Appendix B

Phase 2 Reports

Phase 2 Reports

First: Financial Analysis Memorandum

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Memorandum

To/Attention	City of Brampton	**Date**	October 14, 2022
From	IBI Group	**Project No**	134185 Brampton Parking Plan
Subject	**Financial Analysis – Draft #2.2**		

Financial Analysis

1 Current Parking Revenues and Expenses

The financial performance of Brampton's current parking system is examined in this section. This is based on a discussion between IBI Group and the City of Brampton, with the methodology, assumptions, and documents provided and confirmed by the City of Brampton.

At the end of 2021, Brampton's uncommitted parking revenue reached a deficit of ($12,435,399). Based on the current revenue and expenditure trends, the municipal parking revenue is expected to continue decreasing until 2027, at which net surpluses beginning in the year 2028 should result in a positive revenue balance by the year 2035 without intervention. IBI Group has developed a detailed financial model to forecast the projected reserve fund balance to 2040 and to investigate the potential effect of changes to the pricing structure of hourly and permit parking downtown. These proposed changes are intended to ensure the long-term financial stability of Brampton's parking program.

Exhibit 1-1 outlines the projected 2021 annual operational and capital summary based on the existing conditions. Note that the historical data presented in this section was provided by the City of Brampton.

Exhibit 1-1: 2021 Expenditures and Revenues

Category		Amount	%
Expenses			
Parking Garage Maintenance - Facilities, Operations & Maintenance	$	235,350	3%
Parking Operations - Road, Maintenace, Operations & Fleet - Labour	$	548,029	6%
Parking Operations - Road, Maintenace, Operations & Fleet - Other	$	68,417	1%
Parking Enforecement - Court Administration	$	389,000	4%
Parking Enforcement - By-law Services	$	6,671,526	75%
Approved Capital Expenditures	$	1,000,000	11%
Total Expenses	**$**	**8,912,322**	100%
Revenues			
Parking Lots	$	215,000	3%
Parking Monthly Permits	$	288,000	4%
Parking Meters (Hourly)	$	180,000	3%
Rentals- Auditorium/Theatre	$	-	0%
Parking Enforcement - Fines	$	5,992,609	90%
Total Revenues	**$**	**6,675,609**	100%
Net	$	(2,236,713)	

Based on **Exhibit 1-1**, the following is observed:

- The parking system is projected to generate $6,675,609 in revenue and incur $8,912,322 in expenditures in 2021. Overall, the parking system operations are not projected to be financially sustainable until at least 2035 without intervention in the form of pricing increases.

- Only 74.8% of expenditures are forecasted to be recovered through revenues. Parking operations are desired to be 100% funded through parking user fees.

- By-law Services related to parking enforcement accounts for 75% of existing expenditures and fines received through parking enforcement operations represent 90% of revenues.

1.2 Parking Price Scenarios

Brampton currently charges $2.00 for an hour of metered parking and $44.00 for a monthly parking pass for municipal lots. To better understand the impact that pricing increases will have on projected future revenues and on the long term financial performance of Brampton's parking operations, five parking price scenarios were chosen for evaluation:

- Scenario 1: Status Quo no change to hourly or monthly parking rates;
- Scenario 2: Hourly Price $2.50, Monthly Permit $100.00;
- Scenario 2: Hourly Price $3.00, Monthly Permit $120.00;
- Scenario 3: Hourly Price $3.50, Monthly Permit $140.00; and
- Scenario 5: Hourly Price $4.00, Monthly Permit $160.00.

IBI Group's parking financial model input and assumptions have been developed based on research of comparator municipalities and in collaboration with City of Brampton staff. **Exhibit 1-2** provides an overview on the five parking price Scenarios.

Exhibit 1-2: Parking Price Scenarios Implementation Scheme

Parking Pricing Optimization							
Scenarios		2022	2023	2024	2025	2026	2027
Scenario 1	Hourly	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00
	Permit	$ 44.00	$ 44.00	$ 44.00	$ 44.00	$ 44.00	$ 44.00
Scenario 2	Hourly	$ 2.00	$ 2.50	$ 2.50			
	Permit	$ 60.00	$ 80.00	$ 100.00			
Scenario 3	Hourly	$ 2.00	$ 2.50	$ 3.00	$ 3.00		
	Permit	$ 60.00	$ 80.00	$ 100.00	$ 120.00		
Scenario 4	Hourly	$ 2.00	$ 2.50	$ 3.00	$ 3.50	$ 3.50	
	Permit	$ 60.00	$ 80.00	$ 100.00	$ 120.00	$ 140.00	
Scenario 5	Hourly	$ 2.00	$ 2.50	$ 3.00	$ 3.50	$ 4.00	$ 4.00
	Permit	$ 60.00	$ 80.00	$ 100.00	$ 120.00	$ 140.00	$ 160.00

In an effort to gradually increase parking prices, each of IBI Group's five Scenarios propose yearly, incremental price increases to better align the cost of parking with the cost of transit in Brampton. As transit in Brampton is considerably more expensive than parking and as increases to parking fees are historically unpopular, an incremental approach to pricing increases was used so as to not burden customers with increases greater than 50% of the current parking rates.

- The parking price increases in each of our Scenarios begin in 2023 with a $0.50 increase to the existing hourly parking rate of $2.00 and a $16.00 increase to the cost of a monthly parking permit
- The following year the hourly rate increases proportionally by $0.50 and the monthly rate increases by $20.00.
- As a result, Scenario 2 would reach its final rates in 2024, Scenario 3 in 2025, Scenario 4 in 2026, and the price increases in Scenario 5 would be complete in 2027.

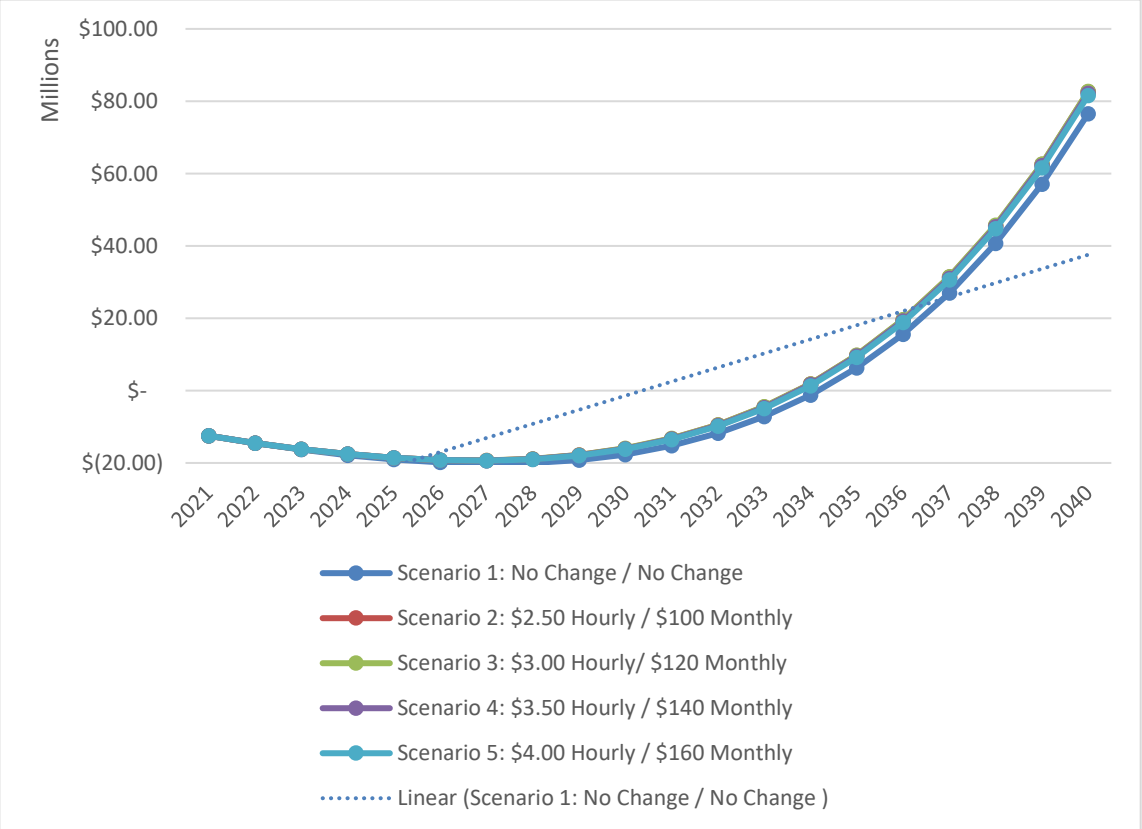
The findings of IBI Group's financial model are presented below in **Exhibit 1-3**, where the projected reserve fund balance of all five Scenarios is illustrated on an annual basis. It is important to note that our projection of the reserve balances do not assume any withdrawals during the 2021 to 2040 period and thus represent the highest possible balance for each scenario. These projections are intended for illustrative purposes only and may not reflect the reserve balances in a 'real world' Scenario where reserve balances may be regularly drawn down to finance infrastructure upgrades and other capital projects.

- Each of the Scenarios, including the "no change" Scenario 1 are projected to achieve positive reserve balances ranging from $.6.2 million to $9.8 million by 2035. However, Scenarios, 2, 3, 4, and 5 are observed achieving positive reserve balances in 2034, one year ahead of Scenario 1.

It is to be noted that the Downtown daily maximum rate, which presently stands at $9.00, should also be increased proportionally to the hourly price increase rate.

Scenario		2040 City Parking Revenue Estimate
Scenario 1: No Change / No Change	$	76,554,824.19
Scenario 2: $2.50 Hourly / $100 Monthly	$	82,653,905.35
Scenario 3: $3.00 Hourly/ $120 Monthly	$	82,781,291.83
Scenario 4: $3.50 Hourly / $140 Monthly	$	82,233,111.54
Scenario 5: $4.00 Hourly / $160 Monthly	$	81,594,896.84

Exhibit 1-3: Reserve Fund Balance Projection to 2040



1.3 Alternative Parking Price Scenarios Key Findings

The parking price projection Scenarios demonstrate that:

- If the City takes no action, the balance of the municipal parking revenue is anticipated to reach negative $20,214,397 by the year 2027.
- If this route is pursued, the City would have to fund the estimated deficits from its other revenue sources such as property taxes.

- Barring an unexpected increase in operational and capital expenditures, with no intervention, the parking revenue is projected to return to a positive balance by the year 2035 due largely in part to the expected population growth in Brampton Centre to the 2040 planning horizon.

- To achieve financial stability in the long term, the City of Brampton should adopt the pricing increases included in either Scenario 2 or Scenario 3, as both achieve similar results as a future strategy to manage parking demand and achieve financial stability for the parking system.

- The parking price increases included in Scenarios 2 and 3 would closer align the cost of parking downtown with the cost of using transit. The cost of which as of 2019 was $3.10 per trip and $128.00 for an adult monthly pass.

1.4 Payment-in-Lieu of Parking Program Evaluation

Using the historical data provided by the City, IBI Group compared the Payment-in-Lieu (PIL) revenue generated to date against the costs of constructing a new parking facility to determine if the City could reasonably collect the amount required to construct additional parking infrastructure by the 2040 planning horizon.

Based on the reserve funding currently available to the parking program for parking infrastructure downtown, which as of 2020 totalled $43,225, the City reserves will not reach an amount that is sufficient to fund any parking infrastructure by the 2040 planning horizon. By 2040 the reserve fund is projected to total $62,553. As illustrated by **Exhibit 1-** this amount would fund the construction, but not the land costs of 15 surface parking spaces, 3 spaces in a freestanding above-ground structure, or 2 spaces in a below-ground parking structure.

However, the regular reserve fund, by 2040, should have sufficient funds, to support the construction of an additional municipal parking garage. Exhibit 1-5 illustrates the cost of land and construction of both an above ground structure and underground parking structure with 1,500 parking spaces in 2022 dollars. The construction costs were sourced from Altus Group’s 2022 Construction Cost Guide and the cost of land based on comparable land sales in the Brampton market.

Exhibit 1-4: Projection of Cash-in-Lieu Reserve Fund #26

Year	Estimated Balance	# Surface Spaces*	# Freestanding Garage Spaces*	# Underground Spaces*
2021	$ 43,244.67	10	2	1
2022	$ 44,093.09	10	2	1
2023	$ 44,958.15	11	2	1
2024	$ 45,840.18	11	2	1
2025	$ 46,739.52	11	2	1
2026	$ 47,656.50	11	2	1
2027	$ 48,591.47	11	2	1
2028	$ 49,544.79	12	2	1
2029	$ 50,516.81	12	2	1
2030	$ 51,507.90	12	2	1
2031	$ 52,518.43	12	2	1
2032	$ 53,548.79	13	2	1
2033	$ 54,599.36	13	2	1
2034	$ 55,670.54	13	2	1
2035	$ 56,762.74	13	2	1
2036	$ 57,876.37	14	2	1
2037	$ 59,011.85	14	3	1
2038	$ 60,169.60	14	3	1
2039	$ 61,350.06	15	3	1
2040	**$ 62,553.69**	**15**	**3**	**2**

**Highest 2022 cost of construction is assumed. Does not include the cost of land.*

Exhibit: 1-5: Cost of Above Ground and Underground Parking (Construction & Land)

Freestanding Parking Garage (above grade) ($2022)	**Low**	**High**
Price Per Square Foot	$ 110.00	$ 150.00
Construction Cost per parking space	$ 17,230.95	$ 23,496.75
Land Cost (10,000 sf) based on $150/sf	$	1,500,000.00
Parking Spaces to be Constructed	1500	1500
Cost of above grade	**$25,846,425.00**	**$ 35,245,125.00**
Underground Parking Garages (below grade) ($2022)	**Low**	**High**
Price Per Square Foot	$ 195.00	$ 265.00
Construction Cost per parking space	**$ 30,545.78**	**$ 41,510.93**
Land Cost (10,000 sf) based on $150/sf	$	1,500,000.00
Parking Spaces to be Constructed	1500	1500
Cost of Surface below grade	**$45,818,662.50**	**$ 62,266,387.50**

Based on the industry best practices of comparator municipalities, including Hamilton Ontario, IBI Group has devised an example PIL program for Downtown Brampton shown below in **Exhibit 1-6.** This example is intended for illustrative purposes only and uses the anticipated growth in Brampton Centre between 2021 and 2040 to determine an average charge per unit as part of a PIL program.

Of an expected 14,780 addition households in Brampton Centre between 2021 and 2041, between 5 and 10 per cent could opt for PIL of parking. It should be noted that as of right now, 10 or even 5 per cent participation in a PIL of parking program is unlikely in the Brampton context of inexpensive and accessible downtown parking.

Exhibit 1-6

Parking Structure Type	Estimated Growth Households in Brampton Centre* (2021-2040)	% Opting for Payment-in-Lieu	Units Contributing to Payment-in-Lieu	Average Cost Per Parking Space (land costs and construction)*	Estimated Charge Per Unit**	Total Collected***
Surface Lot	14,760	5%	740	$ 13,000	$ 7,100	$ 5,250,000
	14,760	10%	1,480			$ 10,510,000
Freestanding Garage	14,760	5%	740	$ 30,400	$ 16,750	$ 22,500,000
	14,760	10%	1,480			$ 24,790,000
Underground Parking	14,760	5%	740	46,000	$ 25,750	$ 19,060,000
	14,760	10%	1,480			$ 38,110,000

*Rounded. Reflects an average of the low and high construction cost range.
**Based on an average of construction and land costs of a 10,000 sf site. Assumes the highest cost of construction. 50% of total construction and land costs.
***Includes both the construction and land costs of an offsite parking lot.

Our example PIL calculation produces a charge per unit of $7,100 towards the construction of a surface lot, $16,750 per unit towards a free standing garage, and $25,750 per unit towards the cost of underground parking infrastructure with a projected total revenue of between $5.25 and $36.11 million dollars towards the PIL program.

1.5 Conclusions and Recommendations

IBI Group developed a financial model that projects Brampton's financial operations to the year 2040 and a parking price plan was identified through five pricing Scenarios to help Brampton's parking operations achieve long term financial stability. Based on our financial assessment of Brampton's parking program we can provide the following conclusions and recommendations.

- Based on the historical data provided by the City and projected by IBI Group, the parking system is expected to generate $7,394,992 of revenue in 2022 and incur $9,443,952 in expenditures in 2022.
- The uncommitted municipal parking revenue is expected to reach a deficit of $14,484,358 in 2022.
- Without intervention, the municipal parking revenue balance is expected to continue decreasing until 2027. If the City takes no action, parking revenue is anticipated to reach a balance of negative $20,214,397 by the year 2027.
- By 2040, all Scenarios, including the "No Change" Scenario are expected to achieve positive parking revenues. However, Scenarios 2 and 3 are projected to achieve the highest revenues at the 2040 horizon year of $82.6 and $82.7 million, respectively.
- The parking prices included in Scenarios 2 and 3 are expected to achieve a positive municipal parking revenue in the year 2034.
- To achieve financial stability of the parking program as soon as possible, IBI Group recommends that Brampton implement price increases to its hourly and monthly parking rates that are aligned with the cost of using Transit.
- The City's Cash-in-Lieu of Downtown Parking reserve fund #26 will not reach an amount that is sufficient to fund any parking infrastructure by the 2040 planning horizon. Based on the current balance, by 2040 the reserve fund is projected to total $62,553.
- Based on our projections, the City's parking program revenue is expected to achieve a positive balance by the year 2040. This positive reserve balance could be capable of supporting the construction, including the land costs, of an above ground or a below ground parking structure in in Downtown Brampton.

- In order to achieve financial stability, it is our recommendation that Brampton implement pricing increases for its municipally operated parking operations that will align the cost of parking with the cost of using public transit and allow the City to accrue surplus operation revenue that can be used to fund the construction of new parking infrastructure. Either of IBI Group's Scenarios 2 or 3, will help the City achieve these goals by 2040.

Phase 2 Reports

Second: Parking Management Plan

Draft Report #2.2

Brampton Parking Plan – Parking Management Plan

Prepared for City of Brampton
by IBI Group
October 14, 2022

Document Control Page

CLIENT:	City of Brampton
PROJECT NAME:	Brampton Parking Plan
REPORT TITLE:	Brampton Parking Plan – Parking Management Plan
IBI REFERENCE:	134185
VERSION:	Draft Report
DIGITAL MASTER:	
ORIGINATOR:	Amjad Dehman, Qing Su
REVIEWER:	Peter Richards
AUTHORIZATION:	Peter Richards
CIRCULATION LIST:	City of Brampton
HISTORY:	1.0 Draft Report #1 (June 2022) 2.0 Draft Report #2 (August 2022) 3.0 Draft Report #2.1 (September 2022) 4.0 Draft Report #2.2 (October 2022)

Table of Contents

1 Introduction

This report intends to consolidate the findings and materials related to Task 8: Parking Management Plan of the Brampton Parking Plan study. Task 8 is one of three main tasks that constitute Phase 2 of Brampton Parking Plan. These tasks are:

- Task 7: Financial Analysis.
- Task 8: Parking Management Plan.
- Task 9: Municipal Parking Strategy Report.

This report will be an integral part of the final study report, as it assists in documenting the study findings as the Brampton Parking Plan progresses and moves from one task to another.

The Parking Management Plan intends to:

- Lay out several strategies and procedures to optimize parking operations in Brampton.
- Better use existing parking facilities and manage parking demand.
- Reduce the need for more parking, while leveraging parking partnership strategies.
- Work towards achieving a financially sustainable parking system.
- Consider all the competing uses at the curbside.
- Improve the services for parking customers and enhance parking enforcement.

The Parking Management Plan builds upon all findings and recommendations that resulted from the previous tasks of the study (Tasks 1 through 7). This report is divided into the following sections:

Introduction: summarizes the purpose of this report, clarifies its relationship to the other tasks and phases of Brampton Parking Plan, and outlines the structure of the report and its sections.

Downtown Parking Management: outlines specific parking management schemes and strategies tailored for Downtown Brampton and comments on the recommendations made in a previous study prepared in 2009 by BA Group and entitled “Downtown Parking Strategy.”

Parking Enforcement: describes the existing parking enforcement practices and challenges in Brampton and provides a list of recommendations aiming to enhance the enforcement efficiency through improved technologies, policies, and resources.

Paid On-street Parking Permit Program: provides guidelines to implement the on-street paid parking permit program, including the implementation phases and some key considerations that are required to be resolved in the residential parking permit program’s development and implementation.

Curbside Decision Making Framework: develops a decision-making framework to prioritize the competing uses at the curbside (e.g., auto, transit, active transportation, commercial vehicles, pick-up & drop-off, etc.) and ensures efficient use of the public space.

Parking Partnerships: discusses several types and forms of parking partnerships, including adding public parking in new developments through incentives, partnering with private owners through operation contracts, entering into finance contracts and be either the lessee or the lessor, and building new parking facilities through the P3 projects.

Transportation Demand Management: introduces various Transportation Demand Management (TDM) strategies and initiatives and explains their relationship with parking.

Summary and Next Steps: summarizes the outcome of this report and the next steps of Brampton Parking Plan project.

2 Downtown Parking Management

Parking is an important component of public policy in any city, but is especially important for downtown districts where different social, employment, commercial and touristic objectives need to be considered and maintained. This section intends to outline specific parking management schemes tailored for Downtown Brampton. The section starts by discussing several parking plans and strategies, and then comments on the recommendations made in a previous study prepared in 2009 and entitled "Downtown Parking Strategy."

2.1 Downtown Parking Management Schemes

2.1.1 Future Parking Supply Needs

As informed from Phase 1 of the present study, the Downtown Brampton parking system is anticipated to be 63% occupied by 2040, with the on-street and off-street systems occupied by 45% and 65%, respectively. In addition, lower parking utilization ratios were forecasted if the long-term impacts of COVID-19 (e.g., increased teleworking arrangements in the future) are considered as a potential scenario. Based on this analysis, it appears that major parking supply concerns are less likely in Downtown Brampton and there does not appear to be a pressing need to build new parking facilities in the near future. However, both the parking supply and demand profiles can be unexpectedly changed in the future (e.g., closure of some garages, streetscaping that reduce the on-street parking, future developments). Therefore, monitoring and reassessing the parking demand and supply in the downtown area frequently and consistently is needed (e.g., every 2-3 years).

2.1.2 Parking Partnership

If the downtown parking facilities remain underutilized, the City is recommended to explore opportunities to lease a part of these facilities to other public and private developers as a way to generate revenue that can be used for other parking initiatives or to build new facilities in the future. Based on the assessment of future conditions (2040 – base condition), presented in Section 5.1.4 in Phase 1 report, an additional 850 vehicles are expected to be accommodated in Downtown Brampton's off-street facilities before utilization reaches 85% and assuming the Nelson Square Garage is not closed (i.e., around 350 vehicles in public off-street parking and 500 vehicles in private off-street parking). Leasing a proportion of the 350 spaces may be considered. On the other hand, owners of the private off-street parking facilities may also seek opportunities to lease a proportion of the available spaces. Establishing parking partnership agreements should always consider the up-to-date parking utilization in the area and the recent or forthcoming changes in the parking demand or supply.

A Downtown Parking Implementation Strategy is being undertaken, supplementary to the Brampton Parking Plan. This supplementary study intends to: 1) investigate strategies that can optimize off-street parking utilization in the Downtown area through shared-use/reservation parking agreements, 2) address recent requests in the order of 1,800 parking spaces from Rogers Communications and post-secondary institutions, and 3) identify potential parking supply opportunities in the Downtown area focusing on structured/below ground parking.

2.1.3 Transient versus Long-term Parking

The parking demand and supply analysis in Phase 1 revealed that there are several on-street facilities that are expected to operate above the 85-90% utilization threshold. In addition, on-street parking supply may be further impacted by future streetscaping, sidewalk widening, and bike lane projects. For example, 100 on-street parking spaces will no longer be available on Main St, from Wellington St to Nelson St W, and Queen St, from Mill St S. to Theatre Lane as a result of streetscaping works. These parking spaces are at the heart of the downtown area. Maintaining

adequate provision of convenient transient parking in the downtown area is essential for local businesses and visitors. Nearby off-street parking facilities can assist in accommodating short-term parking purposes once needed. However, the following arrangements need to be considered:

- Maintain the application of time limits (maximum time permitted) on the on-street parking facilities to encourage higher turnover rates for downtown visitors and business customers. This applies to the on-street parking facilities that will not be removed due to the streetscaping work.
- Reserve some parking spaces for short-term parking purposes on the nearby surface parking lots and also on the ground and first-level floors of parking garages.
- Direct long-term parking and monthly permit holders to the upper floors of the above-ground garages and to the lower floors of the underground garages.
- Provide clear wayfinding and signage to direct short-term parking users to nearby parking facilities especially on the blocks that do not have sufficient on-street parking.

2.1.4 Parking Price Rate

The best practice review in Phase 1 revealed that parking price rates in Downtown Brampton are significantly lower as compared to the comparator municipalities. The average hourly price for downtown on-street parking in the comparator municipalities is $2.98 as compared to $2.00 in Brampton (around 50% higher). Similarly, the average off-street monthly permit price in the comparator municipalities is $152.84 as compared to $44 in Brampton (more than three times higher). Increasing the parking price rates in Downtown Brampton is recommended for the following reasons:

- The municipal parking system is currently operating at a deficit and increasing the revenue is needed to reduce the deficit and achieve a financially sustainable system.
- The added revenue can be used to support other parking initiatives, maintenance activities, improving services, and expanding the parking system.
- A parking price increase would encourage the use of alternative modes of transport and reduce the reliance on private auto.

In addition to increasing the price of parking, the one-hour free complimentary parking offered at the municipal parking garages should be stopped. A large proportion of transient parking users are taking full advantage of the one-hour free parking and this results in a significant financial loss that increases the parking system's deficit. Removing the one-hour free parking would also promote other modes of transport as this can make the total cost of many private-auto trips higher as compared to trips made by transit or other modes. However, transient parking price rate inside the municipal garages is recommended to remain below nearby on-street parking rates. This intends to manage the demand for the on-street parking which is more convenient and is usually given higher price rates relative to the off-street parking. In addition, as suggested by the "2009 Downtown Parking Strategy," a parking token discount program can be considered to allow downtown businesses to offer discounted parking to their customers.

Increasing the parking price rates should be done gradually. In addition, increasing the price should focus more on the monthly and annual permits because: (1) local businesses depend on the short-term and transient parking and can be impacted if the hourly price rate was increased sharply or aggressively, (2) the difference between Downtown Brampton's parking price rates and other municipalities was shown to be especially wide for the monthly parking permits, and (3) the price of long-term parking permits and how it compares to the cost of transit pass have a great influence on the transportation mode choice.

2.1.5 Cash-in-Lieu of Parking

Existing data and the Task 7 "Financial Analysis" revealed that the cash-in lieu (CIL) of parking is not generating sufficient funds to support the construction of a new municipal parking facility. The recently granted parking exemptions in the downtown area (e.g., By-laws 259-2020 and 45-2021) also mean that the CIL of parking has become redundant in the downtown area since no more contributions will be made. Therefore, the CIL of parking is no longer feasible or applicable in the downtown area and other resources to fund parking initiatives and expansion projects are needed as discussed in the next section.

2.1.6 Parking System Funding

In areas where parking requirements are reduced or rescinded, funding the parking system expenses becomes important and challenging. This is because rescinding the parking requirements can result in transferring a proportion of the area's parking demand to off-site public parking facilities which may require additional operation expenses and future expansion projects. In addition, as described earlier, the contribution of the CIL of parking is no more practical. Considering parking for the Community Benefit Charges (CBCs) regime in Brampton can be a feasible alternative option to generate revenue. The municipal parking facilities intend to serve the public including the new developments. Therefore, the cost of operating and building these parking facilities can be considered in the CBC contributions. Additional sources of fund may include increasing parking price for the monthly permits and transient parking and leasing a proportion of the underutilized off-street municipal parking facilities.

2.1.7 Downtown-Tailored TDM Measures

Downtown areas have a special composition of parking users, i.e., they are mainly composed of employees (long-term stay), and visitors (short-term stay). Special TDM measures that are tailored for Downtown Brampton may include the following:

- Consider parking price rate, for both transient parking and long-term permits, as a way to manage parking demand.
- Set the monthly parking permit price rate such that it exceeds the cost of the monthly transit pass.
- Encourage employers to provide their employees with transit pass cost sharing as a measure to reduce their parking demand. This may also be in the form of a general subsidy for any transit-related expenses, i.e., including out-of-City transit trips that are made by GO Transit and other transit providers, to account for different origins of the transit trips. Such a subsidy may replace the employee parking subsidy if presently used.
- Support parking for alternative modes of transport (e.g., parking for bicycle, e-bike, bikeshare, carshare, and micromobility).
- Require new developments to achieve a minimum score based on a TDM checklist. The development's permit may not be granted if a minimum score is not achieved and some incentives may be given to developers achieving high TDM scores (see Section 7.1.6 for more details).
- Consider revisiting the City's employee parking subsidy program and using different policies such as: providing some on-site vehicles that can be available and ready for staff use for work purposes or reimbursing the employees for their parking fees if they demonstrated that the auto-trip was made for specific work purposes.

It is worth noting that the above TDM measures may also be applied in other Intensification Areas identified in Phase One Report of Brampton Parking Plan. In such areas, the plan is to minimize parking supply, enhance transit services, and reach high density targets. These are appropriate conditions for the TDM measures to be effective and create significant changes in modal share.

2.2 Review of 2009 Downtown Parking Strategy

The recommendations of the 2009 Downtown Parking Strategy, a previous study prepared by BA Group for the City of Brampton, were reviewed. Some of these recommendations align with the present study's findings but some do not (which is expected, as it was produced 13 years ago). Exhibit 2.1 below summarizes this review, lists the key recommendations of the 2009 Downtown Parking Strategy, and provides a brief discussion for each.

Exhibit 2.1: Reviewing the "2009 Downtown Parking Strategy" Recommendations

2009 Downtown Parking Strategy's Recommendations	Agreement with the present study?	Rationale
Improve the availability of short-term customer parking	Yes	• Short-term parking is essential for local businesses and visitors. • Several on-street segments operate at or above capacity. • Future streetscaping and bike-lane projects may reduce the existing on-street parking.
Increase the price rate for the annual and monthly parking permits, eliminate the one-hour free parking program, and consider a token discount program for local businesses.	Yes	• Increasing the revenue of the parking system is needed to reduce the current deficit. • Brampton parking price rate is less than other comparator municipalities. • The CIL of parking is no longer applicable and alternative sources of fund are needed • Most transient parking users are taking the advantage of the one-hour free parking and this results in a significant financial loss that contributes to the system's deficit. • Promoting other modes of transport requires removing the one-hour free parking.
The City should plan to add 200 public parking stalls in the core area.	Not valid anymore.	Since 2009, additional parking garages were added to the parking system, e.g., John Street and West Tower garages. The 2019 parking demand and supply analysis indicated that the off-street municipal and private parking facilities experience around 60% utilization. This is forecasted to increase to 65% by 2040.
The City should consider acquiring property or working with existing owners to lease property in order to provide municipally operated shared public parking resources.	Generally yes (in the medium and long term)	Although the parking demand-supply analysis in the downtown area revealed moderate utilization ratio, exploring partnership agreements with private developer can still be useful in the medium and long runs to expand the parking system and accommodate future developments and employment growth.

2009 Downtown Parking Strategy's Recommendations	Agreement with the present study?	Rationale
Development sites outside the exempt zone should be allowed to apply for CIL of parking, only in cases where the City has vacant public parking or plans to provide parking within walking distance.	No	The CIL of parking does not appear to be applicable in Brampton as the City moves towards reducing or rescinding the parking requirements in the strategic and intensification areas. In addition, there appears to be no existing municipal parking facilities outside the downtown area. Therefore, the CIL of parking does not seem to be a mature program for areas outside the downtown because a large start-up cost is needed to build new parking facilities at the time the City's parking system is running at a deficit.
The City should implement a formal transportation demand management program focused on the downtown area.	Yes	The guiding principles of the present study focused on reducing the use of private auto and promoting other modes of transport. A TDM-program focusing on intensification areas, such as the downtown, is needed to support reducing or rescinding the parking requirements in these areas. This should reduce the need to build costly parking facilities in the future.

2.3 Summary Remarks and Recommendations

The following are the summary remarks and recommendations for parking operations and management in Downtown Brampton:

- Based on the 2040 parking demand & supply forecast, there does not appear to be a pressing need to build new parking facilities in the near future in Downtown Brampton. The forecasted parking utilization ratios suggest that parking partnerships can be considered, and the City may lease a limited proportion of its municipal parking system. Reassessing the parking demand and supply changes in the downtown frequently and consistently is however needed.
- To support transient parking in the downtown area, parking garages should continue to serve short-stay parking and parking spaces should be reserved for this purpose.
- Significant changes in parking price rates and policies are needed in Brampton Downton, these include the following:
    - ✓ Removing the one-hour free complimentary parking offered at the municipal parking garages.
    - ✓ Increasing the hourly price rate for on-street parking.
    - ✓ Increasing the price of the monthly and annual parking permits in the downtown area.
- Parking price rate increase should be implemented gradually, but a higher (sharper) increase rate may be given to the parking permits as compared to the on-street transient parking.

- The CIL of parking is no longer feasible or applicable in Downtown Brampton. Other sources of fund should be established and these may include the Community Benefits Charges, increased parking price rates, parking partnerships, and leasing the underutilized parking facilities.
- In order to promote TDM measures that are tailored to Downtown Brampton, a set of TDM requirements needs to be established and new developments should be required and incentivized to be TDM-supportive.

3 Parking Enforcement

3.1 Existing Conditions

In Brampton, parking enforcement is administered by the Enforcement and By-law Services Division of the City. The division is responsible to enforce various City's By-laws and standards including parking. To carry out parking enforcement activities, the City relies on full-time enforcement officers, who meet the broader enforcement requirements and may perform different types of enforcement, in addition to part-time officers who are dedicated to parking and sign enforcement. The City also employs court clerks who assist in the litigation process and resolving parking ticket disputes. The Administrative Monetary Penalty System (AMPS) is being used to administer parking violations.

In terms of enforcement technological aspects, the City has started recently using the License Plate Recognition (LPR) technology to assist in enforcing the "parking considerations" citywide. In January 2020, the City introduced the Automatic License Plate Reader (ALPR) technology, which allows an ALPR camera to be mounted on enforcement vehicles or street poles and automatically capture license plates. Exhibit 3.1 provides photos of this technology. The enforcement vehicle alerts officers automatically and identifies the illegally parked vehicles. Only one ALPR vehicle is being used as a pilot program and the City is planning to assess the feasibility of adding additional equipped vehicles in the future.

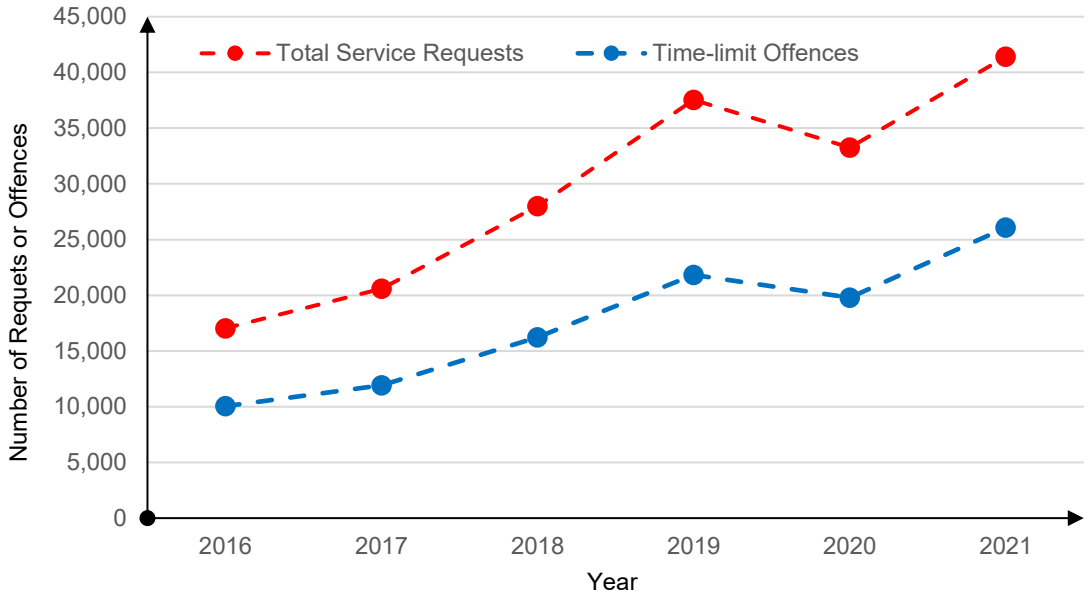
As for parking payment technologies in the downtown, most parking meters were switched to pay and display machines (solar powered, accept coins and credit card) and only few streets still use traditional coin-based parking meters (e.g., George Street North from Queen St. to Nelson St., and Nelson Street from Elizabeth St. to Main St.).

Exhibit 3.1: Automatic License Plate Reader (ALPR) technology

Source: City of Brampton's website

Exhibit 3.2 illustrates the number of received parking enforcement requests from 2016 to 2021. The Exhibit shows the total number of received service requests and also those particularly related to exceeding the time limit, i.e., exceeding the three-hour free parking or parking overnight between 2:00 AM to 6:00 AM. The time-limit offences are therefore not safety related. The trend indicates that the demand for parking related enforcement services has increased drastically in recent years which increases the pressure on the enforcement resources. The statistics also demonstrate that more than half of the received requests are time-limit related. It worth noting that a moderate drop in the enforcement requests was observed in 2020 which can be attributed to COVID-19 impact and the resulting decrease in movement and parking activities.

Exhibit 3.2: Parking Enforcement Requests by Year



Existing parking enforcement challenges include the following:

- Concerns with respect to the amount of illegal on-street parking and support for increasing parking enforcement were repeatedly heard at the public engagement sessions and activities. Some citizens are demanding that enforcement should be more proactive.
- A large number of parking violations are recorded every year citywide. According to the City of Brampton, the City responded in 2021 to 41,406 parking service requests out of which 26,071 were for timed offences (i.e., vehicles parked longer than 3 hours or parked during the prohibited time of 2 am to 6 am).
- The removal of parking requirements for using the basement as an additional unit may result in increased parking demand. Additional enforcement may be needed to ensure that parking violations are not consequently increasing.
- Significant human resources are being consumed to respond to parking violations and also for dispute resolution and post-ticketing litigation.
- Although the City has started using LPR technology, the adoption of this technology is still limited and the City can further leverage this technology and use it more widely. More LPR-equipped devices and vehicles can be used. In addition, upgrades to the payment technologies (e.g., the use of pay-by-plate instead of pay-and-display) can further increase the enforcement efficiency.

3.2 Enforcement Recommendations

In order to improve the practice and efficiency of parking enforcement in Brampton, handle the increasing number of parking offences, and move gradually into a more proactive enforcement approach, the City is recommended to consider several strategies and technologies as outlined below.

Establish priorities among service requests and complaints. As demonstrated in Exhibit 3.2, a large proportion of parking offenses are time-limit based and these usually do not create safety hazards or traffic blockage. Responding to thousands of these complaints every year would drain the available enforcement resources not only because of their number but also because of their

randomness which may require officers to drive from end to end of the City. Establishing priorities, such as to respond first to offences related to safety and traffic blockage, is needed if the available resources cannot address all requests. Prioritizing the requests can be done simply by training the staff responding to the requests and designating limited number of staff for the unurgent or low-priority requests. Alternatively, a more complex option would be to build a priority protocol in the complaint registration system.

Improve the complaints registration system. As demonstrated in Exhibit 3.2, a large proportion of parking offenses are time-limit based. However, in many incidents the residents may register a compliant for a vehicle that may have a "parking considerations" permit and is therefore parking legally. These unverified complaints can consume the enforcement sources unnecessarily when the enforcement officers go to the site and realize lately that the vehicles have parking considerations permit. It is recommended that the complaints registration system be improved such that it encourages explicitly the constituents to provide the license plate number of the suspect vehicle. This way, the enforcement team can assess the situation remotely and decide if the vehicle already has a "parking considerations" permit or a site visit is needed to report the violation. The City of Ottawa, for example, asks explicitly the residents reporting "over time limit" parking infractions to "please provide specific details about the parking issue - including the vehicle make, model, colour and license plate number."

Build a system to track and map parking complaints and violations. This system intends to record all parking complaints and violations in a systematic way with the possibility to create heat maps that illustrate parking complaints and violations by type, area, day, and time-of-day. These maps will assist the enforcement staff to identify the focus areas and better assign resources by time and location. A proactive enforcement patrolling would thereby focus on areas having high violation frequency and safety-related parking offences, and such patrolling would be scheduled ideally during the peak days and times as informed by the tracking system.

Add more enforcement staff as needed. In order to address the increasing number of parking violations, the City is recommended to add more resources in terms of full-time and part-time officers as needed. According to the "City of Brampton Service Delivery Review – Category 1 – Governance & Internal Services -Final Report 2019," part-time officers have been able to generate significant revenue that well exceeds their labour costs. The City is recommended to continue add part-time parking enforcement officers as needed. Significant human resources are being occupied to address the disputes and hearing requests. In order to process the litigation requests more efficiently, it is recommended to extend the hours of hearing and dispute handling to include evening and weekend hours.

Increase the parking fine rates. In order to reduce the number of parking violations, the City should consider increasing the parking fine rates and adopt graduated parking fines which provide an opportunity to target repeat offenders. In addition, the City may consider assigning higher parking fines in some strategic areas encountering high frequency of offences and also during some special events where parking offences create traffic blockage and safety concerns. Such area-based or event-based parking fines should be well communicated to the public and in advance. The City of Kitchener, for example, doubled parking fines during some designated special events and in defined areas and for a set time. The City considered alerting the public by posting signs in the impacted areas, posting in social media, and attaching notices to the event's tickets. The City of Hamilton also designated some areas as "Special Enforcement Areas" with higher parking fines and used signs at the boundaries of the areas to notify the public.

Expand the adoption of LPR technologies. This can involve two types of devices: hand-held LPR devices and ALPR vehicles. The use of ALPR vehicles is more efficient as compared to hand-held devices but their cost may require using a combination of the two types of devices. For example, hand-held devices may be designated more towards crowded and congested areas where the movement of the ALPR vehicles may not be as efficient. However, both the ALPR vehicles and the hand-held devices should be connected and communicate continuously. The

LPR enforcement technologies can be used on public streets as well as inside municipal parking garages. It is worth noting that LPR technologies are growing in popularity among municipalities.

Establish a pay-by-plate system. By implementing a pay-by-plate system, parking enforcement can leverage LPR technology to improve enforcement efficiency not only for the "parking considerations" but also for the paid parking. Pay-by-plate technology allows motorists to use their license plate as a proof of payment. Users enter license plate information through a parking app or smart meters (typically multi-space meters). This may suggest switching the downtown parking meters and pay-and-display machines into pay-by-plate supportive meters.

Use digital license-plate-based parking permits. To increase enforcement efficiency and facilitate mobile LPR enforcement, Brampton is recommended to adopt electronic (digital) permits to facilitate mobile LPR enforcement. These digital permits can be adopted for the monthly or annual permits in the downtown municipal garages, for the complimentary parking considerations, and also for the on-street paid parking permit program if implemented. Pay-by-plate can also be integrated to the digital parking permits. Using license plates as proof of payment for parking permit also inhibits the illegal resale or transfer of permits as they are tied to specific license plates. Most comparator municipalities were determined to use pay-by-plate technology.

Consider collaborating with a third-party parking app provider. Third party providers of parking apps may not only provide the pay-by-phone services (for hourly or digital monthly permits), but many can also offer a set of LPR services by partnering with enforcement agencies. The services typically include providing LPR technology (hand-held devices and cameras), integrating the LPR system with the mobile app and permitting system, and providing training to municipal enforcement officers. In addition, some providers provide a ticket dispute resolution service which helps to filter parking disputes and reduce the investigation burden on the City's side. Under this service, the provider investigates the disputed ticket, and if it is found to be invalid, the provider communicates this to the enforcement authority and explains the situation. The City can subsequently choose either to void or enforce the ticket.

Establish specific enforcement measures for truck parking. Enforcement of unauthorized truck parking is needed to regulate truck parking city-wide and especially in strategic areas. Illegal truck parking can be very unattractive, and it may get too close to residential areas or the primary boulevards and corridors hindering the ability to attract the intended development. It is recommended to add truck parking enforcement as an important task to the other enforcement activities. Officers enforcing truck parking may focus on intensification areas and residential zones.

Consider adding enforcement resources if a paid residential parking permit program is implemented. Efficient enforcement is key for the success of the paid residential on-street parking permit program. If such program is implemented or piloted, proactive and regular enforcement is needed to ensure preserving the curbside to permit holders and targeting the illegal parkers.

4 Paid On-street Parking Permit Program

Residential parking constraints were commonly heard and reported in the public and stakeholder consultation activities and the online public parking survey. The Phase 1 report suggested to develop a residential paid on-street parking permit program to unlock on-street parking for long-term parking purposes and alleviate the widening of driveways beyond the maximum size permitted by the Zoning By-law. The following is an outline of the major phases that can be established to implement such a program followed by some key considerations that are required to be resolved in the residential parking permit program's development and implementation.

4.1 Program Implementation Phases

The program may be carried out throughout several phases as outlined below:

Phase One: Program Feasibility Assessment

This phase intends to ensure that the on-street parking permit program is feasible before moving to the advanced implementation stages. The program feasibility assessment requires evaluating several aspects such as actual parking demand versus available supply, resources needed, program cost, and public support. This phase may include a review of the best practices and selection of the areas where the program can be piloted.

Phase Two: Implement a Pilot Small-Scale Program

Intends to learn how the program is working in practice and identify areas for improvement. The program administration, public acceptance, enforcement efficiency, cost of implementation, and demand of the permits can be further evaluated to guide the program in further details. This pilot would likely be done on a neighbourhood level (likely more than just one neighbourhood to start).

Phase Three: Program Expansion or Adjustment

Based on the Phase 2 findings, adjustments to the program regulations, policies, and boundaries can be made. The program can be applied to neighbourhoods with new parking capacity constraints, and the program can be rescinded from neighbourhoods where existing capacity constraints are resolved through alternative strategies (ex: a new nearby rapid transit line reduces vehicle ownership).

4.2 Program Considerations and Policies

Safety and Operation Impacts: Concerns with potential adverse safety and operation impacts resulting from the program were repeatedly heard in the public and stakeholder engagement activities. These may include, for example, creating conflicts with cyclists and pedestrians, sight distance reduction at driveways and intersections, and any implications to waste collection. In addition, concerns were raised regarding creating a blockage to existing driveways and the street traffic and the impact on the width of nearby sidewalks. A case-by-case review of each application is recommended to evaluate these considerations when deciding whether or not to grant the program. In addition, some general guidelines need to be established to specify where on-street parking is prohibited (e.g., near driveways or intersection corners). Finally, the program will require the evaluation of any changes that need to be made to the ZBLs and City's Traffic By-law.

Awareness Campaign: Since such a program is new for Brampton's citizens, an awareness campaign is needed to to educate the public on the program's objectives, restrictions, and regulations. Clarifications should be given to the public regarding who can benefit from the program and how the adverse impacts will be considered and mitigated.

Program Support: The implementation of such programs requires the support of the majority of homeowners affected by the residential permit program application (e.g., 51% of affected resident support or greater). This requirement is anticipated to minimize negative public reactions to the

program. Support is recommended to be evaluated through a survey of affected residents. The following are some remarks and guidelines that can be considered when carrying out such surveys.

- **Survey design and methods.** The survey should include enough information about the program through a brochure or booklet. The survey questions essentially include the demographics of the respondents and their addresses. Surveying is usually done online or by mail.
- **Approval Process.** Approving a residential on-street parking program based on public surveys follows several stages that differ across cities. In some cities, such programs start with a petition submitted by the residents demanding the implementation of the on-street parking program. This petition is just to serve as an expression of interest. In other cities, the initial selection of the streets (or zones) is done by the municipality without a petition. After identifying potential streets, the City performs a technical review to evaluate the adequacy of implementing the program on the intended street, e.g., evaluate safety, road geometry, etc. A formal questionnaire is then mailed to homeowners on the affected street. If a certain proportion of the returned ballots supported the program, a report recommending the program implementation will be submitted to the City Council for approval. In large Cities, approval of the Community Council or Ward Council may be needed before submission to the City Council.
- **Survey Statistics and Approval Criteria.** Different cities use different statistics to trigger the public support towards residential parking programs. In Toronto, a minimum of 25% of the ballots (questionnaires) should be returned and 50% +1 of these must agree to indicate a positive polling result (a simple majority). In Vancouver, a minimum of 50% of the residents should respond and 50% + 1 must agree to have a successful survey. Streets or blocks that do not return sufficient responses (i.e., return less than 50%) are to be resurveyed. However, they will be only resurveyed after carrying out the other scheduled surveys for other streets that are in the initial queue. In Mississauga, more than half of the residents should support the program in order to carry out the technical assessment by the respective department, and two thirds of the returned questionnaire must be in support to the parking regulation change to pass it to the Ward and City councils. The City of Vaughan has not established a minimum response rate, but it requires a minimum of two-thirds of the property owners/occupants to be in agreement with the on-street parking permit program.

Number of Permits Issued: The number of permits issued per area is recommended to be determined on a case-by-case basis and the actual parking demand and supply of each subject area. Parking demand should be carefully categorized base on the vehicle owners being legal or illegal housing occupants. The intention is to only grant permits to legal occupants. In addition, parking demand of the “parking considerations” program should be also collected as this can impact the permit program.

Once the initial release has been established, Brampton is recommended to monitor the on-street parking utilization. In the event on-street parking remains underutilized, additional permits can be released in a phased manner to ensure permits are not oversold. Permit waitlists are recommended to be created for high-demand areas where the on-street residential parking permits sell out. Residential parking permits can be granted for various periods (e.g., monthly, half year, full year).

Impact on Existing Parking Considerations: The utilization of the residential permit program may become high and create an impact on the existing parking considerations. The supply of the residential parking permits should be always managed so that at least a reasonable parking provision is reserved for visitors, short-term parking purposes, and deliveries. To manage the interaction between the long-term paid permits and the existing parking considerations, then the following situations can be considered:

First: if the friction between parking considerations and long-term parking permits remains light or moderate, then maintaining the 14-day parking consideration permit is deemed appropriate with the possibility to require anyone who wants additional days to pay an additional amount per day.

Second: if the demand of parking considerations is high and hindering the permit program, then stopping completely the complementary parking considerations and setting parking prices for short periods (e.g., 24 or 48 hours) may be considered to manage the demand in some areas. Toronto, for example, provides fee-based temporary resident or visitor on-street parking permits, the fees differ by the period being 24-hour, 48-hour, or 7 days.

Permit Cost: Permit costs are recommended to be set at a point where the collected revenue offsets the cost of operating and maintaining the program. The cost should also be affordable, but at a rate that promotes reduced vehicle ownership and alternative modes of transportation (e.g., consider monthly transit pass costs). The public engagement activities revealed that some residents may question if different permit prices can be given according to some criteria. Such criteria may be established only to promote equity. For example, the City of Toronto uses three-tier system for parking permit costs, i.e., tier one, with the lowest cost, for residents with no access to on-site parking for their first vehicle, tier two for residents with no access to on-site parking for their second and any subsequent vehicle, and finally tier three, with the highest cost, for residents who have access to on-site parking and the permit is demanded for convenience. This should encourage people to use their covered garages for parking instead of storage unit, something that was also heard and supported in the public engagement sessions.

Technology Requirements: Brampton is recommended to adopt digital (electronic) permits to facilitate mobile LPR enforcement. Using the digital permit system and the license plates as proof of payment for parking permit also inhibit the illegal resale or transfer of permits as they are tied to specific license plates.

Winter Maintenance: Winter maintenance is an area where best practices are not clearly established. Based on a review of comparator municipality practices, winter snow clearing is either not addressed, is completed while vehicles are required to park on one side of the street during the entire winter season, or on-street parking is restricted during heavy snow events and owners must find alternative parking opportunities on their own or the municipality offers some assistance through designating alternative parking facilities or using a map that illustrates other parking options.

Toronto, for example, enforces one-side parking and suspends alternate side parking from December 1st through March 31st. When parking changes to the other side of the street, the ruts and accumulated snow on the previous parking side will have to be removed to make the street passable and such snow accumulation cannot be removed by conventional snow ploughs. When deciding the side of the street where parking is permitted, the intention is to select the side that has the largest number of available parking spaces to maximize the parking supply.

According to snowfall and the accumulation intensity, winter maintenance follows one of the following three cases:

- **The snow is light.** Merely salting the street can be sufficient and this creates no impact to the on-street parking.
- **The snow is moderate.** Snow plowing is needed and the snow plow truck may direct the blade to push the snow to the side of the street where parking is prohibited. One-way plowing may be enough for streets with narrow or moderate width, but some wide streets may need two-way or two-pass plowing.
- **The snow is heavy.** Snow removal as a third-level operation is needed to remove the snow completely from the street (picking up snow) and move it away. This requires a snowblower vehicle that move in tandem with dump truck, the snowblower pulls the snow off the street and dumps it into the truck. Snow removal is most effective if vehicles are not present on the street. Snow removal may also involve snow melters and front-end

loaders. The trucks need to dump the snow in specified places, e.g., snow storage facilities or snow melter sites. Salting and snow plowing may also be needed in tandem, before, or after the snow removal to further clean the streets.

Regarding winter maintenance and its impact on the on-street parking program, the City may consider and assess several options including the following:

- **Totally restrict on-street parking during heavy snow events.** Under this approach, the permits are void during heavy snow events. The City will have to issue early snow alerts through a well-established communication protocol (e.g., social media, phone, email, etc.) and require permit holders to remove their vehicles. Ideally, the City should provide or suggest alternative parking locations. This approach may not be practical if the number of parking permit holders citywide is large since they will all seek alternative parking spaces at once.
- **Provide limited winter maintenance activities (with one-side parking policy).** The City only provides the normal snow plowing activities and this may leave snow windrows and piles along the street. Vehicles will have difficulty moving their vehicles into the street.
- **Provide heavy winter maintenance activities (with one-side parking policy).** The City will provide full services of snow plowing and snow removal. Snow clearing may require two passes, i.e., the vehicles may be required to be moved so snow plowing or removal can also be done near the curb. This approach requires the availability of additional financial, mechanical, and human resources, and moving the parked vehicles may be challenging sometimes.

The following are further remarks regarding the winter maintenance:

- Snow clearing or removal is a major process that requires significant resources (mechanical and human). The cost of this process is significant and should be considered in advance when planning the on-street parking program. A well-established winter maintenance plan should be also prepared.
- Snow removal may also require communicating with people through (social media, email, phone, nocking doors) to ask them to remove their vehicles from the street. A communication protocol should be established. Permit holders may be able to remove their vehicles to nearby streets that are already cleaned. If some permit holders could not remove the vehicles, their vehicles may be towed in a “friendly towing” process.
- The use of a third-party provider for winter maintenance and snow removal activities may be considered.
- The number of streets that need “snow removal” and the available resources (e.g., number of snow blowing vehicles available) can determine the speed of the winter maintenance process. It may take several days if the snow event is very heavy and the resources are limited. The available snow blowing vehicles may receive several calls for other cleaning activities at once.
- Snow plowing and snow removal activities may result in some damage to the parked vehicles so a “friendly claim” process must be established.
- Streets that have a wide boulevard are better to accommodate winter maintenance activities, because the boulevard buffer can be used to store the snows.
- The impact of on-street parking on winter maintenance is better to be explained during the public survey stage and public awareness campaign, i.e., it is recommended to explain whether removing or clearing the snow windrow is the responsibility of the homeowners or the City. Similarly, if the permits are void on-street during heavy snow events, this should also be communicated to the public.

5 Curbside Decision Making Framework

The curbside is a scarce resource that serves ever increasing demands from various user groups, such as drivers, couriers and goods delivery vehicles, cyclists, taxis, and transit operators. In order to address competing uses at the curbside and ensure efficient use of public space, a decision-making framework was developed. This framework will aid decision makers in determining where, when and whether it is appropriate to modify the design of a corridor to better serve a given area. The developed framework could be applied to update existing parking by-laws and identify potential areas for new on-street parking or other curbside uses, such as loading or transit access. The framework is shown as a flowchart in Exhibit 5.1.

5.1 Decision Making Flowchart

In the proposed framework, a curb space prioritization review is initiated by any event that includes the modification of road or curb use (i.e., adjustment to on-street parking facilities, resident complaint, etc.).

The first step is to identify the curb typology of the given location. It is intended to reflect both current street designs as well as provide inspiration for future street designs. A curb typology is comprised of three main components: stakeholder profiles, curbside functions, and curb types. The stakeholder profiles (Exhibit 5.2) are determined according to the user groups of the curbside. The manner in which the identified stakeholders interact with the curbside are then used to determine the curbside functions (Exhibit 5.3). Based upon the identified stakeholder and curbside functions, the curbside types or typologies (Exhibit 5.4) are then confirmed by arranging the curbside functions into different hierarchies. The typologies are utilized to guide decisions on how to prioritize and optimize curbside uses for any street later in the flowchart. This material is drawn from Best Practices (such as the Institute of Transportation Engineers Curbside Practioner's Guide), and other North American cities or regions (such as Toronto, Seattle, Washington DC, and the Southern California Association of Governments). The curbside typologies also align well with directions of the City of Brampton Complete Streets Guide: each curbside typology corresponds to a subset of the Brampton Complete Street Typologies, as shown in the Description of Exhibit 5.4.

Although a certain corridor could serve more than one function, curb space is a limited resource and rankings on curbside functions need to be recognized. To rank the importance of each curbside function along each study corridor, the curb type of a certain corridor was identified by relying on curbside stakeholders and curb functions, as well as being informed by the diverse surrounding land uses including residential, commercial, and mixed use. Six curb typology profiles were created to best reflect a range of existing and planned contexts in Brampton. Flexibility in the profiles is required since every corridor will have unique needs and priorities, and local stakeholders should be consulted during the design stage to confirm the selected uses address their needs (recognizing there will be trade-offs). The curb typologies framework created is not an exhaustive list of every type of possible corridor, stakeholder, or curbside function that could exist in Brampton. It is intended to serve as a starting point in better defining the corridor's context, primary functions, and understanding design considerations to better assist curbside decision-making, while ensuring each corridor also works towards the larger network-wide policies of Brampton.

Once a curbside change is desired, the impacts of the recommended modification are then quantified (i.e. km of new protected cycling facilities, number of on-street parking spaces removed, etc.) in order to provide full context to key decision makers. Under the context of Brampton, potential impacted uses of the curbside may include available parking in close proximity, cycling activities, known passenger pick-up and drop-off activities, and commercial delivery activities. Before executing to the next step of the decision tree, only the impacted curbside uses that align with the decision-making priorities of the identified curbside typology are retained to guarantee the

consistency of the designed curbside functions and minimize bias to any specific stakeholder. The usage priorities of each curbside typology are described in Exhibit 5.4.

For the retained curbside uses, their demand and supply are then compared for further evaluation. Specifically, if the future demand for any impacted use is greater than remaining supply, the project is recommended for modification to attempt to minimize this impact. If the project can be modified no further without voiding the original intention, mitigation measures are then to be identified which help reduce the impact's severity. In the case that no additional mitigation measures can be identified and the impact to curbside use is deemed to be unacceptable based on supply and demand estimates, the identified typology of that segment may be revisited.

Exhibit 5.1: Decision Making Framework Flowchart

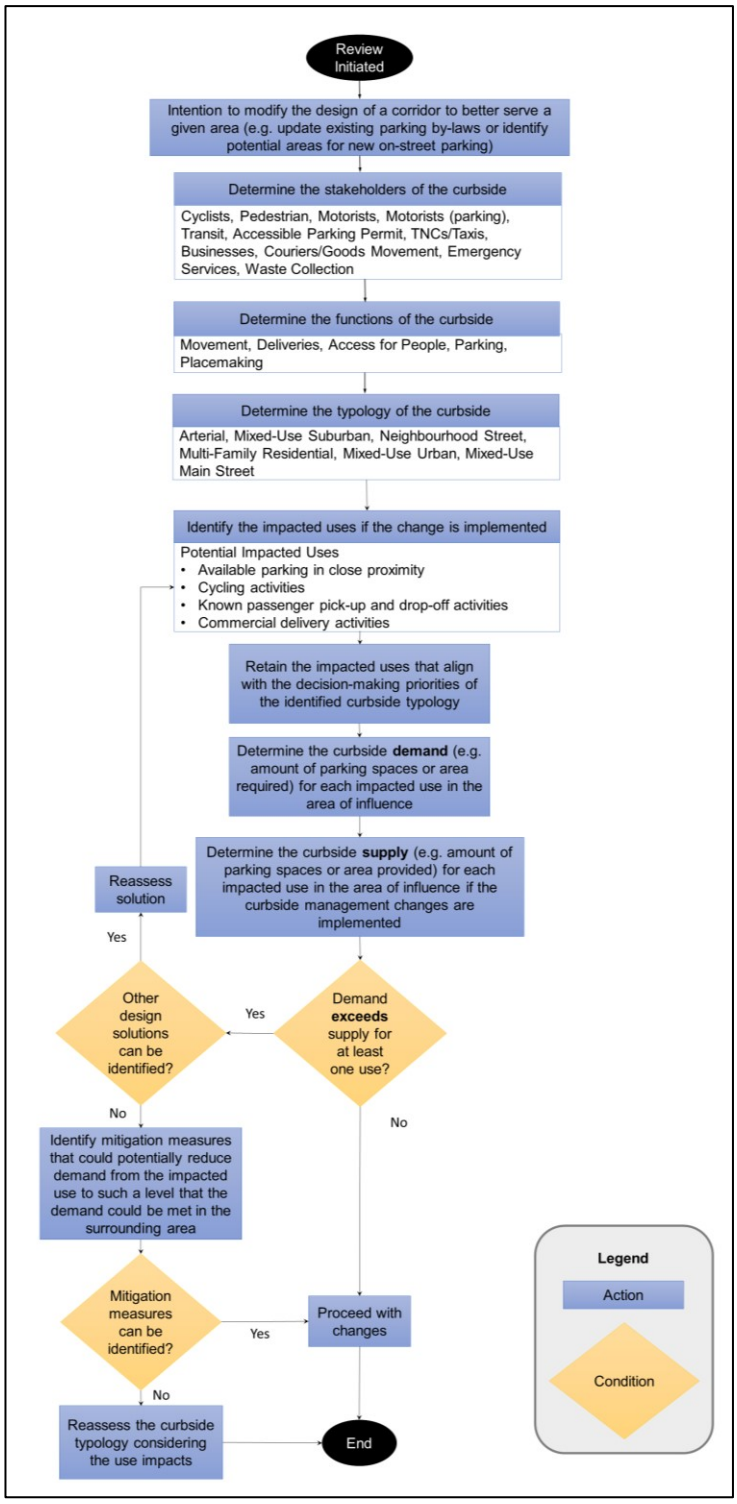


Exhibit 5.2: Curbside Stakeholder Profiles

User	Description	Needs	Challenges
 Cyclists	Want curbside space for exclusive cycling facilities separated from vehicles, either from physically separated cycle tracks, or bicycle lanes buffered by pavement markings.	Exclusive cycling facilities; reduction of potential conflicts and obstacles such as driveways, alleyways, or vehicle turn lanes; bicycle parking facilities; increased safety.	Reduction in cycling facilities, or an increase in conflict zones; decreased safety; dedication of curbside space to other users provides an impediment to the expansion of cycling facilities.
 Pedestrians	Use the curbside to access or interact with other users.	Wider sidewalks. Amenities such as street furniture or landscaping for shade. Parklets/spaces designated for gathering.	Friction from high frequency users traversing the sidewalk (transit, TNC/taxi, or private vehicle passengers, and delivery staff).
 Motorists	Want to have reliable and predictable travel times across the road network.	Removing parking or other (peak period) lane obstructions.	Lane reductions, closures, or blockages for longer than current conditions.
 Motorists (parking)	Want curbside space for parking to visit businesses, residents, etc. User surveys indicate that few drivers are willing to walk further than 400 metre from a parking location to their destination.	Additional parking areas, or user improvements such as ease of access, information on parking availability, or wayfinding.	Reduction in parking supply, and price increases.
 Transit/ Paratransit	Want to have reliable and predictable travel times across the road network (improved travel times); need curbside stops to load/unload passengers.	Removing peak period lane obstructions. Unimpeded access to transit stops and loading areas. Designated lanes.	Land reductions, closures, or blockages for longer than current conditions.
 Accessible Parking Permit	Want curbside space for parking, and loading/unloading of passengers. Dedicated/ designated space would be preferred.	Designated parking/loading areas, or user improvements such as ease of access or wayfinding.	Reduction in parking/ loading areas, and a requirement to pay.

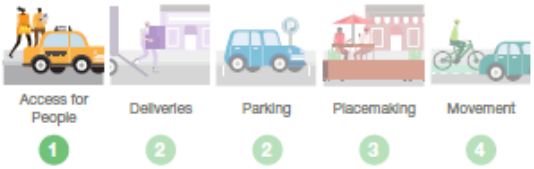
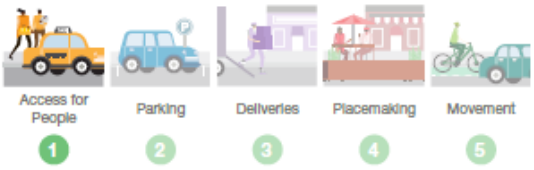
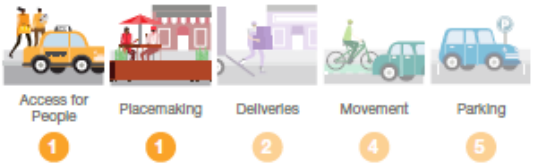
Exhibit 5.2: Continued

User	Description	Needs	Challenges
 TNCs/taxis	Want curbside space to idle and park while awaiting future passengers; need curbside areas to load/unload passengers. Dedicated/designated space would be preferred.	Parking or loading areas or designated TNC/taxi areas in desirable locations, wayfinding to TNC/taxi PUDO zones.	Reduction in parking/ loading supply, or relocation to undesirable/ underutilized locations; additional lane reductions, closures, or blockages (preventing them from loading opportunities).
 Businesses (patios, loading/ pickup zones)	Want curbside space for patios/ designated outdoor areas for customer gathering; want space for loading/pick up zones for food delivery services and order pick up.	Patios/designated outdoor areas for customers. Loading/ pick up zones in desirable locations.	Reduction in space for patios, reduction in loading supply or relocation to undesirable locations such as high-traffic areas that reduce access to the curb; increase in cost of doing business.
 Couriers/Goods Movement	Want curbside space for loading/ unloading of goods in close proximity to their destination. Dedicated/designated space would be preferred. Surveys of couriers indicate that very few are willing to park further than 200 metre from their destination.	Safe and convenient areas to park/load near their destination. Equal service at different times of the day, regulated spaces, or relocation of courier load zones to more desirable locations; decrease in cost of doing business.	Reduction in loading supply or relocation to undesirable locations such as high-traffic areas that reduce access to the curb; increase in cost of doing business.
 Emergency Services	Need curbside access to park, as well as curbside space to access buildings and set up facilities; want to travel quickly and unimpeded across the road network, and need passable space to do so.	Immediate access to the curb to reduce delay during emergencies, removing lane obstructions.	Lane reductions, closures, or blockages for longer than current conditions.
 Waste Collection	Need curbside space for bin placement and temporary parking. Want passable space and convenient access.	Reliable space for bin placement. Temporary loading area for garbage trucks.	Lane reductions, closures, or blockages temporarily. Reduction in residential parking.

Exhibit 5.3: Curbside Functions

FUNCTIONS	PROFILE	DESIGN OBJECTIVES
 **Movement**	• Motorists • Cyclists • Transit/Paratransit • Emergency Services	• Reliable and predictable travel times • Restricted curbside access • Dedicated infrastructure for different users (e.g., transit lanes, cycle tracks, etc.)
 **Deliveries**	• Couriers/Goods Movement • Businesses	• Ensure access for couriers/goods delivery trucks • Loading zones for both short-term and long-term (or multiple) pick-ups/deliveries
 **Access for People**	• Pedestrians • Motorists • Transit/Paratransit • Accessible Parking Permit • TNCs/Taxis • Businesses • Cyclists	• Provide safe, dedicated spaces for vehicles to pick-up/drop-off passengers, including valet loading areas • Ensure safe access for Accessible Parking Permit holders is provided near their destination • Provide unimpeded access to transit stops • Provide infrastructure for cyclists
 **Parking**	• Motorists (parking) • Accessible Parking Permit • Businesses • Waste Collection	• Provide on-street parking for cars, bikes, scooters, and bus layovers • Metered parking can help to manage turn-over and car parking availability • Accessible parking spaces should be provided along the curbspace to accomodate those with differences in ability • Short-term on-street parking can be complemented with nearby off-street lots for longer-term parking • Bike racks, bike share hubs, scooter corrals, micrmobility hubs, and protected/covered bike parking located nearby key destinations can increase accessibility for travellers and make their trips more convenient and efficient • Provide reliable area for waste collection
 **Placemaking**	• Pedestrians • Motorists	• Provide seasonal space for placemaking, such as patios, parklets, food trucks, etc.

Exhibit 5.4: Curbside Typologies

TYPOLOGY	DESCRIPTION	FUNCTIONS (RANKED IMPORTANCE)
Arterial	• Includes the Brampton Complete Street Typology: Major Arterial (Regional) • High volume of vehicular travel • Vehicle throughput oriented • Higher speed limits • Roadway classification is a major, primary, principal, or secondary arterial	
Mixed-Use Suburban	• Includes the Brampton Complete Street Typology: Neighbourhood Connector, Commercial Connector, Employment Collector • Wide lane widths • High volume of vehicular traffic • Diverse modes of transportation • Commonly located in suburban areas • Prioritizes access to retail space or strip malls on one side of the corridor and access to single family homes on the other	
Neighbourhood Street	• Includes the Brampton Complete Street Typology: Neighbourhood Residential, Local Residential • Is surrounded by a blend of single-family homes and multi-family residential buildings • Prioritizes people's access to their homes, access for couriers, and activated public spaces	
Multi-Family Residential	• Includes the Brampton Complete Street Typology: Mixed Used Neighbourhood • High density of apartment homes • Higher density of people than on-street parking spaces available • This corridor type provides space for PUDO, courier deliveries • Provide activated common spaces for residents	
Mixed-Use Urban	• Includes the Brampton Complete Street Typology: Urban Main Street, Local Employment • Prioritizes access for people, order pick-up, retail space & space for outdoor dining • This corridor includes space for PUDO and safe pedestrian, bicyclist, and micrmobility access • Parking provided should be exclusive to micromobility, and not vehicles	
Mixed-Use Main Street	• Includes the Brampton Complete Street Typology: Downtown Street, Shared Street, Lane • This corridor type is the focal point of a downtown area and includes a mix of uses • May provide access to public spaces where motorist access is prohibited	

Mobility Corridors Community Corridors Urban Corridors

5.2 Summary Remarks and Recommendations

Due to the competing demands on the curbside spaces, this curbside decision making framework was presented to achieve a more productive use of public resources. The framework could be applied to update existing parking by-laws and identify potential areas for new on-street parking or other curbside uses, such as loading or transit access. Initiating by these two kinds of intentions, this framework first establishes different curbside concepts including curbside stakeholder, curbside function, and curbside typology to better identify the priorities among various curbside uses. Common curbside uses in Brampton include:

- Available parking supply in close proximity;
- Cycling activities;
- Known passenger pick-up and drop-off activities; and
- Commercial delivery activities.

Once the curbside priorities are identified, the framework relies on the demand-supply comparisons to further determine where, when and whether it is appropriate to modify the design of a corridor.

By determining the curbside priority through this typology concept, the City is recommended to better define the corridor's context, primary functions, and understand design considerations, while promoting consistency across the region. It is recommended that the City identifies the curbside typology according to the surrounding land uses, street functions, as well as road classifications and policy documents to reflect both current street designs and future design inspiration.

It is to be noted that the "access for people" function does not only consider pedestrians, cyclists, and taxis, but it also aims at providing unimpeded access to transit stops. As can be seen in Exhibit 5.4, the "access for people" function is well prioritized especially in the mixed-use urban and main streets and this should be in line with the transit system improvement plans in the City.

6 Parking Partnerships

Parking partnerships is an emerging practice and has not yet seen widespread implementation. However, many Parking Master Plans and municipalities are beginning to recognize the strategy. For example, around 18,000 parking spaces are operated by Toronto Parking Authority (TPA) for third parties, and these spaces constitute around one third of the TPA's entire parking system. There are several reasons that make parking partnership an important strategy for Brampton's future parking system. The City has begun moving towards reducing or rescinding parking requirements for new developments located inside intensification areas (e.g., By-laws 45-2021 and 259-2020). Parking partnership becomes very important in these strategic areas to provide more off-site parking supply opportunities, optimize the use of available parking facilities, and achieve the targeted densities. In addition, the concept of shared parking has been highlighted and promoted in Brampton's planning documents, secondary plans, and the draft zoning by-law update and was also heard in the public and stakeholder engagement program. Shared parking can be promoted through partnerships and agreements. Moreover, several truck parking supply strategies may rely upon partnerships (e.g., shared parking agreements with commuter lots and large venues, etc.). Finally, the public private partnership (P3) can be a promising tool to build new parking facilities for all types of vehicles (passenger cars, trucks, micromobility devices, etc.).

6.1 Parking Partnership Schemes

Parking partnerships may take several forms and arrangements. Below is a further discussion of different types of parking partnerships.

6.1.1 Including Public Parking in New Developments

Some municipalities have been investigating the opportunity to include public parking in new developments through coordination with the developer. The public parking spaces would be in addition to the development's Zoning By-law parking requirements. Adding public parking to new developments may take different arrangements. For example, in one arrangement, the municipality may carry out the maintenance and operations of the public parking spaces, and the profit is then shared with the development owner. In another arrangement, as recommended in the City of London Parking Strategy Study, the City grants density bonuses to the existing zoning by-laws (ex: extra dwelling units, or increased building heights) if the developer agrees to add on-site public parking.

Including public parking in new development is more appropriate in intensification areas having high density and business activity. Although the present study recommends reducing or rescinding the minimum parking requirements in such areas, some developers of large projects are still expected to provide parking facilities for their developments, and they may find the inclusion of public parking spaces a promising business opportunity.

6.1.2 Partnering with Existing Parking Facility Owners

In some cases, municipalities partner with existing parking facility owners to convert a portion of the parking facility to public parking. These agreements require case-by-case considerations. However, in general, the municipality takes over all parking management services, including maintenance, operations, and revenue collection. The municipality first recovers its costs, and the profit is shared 50/50 with the private parking owner. In Oak Park, Illinois for example, the Village has agreements with nearly 30 different private parking lot owners in the Village Centre. These agreements are typically no more than three years and they can be renewed and updated frequently.

6.1.3 Leasing Parking Spaces in Underutilized Parking Facilities

If some municipal parking facilities are found to be underutilized, the City is recommended to explore opportunities to lease a part of these facilities to other public organizations or private developers as a way to generate revenue that can be used for other parking initiatives or to build new facilities in the future. According to Toronto Parking Authority (TPA) annual report, TPA enters into different leases as lessee (for parking facilities) and as lessor (for commercial and residential units). The following remarks should be considered when leasing municipal parking facilities:

- The agreements may be set for long-term but determinate periods, e.g., 10-20 years, and the developers will still be responsible for their after-lease parking needs and the City is not obliged to renew the lease agreement indefinitely.
- The rate of the lease should be flexible and adjusted annually to match the prevailing parking permit rate charged by the City throughout the municipal parking system.
- The City and the developer can meet occasionally, e.g., every three or five years, to revisit the number of the leased parking spaces and these can be changed based on mutual agreements.
- The estimated parking utilization of the facility is recommended to remain lower than 85% throughout the agreement period. Using lower utilization ratios is also desirable to account for some uncertainty in the future parking demand.
- When selecting the lessee, priority should be given for public developments against private ones, since the public developments are anticipated to serve a wider segment of the society.

6.1.4 Partnering with Public Stakeholders

Parking partnership is not limited to the private sector, but municipalities can also partner with public stakeholders. For example, Toronto Parking Authority (TPA) operate parking facilities for third parties including Toronto Transit Commission (TTC), Toronto Community Housing Corporation and Parks, Forestry and Recreation Division, etc. The City can offer sharing its parking facilities with other public organizations through lease agreements and it may also offer parking management expertise throughout a specialized City's parking department or authority. In addition, the City may also be the lessee and operate parking facilities of other public organizations.

6.1.5 Building New Parking Facilities through P3 Program

P3s form an agreement between government agencies and private-sector entities that are used to finance, build, operate, or maintain a project, such as a highway, a transit line, or a parking facility. Depending on how the partnership is structured, the private entity typically completes construction and owns, operates, and maintains the development for a predefined period with the intent of recovering the costs and generating a profit through user fees. Once the pre-agreed period has passed, the private entity transfers the parking facility's ownership to the City. Contracts are normally long-term, lasting up to 40 years or longer.

The potential benefits of partnering with a private entity are evident during every stage of a project. Overall, if everything goes as planned and the agreement is structured correctly, these benefits translate into the public sector taking on a reduced amount of risk for a high-quality product that is delivered on time and within budget. Although public-private partnerships present a number of benefits, there are also a number of drawbacks that must be considered carefully. Passing off risks to the private sector typically comes at a price premium, impacting the overall cost of the project and reducing the decision making power of the public entity. Exhibit 6.1 summarizes the benefits and drawbacks of the P3 program.

Exhibit 6.1: P3 Benefits and Drawbacks

Benefits	Risks
• Access to funding • Construction Expertise • Industry Networks • Timely Construction Completion • Higher Quality Facilities • Management Expertise and Operational Efficiencies • Dynamic Parking Prices to Promote Off-Peak Parking Utilization • Risk Management	• Return on Investment Might be Insufficient for Private Entity • Risk Mitigation Comes at a Cost • Public Entity Relinquishes Control • Parking Rate Structure Yields an Insufficient Return • Costly Legal Fees • Higher Borrowing Costs • Agreement is Long Term and Inflexible

The P3 type of parking agreement appears to be promising for the provision of truck parking supply throughout Brampton given the economic growth of the City especially in the logistics and trucking sector. As mentioned in Phase 1 report, the P3 program can be leveraged to construct new truck parking facilities and locations such as brownfield sites and hydro corridors can be considered. In addition, the P3 program can also be leveraged to provide parking for conventional autos and other types of vehicles (micromobility, bikeshare, ebike, etc.). Brampton is recommended to undertake a Request for Proposal process. Depending on the responses received, the City can evaluate whether a P3 is preferred over managing parking operations municipally. As part of the review process, Brampton would be recommended to hire both a legal counsel and consultants to inform the City of any risks that would come from each P3 partnership.

6.2 Summary Remarks and Recommendations

Parking partnership is very important in strategic areas where parking requirements are reduced or rescinded in order to provide more off-site parking supply opportunities, optimize the use of available parking facilities, promote the concept of shared parking, and achieve the targeted densities.

Several types of parking partnerships and agreements exist in practice. For example, the City can grant a density bonus for developments adding public parking, enter into operation contracts with private owners and share the revenue, enter into finance contracts and be either a lessee or lessor, and build new parking facilities throughout the P3 projects.

A combination of different types of agreements may be implemented in the same area. For example, in Downtown Brampton, if the City's municipal parking facilities are underutilized and the City decided to lease some of the available parking spaces, the City can still in parallel seek to expand the parking supply through other types of agreements (e.g., adding public parking spaces to new developments through business agreements or density bonuses, using the Community Benefit Charges generated revenue to expand the parking system, partnering with existing parking facility owners, etc.). The City should still be cognizant on the need to expand the parking system to accommodate future developments and the long-term growth in population and employment. In addition, the City should explore the ideal combination of partnerships that increases the revenue to the level that promotes the financial sustainability of the parking system while also serving the parking demand. For example, adding more public spaces through business agreements or density bonuses should allow the City to lease more of its available municipal parking spaces.

Establishing a City's parking department or authority is a key step towards expanding the types and the scales of the parking partnership agreements managed by the City. The parking department or authority would manage all these agreements from the legal, financial, and operational perspectives. Thus, staff experienced with all these technical perspectives should be available. However, in the near term, the City may rely on a small or medium team size within a dedicated parking department. This team may grow gradually and the parking department may be expanded and converted into a designated parking authority in the future.

7 Transportation Demand Management

Transportation demand management (TDM) initiatives are used by municipalities and institutions to influence travel behaviour by improving and promoting modes of transportation alternative to single occupancy vehicles. This improves transportation system efficiency and helps manage parking demand by decreasing the volume of single occupancy vehicles on roads and in parking lots. These initiatives take many forms, including policies, programs, services, and products to influence why, when, where, and how people travel. The following sections introduce various TDM strategies and explain their relationship with parking.

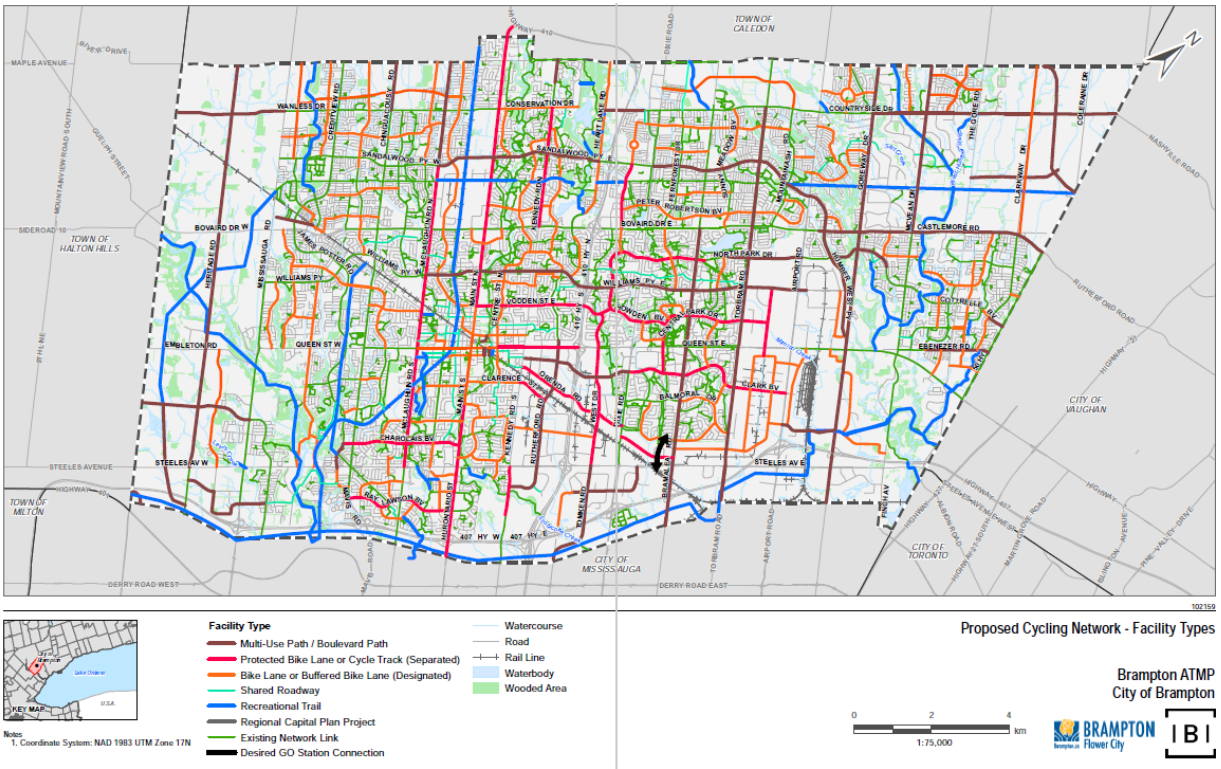
7.1 TDM Strategies and Initiatives

7.1.1 Bicycle Parking and Infrastructure

7.1.1.1 On-going and Planned Improvements

Improvements are being planned to further promote the use of cycling in Brampton. From the infrastructure side, the City of Brampton's Active Transportation Master Plan (ATMP) (2019) and Transportation Master Plan (TMP) Update (2015) outline extensive recommended expansion plans of the existing cycling networks. Exhibit 7.1 illustrates the ATMP's proposed cycling network. From the regulation side, the draft ZBL includes new bicycle parking requirements for several land use categories, these requirements also considered two types of zones, i.e., mixed-use zones and all other zones. More bicycle trips will typically reduce the number or growth of vehicle trips and lead to a more sustainable pattern of urban travel.

Exhibit 7.1: Brampton's Proposed Cycling Network as per the ATMP



Based on a best practice review, the following are additional recommendations to further promote cycling in Brampton from the parking perspectives:

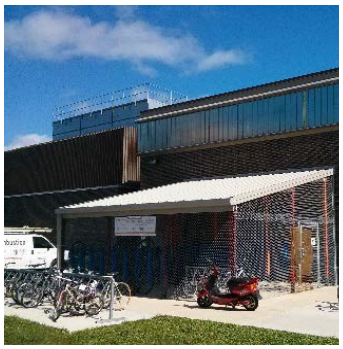
- A comprehensive bicycle parking program should provide both short-term parking (outdoor) to accommodate customers, visitors, couriers, etc. and long-term parking (secured and indoor) for employees, students, residents, etc., who will be parking for more than two hours. Exhibits 7.2 and 7.3 highlight several arrangements of short-term and long-term bicycle parking, respectively.
- 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. The draft ZBL only specifies that a minimum of 50% of bicycle parking spaces must be located in-door for residential developments where the requirement exceeds 50 bicycle spaces. It is recommended that bicycle parking requirements in the draft ZBL to be split into short-term and long-term spaces for different land-uses other than the residential uses.
- Bicycle-supportive guidelines 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.
- Experience has shown that there should be no upper limits on bicycle parking supply.

Exhibit 7.2: Short-term Bicycle Parking

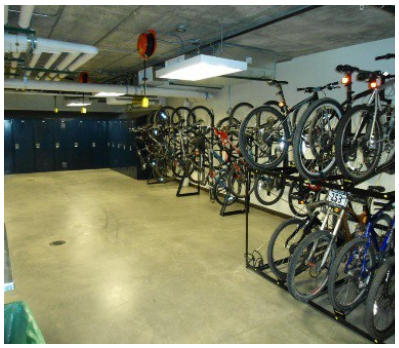
Sheltered short-term parking (Ajax)

Unsheltered short-term parking (Hamilton)

Exhibit 7.3: Long-term Bicycle Parking



Outdoor bike cage
(Hamilton)



Indoor bike room
(Minneapolis)

Bike locker
(Winnipeg)

7.1.1.2 Additional Bicycle Parking in Excess of Requirements

To support cycling as a mode of transportation, some municipalities allow developers to reduce the vehicle parking requirement in exchange for the provision of bicycle parking spaces in excess of those specified by the zoning by-laws. For example:

- The City of Toronto allows a 1 vehicle parking space reduction for every 5 bicycle parking spaces beyond the required minimum, up to a maximum vehicle parking space reduction of 20%. This applies to the City's Policy Area 1.
- The City of Kitchener allows a 1 vehicle parking space reduction for every 5 bicycle parking spaces beyond the required minimum, up to a maximum vehicle parking space reduction of 10%.
- The City of Portland, Oregon allows a 1 vehicle parking space reduction for every 5 bicycle parking spaces beyond the required minimum, up to a maximum vehicle parking space reduction of 25%. Existing parking may be converted to take advantage of this provision.

Brampton's draft ZBL allows to reduce the minimum number of required parking spaces at a rate of 1 vehicle parking space for every 4 bicycle parking spaces, up to a maximum vehicle parking space reduction of 25%. This provision is in line with the best practices as noted above. This reduction shall not apply to parking requirement for any residential dwelling unit, according to the draft ZBL.

7.1.1.3 Scootershare and Bikeshare Programs

Implementing shared micromobility services can help reduce personal vehicle ownership. Efforts are currently underway to proceed with the Brampton's e-scooter pilot program and assess its impact. A Shared Electric Kick Scooter Pilot Program was approved by City Council in February 2022 to permit and regulate the use of personal electric kick scooters in the City of Brampton. Through the pilot program, the City will assess the uptake and impact of an electric kick scooter-share system in the City. It must be emphasized that some concerns and challenges were raised regarding the e-scooter programs which deserve attention. These mainly include safety and accessibility concerns (e.g., illegal sidewalk riding, conflicts with persons with disabilities, added obstructions to the sidewalk by the "lock-to" e-scooters), the difficulty to provide sufficient and efficient enforcement, and insurance and liability issues (coverage and type should include full indemnification and first and third party insurance that covers riders and pedestrians).

Some Canadian cities are running large-scale bikeshare programs, e.g., Toronto, Hamilton, Vancouver, and Montreal. For example, Bikeshare Toronto program has today around 6,850 bikes at 625 stations covering 200 km^2 of the city. With the expected expansion of the cycling network in Brampton, along with the continuous intensification efforts, the City may consider assessing the feasibility of establishing a bikeshare program. Such assessment however should consider the cost and also the potential overlap with other programs such as the e-scooter pilot program.

7.1.2 Transit Network Improvements

Several ongoing and future transit projects will enhance the quality-of-service of the transit lines in Brampton and mainly in the Intensification Areas, e.g., new Züm, new LRT and new rapid transit, in addition to the existing BRT, transit lines and the GO stations. The new LRT is intended to serve the southern part of the Hurontario Corridor whereas the new rapid transit lines are planned along the northern side of the Hurontario Corridor, along Queen street, and along Steels Avenue. Several new Züm lines are also planned along urban boulevards and corridors. The 2015 Brampton Transportation Master Plan Update provides several recommendations to improve and expand the transit system by different future horizons, i.e., 2021, 2031, and 2041.

Improving the transit network is a key step towards achieving the City's sustainable modal split target, i.e., 50% of trips to be made using transit or other sustainable modes of transportation by

2041. Besides infrastructure expansion activities and adding more transit lines, transit-oriented TDM measures that can further promote transit and manage parking demand may include the following:

- Enhance the quality of service by increasing the service frequency, ensuring reliable service, and reducing the congestion onboard the vehicles.
- Use more tools to share information about the transit service, including nearby lines and stops, operation schedules, and any service change updates. For example, this information may be posted in visible place inside large developments.
- Apply transit priority measures, e.g., transit signal priority, exclusive lane, etc.
- Use transit fare incentives, e.g., discounted transit fares programs, converting parking subsidies into transit fare subsidies for employees, etc. Transit fares should be made more attractive as compared to the cost of parking.
- Require large developments to promote transit-oriented TDM measures, e.g., by posting transit information and purchasing a bulk of transit passes.

It is to be noted that improving the transit network, i.e., by adding service lines and increasing the frequency, was highlighted in the public and stakeholder engagement activities.

7.1.3 Carshare Programs

Carsharing is a system which enables members to borrow vehicles for short periods of time (i.e., hours rather than days). They fill a gap within the transportation network by helping individuals meet their daily needs when other transportation options (e.g. transit, walking, cycling) are not practical options for their trip. From a municipality's perspective, carshare can enable residents and local business owners to commute by sustainable modes while still having access to a vehicle for quick personal or business trips during the day, especially in downtown areas.

There has been a trend in the increased use of carsharing as the number of carshare vehicles has steadily increased in Canada over the past decade. In combination with the emergence of several other mode options, carsharing has been effective in reducing car ownership, especially in areas where other multi-modal transportation options are available. In recognizing the limited availability of carshare services in Brampton today, it is likely that as Brampton works towards improving alternative transportation options and citizens become more multi-modal, the demand for carshare services will emerge. It is recognized that parking standards can play an important role in attracting carshare suppliers to an area by allowing parking reductions to developers.

Based on Brampton's draft ZBL, two parking spaces can be reduced for each dedicated car sharing space up to a maximum reduction of 10%. This reduction is not as much as in Toronto and Kitchener ZBLs which allow for a four-vehicle space reduction for every carshare space provided. However, given that carsharing services are not yet widespread in Brampton, a conservative reduction of only two or three spaces is considered appropriate.

7.1.4 Shared Parking

Shared parking involves the use of one parking facility by more than one land use, taking advantage of different parking demand patterns by time of day to reduce the total parking that would be required if facilities were not shared. Shared parking ensures that parking spaces are not designated for any particular user, but operate as a pooled parking resource. The biggest benefits are realized with mixed-use developments, where uses have different peak demand times.

Brampton's draft ZBL includes a provision for shared parking with detailed calculations and these are applicable to any zone in the City. The calculations consider three occupancy periods, i.e., morning, afternoon, and evening. One possible recommendation to enhance this provision is to

include an additional occupancy period for weekends, e.g., Saturdays. The following are several factors that need to be considered when implementing shared parking effectively:

A mixed-use development must be planned with land use types and gross floor area known in advance (e.g., retail, office, restaurant), so that a shared parking calculation can be conducted;

Parking must be unreserved and designed to serve all uses;

When a new business moves in to 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; and

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.

It is to be noted that off-site parking can facilitate the adoption of shared parking between several nearby developments located in the same neighbourhood or area. Off-site parking needs to be within a reasonable walking distance from the development, which is defined as 250m in the draft ZBL. In addition, an agreement has to be made and registered on title.

7.1.5 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. Giving condominium owners and tenants the option to purchase or rent a parking space is one way of maximizing the utility of residential parking supply. There are several ways that unbundled parking can be facilitated, such as:

- Creating a marketplace where tenants/owners can list the availability of their unused parking spaces for rent by other tenants;
- Offering discounts to renters who choose not to take on a parking space; and
- 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.

The Victoria Transport Policy Institute estimated that unbundle parking can typically result in 10-30% reduced parking requirements. However, some municipalities are using a more conservative reduction. For example, the City of Burlington Citywide Parking Standards Review recommended that Burlington adopt a 5% parking requirement reduction for developers unbundling parking from residential units. The District of North Vancouver uses a 5% reduction to the residential parking requirements if a minimum of 50% dwelling units in a building are sold or rented separately from parking spaces and this reduction cannot be applied to the visitor parking spaces. Brampton could consider starting with a parking reduction of 5-10% for unbundled parking. Should this strategy prove successful, a larger reduction may be adopted in the future. Note that unbundled parking is a strategy that is only applicable to high density residential developments. In our experience, the use of unbundled parking is not generally contemplated or regulated through Zoning By-laws.

7.1.6 Dynamic Pricing

Dynamic pricing intends to change parking prices according to the observed parking demand to maintain a desired utilization. Under this scheme, parking prices become performance-based or demand-responsive, i.e., if the utilization goes up, then the parking price increases, and vice versa. The main benefits of dynamic pricing are managing parking demand at high demand locations, increasing the parking turnover, optimizing capacity utilization, and reducing cruising and circling time to find parking spaces, and encouraging the use of alternative modes of transport. Dynamic pricing also encourages the use of alternative modes of transport. This subsequently can reduce traffic congestion and the private auto mode share.

The following remarks need to be considered when implementing a dynamic pricing scheme:

Dynamic pricing needs parking occupancy or utilization data which can be traditionally collected using regular field surveys. However, for more adaptive pricing, parking occupancy data should be collected and updated on real-time basis using smart technologies (e.g., parking sensors, smart meters, smart phone apps, etc.).

Dynamic pricing is more applicable to on-street parking where parking turnover is usually high; however, it can also be applied to off-street parking facilities that serve short-term parking needs.

Parking price update should not necessarily be done continuously based on the real-time parking demand. A periodic pricing update, i.e., every several weeks or months, can still be useful to achieve the main program targets.

Parking price increase or decrease may be limited to 25 or 50 cents per hour for each price update cycle. In addition, a parking occupancy threshold (e.g., >80%) should be established to trigger the price increase. Similarly, another threshold (e.g., <60%) may trigger a price decrease.

Brampton is recommended to consider applying the dynamic pricing strategy in intensification areas having considerable parking demand, e.g., Downtown Brampton. Different pricing rates may be considered for different streets, blocks, or garages and by different times of day. The parking utilization analysis performed in Phase 1 indicated that different utilization ratios exist across different street stretches and garages. As noted above, a real-time adaptive pricing change is not necessary, and a periodic update can be sufficient to achieve the strategy targets.

7.1.7 TDM in New Developments

Many municipalities are beginning to require large developments to demonstrate how they will help minimize vehicle travel and parking demand, particularly in downtown areas. This can include hard infrastructure (e.g., secure bike parking, cyclist facilities, and carpool parking spaces) and soft infrastructure and services (e.g., carshare vehicle on site, discounted or subsidized transit passes, flexible hours or teleworking arrangement, emergency ride home program, and membership in a transportation management association like Smart Commute). Municipalities that now have these types of requirements include the City of Kitchener, City of Hamilton, Region of Waterloo, and Region of Halton.

Requirements for these plans are typically integrated into the development approvals process for a municipality and their implementation is a condition of site approval. In Kitchener and Waterloo, the requirement forms part of the transportation impact assessment while in Hamilton it is a standalone memo. Hard infrastructure requirements are typically required to be shown on site plan, thereby allowing the municipality to ensure they are included in the final development prior to issuing the Certificate of Occupancy. Any soft infrastructure and services typically require the proponent to submit signed contracts or agreements indicating that they will be provided by a third party (e.g., carshare vehicle on site and bulk purchase of transit passes agreement from local agency).

Typically, monitoring of the long-term effectiveness of TDM in new development requirements is based on sampling sites where this was done and comparable control sites. No significant large-scale studies are known to have been done by an Ontario municipality to date as most municipalities have only begun requiring this within the past 3 to 5 years.

The City of Brampton is recommended to consider requiring large scale office, institutional, and residential developments to prepare TDM plans that demonstrate how they will support reductions in single-occupant vehicle travel. Such requirement can be organized throughout the following steps:

A point-based Transportation Demand management checklist needs to be established first. TDM measures related to transit accessibility, cycling, walking, trip reduction, parking, and other aspects or innovative measures can all be included.

Using this checklist, a final total score is to be given to each new development indicating how much it supports TDM.

If the final score is very low, then the development may be classified as non-TDM supportive development. Consequently, the permit of the development may not be granted unless a revised and upgraded TDM plan is submitted for re-review.

If the final score is sufficient for passing, the development is to be granted the permit.

If the final score is high, some incentives may be given to development based on the score achieved. For Intensification Areas, where parking requirements are reduced or rescinded, incentives may include exempting the development from part of the Community Benefits Charges or granting some density bonuses. For the Rest of City, incentives may include reducing the parking requirements according to the achieved score (up to a certain limit).

The City of Brampton is also recommended to consider the following:

- TDM programs may not be only oriented towards reducing parking but they can target reducing the total daily generated vehicular traffic from or to the development. As such, the impact of TDM measures on parking can be part of a larger TDM program.
- There can be an overlap between the TDM programs and other initiatives. For example, the City has established the Sustainable Community Development Guidelines which includes “mobility” as one of its four themes. In addition, there are Sustainability Metrics and Sustainability Score Thresholds developed in 2015 and are currently in use, the City is working in collaboration with the Cities of Vaughan, Richmond Hill, and Markham to update the metrics.
- The TDM Score program may be integrated into other larger programs, be part of the traffic impact assessment, or be a stand-alone memo.
- TDM scoring programs can be especially beneficial when undertaking precinct-level plans for the Intensification Areas identified in Phase 1 report (as per Brampton Plan). The cumulative impact of development-level TDM plans can be significant and is needed in such high-density areas.

7.2 TDM General Remarks and Recommendations

The City of Brampton is recommended to continue improving the cycling network as per the ATMP. This is expected to change the transport mode split in favour to the active and sustainable transportation modes. Brampton is recommended to assess the feasibility of establishing a bikeshare program while considering the cost of such a program and its potential overlap with other programs (e.g., e-scooter).

The draft ZBL specifies parking requirement reductions to promote adding bicycle parking in excess of the requirements, adding dedicated car sharing spaces, and using the concept of shared parking. These provisions are in line with the TDM best practices and expected to reduce the demand for automobile parking in the future.

Unbundled parking is an emerging strategy that can limit the oversupply of parking at high density residential developments. Brampton may start with a 5-10% parking requirement reduction for developers unbundling parking residential units. Should the strategy prove successful, a larger reduction may be considered in the future.

Increasing parking price rate was among the other recommendations made for the downtown area in Section 2.1 of this report. In addition, dynamic pricing is an effective tool to further manage parking at high demand locations. Brampton is recommended to frequently monitor parking demand profile at the strategic locations and assess the need to change parking prices.

Requiring new developments to implement TDM measures is an emerging policy undertaken by many municipalities. The City of Brampton is recommended to consider requiring large scale

office, institutional, and residential developments to prepare TDM plans that demonstrate how they will support reductions in single-occupant vehicle travel. A point-based TDM checklist can be established to assign a total score for each development and incentives such as reducing parking requirements or reducing the Community Benefit Charges can be granted accordingly.

8 Summary and Next Steps

This report consolidates the findings and materials related to Task 8: Parking Management Plan of the Brampton Parking Plan study. The following subjects were discussed: downtown parking management, parking enforcement, curbside decision making framework, parking partnerships, and transportation demand management. The discussion of each subject included several remarks and recommendations. Below is a summary of the report that highlights the key takeaways and findings.

Several parking management schemes and strategies were discussed and recommended for Downtown Brampton. The most important schemes are those related to parking pricing and finance of the municipal parking system which require major changes to the existing practices. Recommended changes to parking price include:

- Removing the one-hour free parking at municipal garages,
- Increasing the hourly price rate of metered on-street parking, and
- Increasing the cost of the monthly and annual parking permits.

The CIL of parking is no longer feasible in Downtown Brampton and alternative sources of fund need to be established which may include the Community Benefits Charges, increased parking prices, parking partnerships, and leasing the underutilized parking facilities.

There is an increasing demand for enhanced parking enforcement in Brampton due to the increasing use of multi-tenant houses and the resulting parking demand surge. In order to improve the practice and efficiency of parking enforcement in Brampton, handle the increasing number of parking offences, and move gradually into a more proactive enforcement approach, the City is recommended to consider several strategies and technologies. These include establishing priorities among service requests and complaints, improving the complaints registration system, building a system to track and map parking complaints and violations, adding more human resources in terms of enforcement officers and court clerks as needed, increasing the parking fine rates mainly to target repeat offenders, special events, and strategic enforcement areas, expanding the adoption of License Plate Recognition (LPR) technology, using digital parking permit system, and collaborating with a third-party parking app provider.

Guidelines to implement the on-street paid parking permit program were discussed, including the general phases that can be established to implement such a program and some key considerations that are required to be resolved in the residential parking permit program's development and implementation. However, Brampton is recommended to launch a detailed study to serve as "Phase One" of the implementation of the program, the study intends to further evaluate several aspects such as actual parking demand versus available supply, resources needed, program cost, public support, and the impact on existing parking considerations. This should further evaluate the on-street program feasibility and the best practices and prepare the City for a pilot permit program.

In order to address competing uses at the curbside and ensure efficient use of public space, a decision-making framework was developed. This framework can aid decision makers in determining where, when and whether it is appropriate to modify the design of a corridor to better serve a given area. The framework relies on establishing different typologies, users (or stakeholders), and functions of the curbside along with priorities.

Parking partnerships will become more important in strategic areas where parking requirements are reduced or rescinded in order to provide more off-site parking supply opportunities and optimize the use of parking facilities. Several types of parking partnerships were discussed, including granting a density bonus for developments adding public parking, entering into operation contracts with private owners and share the revenue, entering into finance contracts and be either a lessee or lessor, and building new parking facilities throughout the P3 projects. A combination

of different types of agreements may be considered in the same area. The on-going initiatives to generate funding support for public parking, such as the Community Benefit Charges in the Downtown and other Major Transit Station Areas, can further promote the use of shared-parking schemes.

TDM initiatives are effective tools to influence travel behaviour by improving and promoting modes of transportation alternative to single occupancy vehicles. Bicycle parking and infrastructure, carshare programs, shared parking, unbundled parking, dynamic pricing, and TDM in new development were discussed as these are considered among the best TDM practices and initiatives that impact parking supply. Requiring new developments to implement TDM measures is an emerging policy that can integrate and promote a wide set of TDM measures in one procedure.

The next steps of Brampton Parking Plan will involve several activities including the following:

- Discuss the existing report materials with the City's Working Committee
- Prepare for the Steering Committee Meeting No. 3
- Plan for Public Engagement Session No. 3
- Complete Task 9: Municipal Parking Strategy Report