITY-WIDE PARKING STANDARDS REVIEW

Appendix A - Results from Public Survey

1. Which types of buildings/developments do you think provide **too many** parking spaces, resulting in unused space? Check all that apply.

a.	Visitor parking at apartments and condos	4
b.	Resident parking at apartments and condos	4
c.	Townhouses	4
d.	Single detached houses	2
e.	Retail plazas	15
f.	Restaurants	6
g.	Big box stores	22
h.	Places of worship, e.g.: churches, mosques	10
i.	Elementary schools	5
j.	High schools	6
k.	Malls	14
l.	Office buildings	8
m.	Medical offices	2
n.	Industrial buildings	15
o.	All of the above	1
p.	None of the above	27

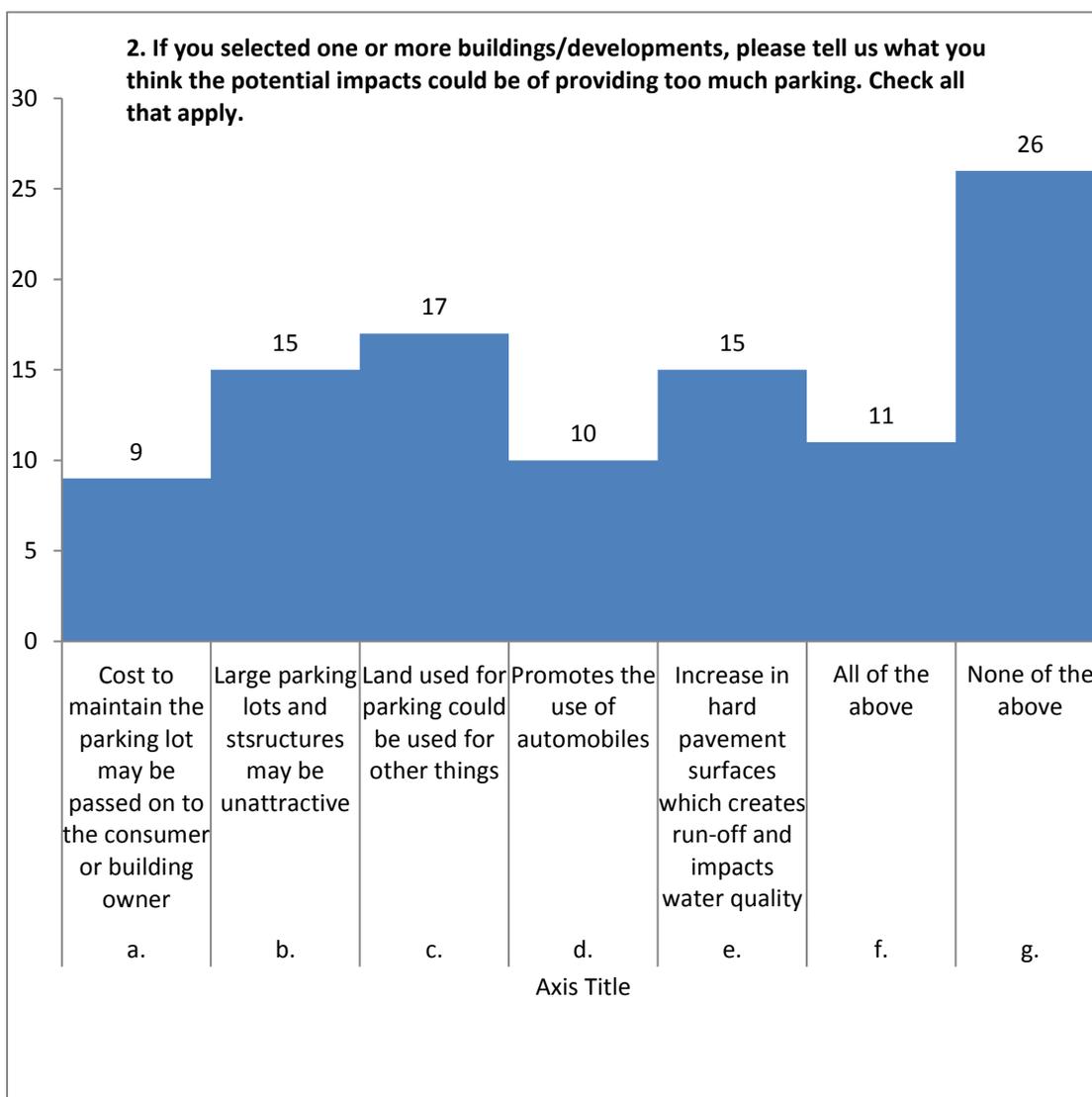


BURLINGTON CITY-WIDE PARKING STANDARDS REVIEW

Appendix A - Results from Public Survey

2. If you selected one or more buildings/developments, please tell us what you think the potential impacts could be of providing too much parking. Check all that apply.

	Cost to maintain the parking lot may be passed on to the	
a.	consumer or building owner	9
b.	Large parking lots and structures may be unattractive	15
c.	Land used for parking could be used for other things	17
d.	Promotes the use of automobiles	10
e.	Increase in hard pavement surfaces which creates run-off and impacts water quality	15
f.	All of the above	11
g.	None of the above	26

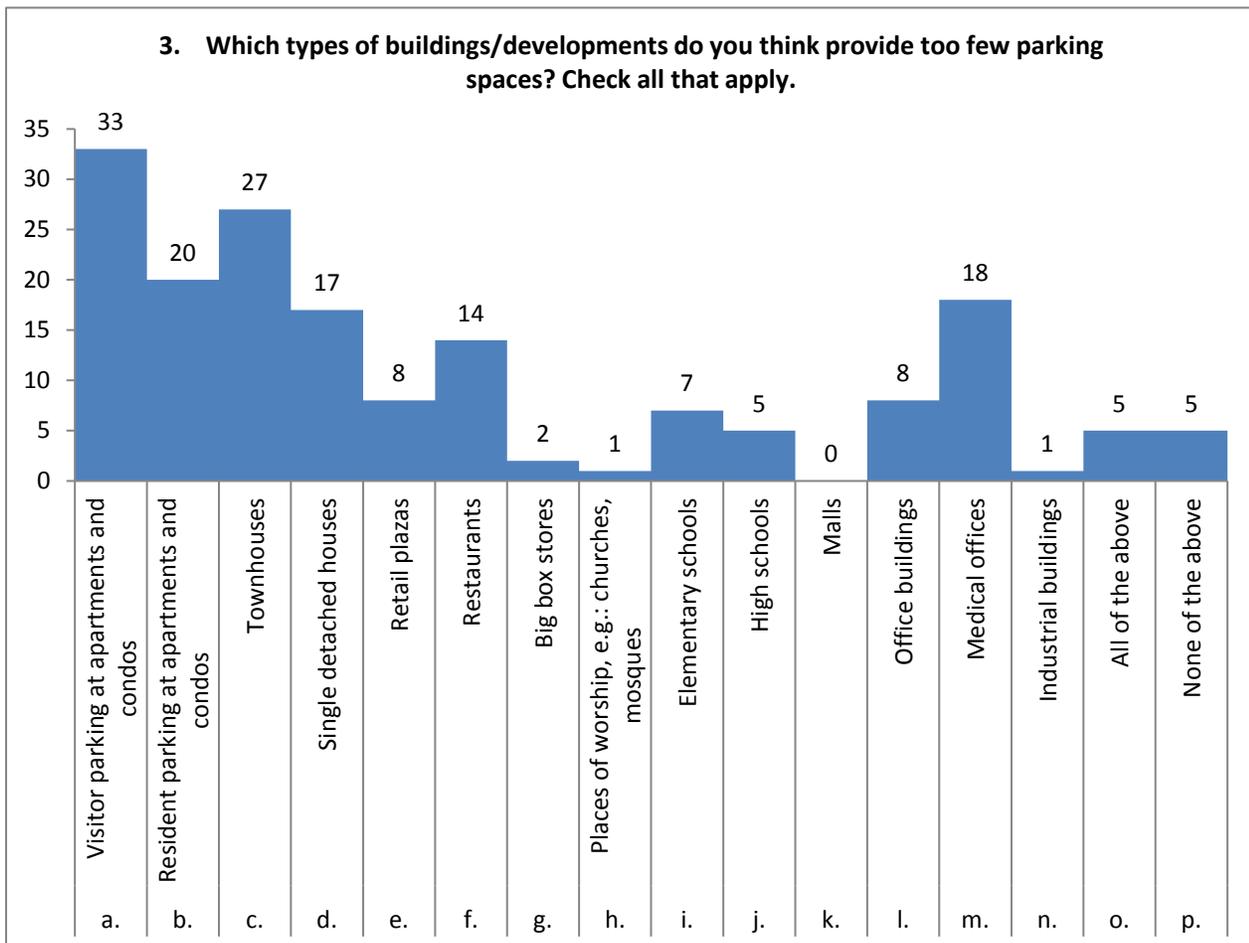


BURLINGTON CITY-WIDE PARKING STANDARDS REVIEW

Appendix A - Results from Public Survey

3. Which types of buildings/developments do you think provide **too few** parking spaces? Check all that apply.

a.	Visitor parking at apartments and condos	33
b.	Resident parking at apartments and condos	20
c.	Townhouses	27
d.	Single detached houses	17
e.	Retail plazas	8
f.	Restaurants	14
g.	Big box stores	2
h.	Places of worship, e.g.: churches, mosques	1
i.	Elementary schools	7
j.	High schools	5
k.	Malls	0
l.	Office buildings	8
m.	Medical offices	18
n.	Industrial buildings	1
o.	All of the above	5
p.	None of the above	5

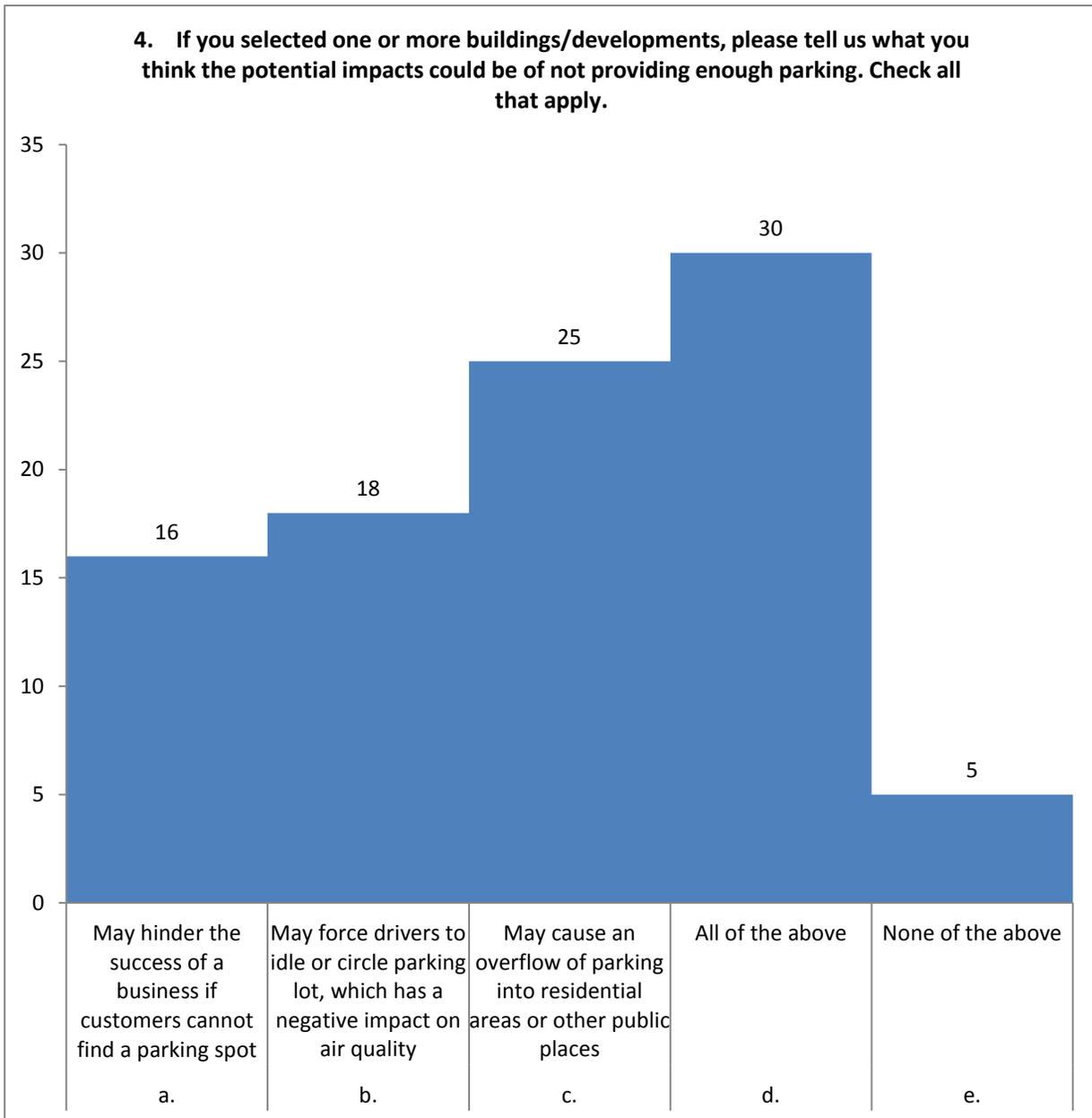


BURLINGTON CITY-WIDE PARKING STANDARDS REVIEW

Appendix A - Results from Public Survey

4. If you selected one or more buildings/developments, please tell us what you think the potential impacts could be of not providing enough parking. Check all that apply.

a.	May hinder the success of a business if customers cannot find a parking spot	16
b.	May force drivers to idle or circle parking lot, which has a negative impact on air quality	18
c.	May cause an overflow of parking into residential areas or other public places	25
d.	All of the above	30
e.	None of the above	5

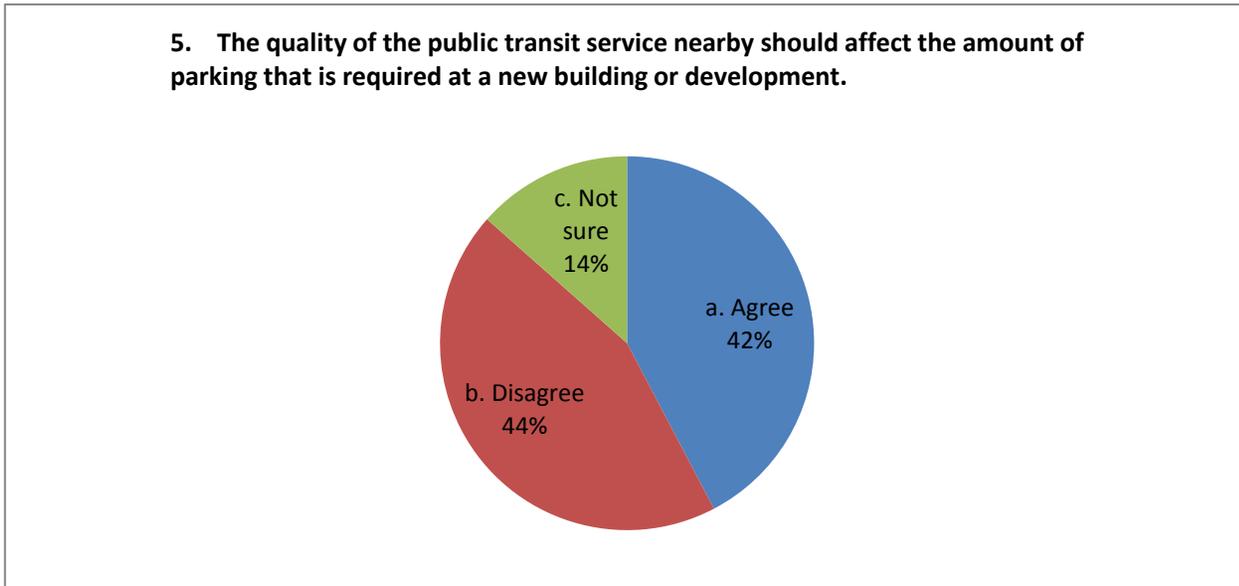


BURLINGTON CITY-WIDE PARKING STANDARDS REVIEW

Appendix A - Results from Public Survey

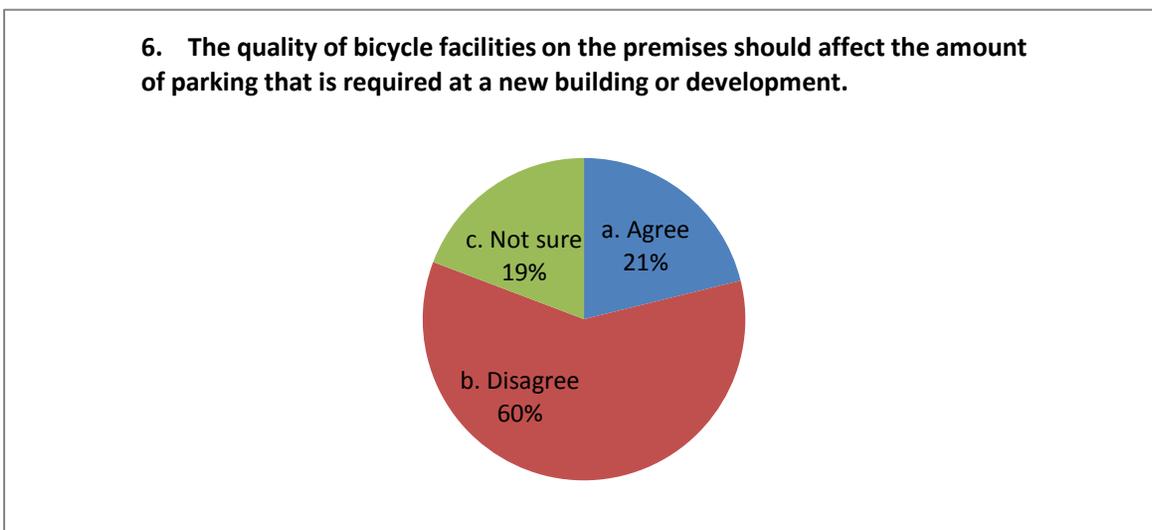
5. The quality of the public transit service nearby should affect the amount of parking that is required at a new building or development.

a.	Agree	22
b.	Disagree	23
c.	Not sure	7



6. The quality of bicycle facilities on the premises should affect the amount of parking that is required at a new building or development.

a.	Agree	11
b.	Disagree	31
c.	Not sure	10

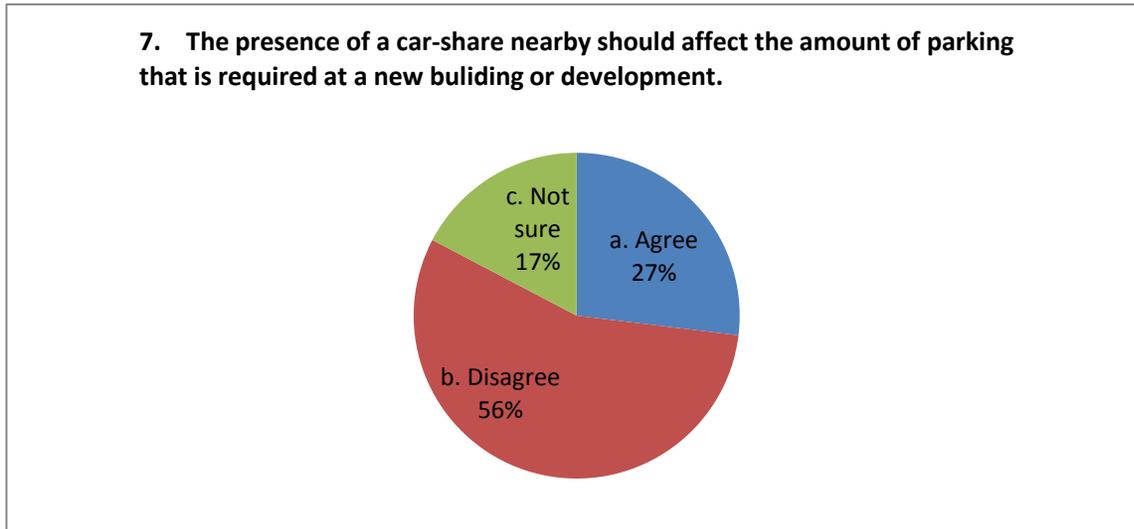


BURLINGTON CITY-WIDE PARKING STANDARDS REVIEW

Appendix A - Results from Public Survey

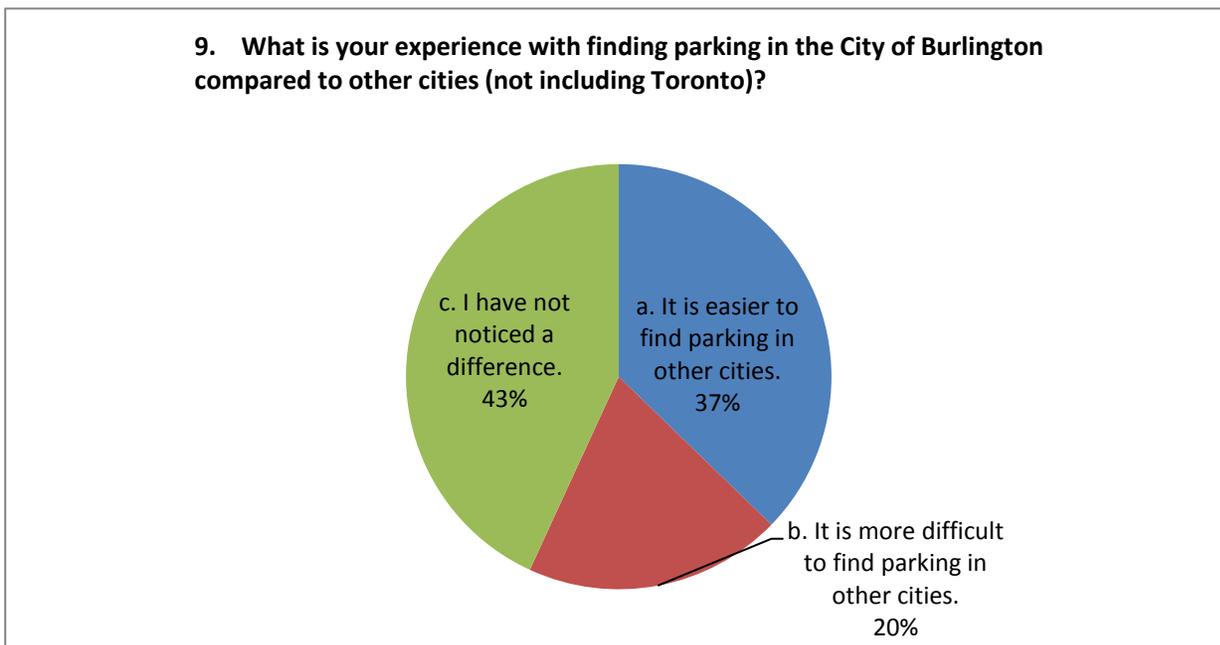
7. The presence of a car-share nearby should affect the amount of parking that is required at a new building or development.

- a. Agree 14
- b. Disagree 29
- c. Not sure 9



9. What is your experience with finding parking in the City of Burlington compared to other cities (not including Toronto)?

- a. It is easier to find parking in other cities. 19
- b. It is more difficult to find parking in other cities. 10
- c. I have not noticed a difference. 22

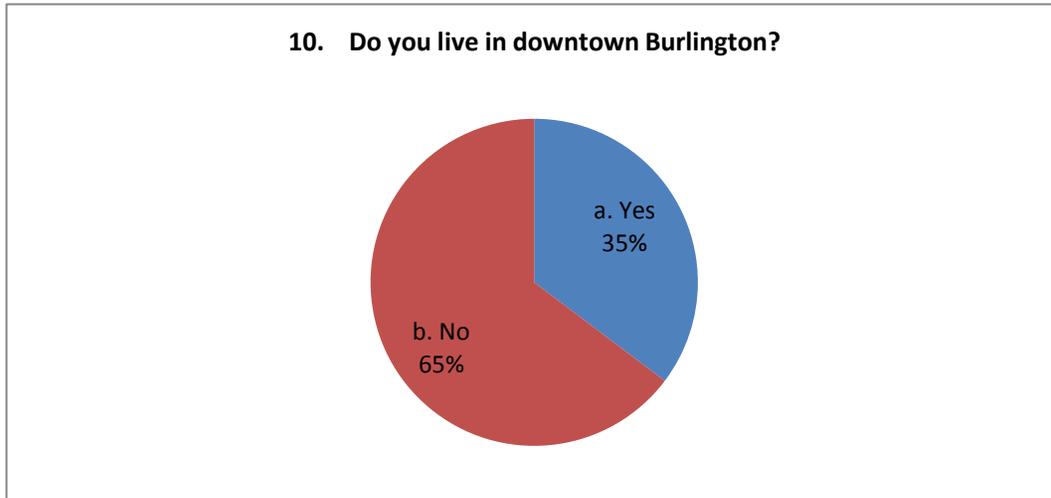


BURLINGTON CITY-WIDE PARKING STANDARDS REVIEW

Appendix A - Results from Public Survey

10. Do you live in downtown Burlington?

a.	Yes	18
b.	No	33



Appendix B – Survey Methodology Memorandum



IBI GROUP
7th Floor – 55 St. Clair Avenue West
Toronto ON M4V 2Y7 Canada
tel 416 596 1930 fax 416 596 0644
ibigroup.com

Memorandum

To/Attention	City of Burlington	Date	April 4, 2016
From	Brian Hollingworth - IBI Group Peter Richards - IBI Group Alex Mereu - IBI Group	Project No	39523
cc	Rosalind Minaji, Kaylan Edgcumbe, Nicole Pettenuzzo, Thomas Douglas, Steve Lucas		
Subject	Burlington Parking Standards Review: Survey Approach		

Purpose

The purpose of this memorandum is to identify an approach and methodology for conducting parking surveys, which will help inform the development of the City-Wide Parking Standards Review in Burlington. This memorandum includes details that summarize the site selection process, survey methodology, and survey scheduling approach. This document will serve as guiding document for the Technical Advisory Committee to approve or recommend amendments to the approach that is proposed, ahead of the scheduled survey start date in the middle of April 2016.

Background

As identified in the RFP for the City-Wide Parking Standards Review, parking surveys will be conducted on 30 different land use types to assess the current state of parking in Burlington. Two to three different developments and locations will be surveyed for each of these land uses. The survey results will contribute to the development of recommendations for the update of Burlington's parking standards.

Parking Survey Methodology

A challenge in this study is to collect meaningful data on a variety of uses to support the development of new parking standards, while recognizing that surveying must be performed efficiently given limited study resources. As such, a "spot survey" approach is recommended. Spot surveys require the surveyor to collect the necessary data upon arrival at the site. Once the data is recorded, the surveyor can move to the next site on their schedule. Each site will be surveyed 2-4 times within the defined peak period to increase the likelihood that the true peak condition is captured.

Spot surveys for selected sites (reflecting the different land uses and geographic contexts noted in the RFP) would be undertaken during pre-selected times to capture the likely peak and typical demand periods. For example, surveys for office developments would be undertaken in the mid-morning and mid-afternoon, while

City of Burlington – April 4, 2016

surveys of retail uses would focus on the PM peak period and weekend period. Residential sites would be surveyed during the evening. We will draw on our previous parking survey experience to propose suitable times for the required land uses. A peak period for each land use is identified in Figure 1.

The data that is collected will be detailed, so that it can be aggregated, validated, and compiled as needed. The surveyor would collect, at a minimum, the following information:

- Address and name of establishment
- Date and time of visit
- Weather conditions
- Parking type
- Transit – Quantity (number of bus routes) and quality (frequency of bus routes) within 400m of the building entrance. This data will be verified primarily through online data.
- Walkability – walkscore.com – include bike score and transit score if available
- Bike network access – This is accessed by determining if the building entrance within 200m of a route contained in the Burlington Cycling Network. This data will be verified primarily through online data.
- Parking Supply including portion of accessible stalls, dedicated stalls (carpool) and bicycle parking. The location of the bicycle parking relative to the building entrance will also be noted
- Observed parking occupancy (demand)
- Photograph of the site
- Other observations

Site Selection

City of Burlington Staff provided an initial list of survey locations for review and assessment. The list included three locations for each of the 30 land uses that were identified in the RFP.

Each location was assessed by IBI Group to determine their constraints from a data collection and analysis perspective. Some of the constraints that were initially identified included a poorly defined site boundary, and locations within larger multi-use plazas with no delineation of parking for each use. In some of these cases, boundaries for the assessment were defined. In other cases, sites were replaced or removed. In all, two to three locations have been finalized for each land use, with the exception of the Storage Locker Facilities use only having one location. The final list of survey locations and peak times is included in Figure 1.

Survey Scheduling

They survey sites have been mapped in GIS and data points include information on peak period and location. This map is provided in Figure 2, at the end of the document.

City of Burlington – April 4, 2016

The peak survey times have been estimates from typical peaks for the types of land uses, as well as referencing the “Popular Times” feature in Google Maps. As noted on a Google Support webpage, “To determine popular times, Google uses data from users who have chosen to store their location information on Google servers. Popular times are based on average popularity over the last several weeks. Not all businesses will have a popular times graph; the graph will only appear for businesses whose hours are listed on Google and about which Google has sufficient popularity data.”

A detailed surveyor schedule will be developed for internal use, to help maximize the time and efficiency of the survey process. The schedule will account for geographic clusters, peak times, and other logistical considerations. To optimize the surveyors’ time, a specific route, aligning with land use peak hours, will also be developed with this schedule.

Next Steps

- Develop detailed survey schedules for internal use (Week of March 28, 2016)
- Brief the Surveyors (Week of April 4, 2016)
- Conduct Surveys (Beginning April 11, 2016 until the end of June, 2016)
- Analyze Survey Results (July 2016)

City of Burlington – April 4, 2016

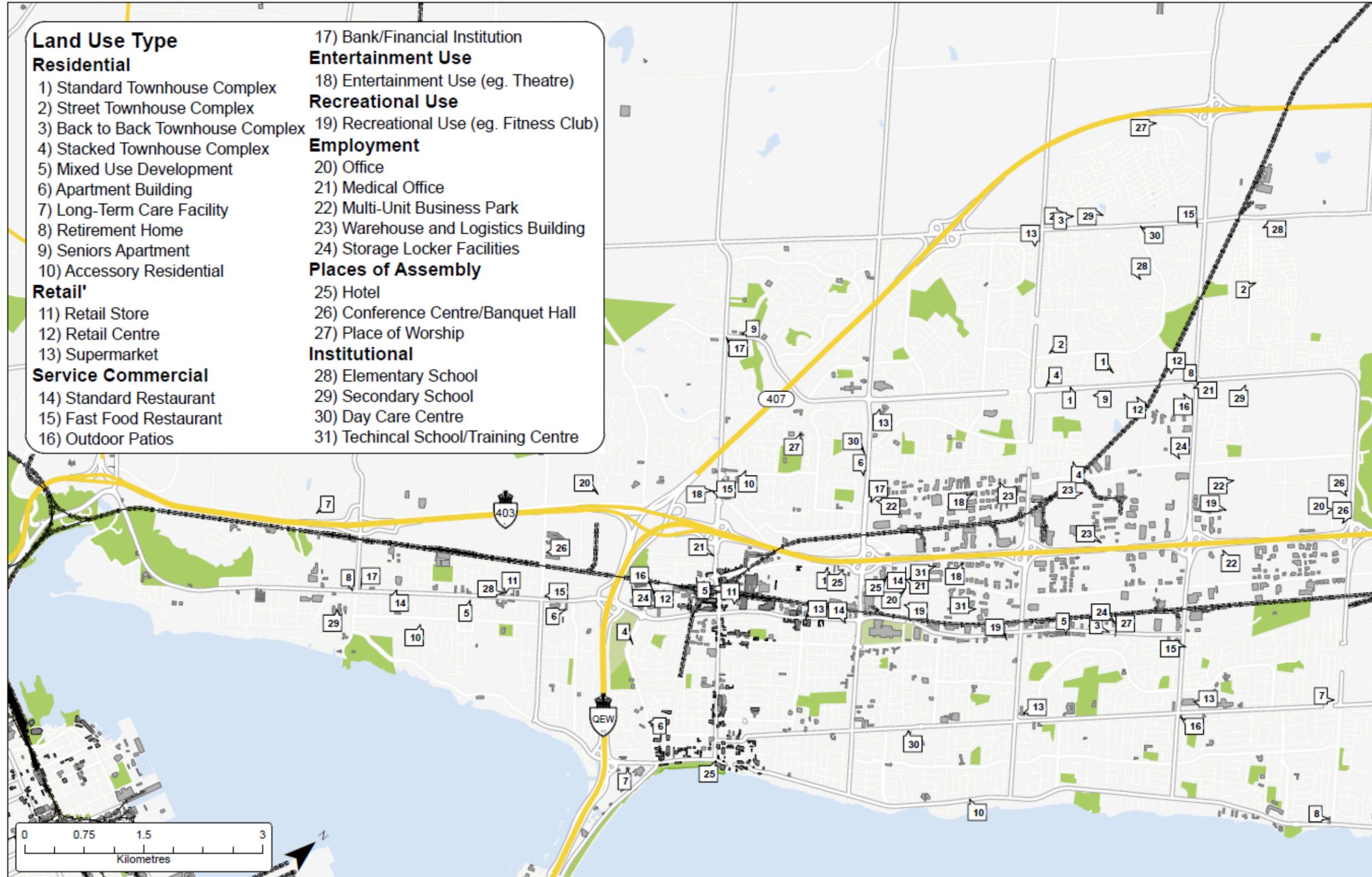
Figure 1: Survey Sites and Peak Demand Periods

Category	Land Use	Address	Peak Period
Residential	Standard Townhouse Complex	4115 Upper Middle Road	WD 20:00-23:00
Residential	Standard Townhouse Complex	2202 Atkinson Drive	WD 20:00-23:00
Residential	Standard Townhouse Complex	2370 Queensway Drive	WD 20:00-23:00
Residential	Street Townhouse Complex	4134 Medland Drive	WD 20:00-23:00
Residential	Street Townhouse Complex	4072 Donnic Drive	WD 20:00-23:00
Residential	Street Townhouse Complex	5321 Applegarth Drive	WD 20:00-23:00
Residential	Back to Back Townhouse Complex	4298 Fairview Street	WD 20:00-23:00
Residential	Back to Back Townhouse Complex	3050 Rotary Way	WD 20:00-23:00
Residential	Stacked Townhouse Complex	1220 Thorpe Road	WD 20:00-23:00
Residential	Stacked Townhouse Complex	4045 Upper Middle Road	WD 20:00-23:00
Residential	Stacked Townhouse Complex	4140 Foxwood Drive	WD 20:00-23:00
Residential	Mixed Use Development	362 Plains Road East	WD 20:00-23:00
Residential	Mixed Use Development	4140 Fairview Street	WD 20:00-23:00
Residential	Mixed Use Development	1401 Plains Road East	WD 20:00-23:00
Residential	Apartment Building	955 Warwick Court	WD 20:00-23:00
Residential	Apartment Building	559 Maple Avenue	WD 20:00-23:00
Residential	Apartment Building	1284 Guelph Line	WD 20:00-23:00
Residential	Long-Term Care Facility	125 Panin Road	WD 20:00-23:00
Residential	Long-Term Care Facility	5959 New Street	WD 20:00-23:00
Residential	Long-Term Care Facility	1182 North Shore Blvd.	WD 20:00-23:00
Residential	Retirement Home	18 Plains Road West	WD 20:00-23:00
Residential	Retirement Home	100 Burloak Drive	WD 20:00-23:00
Residential	Retirement Home	1893 Appleby Line	WD 20:00-23:00
Residential	Seniors Apartment	4100 Upper Middle Road	WD 20:00-23:00
Residential	Seniors Apartment	2055 Upper Middle Road	WD 20:00-23:00
Retail	Retail Store	503 Plains Road East	WD 16:00-18:00, WE 12:00-18:00
Retail	Retail Store	2065 Fairview Street	WD 16:00-18:00, WE 12:00-18:00
Retail	Retail Centre	1235 Plains Road East	WD 16:00-18:00, WE 13:00-15:00
Retail	Retail Centre	2010 Appleby Line	WD 16:00-18:00, WE 13:00-15:00
Retail	Retail Centre	2180 Itabashi Way	WD 17:00-19:00, WE 12:00-18:00
Retail	Supermarket	4025 New	WD 17:00-19:00, WE 12:00-18:00
Retail	Supermarket	2300 Fairview St	WD 17:00-19:00, WE 12:00-18:00
Retail	Supermarket	2900 Walkers Line	WD 17:00-19:00, WE 12:00-18:00
Service Commercial	Standard Restaurant	3140 South Service Rd.	WE 18:00-20:00
Service Commercial	Standard Restaurant	133 Plains Road E.	WE 18:00-20:00
Service Commercial	Standard Restaurant	2422 Fairview St.	WE 18:00-20:00
Service Commercial	Fast Food Restaurant	661 Appleby Line	WE 12:00-14:00
Service Commercial	Fast Food Restaurant	623 Plains Rd. E	WE,WD 12:00-14:00
Service Commercial	Outdoor Patios	5000 New Street	WE 18:00-22:00
Service Commercial	Outdoor Patios	1010 Plains E.	WE 18:00-22:00

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Category	Land Use	Address	Peak Period
Service Commercial	Bank/Financial Institution	3030 Mainway	WD 12:00-13:00
Service Commercial	Bank/Financial Institution	15 Plains Rd. E.	WD 12:00-13:00
Service Commercial	Bank/Financial Institution	5385 Lakeshore Road East, Burlington, Ontario	WD 12:00-13:30 or WD 16:00-18:00
Entertainment Use	Entertainment Use	3330 South Service Road	SAT 23:00-1:00
Entertainment Use	Entertainment Use	3336 Mainway	SAT 12:00-17:00
Recreational Use	Recreational Use	830 Laurentian Ave	SAT 20:00-22:00
Recreational Use	Recreational Use	3584 Commerce Court	WD 18:00-21:00
Recreational Use	Recreational Use	5065 Benson	SAT 16:00-20:00
Employment	Office	5500 North Service Road	WD 9:30-11:30, 13:30-16:00
Employment	Office	1006 Skyview	WD 9:30-11:30, 13:30-16:00
Employment	Office	3150 Harvester	WD 9:30-11:30, 13:30-16:00
Employment	Medical Office	3155 Harvester Road	WD 9:30-11:30, 13:30-16:00
Employment	Medical Office	1066 Brant Street	WD 9:30-11:30, 13:30-16:00
Employment	Multi-Unit Business Park	5100 South Service Road	WD 9:30-11:30, 13:30-16:00
Employment	Multi-Unit Business Park	3060 Mainway	WD 9:30-11:30, 13:30-16:00
Employment	Multi-Unit Business Park	1425-1445 Norjohn Court	WD 9:30-11:30, 13:30-16:00
Employment	Warehouse and Logistics Building	4150 Mainway	WD 9:30-11:30, 13:30-16:00
Employment	Warehouse and Logistics Building	4243 North Service Road	WD 9:30-11:30, 13:30-16:00
Employment	Storage Locker Facilities	4305 Fairview	WE 10:00-14:00
Places of Assembly and Related Uses	Hotel	3063 South Service Road	WE 21:00-23:00 WD 21:00-23:00, 9:00-12:00
Places of Assembly and Related Uses	Hotel	2020 Lakeshore Road	WE 21:00-23:00 WD 21:00-23:00, 9:00-12:00
Places of Assembly and Related Uses	Hotel	2412 Queensway Drive	WE 21:00-23:00 WD 21:00-23:00, 9:00-12:00
Places of Assembly and Related Uses	Conference Centre/Banquet Hall	1120 Burloak Drive	WD 9:30-11:30, 13:30-16:00
Places of Assembly and Related Uses	Conference Centre/Banquet Hall	1159 King Road	WD 9:30-11:30, 13:30-16:00
Places of Assembly and Related Uses	Place of Worship	4310 Fairview Street	FRI 12:30-13:30
Places of Assembly and Related Uses	Place of Worship	2261 Parkway Drive	SUN 10:30-11:30
Places of Assembly and Related Uses	Place of Worship	4691 Palladium	SUN 10:30-11:30
Institutional	Elementary School	4313 Clubview Drive	WD 9:30-11:30, 13:30-16:00
Institutional	Elementary School	2474 Sutton Drive	WD 9:30-11:30, 13:30-16:00
Institutional	Elementary School	481 Plains Road East	WD 9:30-11:30, 13:30-16:00
Institutional	Secondary School	3040 Tim Dobbie Way	WD 9:30-11:30, 13:30-16:00
Institutional	Secondary School	5150 Upper Middle Road	WD 9:30-11:30, 13:30-16:00
Institutional	Secondary School	50 Fairwood Place West	WD 9:30-11:30, 13:30-16:00
Institutional	Day Care Centre	3180 New Street	WD 9:30-11:30, 13:30-16:00
Institutional	Day Care Centre	1350 Guelph Line	WD 9:30-11:30, 13:30-16:00
Institutional	Day Care Centre	4426 Dundas St	WD 9:30-11:30, 13:30-16:00
Institutional	Technical School/Training Centre	860 Harrington Court	WD 9:30-11:30, 13:30-16:00
Note: WD – Weekday WE – Weekend (Friday Night to Sunday morning)			

Figure 2: Survey Site Locations Map



Appendix C – Site Specific Review Summary Table

Appendix C - Site Specific Review Summary

Address	Land Use	Supply	Demand	Utilization	Unit	Quantity	Demand Rate	Supply Rate	By-law Rate
1050 Highland Street	Apartment	18	13	72%	Units	27	0.48	0.67	1.00
1050 Highland Street	Apartment	18	17	94%	Units	27	0.63	0.67	1.00
1050 Highland Street	Apartment	18	14	78%	Units	27	0.52	0.67	1.00
1050 Highland Street	Apartment	18	14	78%	Units	27	0.52	0.67	1.00
1050 Highland Street	Apartment	18	14	78%	Units	27	0.52	0.67	1.00
1015 Sutton Drive	Industrial	96	79	82%	GFA	6272	1.26	1.53	1.00
1015 Sutton Drive	Industrial	96	85	89%	GFA	6272	1.36	1.53	1.00
1015 Sutton Drive	Industrial	96	86	90%	GFA	6272	1.37	1.53	1.00
1015 Sutton Drive	Industrial	96	85	89%	GFA	6272	1.36	1.53	1.00
1015 Sutton Drive	Industrial	96	81	84%	GFA	6272	1.29	1.53	1.00
1015 Sutton Drive	Industrial	96	80	83%	GFA	6272	1.28	1.53	1.00
1015 Sutton Drive	Industrial	96	79	82%	GFA	6272	1.26	1.53	1.00
1015 Sutton Drive	Industrial	96	81	84%	GFA	6272	1.29	1.53	1.00
1831 Walkers Line	Restaurant/Bank	90	39	43%	GFA	1714	2.28	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	27	30%	GFA	1714	1.58	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	38	42%	GFA	1714	2.22	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	36	40%	GFA	1714	2.10	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	36	40%	GFA	1714	2.10	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	50	56%	GFA	1714	2.92	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	40	44%	GFA	1714	2.33	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	36	40%	GFA	1714	2.10	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	55	61%	GFA	1714	3.21	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	25	28%	GFA	1714	1.46	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	35	39%	GFA	1714	2.04	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	50	56%	GFA	1714	2.92	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	32	36%	GFA	1714	1.87	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	34	38%	GFA	1714	1.98	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	57	63%	GFA	1714	3.33	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	66	73%	GFA	1714	3.85	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	85	94%	GFA	1714	4.96	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	71	79%	GFA	1714	4.14	5.25	5.25
1831 Walkers Line	Restaurant/Bank	90	76	84%	GFA	1714	4.43	5.25	5.25

Appendix C - Site Specific Review Summary

Address	Land Use	Supply	Demand	Utilization	Unit	Quantity	Demand Rate	Supply Rate	By-law Rate
1831 Walkers Line	Restaurant/Bank	90	71	79%	GFA	1714	4.14	5.25	5.25
1960 Appleby Line	Retail Centre	364	166	46%	GFA	8133	2.04	4.48	5.25
1960 Appleby Line	Retail Centre	364	162	45%	GFA	8133	1.99	4.48	5.25
1960 Appleby Line	Retail Centre	364	111	30%	GFA	8133	1.36	4.48	5.25
1960 Appleby Line	Retail Centre	364	129	35%	GFA	8133	1.59	4.48	5.25
1960 Appleby Line	Retail Centre	364	88	24%	GFA	8133	1.08	4.48	5.25
1960 Appleby Line	Retail Centre	364	254	70%	GFA	8133	3.12	4.48	5.25
1960 Appleby Line	Retail Centre	364	270	74%	GFA	8133	3.32	4.48	5.25
1960 Appleby Line	Retail Centre	364	256	70%	GFA	8133	3.15	4.48	5.25
1960 Appleby Line	Retail Centre	364	160	44%	GFA	8133	1.97	4.48	5.25
1960 Appleby Line	Retail Centre	364	172	47%	GFA	8133	2.11	4.48	5.25
1960 Appleby Line	Retail Centre	364	166	46%	GFA	8133	2.04	4.48	5.25
1960 Appleby Line	Retail Centre	364	146	40%	GFA	8133	1.80	4.48	5.25
3230 Mainway Drive	Industrial	131	56	43%	GFA	19500	0.29	0.67	1.00
3230 Mainway Drive	Industrial	131	59	45%	GFA	19500	0.30	0.67	1.00
3230 Mainway Drive	Industrial	131	62	47%	GFA	19500	0.32	0.67	1.00
3230 Mainway Drive	Industrial	131	80	61%	GFA	19500	0.41	0.67	1.00
3230 Mainway Drive	Industrial	131	79	60%	GFA	19500	0.41	0.67	1.00
3230 Mainway Drive	Industrial	131	79	60%	GFA	19500	0.41	0.67	1.00
3230 Mainway Drive	Industrial	131	82	63%	GFA	19500	0.42	0.67	1.00
3230 Mainway Drive	Industrial	131	70	53%	GFA	19500	0.36	0.67	1.00
3230 Mainway Drive	Industrial	131	75	57%	GFA	19500	0.38	0.67	1.00
3230 Mainway Drive	Industrial	131	77	59%	GFA	19500	0.39	0.67	1.00
3230 Mainway Drive	Industrial	131	78	60%	GFA	19500	0.40	0.67	1.00
3230 Mainway Drive	Industrial	131	67	51%	GFA	19500	0.34	0.67	1.00
3230 Mainway Drive	Industrial	131	58	44%	GFA	19500	0.30	0.67	1.00
3230 Mainway Drive	Industrial	131	64	49%	GFA	19500	0.33	0.67	1.00
3230 Mainway Drive	Industrial	131	58	44%	GFA	19500	0.30	0.67	1.00
3230 Mainway Drive	Industrial	131	73	56%	GFA	19500	0.37	0.67	1.00
3230 Mainway Drive	Industrial	131	75	57%	GFA	19500	0.38	0.67	1.00
3230 Mainway Drive	Industrial	131	77	59%	GFA	19500	0.39	0.67	1.00
3245 Fairview Street	Retail Centre	86	104	121%	GFA	1849	5.62	4.65	5.25

Appendix C - Site Specific Review Summary

Address	Land Use	Supply	Demand	Utilization	Unit	Quantity	Demand Rate	Supply Rate	By-law Rate
3245 Fairview Street	Retail Centre	86	92	107%	GFA	1849	4.98	4.65	5.25
3245 Fairview Street	Retail Centre	86	89	103%	GFA	1849	4.81	4.65	5.25
3245 Fairview Street	Retail Centre	86	63	73%	GFA	1849	3.41	4.65	5.25
3245 Fairview Street	Retail Centre	86	35	41%	GFA	1849	1.89	4.65	5.25
3245 Fairview Street	Retail Centre	86	99	115%	GFA	1849	5.35	4.65	5.25
3245 Fairview Street	Retail Centre	86	105	122%	GFA	1849	5.68	4.65	5.25
3245 Fairview Street	Retail Centre	86	56	65%	GFA	1849	3.03	4.65	5.25
3245 Fairview Street	Retail Centre	86	40	47%	GFA	1849	2.16	4.65	5.25
3245 Fairview Street	Retail Centre	86	51	59%	GFA	1849	2.76	4.65	5.25
3245 Fairview Street	Retail Centre	86	30	35%	GFA	1849	1.62	4.65	5.25
3245 Fairview Street	Retail Centre	86	95	110%	GFA	1849	5.14	4.65	5.25
4155 Fairview Street	Retail Centre	166	72	43%	GFA	4143	1.74	4.01	5.25
4155 Fairview Street	Retail Centre	166	72	43%	GFA	4143	1.74	4.01	5.25
4155 Fairview Street	Retail Centre	166	80	48%	GFA	4143	1.93	4.01	5.25
4155 Fairview Street	Retail Centre	166	74	45%	GFA	4143	1.79	4.01	5.25
4155 Fairview Street	Retail Centre	166	71	43%	GFA	4143	1.71	4.01	5.25
4155 Fairview Street	Retail Centre	166	61	37%	GFA	4143	1.47	4.01	5.25
4155 Fairview Street	Retail Centre	166	56	34%	GFA	4143	1.35	4.01	5.25
4155 Fairview Street	Retail Centre	166	134	81%	GFA	4143	3.23	4.01	5.25
4155 Fairview Street	Retail Centre	166	61	37%	GFA	4143	1.47	4.01	5.25
4155 Fairview Street	Retail Centre	166	70	42%	GFA	4143	1.69	4.01	5.25
4155 Fairview Street	Retail Centre	166	80	48%	GFA	4143	1.93	4.01	5.25

Appendix D – List of Stakeholders

Appendix D - Stakeholders

Steering Committee	
Name	Organization
Rosalind Minaji	City of Burlington – Planning
Kaylan Edgecumbe	City of Burlington - Transportation
Silvina Kade	City of Burlington – Planning
Tina Vassalli	City of Burlington – Planning
Stakeholder Committee	
Name	Organization
Denise Beard	City of Burlington - Parks & Recreation
Ang Capone	City of Burlington - Capital Works
Josh Mederos	City of Burlington - Engineering
Ian Cameron	Burlington Economic Development Corporation
Mark Steffler	Burlington Economic Development Corporation
Fleur Storaice Hogan	Sustainability Project Coordinator
Rita Hardy	Downtown Parking Advisory Committee
Todd Evershed	City of Burlington - Planning
Jenna Puletto	City of Burlington – Mobility Hubs
Samantha Romlewski	City of Burlington – Mobility Hubs
Rosa Bustamante	Special Business Area Coordinator
Al Kirkpatrick	Integrated Transportation.
Joe Wintar	Fire
Suzanne Mammel	Housing

Appendix E – List of Land Use Categories

Appendix E – Land Use Categories

DEFINED PARKING STANDARD LAND USES	EXISTING USE	SURVEYED USE*	LAND USE CATEGORY FOR NEW PARKING STANDARDS
Detached Dwelling, Semi-Detached Dwelling, Duplex Dwelling, Triplex Dwelling	✓	x	✓
Street Townhouse Dwelling, Street Triplex Dwelling, Street Fourplex Dwelling	✓	✓	✓
Townhouse Dwelling, fourplex Dwelling, Cluster Homes	✓	✓	✓
Stacked Townhouse Dwellings	✓	✓	✓
Back-to-Back Townhouse Dwellings	Grouped with Stacked Townhouse	✓	✓
Apartment Building	✓	✓	✓
Dwelling Units on the 2nd or 3rd floor of a 2 or 3 storey commercial building	✓	x	✓
Accessory Dwelling Unit	✓	x	✓
Adult Entertainment Establishment	✓	x	✓
Allotment Garden	✓	x	x
Bank, Trust Company, Credit Union	✓	✓	✓
Bed & Breakfast Home Boarding House	✓	x	✓
Recreational Establishment	✓	✓	✓
Fitness Centre	x	x	✓
Cemetery	✓	x	✓
Community Institution	✓	x	✓
Convent and Monastery	✓	x	✓
Convention Centre, Conference Centre, Banquet Hall	✓	x	✓
Correctional Facility	✓	x	✓
Correctional Group Home	✓	x	✓
Day Care Centre	✓	✓	✓
Emergency Shelter	✓	x	✓
Entertainment Establishment	✓	✓	✓
Funeral Home, Mortuary, Crematorium	✓	x	✓
Group Home	✓	x	✓
Home-Based Business	✓	x	✓
Home Day Care	✓	x	✓
Hospital, Health Care Facility	✓	x	✓
Hotel	✓	✓	✓
Industrial Uses	✓	x	✓
Warehouse and Logistics	x	✓	✓
Storage Locker	x	✓	✓

Appendix E – Land Use Categories

DEFINED PARKING STANDARD LAND USES	EXISTING USE	SURVEYED USE*	LAND USE CATEGORY FOR NEW PARKING STANDARDS
Kennel	✓	x	✓
Library, Museum, Post Office	✓	x	✓
Lodge, Fraternity, Private Club	✓	x	✓
Long-Term Care Facility	✓	✓	✓
Movie Theatre	✓	✓	Group with Entertainment Establishment
Night Club, Dance Hall	✓	✓	✓
Office: Medical	✓	✓	✓
Office: Other	✓	✓	✓
Multi-use Business Park	x	✓	✓
Place of Assembly	✓	x	✓
Place of Worship (Fixed Seating)	x	✓	✓
Place of Worship (Based on Worship Area)	x	✓	✓
Retail Store	✓	✓	✓
Retail Centre	✓	✓	✓
Residential Social Service	✓	x	✓
Restaurant Fast Food	✓	✓	✓
Standard Restaurant	✓	✓	✓
Restaurant with Patio	✓	✓	✓
Retirement Home	✓	✓	✓
Seniors Apartment	x	✓	✓
Elementary School	✓	✓	✓
Secondary	✓	✓	✓
Post-Secondary	✓	x	✓
Business, Commercial, Trade Schools	✓	x	✓
Service Commercial Uses	✓	x	✓
Supermarket	✓	✓	✓
*Surveyed Use indicates the land uses that were surveyed for the purpose of the parking study			