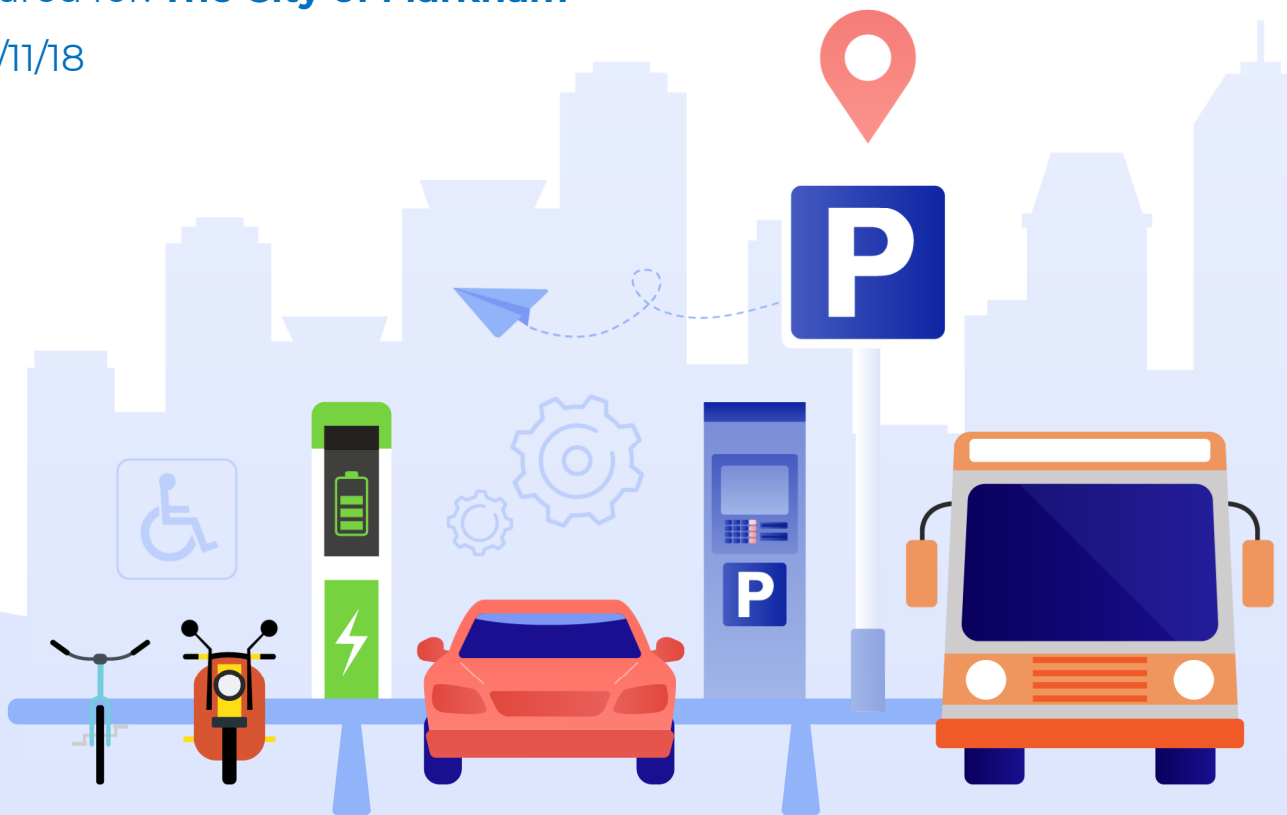


Markham Citywide Parking Strategy

Final Recommendations Report

Prepared for: **The City of Markham**

2025/11/18



EXECUTIVE SUMMARY

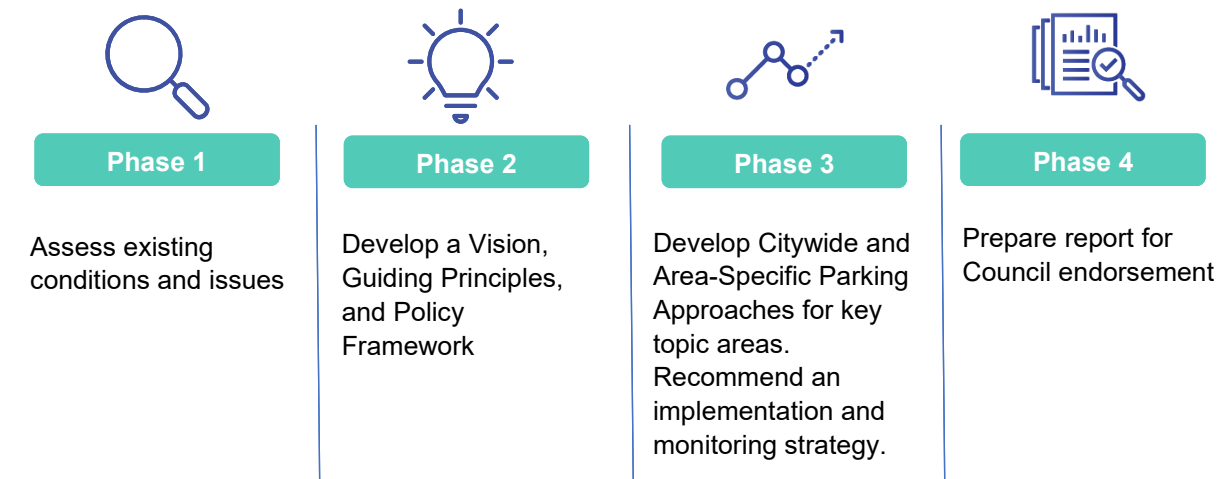
PURPOSE AND OBJECTIVES

The purpose of the City of Markham Citywide Parking Strategy (CWPS) is to establish a policy framework to guide the planning, management, and provision of parking in Markham. This strategy was developed in alignment with Markham’s overarching city-building objectives and complement the ongoing Markham Transportation Master Plan and the forthcoming Official Plan Review.

The CWPS positions parking as an essential component of a complete and sustainable transportation system. It addresses residential parking needs, supports local businesses, advances a continued shift toward a multi-modal travel, contributes to the City’s climate and sustainability goals, and prepares for emerging trends such as micromobility, electric vehicles (EVs), and connected and automated vehicles (CAVs).

STUDY PROCESS AND ENGAGEMENT

The CWPS is organized into four study phases:



A robust engagement program informed all phases of the study. Input was obtained from Council, internal and external stakeholders, and the community through workshops, focus groups, pop-up events, and an online platform. Key themes emerging from engagement included:

- The desire for appropriate parking standards and area-specific parking solutions,
- Support for sustainable travel modes and municipal paid parking,



- The importance of equity and accessibility, and
- The desire for improved trail and recreational parking.

These insights emphasize that parking management must respond to diverse local contexts and support City’s broader building objectives.

VISION AND FRAMEWORK

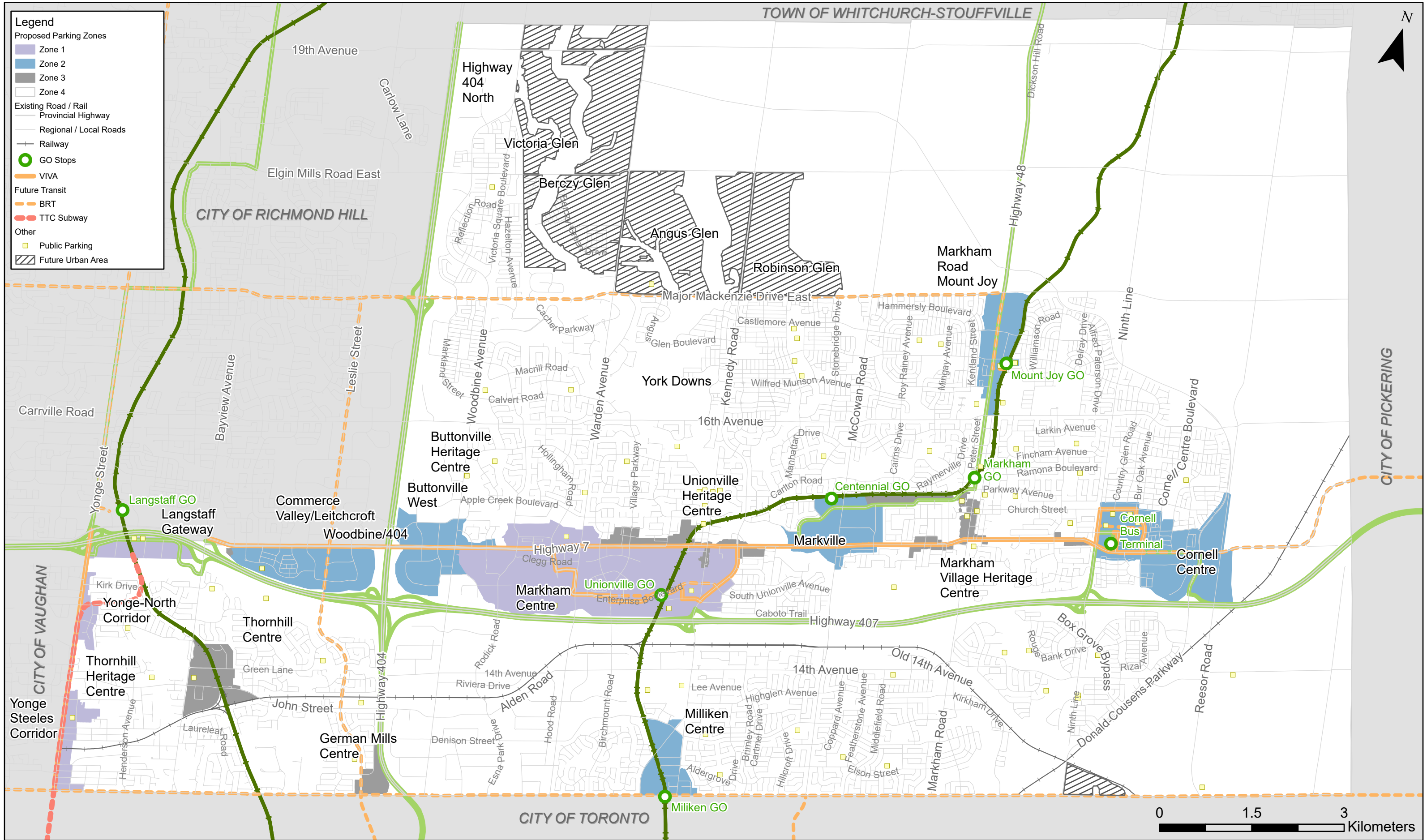
Markham’s vision for parking is to create adaptive area-specific policies, standards and programs that align with the City’s commitment to providing residents, visitors, and businesses with an efficient, safe, equitable, reliable, and convenient transportation system and support the City’s transformation into a more sustainable, multi-modal, and livable city.

Supporting the vision are four parking principles:



To enable a context-sensitive approach to parking management, the CWPS recommended that four Parking Zone Map be created in the City as presented in **Exhibit 1**. A Parking Zone Criteria is recommended to evaluate key drivers affecting parking demand and guide the geographic delineation and assignment of Markham’s Parking Zones. The criteria consider access to frequent transit service, urban structure (including Provincial and Markham Official Plan designations), land use mix and density, availability of public parking, walkability and availability of cycling infrastructure, and the use of paid parking and other parking management measures.

Recommended Parking Zones



KEY POLICIES

Key parking policies were developed in alignment with the CWPS vision and framework:

1. Develop Parking Standards to complement the City’s Parking Zones
2. Develop a citywide Transportation Demand Management Program
3. Transition from unpaid to paid public parking in Zones 1 and 2
4. Ensure equitable allocation of curb space, manage public assets, and support mobility through appropriate curbside management practices
5. Expand the citywide on-street parking system
6. Develop and leverage an integrated smart parking technology platform to support various functions including parking and curbside delivery while minimizing deployed infrastructure.
7. Develop parking considerations for connected and automated vehicles (CAV) for on-street and off-street parking
8. Develop and leverage an integrated smart parking technology platform to support various functions including parking and curbside delivery while minimizing deployed infrastructure
9. Develop a citywide parking policy for micromobility devices
10. Develop appropriate parking supply and improve multi-modal access at high-priority trailheads and major parks

GOVERNANCE AND FINANCE PRINCIPLES

Parking governance and finance principles were also developed to guide future decision-making related to parking:

- Support the CWPS Vision
- Balance between revenue optimization and community benefits in meeting the City’s strategic objectives.
- Maintain City control over planning, operations, and financial objectives.
- Optimize the integration of parking into the overall multi-modal transportation network.
- Develop parking policies, procedures, and guidelines that provide accountability, traceability of decisions, and openness.



- Provide public parking services where revenue covers all parking costs with no contribution from the property tax base.

IMPLEMENTATION AND MONITORING

The implementation plan outlines the actions required to deliver the CWPS recommendations. Actions are sequenced to balance short-term solutions with long-term strategic planning. Implementation will be initiated by City staff at the appropriate times and subject to Council approval and available sources.

The short-term action items to be completed within five years include:

- Incorporate the Parking Zones Map into the Official Plan
- Update Parking and TDM Standards
- Review the Residential Overnight On-Street Parking Permit Program
- Develop a Micromobility Parking Strategy
- Develop a Curbside Management Guideline to address community needs for on-street parking and delivery

An action to be undertaken on an ongoing basis is:

- Conduct educational campaigns to promote public awareness of parking regulations and to encourage existing buildings to be upgraded with EV and micromobility parking

The future action items to be initiated beyond five years include:

- Develop a Municipal Parking Management Plan to address paid parking and the delivery of additional parking infrastructure
- Create Parking Management Plans for Heritage Areas
- Develop a municipal electric vehicle (EV) parking management plan to guide the delivery of municipal EV charging infrastructure
- Review and integrate smart parking technology into municipal parking operations
- Develop a Parks and Trails Parking Management Plan to improve access to key recreational destinations
- Develop a Connected and Autonomous Vehicles (CAV) Parking Plan, including standards for CAV infrastructure

To track implementation progress, the CWPS includes a Key Actions Tracking Form for internal use and recommends the following recurring reviews:



- Parking governance structure review every 3 to 5 years
- Annual review of municipal parking assets
- Annual or semi-annual review of parking fees
- Annual parking budget program and capital needs plan



TABLE OF CONTENTS

- EXECUTIVE SUMMARY III
- Purpose and Objectivesiii
- Study Process and Engagementiii
- Vision and Frameworkiv
- Key policies.....vi
- Governance and Finance Principlesvi
- Implementation and Monitoring.....vii

- 1 INTRODUCTION 9
 - 1.1 Study Purpose9
 - 1.2 Study Process.....9

- 2 ENGAGEMENT 11

- 3 PARKING POLICY FRAMEWORK 14
 - 3.1 Methodology14
 - 3.2 Parking Vision Statement14
 - 3.3 Guiding Principles.....14
 - 3.4 Parking Zones and Criteria.....15
 - 3.4.1 Application 18

- 4 PARKING POLICIES 20
 - 4.1 Methodology20
 - 4.2 Land Development Parking Plan20
 - 4.2.1 Context.....20
 - 4.2.2 Policy.....24
 - 4.3 Curbside Management & On-Street Parking Plan32
 - 4.3.1 Context.....32
 - 4.3.2 Policy.....38
 - 4.4 Parking Technology Plan41
 - 4.4.1 Context.....41
 - 4.4.2 Policy.....43
 - 4.5 Connected Autonomous Vehicles Parking Plan47
 - 4.5.1 Context.....47
 - 4.5.2 Policy.....49
 - 4.6 Electric Vehicle (EV) Parking Plan50
 - 4.6.1 Context.....50



TABLE OF CONTENTS

- 4.6.2 Policy..... 53
- 4.7 Micromobility Parking Plan58**
- 4.7.1 Context..... 58
- 4.7.2 Policy..... 59
- 4.8 Trails and Major Parks Parking Plan62**
- 4.8.1 Context..... 62
- 4.8.2 Policy..... 63
- 5 PARKING GOVERNANCE 67**
- 5.1 Parking Organizational Structure67**
- 5.2 Types of Organizational Structure.....70**
- 5.2.1 Horizontally Integrated Parking Organizational Structure (Existing Markham)..... 70
- 5.2.2 Vertically Integrated Parking Organizational Structure 74
- 5.2.3 Parking Authority 74
- 5.2.4 Privatization 74
- 5.2.5 Public Private Partnership (P3) / Business District 75
- 5.2.6 Private Sector Parking 75
- 5.3 Evaluation of Parking Organizational Structures82**
- 5.3.1 Considerations for a Parking Authority 84
- 5.3.2 Recommendation for a Municipal Parking Organizational Structure . 87
- 5.3.3 Rationale for a Vertically Integrated Parking Organizational Structure 89
- 5.4 Governance and Finance Principles90**
- 6 PARKING FINANCIAL ASSESSMENT 91**
- 6.1 Importance of Parking Finance91**
- 6.2 Elements and Assumptions of Parking Financial Model93**
- 6.2.1 Elements of the Financial Model 94
- 6.2.2 Critical Assumptions of the Financial Model 95
- 6.3 Financial Evaluation of Parking Facility Options97**
- 6.3.1 Parking Structures & Surface Lot 98
- 6.3.2 On-Street Parking..... 100
- 6.3.3 Overnight Residential Parking Permits 102
- 6.4 Recommendations for Financial Parking Operation103**
- 6.4.1 Risk Mitigation 103



7 IMPLEMENTATION PLAN 105
8 MONITORING PLAN..... 115

TABLE OF CONTENTS



1 INTRODUCTION

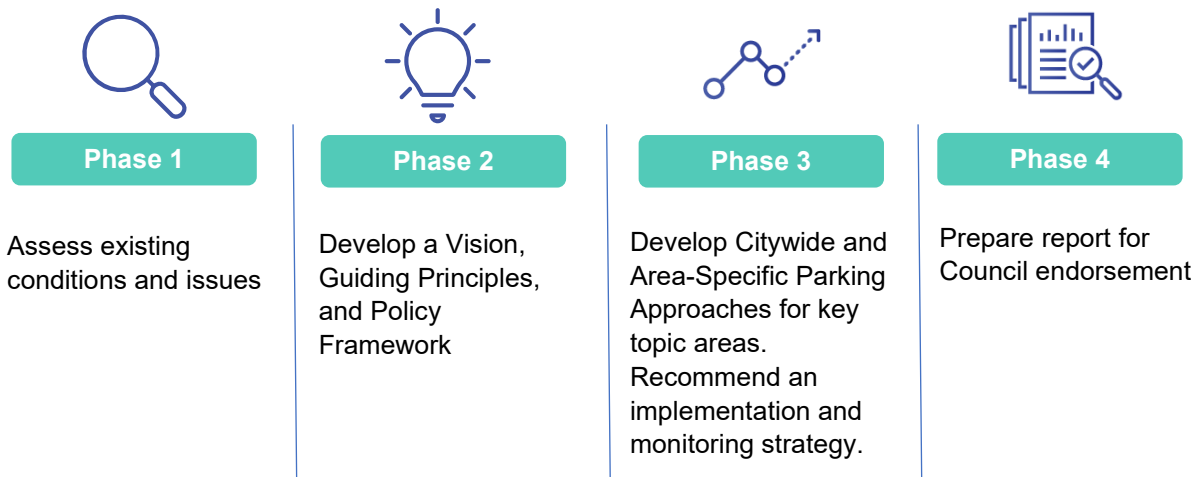
1.1 STUDY PURPOSE

The purpose of the City of Markham Citywide Parking Strategy (CWPS) is to develop a policy framework to guide the planning, management, and provision of parking in Markham. This strategy was developed in alignment with Markham’s overarching city-building goals and is complementary to the ongoing Markham Transportation Master Plan and the forthcoming Official Plan Review. The CWPS leverages parking to address residential parking needs, support local businesses, advance a continued shift toward a multi-modal City, contribute to the City’s climate and sustainability objectives, and adopt emerging trends such as micromobility, electric vehicles, and connected and automated vehicles in the longer term.

1.2 STUDY PROCESS

The Citywide Parking Strategy is organized into four study phases as described below.

Figure 1-1 The CWPS Study Process



Phase 1: Assess existing conditions and Issues.

The Phase 1 background report (March 2023) provides the foundation for developing the study recommendations.

Phase 2: Develop a Vision, Guiding Principles, and Policy Framework.

These elements ensure a cohesive parking strategy that aligns with Markham’s broader city-building and transportation planning goals. The draft vision, guiding principles and



parking zone criteria were presented to the Development Services Committee (DSC) and endorsed by Council in May 2023.

Phase 3: Develop Citywide and area-specific parking approaches for key topic areas and recommend an implementation and monitoring strategy.

The recommended policies address land development parking, curbside management and on-street parking, parking technology, connected autonomous vehicle parking, electric vehicle parking, micromobility parking, trails and major parks parking.

Key milestones in presenting the study to Council included:

- February 2024: A Council Workshop was held through a Special DSC to review and receive feedback on draft parking policies and recommendations. The presentation was received by Council.
- September 2024: The draft governance and financial principles were presented and endorsed by Council.
- June 2025: A Council Workshop was held through a Special DSC to present and receive feedback on the draft Implementation and Monitoring Plan. The presentation was received by Council.

Phase 4: Prepare a draft and final report for Council endorsement.

This report presents the final study recommendations including Markham’s parking vision and framework, parking policies, governance and finance principles, an implementation plan, as well as a monitoring plan.

Extensive engagement was undertaken throughout the study to inform and gather feedback from City staff, members of Council, and the public, including residents, business and development communities. The input received was considered in the review and preparation of the final study recommendations.



2 ENGAGEMENT

A robust engagement program was undertaken throughout the study (2022 to 2025) to inform stakeholders and solicit feedback for incorporation into the study recommendations.

External Engagement

The public and stakeholder engagement program aimed to promote public awareness of the CWPS, encourage participation in engagement activities, and engage stakeholders through various methods and in both online and in-person settings. The external engagement activities completed for the CWPS included the following:

- A project website on Your Voice Markham used throughout the duration of the project to provide study information, updates, as well as opportunities for engagement, including the Ideas Tool, Places Mapping Tool, and an online survey
- A virtual public open house to present and solicit input for the development of key parking policies
- Three virtual focus group meetings to discuss the parking vision, framework, and key policies with community members representing Markham’s Business Improvement Areas (BIAs), equity deserving groups, major employers, land owners and developers
- Two stakeholder surveys to identify existing issues and to understand the community’s values and aspirations for accommodating future growth in the City
- Seven community pop-up events were held across all study phases to share information and solicit feedback on the parking vision, framework, and implementation plan at Markville Mall, Thornhill Community Centre, Cornell Community Centre, and Milliken Mills Community Centre

Internal Engagement

Internal engagement with staff from various City departments was crucial in developing a comprehensive understanding of the City’s priorities, collecting input in the development of the study recommendations, and ensuring that the recommendations align with multiple ongoing and interrelated initiatives. A structured review process included:

- Five meeting presentations and discussions with the Internal Advisory Committee (IAC) comprised of representatives from City departments with a role of function in parking planning, operations and management
- Three meetings with the Executive Leadership Team (ELT) to review and validate the key study recommendations



Council Engagement

Markham Council was engaged at each study phase through a series of staff reports and presentations to the Development Services Committee (DSC) and in-depth study workshops via Special DSC meetings. As noted in Section 1.2, these include:

- A report to the DSC (May 30, 2023) presenting the draft parking vision, guiding principles and parking framework (Parking Zones)
- Workshop #1 (February 12, 2024, via special DSC) presenting and soliciting feedback on the draft parking policies
- A report to the DSC (September 17, 2024) presenting the draft governance and finance principles
- Workshop #2 (June 16, 2025, via special DSC) presenting the draft implementation and monitoring plan

Key Takeaways

The engagement outcomes confirmed that parking is a common concern for residents and businesses alike. The feedback received reflected on current parking constraints, opportunities to roll out parking solutions in the short-term, and aspirations for continued improvements. These are summarized into the following six key themes:

- Parking Standards
 - Address insufficient parking supply in some areas
 - Desire for more on-street parking
 - Explore shared parking opportunities
 - Address the impacts of Provincial legislation on parking supply for new developments
- Area Specific Parking Solutions
 - Need for separate parking strategies for Heritage Areas
 - Address increasing parking demand in multigenerational homes through the overnight parking permit program
- Support Sustainable Travel Modes
 - Support public transit to reduce auto dependency
- Desire to integrate EV chargers at key destinations
- Municipal Paid Parking
 - Roll out municipal paid parking in strategic locations
 - Explore public-private partnerships
 - Explore funding mechanism to expand municipal parking supply
- Equity and Accessibility



- Address Accessible parking needs (on and off sites)
- Establish Parking requirements for affordable housing
- Trail and Recreational Parking
 - Address insufficient parking near major trails and major parks

The opportunities and constraints identified through the engagement process highlight the need for a context-sensitive approach to parking provision and management. They also emphasize the essential role that parking plays in a well-functioning city, supporting local businesses, enabling housing affordability, and advancing sustainability objectives.

The feedback received through all phases of engagement directly informed the formulation and refinement of the CWPS vision, governance principles, policies, and implementation plan. This collaborative process ensured that the final Strategy reflects Markham's diverse contexts and provides a practical and balanced framework for managing parking citywide.



3 PARKING POLICY FRAMEWORK

3.1 METHODOLOGY

Markham’s parking policy framework was developed based on the findings of the CWPS Phase 1 background review which examined the current policy context at the Provincial, Regional, and municipal levels, current and future land use, and multi-modal transportation context, as well as parking trends and best practices in other jurisdictions. The parking policy framework includes a parking vision, guiding principles, parking zones and corresponding criteria and guidelines.

3.2 PARKING VISION STATEMENT

The CWPS Parking Vision expresses Markham’s intention to leverage parking as a key component of city-building and transportation planning. It articulates the values of the community including residents and businesses, and aligns with the City’s Official Plan and 2020-2026 Strategic Plan.

Markham’s vision for parking is to create adaptive area-specific policies, standards and programs that align with the City’s commitment to providing residents, visitors, and businesses with an efficient, safe, equitable, reliable, and convenient transportation system and support the City’s transformation into a more sustainable, multi-modal, and livable city.

3.3 GUIDING PRINCIPLES

The following guiding principles elaborate on Markham’s Parking Vision and were used to guide the development of the parking policies presented in Section 4.



1. Adapt to Local Mobility Contexts:

- Tiered Parking Requirements: apply higher and lower requirements depending on local mobility context.

2. Support Sustainability, Climate-resilience, and Net Zero Emissions by 2050:

- Transit and Active Transportation Accessibility: encourage and support increased transit service and active transportation across the City.

3. Integrate Development and City Building Objectives:

- Priority of land/resources: consider parking against other priorities when making decisions on the best use of land and best investment of resources.
- TDM: Integrate TDM solutions into developments and require higher TDM initiatives in areas with lower vehicle parking requirements.

4. Improve Efficiency of Parking Infrastructure and Operations:

- Shared/Public Parking: allow sharing parking facilities/supplies among nearby land uses.
- Price Parking: price public parking and unbundle the sale of parking from residential units.
- Smart Parking Technology: use appropriate technology to monitor, manage, and operate parking and communicate parking and travel information.
- Parking Management: apply parking management measures to minimize over- and undersupply of parking spaces.

These principles should continue to guide the City’s future decision-making on parking-related issues.

3.4 PARKING ZONES AND CRITERIA

To enable a context-sensitive approach to parking management, it is recommended that four Parking Zones be created in the City representing four different parking contexts.

The Parking Zone Criteria presented in **Exhibit 3-1** was created to guide the geographic delineation and assignment of Markham’s Parking Zones. It evaluates the key aspects of a local area context that affect parking demand. These include access to frequent transit service, urban structure (including Provincial and Markham Official Plan designations), land use mix and density, availability of public parking (including municipal and privately owned facilities), walkability and availability of cycling infrastructure, and the use of paid parking and other parking management measures.

The resulting Parking Zone map is shown in **Exhibit 3-2**.



Exhibit 3-1 Parking Zone Criteria

Criteria		Parking Zone 1	Parking Zone 2	Parking Zone 3	Parking Zone 4
1. Transit	a) 15-min access to two Regional Transit Services, across more than one municipality (operational, in delivery, development, or planned) Examples: GO Transit, Highway 407 Transitway	Yes	Not required	Not required	Not required
	b) Frequent Rapid Transit or Frequent Bus Transit Service (15-min all-day two-way service, operational, in delivery, development, or planned) Example: VIVA BRT	Yes	Yes	Yes	Not required
2. Urban Structure	a) Urban Growth Centre, Major Transit Station Area (MTSA), or Mobility Hub	Yes	Yes	Not required	Not required
	b) Secondary Plan Area containing an Intensification Area or Key Development Area (KDA)	Yes	Yes	Not required	Not required
3. Land Use and Density	a) Mix of uses to support 'live, work, and play'	Yes	Yes	Yes	Not required
	b) Medium to high density uses Example: Multi-unit residential and multi-storey Office	Yes	Yes	Yes	Not required
4. Public Parking Supply	Availability of public parking (City and privately owned), shared parking, and on-street parking (existing, planned, or proposed)	Highest	Lower than Parking Zone 1 but higher than Parking Zone 3	Lower than Parking Zone 2 but higher than Parking Zone 4	Lowest
5. Active Transportation	a) Walkability	Highly walkable (Walk score is 90+)	Some walkability, lower than Parking Zone 1 but higher than Parking Zone 3 (Walk Score is 25+)	Some walkability, lower than Parking Zone 2 but higher than Parking Zone 4 (Walk Score is 25+)	Limited walkability
	b) Bicycle parking and cycling facilities	High accessibility to bicycle parking and cycling facilities	Some accessibility to bicycle parking and cycling facilities, lower than Parking Zone 1 but higher than Parking Zone 3	Some accessibility to bicycle parking and cycling facilities, lower than Parking Zone 2 but higher than Parking Zone 4	Limited or no accessibility to bicycle parking and cycling facilities
	a) Shared mobility services Examples: car share, bike share, ride share	Yes	Yes	Yes	Limited
6. Parking Management Measures	a) Unbundled parking	Yes	Yes	Yes	Encourage where appropriate
	b) Pick-up and drop-off zones	Yes	Yes	Yes	Encourage
	c) Paid parking	Encourage	Encourage	Encourage where appropriate	Encourage where appropriate



The recommended Parking Zones are described as follows:

- Parking Zone 1 captures the most urban and transit accessible parts of the City, consisting of the MTSA along the Yonge corridor, Langstaff Gateway, and the Markham Centre Secondary Plan area. Parking Zone 1 boundaries follow either MTSA or Secondary Plan area boundaries. As such, Parking Zone 1 includes lands in Markham Centre that are not part of an MTSA.
- Parking Zone 2 captures the second most urban and transit accessible parts of the City, and includes MTSA along the Highway 7 and GO rail corridor, as well as the Markville, Markham Road Mount Joy, Milliken Centre, and Cornell Centre Secondary Plan areas. Parking Zone 2 boundaries follow either MTSA or Secondary Plan area boundaries. As such, Parking Zone 2 includes lands in Markville, Markham Road Mount Joy, Milliken Centre, and Cornell Centre Secondary Plan areas that are not part of an MTSA.
- Parking Zone 3 captures lands with some urban characteristics such as mixed uses, higher densities, and frequent transit. Parking Zone 3 includes Thornhill Centre, German Mills Centre, Markham Main Street's mixed-use area, as well as some fringe areas abutting Parking Zones 1 and 2.
- Parking Zone 4 captures the remaining lands in Markham that have suburban characteristics.

The Parking Zone map is intended to evolve over time to keep up Markham's changing urban landscape and mobility context. For example, with future Official Plan updates and transportation network improvements, certain lands may merit a change in Parking Zone designation. Any update to the Parking Zone delineation or designation should aim to achieve a best fit in the Parking Zone Criteria. Use of the criteria encourages fair decision making, and ensures that the appropriate parking treatments will be applied for the location context.

3.4.1 APPLICATION

The Parking Zones provide a framework for the City to set tiered parking and TDM requirements. The City should aim to achieve the lowest parking supply in Parking Zone 1, and maintain a sufficient parking supply (highest) in Parking Zone 4 to support a suburban, auto-oriented context.

Recent changes to the Ontario Planning Act (*Bill 185 – Cutting Red Tape to Build More Homes Act, 2024*) restrict the City from imposing minimum parking requirements for developments in Major Transit Station Areas (MTSAs). This affects lands in Parking Zones 1 and 2 which include all of Markham's MTSAs. Accordingly, there are no minimum parking requirements in Parking Zones 1 and 2, however the City can set maximum parking requirements to control the supply of parking in these Parking Zones.



The specific minimum and maximum parking requirements for various land uses in each Parking Zone are to be determined in a separate study undertaken by the City.

It should be noted that some parts of Parking Zones 1 and 2 are not designated as MTSA lands, and the City has the legislative authority to impose minimum parking requirements in those specific areas. For ease of zoning by-law interpretation and administration, it is recommended that no parking minimum requirements apply in all of Parking Zones 1 and 2.

Aside from parking and TDM requirements for new developments, the Parking Zone framework also enables the City to vary other parking regulations and parking management tactics by Parking Zone. Considerations may include, for example, the application of paid parking, parking time limits, parking permits, TDM and multi-modal investments in the public realm.



4 PARKING POLICIES

4.1 METHODOLOGY

Parking policies for Markham were developed based on the background understanding established in Phase 1, the vision and policy framework developed in Phase 2, and input gathered from extensive engagement with residents, businesses, City staff, and Council.

4.2 LAND DEVELOPMENT PARKING PLAN

This section provides an overview of the relevant context considered in developing the policies related to land development parking and presents the parking policy and sub-policies.

4.2.1 CONTEXT

Existing issues in the City of Markham were identified based on a review of current City policies and guidelines, and feedback obtained from various stakeholders and the public. As such, the key issues pertaining to land development are summarized below:

Parking Standards

Markham’s new Comprehensive Zoning By-law 2024-19 (CZBL) came into force in January 2024. The CZBL includes significant changes to the parking standards in the previous City of Markham Parking Standards By-law 28-97. Some of the major changes are as follows:

- Provision of two sets of parking standards – one for Key Development Areas (KDAs) and Major Transit Station Areas (MTSAs) or other areas deemed appropriate through a Zoning By-law Amendment, and the other for all other areas within the City. Previously, the City’s Zoning By-law included only one general parking standards applicable throughout the City.
- Inclusion of bicycle parking space requirements
- Inclusion of electric vehicle parking requirements

Subsequently in June 2024, changes to the Planning Act (*Bill 185 – Cutting Red Tape to Build More Homes Act, 2024*) restricted the City from imposing minimum parking requirements for developments in MTSAs. Through consultation with City staff, it was confirmed that this applies to all of Markham’s MTSAs, and that a future update to the City parking standards is needed to align with the new provincial legislation.



Four Parking Zones are recommended to enable the application of tiered parking and TDM requirements as well as other parking regulations and parking management measures. Its implementation would require the adoption of the recommended Parking Zones Map into the Official Plan, which would then enable Parking Zone-specific parking requirements to be established in the CZBL

A jurisdictional scan performed for similar jurisdictions across Canada (as part of the CWPS Phase 1 background review) indicates that there is scope for further reduction of vehicular parking requirements in certain zones within the City.

Accessible Parking

Accessible parking is required as a component of the minimum parking supply in the Markham CZBL. Therefore, when eliminating or reducing parking requirements, accessible parking regulations also need to be examined. It is noted that accessibility is a key topic raised by various stakeholders throughout the study process. Accessibility is also an important consideration for building an equitable transportation system.

Accessible parking in Markham is subject to provincial legislation, specifically the Accessibility for Ontarians with Disabilities Act (AODA) which sets out minimum standards for accessible parking supply and accessible parking design (dimensions, location). Future updates to the CZBL need to be consistent with AODA requirements, and may exceed them. The AODA provides comprehensive accessible requirements that are adopted by most GTA municipalities, however the following limitations should be noted:

- The AODA requires that accessible parking spaces be provided in a parking facility. However, in the case of a development with zero parking, no accessible parking requirements apply. Toronto's accessible parking requirements deviate from this approach by incorporating a minimum accessible parking requirement related to land use (accessible spaces required per number of units or GFA). This approach has raised practical challenges. For example, accessible parking spaces are required in an otherwise zero-parking development. In a downtown setting, there are more desirable uses for the ground level than accessible parking, and meeting accessible parking requirements underground can be impractical (a ramp servicing only a few accessible parking spaces).
- The AODA governs only parking facilities that are open to the public. This includes workplaces and residential visitor parking but excludes resident parking. The AODA suggests that its parking standards be applied as a guideline for private parking (resident parking). Markham may choose to adopt the AODA parking standards as a requirement for all uses.
- When a municipality plans for on-street parking, the AODA requires that the public be consulted, so that any accessible needs can be heard and considered.



Affordable Housing

The City of Markham ‘*Affordable and Rental Housing Strategy Report*’ (2021) states that 1 in every 3 households in the City has housing affordability issues. Therefore, the City plans to increase the supply of affordable housing through inclusionary zoning by developing an Inclusionary Zoning By-Law for select MTSA’s and then beyond MTSA’s. Parking requirements can be a barrier to affordable housing since constructing parking increases development costs.

Residents seeking affordable housing units may be more tolerant of lower parking supplies given the high costs of vehicle ownership, they may also be more receptive to TDM measures that encourage the use of alternative travel modes. The shift away from vehicle ownership toward alternative modes depends also on local contexts and the ability of those residents to meet their travel needs without a car.

The new CZBL does not include any unique parking requirements for affordable housing units. As such, the minimum parking space requirements for apartment dwellings, multiple dwellings, and multiplex dwellings in the CZBL may be prohibitive to the provision of affordable housing units. There may be opportunities to provide alternative (reduced) parking requirements for affordable housing along with supportive TDM requirements in appropriate Parking Zones.

Shared Parking

Shared parking provisions for mixed-use developments are commonplace and are already implemented in Markham’s new CZBL. Shared parking refers to an arrangement where a specific parking supply is shared among different users. This allows for more efficient use of parking spaces, which frees up space for other land uses or supports higher development densities. Shared parking is most effective between land uses with complimentary temporal parking demand characteristics.

The concept of shared parking can be expanded and applied to mixed uses on multiple development sites within a walkable area. For example, an office requires parking during the weekday daytime. During the evenings and weekends, the office parking sits mostly empty and can be used to accommodate other users who experience their peak activity during this time. A nearby church may wish to use the office parking on Sundays. A memorandum of understanding (MOU) between the office and the church is typically required to implement the shared parking arrangement. The City may require the MOU to ensure that sufficient parking is provided at each site. Shared parking between multiple sites is typically addressed through development review on a site-by-site basis.



Public Parking and Public-Private Partnerships

A development may offer its on-site parking for public use, thereby sharing its parking supply with all other surrounding uses within acceptable walking distance. This is typically done only for residential visitor parking and non-residential parking, and may be operated as paid parking. An example in Toronto is the incorporation of Green P public parking levels within a larger parking garage belonging to a private development. This is delivered through a public-private partnership (P3) between the Toronto Parking Authority (TPA) and the land developer. The parking garage is especially designed to have a Green P parking component with separate access control, payment system, and design criteria (parking dimensions, signage).

To deliver public parking supply in private developments, Markham may consider:

- Permitting public paid parking in appropriate zones, this would give developers the option to construct public parking in place of dedicated visitor/employee parking, and
- Pursuing the delivery of municipal parking via P3.

Transportation Demand Management (TDM) Integration

TDM involves the use of policies and programs to manage travel demand by encouraging alternative travel modes and reducing single occupancy vehicle (SOV) travel. The convenience of available and cheap parking or lack thereof is powerful in influencing travel mode choice. Where parking is reduced, other TDM measures can encourage people to adopt alternative travel modes.

TDM is traditionally used to justify parking reductions in development applications where the requested parking reduction is considered on a case-by-case basis. To achieve a more consistent approach, some jurisdictions, such as the City of Vaughan and the Region of Waterloo have established TDM guidelines that specify parking reduction as a TDM measure, and support the concept of earning parking reductions through TDM implementation. In Vaughan, earned parking reductions are included in the Zoning By-law.

Markham currently has a TDM Plan Terms of Reference (June 2023) to guide the preparation of TDM plans to be submitted as part of development applications. The City does not have its own TDM Guidelines, nor does it permit earned parking reductions in the CZBL through the implementation of TDM measures. Given the elimination of minimum parking requirements in Parking Zones 1 and 2, it is now more critical for the City to develop a more robust TDM guideline, which may also include minimum TDM requirements.



Paid Parking

Given the recent elimination of minimum parking requirements in MTSA's (captured in Parking Zones 1 and 2) and a trend of lower on-site parking supply in developments, parking demands may spillover and overwhelm the on-street parking supply and other off-street public parking facilities. Paid parking is an effective tool to manage parking demand, especially when the parking fees make a trip more costly than taking transit.

Factors affecting the feasibility of paid parking include land use context and opportunities for free parking nearby. For example, in an unsuitable location, the introduction of paid parking can push people to park in free parking lots nearby, or even drive away business where potential customers choose to meet their shopping and service needs elsewhere.

Parking in Heritage Areas

Parking on Markham's Main Streets was a major issue identified by stakeholders including members of Council. Specifically, in historic Main Street Unionville and Main Street Markham, on-street parking spaces are highly sought after and highly utilized as these are the most visible and provide the most convenient access to businesses on the Main Street. In the Unionville Heritage Area, off-street parking is provided in the rear lots, however the parking is disjointed and there are opportunities to improve the visitor parking experience by consolidating the rear lots into a larger lot with a more efficient parking layout.

4.2.2 POLICY

The policies related to land development are presented below in bold text. Details are provided for the City's consideration and are not intended to be directly implemented as policy, allowing flexibility for the City to determine the necessary details during follow-up studies and during implementation.

Policy 1: Develop Parking Standards to complement the City's Parking Zones

- **Policy 1.1: Right-size parking by varying parking standards by Parking Zone and update regularly as Markham transitions over time**

The following details may be considered:

- Update the vehicular parking requirements in the CZBL to align with the Parking Zones. The lowest parking provision would be targeted in Parking Zone 1, while the highest parking provision would be targeted in Parking Zone 4.
- Eliminate minimum parking requirements in Parking Zones 1 and 2 to comply with Provincial legislation. For ease of administration, this includes lands in Parking Zones 1 and 2 that are beyond MTSA boundaries. Parking maximums can be established.



- Consider accessible parking needs when updating vehicular parking requirements, and ensure compliance with the Accessibility for Ontarians with Disabilities Act (AODA).
 - Establish TDM guidelines for developments to support the reduction and elimination of minimum parking requirements in the City.
 - Periodically review and update the criteria for different Parking Zones, the Parking Zone map, as well as parking requirements in keeping with the City’s transition over time.
 - In addition to zoning updates, amendments of Parking Zones or parking requirements may be considered on a site-by-site basis through development review.
- **Policy 1.2: Encourage shared parking for the efficient use of land and infrastructure**

The following details may be considered:

- Continue to support shared parking for the efficient use of land and infrastructure. Shared parking can improve housing affordability by lowering parking construction costs.
 - Support shared parking provisions for mixed-use developments through the CZBL.
 - Support off-site shared parking arrangements between multiple developments in the development review process.
- **Policy 1.3: Support affordable housing through reduced parking requirements where appropriate**

The following details may be considered:

- Establish a definition of affordable housing, and reduce minimum parking requirements for affordable housing units in Parking Zone 3 where alternative mode choices are available. A reduction of 30 to 50 percent may be considered. (Parking Zones 1 and 2 would not have any minimum parking requirements but would have supportive TDM requirements)
 - No reductions should be considered for Parking Zone 4 since there are fewer alternative mode choices and communities are more auto-dependent.
 - Support further site-specific parking reductions where appropriate in the development review process.
- **Policy 1.4: Develop parking management plans for Heritage Areas including consideration for paid parking**

The following details may be considered:



- Establish Heritage Parking Plan Areas for the Thornhill Heritage Centre, Unionville Heritage Centre, and Markham Village Heritage Centre as shown in **Exhibit 4-1**.
- For each Heritage Parking Plan Area, conduct a study to identify major parking challenges and develop a parking management plan in collaboration with City staff, residents, local businesses, and other stakeholders.
- The parking studies should include a parking demand and supply analysis, development of parking supply options, determination of paid versus free parking, consider implementation and cost, enforcement protocol and resource requirements.



Policy 2: Develop a Citywide Transportation Demand Management (TDM) Program

- **Policy 2.1: Enhance citywide TDM Guidelines and Measures**

The following details may be considered:

- Prepare a TDM guideline for developments that identifies appropriate TDM strategies and measures as well as their applications in the different Parking Zones.
- Consider maximum TDM application in Parking Zone 1, and minimum TDM application in Parking Zone 4 with a focus on measures that are compatible with a suburban context.
- The TDM guidelines may specify measures that are required, encouraged, or not recommended for key land uses in each Parking Zone.
- Conduct post-occupancy travel surveys to evaluate the effectiveness of proposed TDM strategies.
- Review the TDM guidelines on a regular basis and update them based on recent trends in transportation and best practices.

A list of potential TDM measures is presented in **Exhibit 4-2**. A sample TDM guideline format is shown in **Exhibit 4-3**.

- **Policy 2.2: Introduce earned parking reductions through enhanced TDM provision**

The following details may be considered:

- Explore opportunities to earn parking reductions in Parking Zones 3 and 4 by exceeding minimum TDM requirements such as provision of additional bicycle parking beyond minimum requirements. This provides a pathway to achieving parking reductions without a minor variance or Zoning By-law Amendment (ZBA) and secure enhanced TDM measures.
- Soft TDM measures such as services and programming are not suitable for inclusion in the CZBL. For example, while a car share spaces can be designated in a development, the corresponding car share service may end due to market conditions and create a zoning non-conformance. Soft TDM measures should be addressed in the TDM guidelines.



Exhibit 4-2 Potential TDM Measures for Developments

Active Transportation
<ul style="list-style-type: none"> • Micromobility parking on-street or in the right-of-way (racks, lockers)
<ul style="list-style-type: none"> • Micromobility parking in a secure off-street location
<ul style="list-style-type: none"> • Bike/scooter share
<ul style="list-style-type: none"> • Showers and changing facility
<ul style="list-style-type: none"> • Bike repair station
<ul style="list-style-type: none"> • Micromobility hub
<ul style="list-style-type: none"> • Bike shop vouchers
<ul style="list-style-type: none"> • Prominent building entry for bikes, bike elevator or ramp
Transit
<ul style="list-style-type: none"> • Free or discounted transit passes for 1 year for residents or employees at initial building occupancy
<ul style="list-style-type: none"> • Transit amenities (shelters, Wi-Fi, etc.)
<ul style="list-style-type: none"> • Encourage or require commercial tenants to subsidize employee transit passes
<ul style="list-style-type: none"> • Subsidize dedicated transit route or shuttle
Parking
<ul style="list-style-type: none"> • Designate car share spaces
<ul style="list-style-type: none"> • Subsidize car share membership fees for 1 year for residents at initial building occupation
<ul style="list-style-type: none"> • Encourage commercial tenants to organize or participate in a carpooling program
<ul style="list-style-type: none"> • Promote carpooling
<ul style="list-style-type: none"> • Designate carpool parking spaces
<ul style="list-style-type: none"> • Paid parking
<ul style="list-style-type: none"> • Performance pricing or dynamic pricing for paid parking
Travel Information, Management and Oversight
<ul style="list-style-type: none"> • Information packages for new residents or employees
<ul style="list-style-type: none"> • Real-time travel information on mobile app, web portal, or screen in public area
<ul style="list-style-type: none"> • ITS systems on-street (roadway or transit)
<ul style="list-style-type: none"> • TDM committee
<ul style="list-style-type: none"> • TDM education program and promotion events
<ul style="list-style-type: none"> • Perform monitoring surveys
<ul style="list-style-type: none"> • Coordination with municipalities and transit agencies to provide appropriate infrastructure (bike lanes, transit priority measures, carpool, or HOV lanes)
Other
<ul style="list-style-type: none"> • Business centre to support remote work in residential uses
<ul style="list-style-type: none"> • Business services (e.g., UPS store) at or near development
<ul style="list-style-type: none"> • Require office tenants to offer flexible hours or remote work



Exhibit 4-3 Sample TDM Guideline Format

TDM Measure	Intent	Applicable Parking Zones	Applicable Land Use				
			Transit-Oriented Mixed-use	Commercial/Employment	Industrial	Urban Residential	Suburban Residential
Active Transportation							
Bike share	Increase modal options for the community	1, 2, 3	Encouraged	Encouraged	Where appropriate	Encouraged	Where appropriate
Transit							
Free or discounted transit passes for 1 year for residents or employees at initial building occupancy	Introduce transit services and help establish travel habits including transit use	1, 2, 3, 4	Required	Encouraged	Encouraged	Required	Encouraged
Parking							
Designate carpool parking spaces	Encourage carpooling to reduce traffic and parking demand	1, 2, 3, 4	Encouraged	Encouraged	Encouraged	Where appropriate	Where appropriate
Travel Information							
Information package for new residents or employees	Promote the use of alternative travel modes	1, 2, 3, 4	Required	Required	Required	Required	Required
Monitoring							
Conduct post-occupancy travel surveys	Evaluate the effectiveness of TDM implementation	1, 2, 3, 4	Required	Required	Required	Required	Required

Note: This sample does not show a complete list of TDM measures. A full TDM guideline is being developed in a separate ongoing study.



Policy 3: Transition from unpaid to paid public parking in Parking Zones 1 and 2

- **Policy 3.1: Consider public parking supply opportunities, including partnerships**

The following details may be considered:

- Permit privately-operated paid public parking in developments. For example, commercial or visitor parking may be provided as paid public parking. Any maximum parking requirements set out by the zoning by-law would still apply.
- Consider public private partnerships (P3) to establish public parking within new developments. For example, one level of a garage can be dedicated to municipal paid parking, with the remaining levels dedicated to private parking. This method of delivering parking makes better use of land and is more cost-effective than purchasing land to construct a parking facility.

- **Policy 3.2: Consider municipal on-street and off-street parking facilities**

The following details may be considered:

- When planning for municipal paid parking, an area-specific parking study should be undertaken for each candidate location to analyze the parking supply and demand, and assess whether paid parking is feasible. A detailed business plan should be prepared to assess the project specific capital and operating costs, revenue, return on investment and payback period. An enforcement protocol should also be developed, and should manage the impacts of parking spillover to the surrounding neighbourhoods as people may choose to use free parking nearby.
- Introduce paid on-street parking in high-demand areas to reduce demand and increase turnover. A pilot program can be established in Parking Zone 1, then gradually expand paid parking to Parking Zone 2. Paid parking may be considered in other Parking Zones in the longer-term future.
- Parking fees should reflect the local demand and true cost of parking. Implementation of dynamic pricing can be considered in the future.



4.3 CURBSIDE MANAGEMENT & ON-STREET PARKING PLAN

This section provides the context considered in developing the policies related to curbside management and on-street parking and presents the parking policy and sub-policies.

4.3.1 CONTEXT

Existing issues in the City of Markham were identified based on a review of current City policies and guidelines, and feedback obtained from various stakeholders and the public. As such, key issues pertaining to curbside management and on-street parking are illustrated below:






Curbside Management

The public curbside space refers to the space along the streets between travel lanes and sidewalk. Within this limited space, many essential activities of a city take place such as parking, loading/unloading, small commercial deliveries, transit pick-up/drop-off, taxi stands, sidewalk cafes and sometimes trash collection. The proliferation of shared mobility options like bike share, for-hire vehicles, micro-mobility modes and e-commerce package deliveries has intensified curbside access demand and competition with other activities.

The curbside functions in Markham can be grouped into five key functions including movement (travel lanes), access for people (transit stops, pick-up/drop-off), access for goods (loading), parking, and greening and activation. These are described in **Exhibit 4-4**.



Exhibit 4-4 Description of Curbside Functions

Function	Definition	Uses
 <p>Movement</p>	Moving people and goods	Transit lanes Travel lanes Bike lanes Pedestrian walkways
 <p>Access for people</p>	Access for people arriving, departing, and transferring between places	Passenger pick-up and drop-off Transit stops
 <p>Access for goods</p>	Access for goods and services to reach their markets and customers	Short term deliveries
 <p>Parking</p>	Storage for vehicles, devices, and other modes	Vehicles Bike & Micromobility Micromobility hub Transit
 <p>Greening/Activation</p>	Enhancement of street aesthetics and environmental health	Recreational and relaxation spaces Green areas Programmable space Retail space Sidewalk cafes Parklets
Image source: Seattle Department of Transportation, City of Bellevue		

Curbside management refers to the optimization of uses within the curbside space. Benefits of good curbside management include reduced congestion, enhanced safety for all modes, economic support, and efficient use of transportation infrastructure. Key steps in creating a curbside management plan include:

- Understanding the existing infrastructure and various curbside uses through a curbside inventory
- Defining corridor typologies with unique functions and characteristics, such as major thoroughfares to carry traffic and main streets to support vehicular and pedestrian access to businesses in a lower-speed environment
- Allocating curbside uses to the appropriate corridor types

- Organizing the curb space to accommodate the intended curbside functions through design features, signage, technological tools, and enforcement

Municipalities including Toronto, Edmonton, Seattle have adopted curbside management policies defining the curbside lane and allocating curbside use priorities by context. To ensure curbside space is being used effectively and safely in Markham, an organized approach is required to manage curbside priorities for a safe, livable, and accessible City for residents, businesses, and workers. Further, with growing demand, there is a need to adopt policies that can be refined to better manage curbside prioritization with changes in demand.

A preliminary curbside analysis was conducted to develop six corridor types for Markham, including Transit Priority Zone, Major Thoroughfare, Urban and Mixed-use Corridor, Main Street, Suburban Residential Zone, and Employment Zone, described in **Exhibit 4-5**. Primary and secondary curbside functions were also identified for each corridor type. On-street parking is identified as a primary curbside function in the Suburban Residential Zone, reflecting the community’s demand for on-street parking to supplement residential parking needs, particularly in newer subdivisions with lower on-site parking supply and multi-generational homes with multiple vehicles. The potential for on-street parking is protected as a secondary curbside function in the other five corridor types. On-street parking may be provided to support surrounding land uses where space is available. Temporal allocation of curbside uses is also an important consideration. For example, on-street parking may be accommodated during off-peak hours.



Exhibit 4-5 Markham's Corridor Types for Curbside Management



Transit Priority Zone

- Transit corridors are currently Regional Roads. In the future, some Markham Roads may also be designated with a transit focus.
- Example: Birchmount Road and Enterprise Boulevard (pictured)

Primary Functions:

- Movement of transit, traffic, bikes & micromobility
- Access for people (pick-up & drop-off, transit stops)

Secondary Functions (provided as-needed):

- Access for goods (short-term delivery)
- Bike & micromobility parking
- Activation (sidewalk cafes, parklets)
- Greening (street trees, planters)
- Vehicle parking (paid parking)



Major Thoroughfare

- Example: John Street and Leslie Street (pictured)

Primary Functions:

- Movement of transit, traffic, bikes & micromobility

Secondary Functions (provided as-needed):

- Access for people (pick-up & drop-off, transit stops)
- Access for goods (short-term delivery)
- Bike & micromobility parking
- Activation (sidewalk cafes, parklets)
- Greening (street trees, planters)
- Vehicle parking (paid parking)



Urban and Mixed-use Corridor

- Example: Yonge Street and Doncaster Avenue

Primary Functions:

- Movement of transit, traffic, bikes & micromobility
- Access for people (pick-up & drop-off, transit stops)

Secondary Functions (provided as-needed):

- Access for goods (short-term delivery)
- Bike & micromobility parking
- Vehicle parking (paid parking)
- Activation (sidewalk cafes, parklets)
- Greening (street trees, planters)



Main Street

Description:

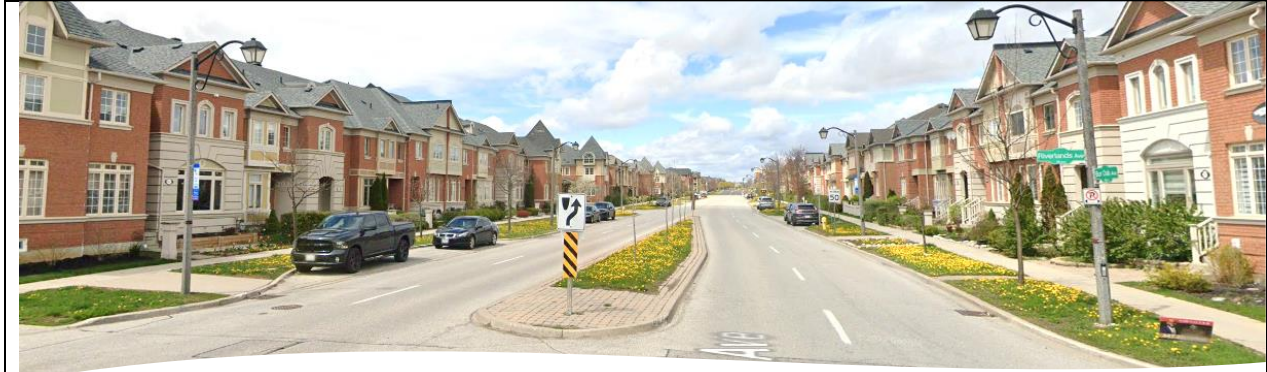
- Candidate for flex zones
- Example: Markham Main Street

Primary Functions:

- Movement of transit, bikes & micromobility
- Access for people (pick-up & drop-off, transit stops)

Secondary Functions (provided as-needed):

- Access for goods (short-term delivery)
- Bike & micromobility parking
- Vehicle parking (paid parking)
- Activation (sidewalk cafes, parklets)
- Greening (street trees, planters)
- Movement of vehicles



Suburban Residential Zone

- Example: Bur Oak Avenue and Riverlands Avenue (pictured), South Park Road

Primary Functions:

- Movement of transit, traffic, bikes & micromobility
- Vehicle parking (residential permit/visitor parking)

Secondary Functions (provided as-needed):

- Access for people (pick-up & drop-off, transit stops, school bus)
- Access for goods (short-term delivery)
- Greening (street trees, planters)



Employment Zone

- Example: Centurian Drive and Allstate Parkway (pictured)

Primary Functions:

- Movement of transit, traffic, bikes & micromobility
- Access for people (pick-up & drop-off, transit stops)

Secondary Functions (provided as-needed):

- Vehicle parking (as needed)
- Greening (street trees, planters)

Source: Google Streetview

On-Street Parking

At present, the City of Markham allows daytime on-street parking on City streets with no time limits unless posted otherwise. Overnight on-street parking is prohibited except with an overnight street parking exemption or a monthly overnight parking permit. All existing parking permits and overnight exemptions are not valid during snow clearance and winter maintenance.

On-street parking was a key topic raised by various internal and external stakeholders throughout the engagement process. Specific issues are summarized below:

- A desire for more residential overnight on-street parking to support affordable housing units, secondary suites, and multi-generational households.
- Narrow private roads do not have sufficient pavement width to accommodate on-street parking, for example, condo roads in some townhouse blocks
- A desire for more on-street parking to support nearby employment uses, particularly in older employment zones where the turnover of building tenants exhibits varying levels of parking demand
- A need to accommodate deliveries on-street in some neighbourhoods
- The importance of maintaining adequate travel lane widths for two-way traffic and emergency vehicle access (the creation of new on-street parking spaces may impede vehicle movement)
- The need for logistical solutions for on-street parking users during winter maintenance. One idea is exploring the use of existing municipally-owned parking facilities (parks and community centres) to accommodate parking permit holders during snow events.
- Some instances of illegal on-street parking
- Neighbourhood streets are being used for all-day parking by commuters who park on-street and walk to nearby transit stations (a need for appropriate parking management in high demand locations)
- A desire for more micromobility parking

To better manage the parking demand and to encourage higher turnover in certain Parking Zones, a new on-street parking approach is required to balance public needs, consider on-street parking requirements for different land uses, and address City requirements for winter maintenance and emergency vehicles.

4.3.2 POLICY

The policies related to land development are presented below in bold text. Details are provided for the City's consideration and are not intended to be directly implemented as



policy, allowing flexibility for the City to determine the necessary details during follow-up studies and during implementation.

Policy 4: Ensure equitable allocation of curb space, manage public assets, and support mobility through appropriate curbside management practices

- **Policy 4.1: Develop citywide Curbside Management Guidelines for six corridor types:**

- **Transit Priority Zones**
- **Major Thoroughfare**
- **Urban & Mixed-use Corridor**
- **Main Streets**
- **Suburban Residential Zones**
- **Employment Zones**

The following details may be considered:

- A curbside inventory, jurisdictional scan, and public feedback should be collected to inform the development of Markham’s curbside management principles.

Six corridor types are suggested based on a high-level review of Markham’s existing and future transportation context as shown in **Exhibit 4-5**.

- However the corridor types are subject to change depending on the detailed findings and assessments to be completed under a separate Curbside Management study.

- **Policy 4.2: Develop a hierarchy of essential curb functions based on corridor characteristics**

The following details may be considered:

- Each corridor type should be examined, and its associated primary and secondary curbside functions should be ranked. Rankings for curbside functions should be based on the background review, including field investigations and stakeholder engagements. An overview of the six corridor types is provided in **Exhibit 4-5**.

- **Policy 4.3: Ensure curbside features are appropriate for the location and temporal context**

The following details may be considered:

- Design curb space for the prioritized modes and functions while supporting flexible use throughout the day, week or year.
- Address safety features associated with curbside uses such as intersection design treatments, pathways, crosswalks, bulb-outs, signage when devising mode priority frameworks for curbs



- **Policy 4.4: Ensure flexible curb management to optimize curb spaces that are high in demand**

The following details may be considered:

- Implement flex zones (flexible areas) to serve different right-of-way functions along the roadway segments through time limits, time-of-day restrictions, and dynamic parking pricing strategies. Some examples of flex zones include combined commercial and passenger loading zones, peak-period travel lanes used for off-peak loading or parking, and conversion of on-street parking to parklets.
- Leverage technology to manage the utilization of on and off-street paid parking spaces, make it easier to find parking and access for pick-ups and drop-offs in high demand areas.

Policy 5: Expand the citywide on-street parking system

- **Policy 5.1: Update the residential overnight parking permit program**

The following details may be considered:

- Residential overnight on-street parking permits should primarily target low-density residential areas with low traffic volumes and slower vehicle speeds.
- Eligibility criteria should be developed for obtaining permits and may consider eligible dwelling types. To ensure fair distribution of permits among residents, the City may consider setting a limit to the number of permits per household, or give priority to the first vehicle of a household.
- Permits should only be valid for the neighbourhood area for which it was issued.
- The price should be set strategically to encourage alternative travel modes. Additional permits beyond the first should cost more.
- Number of permits for each area should consider the available supply of on-street parking spaces. This can vary depending on road width and driveway spacing.
- Consider opportunities to use existing City-owned parking facilities to support the overnight on-street parking permit program.

- **Policy 5.2: Prioritize short-term on-street parking (over daily parking) in Parking Zones 1 and 2**

The following details may be considered:

- Short-term on-street parking is most effective in commercial or mixed-use areas. This type of parking can accommodate customers, passenger pick-up/drop-off, food or small parcel pick-up and delivery.



- Limiting parking duration can be done through parking regulations (time limit) or by scaling parking fees. Higher parking fees can discourage employee and commuter parking on-street.
- **Policy 5.3: Consider on-street delivery zones or permit program**

The following details may be considered:

 - Investigate the need for on-street delivery zones or delivery permits to support businesses. This may be appropriate in areas where short-term on-street parking is insufficient to meet curbside loading demands.
- **Policy 5.4: Consider supplemental on-street parking in employment areas where appropriate**

The following details may be considered:

 - Investigate the need for on-street parking to support specific employment areas. For example, with the turnover of tenants in an older employment area over time, parking demands can fluctuate and result in localized deficits. Adding on-site parking may be impractical at existing sites. There may be opportunities for the City to support businesses by accommodating spillover parking related to employment uses on-street where curb space is available.
 - New developments should plan to accommodate all of their parking needs on-site, consistent with the City’s current policies.

4.4 PARKING TECHNOLOGY PLAN

This section provides the context considered in developing the policies related to parking technology and presents the parking policy and sub-policies with explanatory notes where appropriate.

4.4.1 CONTEXT

The application of advanced and emerging technologies is increasing levels of connectivity and changing how we travel and engage with our surroundings – it is the approach of improving mobility through smarter intelligent transportation systems. It can include smart parking strategies, connected and autonomous vehicles, utilizing technology to help manage the curb, and priority parking mechanisms. Technology and innovation together have revolutionized the approach cities, like Markham, rely upon to improve the efficiency of parking management and reduce congestion, while continuing the path toward developing livable communities.

The integration of technology in city planning approaches is not solely based on creating “smart cities.” Understanding technological tools and adapting them to the City of Markham’s goals and objectives can serve as one of many stepping stones toward



sustainable communities and sustainable mobility. Leveraging tools such as sensor systems, cameras, and monitoring technology can inform parking patterns and their usage, highlighting solutions to manage traffic flow, reduce emissions, and mobility network efficiencies.

At the present time, the City of Markham's Official Plan does not include the integration of emerging technologies and smart parking strategies for further optimization of parking. Looking ahead to Markham's future, the overarching purpose for leveraging smart parking is to introduce the appropriate technology that will allow the City to monitor, manage, and communicate sustainable parking solutions.

Recognizing that Markham has many changing needs that are related to parking, a set of operational functions that could be supported through the application of technology has been brought forward for the City of Markham. The recommendations are based on input received through stakeholder engagement sessions, understanding of the evolution of parking technology, and policy changes recommended through this report. The identified needs are detailed below:

- Ensuring compliance with paid and permit parking through effective use of resources and existing violation enforcement systems.
- Considering safety, congestion and transit operations impacts of violations of 'no-stopping' or 'no-standing' zones and automated enforcement opportunities.
- Managing the potential increase of administrative burden on the City of Markham associated with paid parking.
- Contending between shared parking and off-street parking lots, with inconsistent usage throughout the day. For example, employee designated parking lots being underutilized during non-business hours, whereas there is an opportunity to introduce different uses during periods of non-business hours.
- Managing the impact of the popularity of e-commerce which has led to an increase in commercial deliveries. For multilevel residential buildings and/or in high density areas, commercial vehicle deliveries occupy curbside parking spaces, in many cases contributing to additional traffic congestion as well as increased emissions and fuel consumption in instances where traditional internal combustion engines (ICE) vehicles are utilized.
- Creating flexibility with how the curb is used on an hourly, daily or weekly level. With the continued rise in e-commerce and the associated delivery requirements, curbside space is steadily in high demand, generating the need for better distribution and processes for utilizing this space to accommodate the changing needs.
- Simplifying payment strategies. At present, the City of Markham has implemented 24 electric vehicle (EV) charging stations for public use.



However, the increased pressure for converting traditional vehicles to EVs will require the municipality to implement extensive charging infrastructure to support their use. Alectra is undertaking a pilot project to install charging stations at several City-owned Community Centres. However, the City acknowledges that an even greater number of chargers are required with the gradual transition towards EVs. Managing the payment for EV charging and parking through a single interface will make things easier for users.

- Gathering data to understand parking usage. The City has highlighted GO, VIVA, and YRT stations as some of the key areas of concern pertaining to limited park-and-ride facilities. Where there are no or limited park-and-ride options, transit riders are parking longer term on neighbourhood streets.

The City of Markham is looking for more than the typical and traditional parking solutions that municipalities are accustomed to. An integrated Smart Parking solution is required to deliver the current and future needs of the City. Through this city-wide parking strategy, key parking technology solutions have been identified that will set the stage for developing formal implementation protocols.

4.4.2 POLICY

The policies related to parking technology are presented below in bold text. Details are provided for the City’s consideration and are not intended to be directly implemented as policy, allowing flexibility for the City to determine the necessary details during follow-up studies and during implementation.

Policy 6: Develop and leverage an integrated smart parking technology platform to support various functions including parking and curbside delivery while minimizing deployed infrastructure.

Smart parking technology should be integrated to ensure software and hardware solutions are connected and can interact across platforms

- **Policy 6.1: Develop a demand-based pricing strategy**

The following details may be considered:

- Pricing is an effective tool to change behaviour and dynamic, demand-based pricing is a newer tool. Demand-based pricing strategies in parking initiatives leverage technology to help increase the availability of parking spaces, especially in denser and more urban areas. The collected data can be used to analyze and develop demand-based pricing based on the average occupancy rate within areas of the city and based on demand-based parking spaces based on proximity, time of day, and duration. For example, pricing is an effective mechanism to encourage people to park on side streets as opposed to main streets by dynamically adjusting parking rates to create an incentive to park on side streets. Fusing technology with demand-based pricing is an innovative parking management strategy



because it can incentivize utilization of all parking spaces versus drivers spending a significant amount of time searching for parking. Coupled with dynamic parking rates could be incentive programs that are managed by local BIAs to encourage repeat customers.

- **Policy 6.2: Provide a digital platform for enforcement and a violation ticketing system**

The following details may be considered:

- To alleviate limitations around resourcing parking enforcement and associated administrative processes, develop an automated enforcement system that is integrated with Markham’s existing violation ticketing system, Gtechna Parking Solutions. Gtechna is a streamlined approach to violation enforcement using a cloud-based parking citation and payment process with license plate recognition software. Also consider other enforcement needs such as enforcement of ‘no-stopping’ or ‘no standing’ zones. Automated enforcement systems come in many shapes from automated enforcement robots to optical based systems.

- **Policy 6.3: Support flexible curbside use**

The following details may be considered:

- The curb is under increasing levels of demand and having static uses may not be the most efficient way to manage it. Leveraging technology to allow the curb use to be changed dynamically or on a fixed schedule to support reservations, on-demand parking, commercial loading zones or pick up/drop offs should be integrated into the technology platform. The curb use could change by location, time of day, day of week or by using real-time data. As an initial step, a city-wide assessment could be conducted to categorize curb segments based on regulation, signage, and messaging currently in-place. The collected data will be used to map and understand existing infrastructure as well as current uses and highlighting future needs.
- Dynamic curb regulations and reservation will require supporting curbside management by-laws, signage updates, and enforcement protocols.

- **Policy 6.4: Encourage Smart Loading solutions for commercial loading zones**

The following details may be considered:

- Technologies currently exist to support commercial loading zone reservations and enable policies to reduce carbon emissions. For example, one system allows longer dwell times in commercial loading zones for green vehicles. As electric vehicles are also typically much quieter than ICE, considerations for supporting different time of day



usage by vehicle type could also be supported. Reviewing and understanding challenges with existing commercial loading zones and including technology to address these issues is recommended.

- **Policy 6.5: Enable dynamic pickup/drop off and reservations for car-sharing and e-deliveries**

The following details may be considered:

- On-demand ridesharing, and subsequently e-deliveries, has been recognized as an effective way to meet both the growing and changing needs of individuals. Congestion at the curb results however with vehicles often double parked which creates congestion. Leveraging technology to enable short reservations of curbside space for parking and delivery for services such as ride hailing and parcel delivery operations (i.e. food and courier services) is possible and may support more efficient operation. Alternatively, providing free access to condo parking for short periods may also be an effective solution.

- **Policy 6.6: Explore technology to enable shared public/private parking**

The following details may be considered:

- Conduct a city-wide assessment to evaluate parking categorization allotment, including businesses and private parking. The collected data can be used to inform a shared parking management strategy based peak hours, seasonal use, nearby public transit options, neighbourhood walkability. Integrating public and private parking solutions could create opportunities to share parking spaces based on availability and agreed upon rules. Conversations with the private sector would be required to discuss opportunities. To support shared public/private parking, Markham's Smart Parking system would need to be able to integrate or interface with a variety of private parking systems to be able to share real-time information about parking availability and to facilitate revenue sharing. Memorandums of Understanding (MOUs) would also be required between Markham and the private companies outlining service level agreements, functional requirements and revenue sharing models.

- **Policy 6.7: Explore parking guidance in Parking Zones 1 and 2**

The following details may be considered:

- Parking pressures may be anticipated to increase in Parking Zones 1 and 2 as a result of continued development and decreasing parking provision. Parking guidance systems can increase the efficiency of parking and alleviate traffic congestion by guiding drivers to available parking spaces. This technology can be deployed on an individual site or on an area-wide basis. Area-wide parking guidance can



include on-street and off-street facilities, as well as both privately and publicly owned parking. Deployment of parking guidance systems will require cooperation from public and private operators and compatibility with the City's technology platform.



4.5 CONNECTED AUTONOMOUS VEHICLES PARKING PLAN

This section provides the context considered in developing the policies related to connected autonomous vehicles (CAV) parking and presents the parking policy and sub-policies with explanatory notes where appropriate.

4.5.1 CONTEXT

CAV stands for connected and automated or autonomous vehicles. Automated has been chosen for this report as it captures the fact that automated driving is possible for specific use cases prior to all vehicles being fully autonomous. As shown in **Exhibit 4-6**, SAE International defines six levels of automation where SAE Level 5 is fully autonomous and SAE Level 4 operates autonomously under some use cases. In addition to being automated or autonomous, it is also expected that these vehicles will be connected to other vehicles, infrastructure, and other devices.

Exhibit 4-6 Six Levels of Automation

SAE J3016™ LEVELS OF DRIVING AUTOMATION™

Learn more here: [sae.org/standards/content/j3016_202104](https://www.sae.org/standards/content/j3016_202104)

Copyright © 2021 SAE International. The summary table may be freely copied and distributed AS-IS provided that SAE International is acknowledged as the source of the content.

	SAE LEVEL 0™	SAE LEVEL 1™	SAE LEVEL 2™	SAE LEVEL 3™	SAE LEVEL 4™	SAE LEVEL 5™
What does the human in the driver's seat have to do?	You are driving whenever these driver support features are engaged – even if your feet are off the pedals and you are not steering			You are not driving when these automated driving features are engaged – even if you are seated in “the driver’s seat”		
	You must constantly supervise these support features; you must steer, brake or accelerate as needed to maintain safety			When the feature requests, you must drive	These automated driving features will not require you to take over driving	
Copyright © 2021 SAE International.						
What do these features do?	These are driver support features			These are automated driving features		
	These features are limited to providing warnings and momentary assistance	These features provide steering OR brake/acceleration support to the driver	These features provide steering AND brake/acceleration support to the driver	These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met		This feature can drive the vehicle under all conditions
Example Features	<ul style="list-style-type: none"> • automatic emergency braking • blind spot warning • lane departure warning 	<ul style="list-style-type: none"> • lane centering OR • adaptive cruise control 	<ul style="list-style-type: none"> • lane centering AND • adaptive cruise control at the same time 	<ul style="list-style-type: none"> • traffic jam chauffeur 	<ul style="list-style-type: none"> • local driverless taxi • pedals/steering wheel may or may not be installed 	<ul style="list-style-type: none"> • same as level 4, but feature can drive everywhere in all conditions

Source: <https://www.sae.org/blog/sae-j3016-update>



The future of SAE Level 5 (fully autonomous vehicles) is unclear and uncertain. Work done for the GTHA CAV Readiness Plan that was completed in 2020 showed the potential for 40% saturation of CAV (SAE Level 4 & 5) by 2041 – which does not mean fully autonomous but some level of connection and automation. The GTHA CAV Readiness Plan showed approximately 10% saturation by 2024, and as current Provincial legislation only allows testing of driverless AVs as part of the pilot, under specific conditions to ensure safety, it is fair to assume that the 2041 targets may be optimistic. In addition, the recent AV shuttle trials in Whitby highlighted some challenges that need to be overcome when operating a CAV in mixed traffic and with our environmental conditions of blowing leaves and snow.

As a result of the uncertainty related to timing, when thinking about the impact of CAV, it is useful to consider different levels of preparedness that Markham could follow. Two current best practice documents were reviewed:

- US MUTCD that was released in Dec 2023 and includes guidance on how to support Automated Vehicles (for guidance only); and,
- GTHA CAV Readiness Plan released in 2020 which examined infrastructure, institutional and operational readiness requirements for connected and automated vehicles and included input from over 70 stakeholders across the GTHA.

The following Levels were developed:

- Level A – this preparedness level considers development of an AV only zone appropriate for SAE Level 4 and 5 operations. In this zone there would need to be automated parking solutions, including payment. As there are no people required to park the vehicle, the parking spots for AVs could be much narrower and more compact. And, because the parking doesn't have to be close to where the people are located, the AV parking could be located in underutilized areas outside of Zone 1 and Zone 2.
- Level B – this level of preparedness would focus on the connected part of CAV and also consider mixed CAV and non-CAV use. Level B would cover SAE Level 0-3 as well as connectivity through some type of onboard physical or virtual unit.
- Markham could prepare in a number of ways. They could deploy Roadside Units (RSUs) to communicate with the vehicles and share parking information directly with the vehicle through a modification to the Traveller Information Message (TIMS). Current standards for line painting and signing could be reviewed and modified to meet the US MUTCD suggested guidelines.
- Level C is the do-nothing approach. This approach recognizes that it's unclear when a future with CAV will arrive. This approach is mindful of not precluding CAV in the future. For example, when considering parking technology, considering that there may be no driver in the future,



technologies such as license plate recognition may be better. Level 3 also considers EV charging needs as CAV will most likely be electric. Even under Level C, the City would continue to monitor CAV advancements and design parking or curb infrastructure so as not to preclude future CAV retrofits.

4.5.2 POLICY

The policies related to connected autonomous vehicles (CAV) parking are presented below in bold text. Details are provided for the City’s consideration and are not intended to be directly implemented as policy, allowing flexibility for the City to determine the necessary details during follow-up studies and during implementation.

Policy 7: Develop parking considerations for connected and automated vehicles (CAV) for on-street and off-street parking

- **Policy 7.1: Using current best practices identify levels of CAV preparedness for the City of Markham**
- **Policy 7.2: Support the shift to parking technologies that can work with automated vehicles (i.e. License Plate Recognition)**

The following details may be considered:

- Using current best practices (*US MUTCD Dec 2023, GTHA CAV Readiness Plan 2020*), identify three levels of preparedness that Markham could choose to implement:
 - Level A – AV only zone (automated parking systems, reduced space).
 - Level B– CAV infrastructure preparedness (Roadside Units (RSU), painting, signing etc.)
 - Level C– Do Nothing
- For Level A, Level B and Level C
 - Consider parking technologies that can work with automated vehicles (i.e. License Plate Recognition)
 - Consider EV charging needs as automated vehicles will likely be electric
- For Level A
 - Level A can focus on assessing existing parking facilities to determine their opportunity for converting to CAV-only facilities – automated parking systems. Additionally, consideration for any new parking facilities to be able to convert in the future can be incorporated into new designs. In this new parking paradigm, vehicles can self park eliminating need for circulation space, stairs etc. Some type of cloud-based parking management



system that allows vehicles to communicate location and when they need to leave would be required.

- For Level B
 - Develop a pilot to consider connecting vehicle integration with roadside infrastructure.

4.6 ELECTRIC VEHICLE (EV) PARKING PLAN

This section provides the context considered in developing the policies related to electric vehicle (EV) parking and presents the parking policy and sub-policies with explanatory notes where appropriate.

4.6.1 CONTEXT

Electric vehicles (EVs) represent a sustainable shift away from traditional internal combustion engine (ICE) vehicles, particularly in regions with clean electricity sources, offering a potent solution to curb on-road transportation emissions and aiding Canadian communities in achieving their climate objectives. The rise of zero-emissions vehicles (ZEVs), which include battery electric and hydrogen fuel cell vehicles, is expected to accelerate across Canada, in part, to the federal EV sales mandate. Through this mandate, the federal government requires automakers to meet its mandatory target of ensuring that all new light-duty passenger vehicles sold in Canada be zero-emissions by 2035¹. Therefore, it is imperative for municipalities to prepare and support this rapid shift to zero-emissions transportation.

Furthermore, as of July 1, 2023, the Federal Clean Fuels Regulation mandates a reduction in the transportation fuel carbon intensity, compelling suppliers to mitigate emissions or procure carbon credits to avoid penalties. This regulation introduces a credit trading system, allowing electric vehicle charging network providers to accrue credits from the sale of low-carbon transportation fuels. Consequently, the private sector is incentivized to expand charging infrastructure nationwide, alleviating the financial burden on municipalities for infrastructure funding. However, this development also presents potential economic risks and potential land-use agreement concerns. For instance, the City of Markham will need to devise a strategy to regulate private infrastructure investment in both private and publicly-owned parking spaces, ensuring equity, transparency, and access citywide.

Electric Vehicle Charging

Electric vehicles need to be charged, and they will primarily be charged overnight at home. Charging electric vehicles involves plugging them into their hardware, known as electric vehicle supply equipment (EVSE), which is linked to the electricity grid.

¹ <https://www.canada.ca/en/environment-climate-change/news/2023/12/canadas-electric-vehicle-availability-standard-regulated-targets-for-zero-emission-vehicles.html>

Charging capabilities span three levels, from Level 1, the slowest, to Level 3 or DCFC, which offers the fastest charging rates, catering to diverse charging needs and preferences. It is expected that most home charging will be done through Level 1 and 2, while public ‘on the go’ charging will be Level 3 (DCFC).

Exhibit 4-7 Electric Vehicle Charging Levels

Charger Type	Level 1 (AC)	Level 2 (AC)	Level 3 (DCFC)
Output	120V wall outlet, 1 kW	208V or 240V dryer outlet, 3-19 kW	480+V, 50-350 kW
Typical Use	Level 1 charging uses 120-volt (V) alternating current (AC), delivered by a standard three-prong household plug. New 120 V outlets are rarely installed for EV charging, but existing outlets can provide easy access to charging where Level 2 is not available. Level 1 charging is the slowest of all charging levels, and can take up to 16 hours to charge a vehicle with 380km range.	Level 2 charging uses the same voltage as a dryer or oven, and can provide between 30 to 50 km of range per hour. Level 2 charging stations are the most common for both public and at-home charging, and many allow for networking, and/or incorporation into electric vehicle energy management systems.	Level 3 charging, also known as Direct Current Fast Charging (DCFC) uses high voltage electricity to deliver charging that can be up to 30 times faster than Level 2. The higher cost equipment and upstream infrastructure make this level impractical for most residential applications and is better suited to major centres.
Charge Time	Up to 16 hours	4 – 11 hours	80% in 20-45mins

What is EV-Ready?

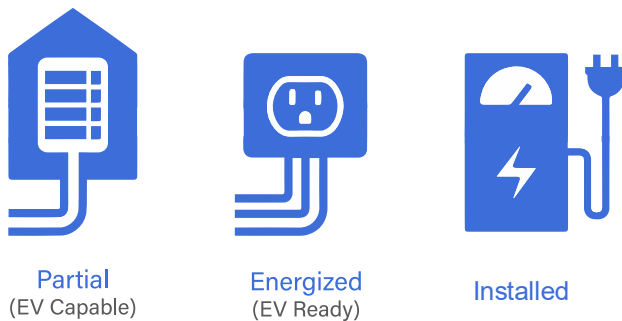
“EV-Ready” refers to a location that has the necessary electrical infrastructure, such as wiring and conduit, to install Electric Vehicle (EV) charging stations. However, an EV-Ready location goes beyond just being capable of supporting an EV charger. It includes all the required infrastructure, including the wires and circuit breakers. The circuit may

be terminated in a junction box or to a receptacle. An EV-Ready location includes everything needed to power an EV charger, except for the charger itself.

In some jurisdictions, there are specific requirements for an EV-Ready plan². For example, in British Columbia, Canada, an EV-Ready Plan outlines a strategy that provides a minimum of one EV-Ready parking space per residential unit. This helps ensure Multi-Use Residential Buildings have an approach to make their building future-proofed to provide all residents with a simple process to access EV charging at their parking space.

The benefit of having an EV-Ready location is that it allows for the simple installation of a charging station in the future if needed. Rather than a complete retrofit job, the contractor would simply need to pull wire through the conduit and connect to the charger. This can save the owner thousands of dollars as they would avoid work like concrete or asphalt cut and patch. Different levels of EV readiness are shown in **Exhibit 4-8**.

Exhibit 4-8 Electric Vehicle Readiness



EV charging considerations should be integrated into the core planning processes of new developments. This involves collaborating closely with city planners, developers, and stakeholders to assess EV charging needs based on factors like anticipated population density, vehicle ownership projections, and the evolving EV landscape. Incorporating charging infrastructure into architectural designs, parking layouts, and utility planning ensures that electric mobility remains seamlessly accessible to residents and visitors as the city evolves.

It is recommended that the City coordinate this parking strategy with a city-wide electric vehicle (EV) and charging strategy - a comprehensive plan to promote the adoption of electric vehicles and create an infrastructure plan that supports their use. Within the EV strategy, Markham may gain a better understanding of the gradual electric vehicle uptake and how much charging infrastructure may be required in the short, medium, and long term. The City can develop policies and programs to ensure there is sufficient infrastructure for residents and visitors to charge their vehicles over a phased period. It

² <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/power-smart/electric-vehicles/ev-ready-plan-requirements.pdf>

is expected that the EV charging strategy will guide some of the City of Markham’s parking policies related to electric vehicles in the long-term.

4.6.2 POLICY

The policies related to electric vehicle parking are presented below in bold text. Details are provided for the City’s consideration and are not intended to be directly implemented as policy, allowing flexibility for the City to determine the necessary details during follow-up studies and during implementation.

Policy 8: Develop and leverage an integrated smart parking technology platform to support various functions including parking and curbside delivery while minimizing deployed infrastructure

- **Policy 8.1: Set 100% EV-ready requirements for all resident and visitor parking in new development capable of supporting a Level 2 charger (Citywide)**

The following details may be considered:

- While many EV owners have the convenience of charging their vehicles at home or at their workplace, not all drivers have access to such charging facilities. This is especially true for individuals who reside in apartments, condos, or rental properties, where installing private charging infrastructure might be challenging due to costs associated with electrical upgrades and civil work, complicated condo decision making processes, and insufficient electrical capacity in the building.
 - Embedding public EV charging considerations in new developments and planning processes is a forward-looking strategy that aligns urban growth with sustainable transportation. As cities expand, integrating EV charging infrastructure from the outset ensures that the parking landscape evolves in harmony with the increasing demand for electric mobility.
 - All residential parking spaces provided for dwelling units located in a residential building, mixed-use building, and multiple dwelling unit building, including visitor parking, must include an energized outlet capable of providing Level 2 charging or higher to the parking space.
- **Policy 8.2: Conduct further study to set EV-ready parking requirements for non-residential parking in new developments based on best practices, and to align with federally mandated zero-emissions vehicle (ZEV) Sales Targets (100% by 2035)**

The following details may be considered:

- Through this study, the City can determine what percentages of non-residential (i.e. Industrial and commercial) parking should be dedicated EV-Ready, based on best practices in other jurisdictions



and expected EV demand. By considering developer contributions to fund new public chargers necessitated by these developments, the costs associated with expanding the charging network are shared responsibly and in proportion to the demand generated by urban growth.

- **Policy 8.3: Educate developers and landowners on how to plan for EV-ready parking**

The following details may be considered:

- Consider supporting the development of educational programs aimed at developers and landowners to highlight the benefits of providing “EV-ready” parking in their properties. These programs would serve as a platform to disseminate information about the environmental, economic, and societal advantages of supporting the growth of electric vehicles.
- Educational programs could cover topics such as the increasing demand for EV infrastructure, the potential for EV charging stations to generate additional revenue, and how to start planning for EV charging in their parking lots (costs, electrical capacities, civil work, etc.). Partner with local educational institutions, environmental organizations, and industry experts to deliver these programs and ensure they provide accurate and up-to-date information.
- Offer incentives such as exclusive certificates, publicity opportunities, or expedited permit processes for developers and landowners who successfully implement EV-ready parking in their projects.

- **Policy 8.4: Provide public charging infrastructure in collaboration with the local utility (Alectra) in priority locations**

The following details may be considered:

- To ensure the deployment is equitable and accessible for the community, the City of Markham should identify and prioritize areas for the charging infrastructure. Area prioritization should include factors such as current and projected EV adoption and land ownership, promotion of EV adoption at key destinations, urban integration, accessibility, utilization potential, as well as equitable access to chargers.
- Prioritized areas should be identified by collaborating with the public and stakeholders, including the local utility supplier (such as Alectra). The growing need for EV charging will create a strain on the network, therefore collaboration with utilities would ensure that the electrical grid can support the increased demand from EV charging within identified priority areas. Collaboration between the City and the local utility should involve joint planning, and support for grid upgrades as well as municipal programming to help the public reduce the



electrical demand during peak periods (i.e. through energy rebates, incentives, etc.).

- **Policy 8.5: Conduct further study to expand the EV strategy for City-owned and operated EV parking facilities (on- and off-street):**
 - **Set EV-ready and/or electric vehicle supply equipment (EVSE) installation requirements**
 - **Pursue incentives, payment, and revenue generation to cover costs**
 - **Ensure equity when expanding EV parking facilities**
 - **Ensure new chargers installed are OCPP (Open Chargepoint Protocol) compliant**
 - **Set consistent charging rates across City to ensure vehicle turnover**
 - **Reduce payment confusion**
 - **Develop signage for EV parking areas**
 - **Consider accessible EV parking design**
 - **Consider world-wide best practices for on-street charging**

The following details may be considered:

- Equity considerations:
 - As the City of Markham deploys EV parking infrastructure, equitable accessibility to those infrastructure should be considered. Fair and equal access, regardless of the geographical location, demographics, personal situation, etc. to ensure all individuals can have access to those charging infrastructure.
 - Throughout the deployment of EV parking within the City, Markham should conduct an equity analysis to better identify and prioritize areas based on set equity measures. These measures should highlight the development of low-income neighborhoods, MURB (multi-unit residential areas) areas, among other criteria.
- OCPP (Open Chargepoint Protocol) compliance:
 - By ensuring OCPP compliance, the City can facilitate a seamless and user-friendly experience for EV drivers, regardless of the make or model of their vehicle or the type of charging station they use. OCPP compliant charging stations will also provide insightful data that the City can leverage to better plan for future implementation and monitor progress of their environmental goals.



- The City of Markham should ensure that all new EV chargers installed in publicly-owned parking areas are compliant with the Open Charge Point Protocol (OCPP). This open-source protocol standardizes communication between open EV chargers and charging station management systems (CSMS), allowing for interoperability across different charging equipment, software systems.
- Collaborate with organizations such as the Open Charge Alliance, as well as introduce inspection and certification processes for all new EV charger's deployment.
- Provide information sessions to help developers and landowners understand the benefits and requirements of OCPP compliance.
- Explore alternative governance models for infrastructure within the City, such as EV Charging as a Service (CaaS) - the outsourcing the management of charging infrastructure to a third party. Evaluate opportunities and risks associated with these alternative models.
- EV charging rates:
 - Consistent charging rates across its EV parking locations would ensure efficient use of designated EV parking spots. Discouraging long use of the EV parking location could be socially and financially beneficial, as it would provide charging opportunities to more vehicles, ensure fair access to all users, and promote efficient use of the resource. A standardized pricing model would encourage users to move their vehicles once the charging cycle completes, allowing for the charging infrastructure to be available for another user.
 - Pricing models should consider factors such as the time of the day, the duration of the charging period, the peak demand, location, and the level of charge provided. Pricing may be designed in such a way that is high enough to encourage electric vehicle owners to charge at home rather than in public parking areas, but low enough to encourage the public to shift to electric vehicles over the traditional internal combustion engine vehicles.
- Reducing payment confusion:
 - As the City provides additional EV parking, an important aspect of the public adoption of these charging spaces will be the convenience and smooth user experience through the complete charging cycle, including the payment procedures.
 - The City of Markham should aim to reduce payment confusion across all City-owned charging infrastructure, offering clear and



uniform experience across at each EV parking location. Standardized payment process, including pricing structure, signage, payment ease, clear instructions, fairness and compatibility with a variety of payment methods will help simplify the payment process, enhance the parking experience for EV drivers and encourage more residents to adopt electric vehicles.

- Accessible EV parking design:
 - EV parking spaces should be designed to ensure accessibility for all its users. The City of Markham should consider encouraging EV parking designs that are compliant with the Accessibility for Ontarians with Disabilities Act (AODA), in which the design of parking spaces must be accessible to visitors with disabilities and who hold accessible parking permits. Research on best practices for accessible EV parking design is currently underway in British Columbia, and in the fall of 2022, BC Hydro announced its entire EV charging network would be fully accessible. This will happen through retrofitting older stations and building new barrier-free sites by 2024. The accessibility features include wider parking stalls, paved access, lowered chargers, wider protective bollards, improved lighting and better signage.
 - Accessible EV parking may consider standard heights, visible text, and the path of travel, including include accessible walking surfaces, doorways, ramps, curb ramps, elevators, and, where permitted, platform lifts.
 - Pursue incentives, payment and revenue generation to cover the costs of infrastructure
 - The City of Markham could leverage various incentives available to reduce the financial barriers associated with the provision of EV parking, as well as explore opportunities to generate revenue to help cover the cost of the infrastructure.
 - Leverage federal and provincial incentives as well as financing options where possible
 - Implement user fees to generate revenue through paid parking solutions, which in turn could also encourage efficient use of the charging infrastructure.
 - Consider negotiating favorable terms with EV charging providers to recuperate some of the benefits from the sale of the clean fuel credits wherever the City provides charging infrastructure at its public parking lots.



4.7 MICROMOBILITY PARKING PLAN

This section provides the context considered in developing the policies related to micromobility parking and presents the parking policy and sub-policies with explanatory notes where appropriate.

4.7.1 CONTEXT

Micromobility encompasses a range of small, lightweight vehicles operating at speeds typically below 32 km/h and driven by users personally. Micromobility devices include bicycles, e-bikes, electric scooters, electric skateboards, and shared bicycle fleets.

The City of Markham recognizes micromobility as a desirable mode for first and last-mile needs. The City is currently piloting its scooter share program in Markham Centre in partnership with Scooty. Additionally, the City is in the process of preparing its Transportation Master Plan (TMP). The TMP is anticipated to include the use of citywide implementation of micromobility devices. Additionally, it is anticipated to address various issues regarding these devices including wayfinding, signage and pavement markings, and opportunities for public-private partnerships.

As per Ontario Regulation 389/19 – Pilot Project Electric Kick-Scooters and Ontario Regulation 141/21 - Pilot Project Cargo Power-Assisted Bicycles, new micromobility forms will emerge and continue to be rolled out on Ontario roadways. Additionally, curbside space is increasingly in high demand with the continued rise in e-commerce and associated delivery systems; micromobility will increasingly compete for curbside space.

New micromobility devices being introduced in the market pose several challenges including safety concerns. Recently, electric micromobility device batteries, specifically lithium-ion e-bike batteries, have led to fires and even explosions in rare cases as seen on a Toronto Transit Commission (TTC) subway car in December 2023. The onus of these unfortunate incidents has been placed on the user, and the misuse of their device, often traced back to using the said device outside of the stated manufacturer limitations. For example, it has been noted that some riders use their electric micromobility device all season when manufactures have stated that they are not meant to be used in the winter to avoid cold and wet conditions, while some riders tamper with the battery to improve its quality. Both actions can cause malfunctioning and combustion. While users may be responsible in some cases for battery malfunction, in others, it is the case of a more nuanced lack of device standardization and sales. At present, there are no micromobility device or battery safety standardization guidelines from the federal or provincial level. There is an independent organization, Underwriters Laboratories of Canada (UL), that conduct safety testing, inspection, and certification on a variety of products including e-bike batteries. This is not guided by federal policy or acts, nor is it federally or provincially required to be adhered to by micromobility



distributors or buyers. Although Metrolinx, a provincial agency, stated that starting April 9th, 2024, all e-bikes that do not have a certified UL or CE (European standard) battery will be banned from trains across the GO Transit network. To protect individuals including gig workers, commuters, and recreational users who already have these banned e-bike models, and those who rely on micromobility device leasing schemes, greater mechanical/battery oversight and regulation is needed for the safety of all users and those they encounter.

Amenities that support all types of micromobility devices can improve the overall experience of users by providing convenience, comfort, and safety while using their devices. Amenities can help micromobility modes be more widely adopted across Markham. Micromobility amenities can include end-of-trip cycling facilities such as shelters and rest areas, water refill stations, and micromobility parking. In the past, the City’s Zoning By-law did not include specific bicycle parking requirements; therefore, several existing developments in the City lack adequate bicycle parking facilities. Recently, the City included bicycle parking requirements for developments in its new Comprehensive Zoning By-law. However, for consistency purposes, it will be required to align the recommendations in the Zoning By-law with the requirements for the different zones proposed in this study. It is to be noted that the new Comprehensive Zoning By-law does not include any requirements for end-of-trip facilities such as change room and shower facilities.

4.7.2 POLICY

The policies related to micromobility parking are presented below in bold text. Details are provided for the City’s consideration and are not intended to be directly implemented as policy, allowing flexibility for the City to determine the necessary details during follow-up studies and during implementation.

Policy 9: Develop a citywide parking policy for micromobility devices

- **Policy 9.1: Develop a citywide micromobility parking program including consideration for Micromobility Hubs, with priority in Zones 1 and 2**

The following details may be considered:

- Conduct a citywide inventory of on-street bicycle parking supply and demand, amenities, and issues. At present, the City has no inventory of its bicycle parking facilities and associated infrastructure. An updated inventory will help in providing a better understanding of the existing parking supply as well as parking needs in specific areas of the City.
- Provide on-street micromobility parking following existing standards established in the NACTO Guidelines for Regulating Shared Micromobility. Micromobility parking should be provided in parks,



private owned public spaces, and wherever appropriate within the right-of-way.

- Incorporate micromobility in the curbside management strategy to determine appropriate conditions for providing on-street micromobility parking for all types of standard and non-standard device sizes (e-cargo bikes, e-bikes, standard bicycles etc.)
 - Address the supply and demand of micromobility parking infrastructure within public right-of-way; consider partnership with private businesses.
 - Impose restrictions on on-street objects that can be used for locking micromobility devices.
 - Implement micromobility hubs combining multiple shared services at a single location. Locate the hubs in strategic areas within the City such as near transit stations to help establish first and last kilometre connections. Ensure safe parking of micromobility devices at these hubs through implementation of smart technologies and incentives. Micromobility hubs will have the highest concentration/priority in Zone 1, followed by Zones 2 and 3, with lowest priority in Zone 4.
 - Establish penalties, such as graduated fines and possible suspension from micromobility programs, for non-compliance with micromobility parking requirements.
- **Policy 9.2: Implement electric micromobility charging infrastructure**
The following details may be considered:
 - Provide standard outlets at micromobility parking locations where possible, with more outlets provided at popular rest areas, parks, and major transit stations. The highest concentration/priority of these outlets should be in Zone 1, followed by Zones 2 and 3, with lowest priority in Zone 4.
 - Pair electric micromobility charging stations with electric vehicle charging stations where possible. Co-locations will enhance multi-modal connections and improve infrastructure cost savings.
 - **Policy 9.3: Incorporate parking programs and charging infrastructure for other micromobility devices adopted by the City**
Depending on the outcomes of the ongoing TMP, the micromobility parking program should accommodate an appropriate range of micromobility devices in the City.
 - **Policy 9.4: Incorporate micromobility parking in developments by:**
 - **Policy 9.4.1: Aligning the Zoning by-law minimum bicycle parking requirements to the Parking Zones, with higher requirements in Zones 1 and 2**



The following details may be considered:

- Review the recently proposed bicycle parking requirements in the City's new Comprehensive Zoning By-law and align the recommendations in the Zoning By-law with the requirements for the different zones proposed in this study. As such, the higher bicycle parking requirements (Alternative Bicycle Parking Standards in the Zoning By-law) are applicable for Zones 1 and 2, while the lower bicycle parking requirements (Bicycle Parking Standards) are applicable for Zones 3 and 4.
- Include requirements for end-of-trip facilities (including change and shower facilities) for long-term bicycle parking in the Zoning By-law.
- Address parking for other micromobility devices through development review.

○ **Policy 9.4.2: Requiring electric micromobility charging infrastructure in new developments**

The following details may be considered:

- Provide accessible and secure battery charging stations at long-term micromobility parking locations.
- Pair electric micromobility charging stations with electric vehicle charging stations in new developments, where possible.
- Consider inclusion of requirements for micromobility charging stations in the Zoning By-law.
- Consider fire safety when locating and designing storage and charging stations.

○ **Policy 9.4.3: Conducting a public education campaign to promote the provision of micromobility parking in existing developments**

The following details may be considered:

- Conduct a campaign highlighting the benefits of micromobility as a sustainable and cost-effective mode of transportation and the importance of secure parking at key destinations, specifically for existing residential developments and commercial establishments.
- Conduct a micromobility parking campaign that illustrates the ways in which residents and visitors can safely park their micromobility devices at long- and short-term parking locations in existing developments throughout Markham.



4.8 TRAILS AND MAJOR PARKS PARKING PLAN

This section provides the context considered in developing the policies related to trails and major parks parking and presents the parking policy and sub-policies with explanatory notes where appropriate.

4.8.1 CONTEXT

Trail parking refers to the parking that is close to trail networks, predominately trailheads. A trailhead can be defined as a designated public access point to a trail. Usually this is where a user will begin and/or end their journey, where they can gather more information on trail wayfinding and connectivity to a wider network. While there are usually various access points to a trail, often referred to as minor access points (e.g. a road crossing in a neighbourhood or an intersection of two trails), trailheads are often developed with amenities for trail users including restrooms, drinking fountains, trash receptacles, signage, and parking.

The Rouge National Urban Park Management Plan (2019), which is applicable in the City of Markham and beyond, provides guidance for providing park access for all travel modes. In general, the trails parking strategy aims to achieve the following:

- Expand the trails parking supply at high priority locations where parking pressures currently exist;
- Facilitate travel planning and parking management.
- Enhance on-street parking signage and enforcement in high-priority areas

Within Markham, on-street parking complaints have been noted near trailheads. Some of these City trails with existing parking needs are as follows:

- Rouge Valley Trail System from Toogood Pond to Bob Hunter Memorial Parking (Zone 4), such as the end of Princess Street;
- New proposed trails in Markham Centre;
- The Lake-to-Lake Cycling Route and Walking Trails (Parking Zones 2 and 4); and
- The proposed South York Greenway.

The importance of providing other options outside of on-street parking for trail users is clear. There are a variety of ways to alleviate parking pressures at high-priority locations including providing trailhead dedicated parking and various pick-up and drop-off strategies such as increased local transit services to and from transit hubs and low-cost or free shuttle bus services within certain parks. An example of this is the Gatineau Park Shuttle (located in Gatineau Park Ottawa). The National Capital Commission (NCC) provides a free shuttle service in the summer on Saturday and Sundays. The shuttle will



bring users to popular destinations near the parkways. Additionally, they provide real-time parking availability online for parking lots within the Park.

Another way to alleviate parking pressures is by supporting first-and-last kilometre options to and from trailheads. This can look like implementing wayfinding signage and mobile applications showing how to get to and from a central location such as a commuter parking lot, bus stop and or future rapid and GO transit stations. Modes can consist of both active transportation and public transportation.

Another key component of the trail parking strategy is to ensure the safety of trail users. This can be done by following contextually applicable standards, such as Toronto’s Multi-use Trail Design Guidelines, which prioritize avoiding conflict between trail users where possible, and at minimum managing these conflict points. The City of Markham’s Pathways and Trails Master Plan should be adopted where appropriate throughout the implementation of the trails and major parks parking plan.

4.8.2 POLICY

The policies related to trails and major parks parking management are presented below in bold text. Details are provided for the City’s consideration and are not intended to be directly implemented as policy, allowing flexibility for the City to determine the necessary details during follow-up studies and during implementation.

Trails and Major Parks Parking Management Plan

Policy 10: Develop appropriate parking supply and improve multi-modal access at high-priority trailheads and major parks

- **Policy 10.1: Determine high-priority trails**

The following details may be considered:

- Review the existing and proposed trail network in the City and apply the ‘high-priority’ trail criteria proposed below to determine trails that are suitable for introduction of new parking lots or expansion of existing lots.
 - Adapt the Parks Canada Trail Classification Guide to the City’s context to determine the ‘high-priority trail and major park criteria.’
 - There are 4 trail types, with types 1 and 2 being the most accessible resulting in higher pedestrian and vehicular traffic. Recommend the need for parking facilities at trailheads for these two types of trails.



- The classification criteria include distance, grade, elevation, surface (paved, hard packed etc.), width of trail, and level of use (which can be obtained from the city trailhead user counts, if available, by partnering with stakeholders like the Toronto Region Conservation Authority, or from big data such as the Strava application).
- Consider the following when determining the ‘high-priority trail criteria’ dictating high-priority parking locations in the City’s context:
 - Proximity to existing off-street parking lots, such as GO and Civic Parking Lots. Closer proximity would indicate less of a need for an additional trail parking lot.
 - Feasibility/cost of off-street parking – considerations for space and budget required for off-street parking.
 - Availability of on-street parking – determination of on-street parking spaces, if any, which can be used for trail parking.
 - Connection to active transportation infrastructure such as trail connections to the wider active transportation network. If connections are identified, less vehicular parking may be provided with effective travel planning.
 - Obtain inputs from trail users and other stakeholders on a regular basis and implement modifications based on these inputs.
 - Proximity to/within a proposed parking zone – a trail is in a Parking Zone with lower automobile parking demand, will generate less need for trailhead parking compared to other parking zones.
- **Policy 10.2: Introduce multi-modal travel planning and parking management measures through the development of TDM, parking standards and appropriate infrastructure**

The following details may be considered:

- Functionally implement and design vehicular and micromobility parking at predetermined high-priority sites. The following implementation steps are recommended:



- Apply contextually applicable standards, such as Toronto’s Multi-use Trail Design Guidelines. This is done through various design approaches including designing trails that avoid running through parking lots. Where this isn’t possible, design trails that cross the width of the parking lots to minimize conflict points.
- Develop appropriate parking rates for automobiles: rates should be based on the anticipated activity (demand) and trail length. For example, the Recreation Sites and Trails B.C. recommends a standard of 1.5 parking units per 1 km of trail, with a minimum of 10 units. Develop similar parking rates for bicycles and other micromobility devices (e-bikes, cargo e-bikes etc.) in the City’s TMP.
- Establish amenity ‘nodes’ at high-priority trailhead parking lots, where feasible. Amenities may include both mandatory and optional features such as restrooms, water fountains, signage, seating, etc. Guidelines from the City’s Pathways and Trails Master Plan can be adopted where appropriate.
- Implement seasonal parking lot maintenance following the City’s Pathways and Trails Master Plan.
- Implement various travel planning and management measures applicable to the City’s context. Such measures may include:
 - Online parking availability status and/or reservation-based parking system: potential priority for local residents to be considered.
 - Coordinate with York Region Transit to improve transit access to trails. Consider implementing in-park shuttle service connecting high-priority trails and major parking lots.
 - Determine passenger pick-up and drop-off locations at high-priority trailheads.
 - Implement centralized parking hubs to allow shared parking with other uses through partnerships with private parking lots and/or City owned lots.
 - Encourage carpooling through promotion of existing apps such as ‘Pop-a-ride’ or through creation of a City park/trail specific app.



- Implement wayfinding and trip planning tools to expand first and last kilometre choices. For example, wayfinding/mobile apps may guide users how to get to trail access points using connected regional/local trails, public transit etc. from commuter parking areas.
- **Policy 10.3: Enhance on-street parking signage and enforcement in high-priority areas using appropriate technology**

The following details may be considered:

- Implement on-street parking signage at high-priority trail locations to notify trail users where they can and cannot park. Include various travel planning and management measures on parking signage to facilitate travel planning (e.g. ride share passenger pick-up and drop-off areas)
- Monitor parking in high-priority areas and implement adequate enforcement measures including penalties for parking violations (such as graduated fines).



5 PARKING GOVERNANCE

The provision of parking services and infrastructure requires coordination and structure to operate effectively and efficiently. There are different approaches that have advantages and disadvantages and levels of suitability for the City of Markham. This Chapter will describe the current governing structure for municipal public parking in Markham, evaluate the different types of organizational structures typically used by municipalities and recommend an approach for the future of parking in Markham.

It is important to adopt the best type of parking organizational and service delivery structure to meet the City’s overall strategic goals and vision for parking. A proper governance structure will result in the alignment of policies, operations, and financial objectives to better meet the needs of the City and the citizens it serves. With the existing organizational structure, parking is complex as planning, operations, finance, and enforcement are disconnected with no overarching voice for parking.

5.1 PARKING ORGANIZATIONAL STRUCTURE

A public parking organizational structure is how a municipality arranges the roles, responsibilities, job functions, accountability, and decision-making authority to best achieve the municipality’s strategic goals and objectives in the provision and delivery of parking services as one tool for contributing towards city building.

Parking in the City of Markham is currently managed on a case-by-case basis. There is no one central staff group within the City’s organizational structure that oversees all parking-related work. For example, if a city owned parking facility is attached to a community centre, such as the Cornell Community Centre, that lot is the responsibility of Recreation Services staff. If a new development is proposing a parking reduction, that is reviewed and decided on by the Planning Department with input from Transportation Planning. The Bylaw & Regulatory Services unit (part of the Corporate Services division) is responsible for enforcement of all bylaws, including parking and the administration of the residential on-street monthly parking permit program. Existing paid parking across the City is limited, such as at the Cornell Community Centre parking garage (after the first 3-hour free period) and the on-street monthly parking permit program available on specific streets within the City.

Exhibit 5-1 shows the current high-level governance structure. Many “hands” are involved with parking: large divisions and departments such as Corporate Services, Community Services, Recreation Services, Operations, Planning and Development and Engineering focused on very specific functions such as traffic management, accessibility standards, parking enforcement, maintenance and winter control of on-street and off-street parking, zoning bylaw parking requirements, transportation network design, driveway widenings, TDM (Transportation Demand Management), parking customer service (311), administration of monthly overnight parking permits, parking



ticket processing and administration, preparation and monitoring of parking capital and operating budgets, website parking content, business case analysis for additional public parking facilities, deployment of Electric Vehicle (EV) charging stations and other functions.



5.2 TYPES OF ORGANIZATIONAL STRUCTURE

There are a variety of organizational structures in use by different jurisdictions in North America. This section provides an overview of the different options and describes Markham’s existing operations.

5.2.1 HORIZONTALLY INTEGRATED PARKING ORGANIZATIONAL STRUCTURE (EXISTING MARKHAM)

The existing parking organizational structure in the City of Markham operates as a horizontally integrated structure with parking functions spread across many departments, divisions, and sections. Each group manages one or more parking functions and no one department or division has total responsibility, accountability and full understanding of all parking functions and interrelationships. This structure is commonly adopted by comparable municipalities where the municipality oversees all aspects of parking, ranging from policy development to enforcement. The horizontally integrated structure is shown in **Exhibit 5-2** and **Exhibit 5-3** and comprised of nine parking functions. City Council is responsible for all policies and fee setting.

The existing organizational structure is the result of an evolutionary process that occurred as the City has developed and grown in population. The structure has made economic sense and is organizationally effective when parking is less complicated and with few paid parking facilities. A small number of staff from different departments used to be adequate to address the various parking functions, however, growing parking demand will require greater controls and policies to manage parking demand and supply through TDM measures.

A more detailed description and the purpose of this and each of the other parking organizational structures are outlined in **Exhibit 5-4**.

Exhibit 5-2 shows a summary of existing parking functions by department, by the core department and sections, and the supporting departments and sections involved, along with an approximate number of full-time staff. Apart from 16 enforcement officers in the Bylaw and Regulatory Services section, most staff across many departments and sections are only partially involved in parking.

The horizontally integrated organizational structure has served the City well as an effective organizational model. Parking is now viewed as an important municipal policy tool for city building rather than simply providing parking spaces for automobiles. Therefore, this type of organizational structure should be part of a future governance review as the City implements Citywide Parking Strategy policies to effectively manage and administer parking in the City of Markham.



Exhibit 5-2 - Summary of Existing Parking Functions by Department

High-Level Parking Function	Core Department(s) & Section(s) Involved	Supporting Department(s) & Section(s) Involved
Financials	Financial Services Recreation Services – Cornell Community Centre garage with private parking operator (Staff mainly to parking: 2)	Only Core Departments
Customer Service	311 Recreation Services	Sustainability & Asset Management
Compliance (Enforcement)	Bylaw and Regulatory Services (Staff mainly to Parking: 16 full-time, 21 part-time)	Sustainability & Asset Management
Backoffice Administration (Tickets & Permits)	Bylaw – Administrative Monetary Penalty System (Staff mainly to parking: TBD)	Bylaw – Parking Administration
On-Street Parking	Engineering – Traffic (Staff mainly to parking: 2)	Operations – Roads & Survey
Off-Street Parking	Recreation Services Cornell Community Centre parking garage (Qty: same 2 noted in Financial)	Operations Sustainability & Asset Management
Parking Planning	Engineering – Transportation Policy & Strategy	Sustainability & Asset Management (Qty:1)
Land Use – City Building Coordination	Planning – Policy Engineering – Transportation Planning Engineering – Transportation Policy & Strategy	Planning – Urban Design
Multimodal Integration	Engineering – Transportation Policy & Strategy Engineering – Transportation Planning	Planning – Policy
Total Full-Time Parking Staff*	20	1

*Note: TOTAL full-time staff that may be **partially** involved in parking: a) Core Departments = 62 and b) Support Departments = 106 (as of 2024)



Exhibit 5-3 - Municipal Integrated Parking Organization Structures

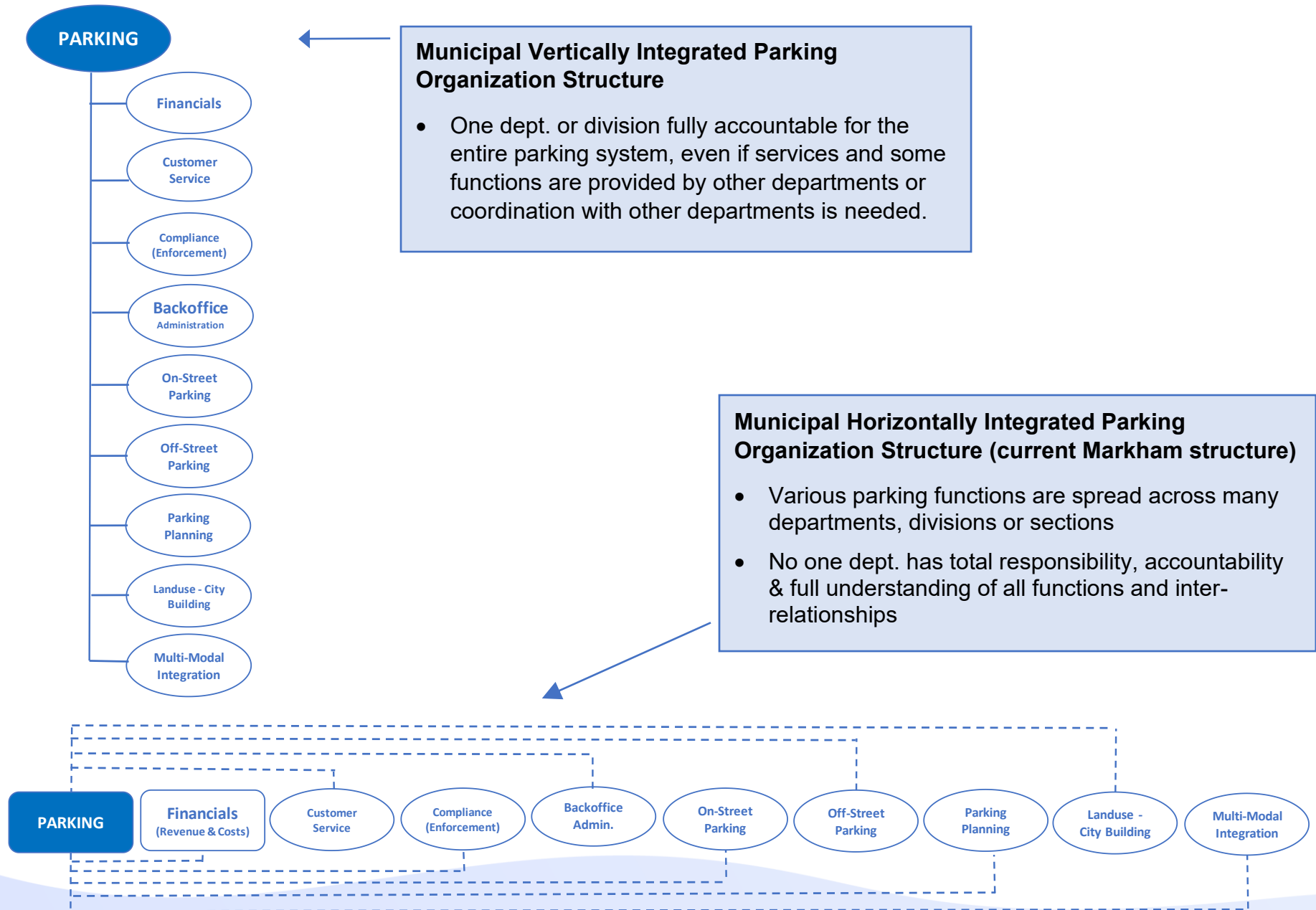


Exhibit 5-4 - Types of Parking Organizational Structures

	Municipal Parking Horizontally or Vertically Integrated	Parking Authority	Privatization	Public Private Partnership (P3)/ Business District	Private Sector Parking
Description	<p>Horizontal: Various aspects of parking are spread across many departments and sections. Each section, division, or department manages one or more parking functions. No one department has total responsibility, accountability, and full understanding of all functions and interrelationships.</p> <p>Vertical: One division or section, led by a department head.</p>	Publicly owned and managed organization separate from the municipality with its own Board of Directors & CEO and comprised of citizen appointees and Councillors.	Municipalities can operate, maintain, and plan for the future by outsourcing on-street and off-street parking facilities to a private consortium of investors over a 35 to 50-year-plus term in exchange for a large upfront cash payment. Assets remain the property of the municipality.	Parking is operated & managed by a downtown business improvement group, Chamber of Commerce, Board of Trade, or urban renewal agency through an operating agreement with the municipality.	The private sector provides off-street parking as part of their developments that may allow public parking based on demand and supply with parking fees determined by the marketplace and fully controlled by the private sector (not City Council).
Governance	Public Board or Council Oversight & Governance	Public Board or Council Oversight & Governance	Public Board or Council Oversight & Governance	Public Policy & Standards Setting	Private Board Oversight & Governance
Service Delivery	Public	Public	Shared	Shared	Private
Risk	Public	Public	Shared	Shared	Private



5.2.2 VERTICALLY INTEGRATED PARKING ORGANIZATIONAL STRUCTURE

Exhibit 5-3 and **Exhibit 5-4** also shows a municipal vertically integrated organizational structure that consists of one department or section led by a manager who is fully responsible for on-street and off-street parking, parking system planning, enforcement and other parking functions that may or may not be included within this organization structure. This type of organization is a “one-stop shop” for parking services with full accountability for operations and for coordination and interacting with other municipal departments and sections on land use and transportation planning, economic development, special events, TDM, and active transportation. Council maintains full control of policies and fee setting.

5.2.3 PARKING AUTHORITY

A Parking Authority is a municipal special purpose body which is publicly owned and managed, but separate from the municipality, as shown on **Exhibit 5-4**. Such a body has its own CEO (Chief Executive Officer) and Board of Directors comprised of citizen appointees and Councillors. This type of organization structure focuses on all aspects of parking provision and operations, and has responsibility for parking facility planning, construction, maintenance, ownership, and setting fees and fines. Policies and fees are decided independently of the municipal Council. A parking authority’s primary focus is on revenue generation. The authority is expected to be 100 percent self-funded and many parking authorities contribute a substantial surplus back to the municipality.

5.2.4 PRIVATIZATION

A privatization organizational model allows municipalities with serious financial debt and cash issues to operate, maintain, and plan by outsourcing on-street and off-street parking facilities to a private consortium of investors typically for at least 35 to 50 years in exchange for a large upfront cash payment from the private organization, as shown on **Exhibit 5-4**. Assets remain the property of the municipality, but operating risks (i.e. management and maintenance costs) and capital expenses are transferred to private organization for the duration of the agreement. The municipality obtains capital funding from the private investor for new parking facilities and technologies.

The primary challenge for a privatization organization model is the development and implementation of a long-term agreement that is fair to both the municipality and the private organization.

Privatization of parking has occurred only in American cities and universities and only during the last 15 years.



5.2.5 PUBLIC PRIVATE PARTNERSHIP (P3) / BUSINESS DISTRICT

A public private partnership (P3) parking organizational structure refers to a downtown business district organization that operates and manages parking through an operating agreement developed with the City, as shown on **Exhibit 5-4**. The organization might be a business group, Business Improvement Area (BIA), Chamber of Commerce, Board of Trade, or urban renewal agency. In small cities, for example, where parking infrastructure may be lacking, the business district parking organization can establish relationships with private sector landowners willing to work with the City to provide parking. A business district parking organization means that businesses are committed to making parking successful and ensuring the attractiveness of downtown and vitality of commercial streets for residents and tourists.

5.2.6 PRIVATE SECTOR PARKING

Unlike a privatization organizational model where the parking assets remain the property of the municipality, the private sector parking model provides off-street parking as part of their developments that may allow public parking based on demand and supply with parking fees determined by the marketplace and fully controlled and owned by the private sector (not City Council), as shown on **Exhibit 5-4**. The private sector plans, finances, builds, operates, and manages parking facilities (i.e. surface lots, above ground and underground parking structures), relieving the City of these intensive capital investments. However, it is possible to develop shared parking agreements between a private sector parking provider and the municipality to allow for public parking.

The City is fully responsible for ON-STREET public parking that: a) encourages commerce and supports local businesses and services and b) supports the City's strategic goals of city building and multi-modal integration.

Exhibit 5-5 provides a more detailed description, purpose, and comments on each of the parking organizational models and subsequently evaluated in the following section.



Exhibit 5-5 - Review of Parking Organizational Models

Model	Description	Purpose	Comments
<p>Municipal Horizontally Integrated</p>	<ul style="list-style-type: none"> • Various aspects of parking are spread across many departments and sections. • Each section, division or dept. manages one or more parking functions. • No one dept. has total responsibility, accountability & full understanding of all functions & interrelationships of parking. 	<ul style="list-style-type: none"> • Most were established in the late 1940s and 1950s and focused on managing on-street parking meters to achieve vehicle turnover of spaces and meet greater demand created by increasing car ownership by constructing off-street lots & garages to support local businesses. • Successful in large cities where extensive parking infrastructure is required to meet the growing demand by providing lots, garages, joint venture agreements with developers for shared parking and expanded on-street payment areas. 	<ul style="list-style-type: none"> • The municipality may also outsource operations through a contracted management agreement or lease agreement with guaranteed monthly revenue over a 5-year plus contract – very common among Ontario hospitals and commercial building owners and managers. • Some municipalities contract out: <ul style="list-style-type: none"> ○ Maintenance & repair of on-street pay & display machines ○ Enforcement ○ Revenue collection.



Model	Description	Purpose	Comments
Municipal Vertically Integrated	<ul style="list-style-type: none"> One division or section, led by a department head, is fully responsible for on-street and off-street parking, parking system planning, enforcement and other parking functions. 	<ul style="list-style-type: none"> ‘One stop shop’ for parking services. Full accountability for operations and coordination of and interaction with other municipal departments and sections on land use & transportation planning, economic development, special events, Transportation Demand Management and Active Transportation. 	<ul style="list-style-type: none"> The “Parking Department” under this model may also decide to outsource aspects of parking operations (similar to the above comments). Variations of this model exist depending on the size of parking operations, type of services, overall municipal organizational structure & extent of urban development.



Model	Description	Purpose	Comments
Municipal Parking Authority	<ul style="list-style-type: none"> Publicly owned and managed organization separate from the municipality with its own Board of Directors & CEO and comprised of citizen appointees and Councillors. They are focused on all aspects of parking operations, responsible for parking facility planning, construction, maintenance, ownership, and setting fees & fines (independently of the municipal Council). Prime focus on revenue generation and 100% self-funded, often contributing millions of dollars annually in dividends (profit) back to the municipality. 	<ul style="list-style-type: none"> The growth of the municipality resulted in the need for a parking function. They usually started in the existing public works dept. that was responsible for roads and traffic management. Municipal bylaw enforcement for zoning and animal control already existed and was given added function for parking. The finance division is already responsible for revenue (taxes, permits, etc.), resulting in an additional function when pay parking is introduced. 	<ul style="list-style-type: none"> Works with the municipality for zoning parking requirements, Payment-in-Lieu contributions and joint ventures with developers. Parking authorities may also contract out to a private operator to manage off-street parking facilities. Toronto is no longer pursuing joint capital parking structures with private developers and instead focusing on developing parking management service agreements with public and private sector building and property managers. Thunder Bay and Winnipeg Parking Authorities are still accountable to municipal Councils and act more as a Municipal Vertically Integrated organization structure.



Model	Description	Purpose	Comments
Privatization	<ul style="list-style-type: none"> • Municipalities can operate, maintain, and plan for the future by outsourcing on-street and off-street parking facilities to a private consortium of investors over a 35 to 50-year-plus term in exchange for a large upfront cash payment. • Assets remain the property of the municipality. • City transfers to the private consortium: (a) operating risk (i.e. management & maintenance costs) and (b) capital expenses for the term of the long-term agreement. • Gain extra capital funding from an investor for new facilities. • This has been a trend only in US cities and universities over the last 15 years. • The largest challenge is developing and implementing a long-term agreement that is fair to a city and the private consortium. 	<ul style="list-style-type: none"> • Lack of funds to maintain, modernize or upgrade parking infrastructure, such as on-street meters/technologies and parking garages in need of intensive capital refurbishment. • There is a need for new parking facilities (lots or garages) but a shortage of City funds. • A city looks to the future requirements for parking infrastructure refurbishment or replacement (i.e. parking garage) and determines they do not have the finances to undertake such a capital-intensive project, so they pursue private sector investors. 	<ul style="list-style-type: none"> • If a municipality is under pressure to reduce costs and to fund growth, key questions are: <ul style="list-style-type: none"> ○ Is parking a key core service? ○ Can the capital be better invested elsewhere into core municipal services?



Model	Description	Purpose	Comments
<p>Public Private Partnership (P3)/ (Business District/ Business Improvement Area)</p>	<ul style="list-style-type: none"> • Parking is operated & managed by a downtown business improvement group, Chamber of Commerce, Board of Trade, or urban renewal agency through an operating agreement with the City. • Smaller cities may not have the parking infrastructure, which provides them with opportunities to establish relationships with the private sector landowners willing to work with the City in providing parking. 	<ul style="list-style-type: none"> • The downtown business community has a vested interest in urban renewal and resurgence and often has skills in strategic planning that may be lacking in traditional municipal structures. • Business is committed to making parking successful in meeting the business community’s concerns about the vitality of commercial streets and the downtown’s attractiveness to residents and tourists. • Encourage parking efficiency and parking infrastructure investment. • Plan parking facilities at strategic locations. 	<ul style="list-style-type: none"> • Montreal (Stationnement de Montreal) created this Business District organizational model in 1995 to optimize paid on and off-street parking in the downtown & was a subsidiary of the Montreal Board of Trade under an agreement with the City of Montreal. • Public Private Partnership generated much higher revenue for the City of Montreal than originally projected, contributing \$50 million per year to the City. • However, the City of Montreal determined rates, locations and other regulations. • In 2020, Montreal changed the governance and management arrangements due to a new parking policy to broaden the mandate of parking to city-wide sustainable mobility management, which the Board of Trade supported and now known as Agence de Mobilité Durable (Sustainable Mobility Agency).



Model	Description	Purpose	Comments
<p>Private Sector Parking</p>	<ul style="list-style-type: none"> • The private sector provides Off-Street parking as part of their developments that may allow public parking based on demand and supply with parking fees determined by the marketplace and fully controlled by the private sector (not City Council). • The private sector landowner makes the decisions on provision of off-street parking, daily operations and parking fees without City Council's approval. • Municipal objectives may be given low priority, such as, “City building” and promotion of multi-transportation modes. • Depending on parking fees, the economy and demand and supply, private sector may have insufficient capital to expand parking infrastructure. 	<ul style="list-style-type: none"> • Private sector, plans, finances, builds, operates and manages parking facilities (i.e. surface lots, above ground and underground parking structures), relieving the City of these intensive capital investments. • Beneficial in the provision of public parking facilities through possible shared parking agreements or partnerships without intensive capital investments. 	<ul style="list-style-type: none"> • The private sector landowner makes the decisions on provision of off-street parking, daily operations and parking fees without City Council's approval. • Municipal objectives may be given low priority, such as, “City building” and promotion of multi-transportation modes. • Depending on parking fees, the economy and demand and supply, private sector may have insufficient capital to expand parking infrastructure.



5.3 EVALUATION OF PARKING ORGANIZATIONAL STRUCTURES

The parking organizational models were evaluated at a high level for the Markham context based on six (6) criteria and the total ranking preference, as shown in **Exhibit 5-6** and listed below:

- Parking Vision
- Service
- Control / Decision Making
- Integration
- Self-Sustainability, and
- Transparency.

The criteria and high-level evaluation are designed to assess how well parking meets the objective of city building and the principles of taking a leadership role in influencing parking strategy and maintaining a cooperative approach with other City divisions and departments in attaining the City’s corporate goals and objectives. Each criterion was assigned a positive, neutral, or negative rating.

From this analysis, the vertically integrated organizational structure is “preferred” and offers the most significant improvement from the current horizontally integrated organizational structure in achieving the City’s vision and supporting the strategic goal of using parking as a tool for city building. The other organizational structures, parking authority, privatization, business district (P3) and private sector are “not preferred.”



Exhibit 5-6 - Evaluation of Parking Organizational Structures

Evaluation Criteria	Criteria Description	Horizontally Integrated	Vertically Integrated	Parking Authority	Privatization	Business District / P3	Private Sector
Parking Vision	Create adaptive area-specific policies, standards, and programs that align with the City's commitment to providing residents, visitors, and businesses with an efficient, safe, equitable, reliable, and convenient transportation system and support the City's transformation into a more sustainable, multi-modal, and livable city.	●	●	●	●	●	●
Service	Balance between revenue optimization and community benefits in meeting City's strategic objectives (i.e. city building).	●	●	●	●	●	●
Control / Decision Making	Level of City maintaining control over planning, operations, and financial objectives (i.e. setting parking fees and budgets).	●	●	●	●	●	●
Integration	Degree of integration of parking into the overall transportation network in achieving alternative mobility management services for residents, workers and visitors.	●	●	●	●	●	●
Self-Sustainability	The provision of public parking services where revenue covers all parking costs at no or minimal contribution from the property tax base.	●	●	●	●	●	●
Transparency	Parking policies, procedures and guidelines that provide accountability, traceability of decisions and openness within the parking governance model for residents and visitors.	●	●	●	●	●	●
TOTAL		Possible	Preferred	Not Preferred	Not Preferred	Not Preferred	Not Preferred

POSITIVE ● NEUTRAL ● NEGATIVE ●



5.3.1 CONSIDERATIONS FOR A PARKING AUTHORITY

While **Exhibit 5-6** shows the vertically integrated organizational structure as the most appropriate model for the City of Markham, it is recognized that the City devoted past resources and analysis between 2008 and 2012 to the possibility of establishing a parking authority.

A parking authority is not recommended for the following reasons:

- Examinations of parking authorities are found in cities with a large number of public pay parking spaces (garages, surface lots and on-street), ranging from 6,000 (Winnipeg) to 59,000 (Toronto) spaces. In contrast, Markham has only 307 pay parking spaces in the Cornell Community Centre parking garage and payment is partial, that only occurs beyond the first 3 hours (i.e. free parking validation program).
- Historically, in the 1940s, 1950s and 1960s, parking authorities were established with a major municipal goal to expeditiously expand the provision of both new on-street and off-street pay parking spaces to support local businesses unencumbered by municipal approval processes that would delay such major expansion.
- Parking Authority boards make decisions on day-to-day operations, including parking fees, without approval by the City Council and with no public input, thus limiting the opportunity to achieve the City's parking management objectives.
- City building and the promotion of transit and active transportation may be given low priority as they may negatively impact the primary objective of increasing parking revenue and cost efficiency. In 2021, the 55-year-old Calgary Parking Authority was disbanded and transitioned in 2022 to a City division to expand its role beyond parking through a multi-modal vertically integrated organization and using parking to contribute to city building.

Exhibit 5-7 lists 17 Canadian cities and provides information about each city's population, number of public pay parking spaces and approach to parking, including the type of parking business model adopted and the primary contracted services.

Most Canadian cities have horizontally and vertically integrated organizational structures, followed by only 4 parking authorities in the country. Montreal is different as it has a separate parking organization, Agence de Mobilité Durable (Sustainable Mobility Agency), with sustainable mobility management responsibilities. Up until 2020, it was operated and governed as a Business District in the downtown by Montreal's Board of Trade. Since that time, the Executive Committee of the City of Montréal has appointed the members of its Board of Directors for the period that it sees fit and appoints two City of Montréal representatives to act as observers.



The Canadian cities with parking authorities are Thunder Bay, Toronto, Vancouver, and Winnipeg. These cities (except for Thunder Bay) are larger and have a higher number of public pay parking spaces than the other cities.

Except for London, Ontario, the other Canadian cities organize their parking functions horizontally or vertically integrated within a department, division, or branch. London, Ontario has a standalone vertically integrated parking department operating within the single tier level of Transportation Services and at the same level as public transit (London Transit Commission).



Exhibit 5-7 Benchmarking Parking Organizational Structures

Benchmark					Parking Organizational Model				
City	Population	Public Pay Parking Spaces	100% Non-tax Supported	Governance	Municipal		Parking Authority	Primary Contracted Services	Separate Organization/ Business District
					Vertically Integrated (Parking Dept)	Horizontally Integrated (Section within Dept)			
Markham ⁽¹⁾	338,500	307 ⁽⁷⁾	No	Council		Yes		Parking equipment, monitoring, maintenance and repair, ticketing on private property	
Brampton	703,000	4,518	Yes	Council		Yes		None	
Burlington	194,175	1,519	Yes	Council		Yes		Enforcement	
Calgary	1,306,000	17,374	Yes	Board	Yes		Disbanded 2021	None	
Edmonton	1,010,899	6,562	Yes	Council		Yes		Enforcement	
Hamilton	569,000	3,700	Yes	Council		Yes		None	
London	422,000	2,664	Yes	Council	Yes			Enforcement some off-street	
Mississauga ⁽²⁾	766,000	1,997	Yes ⁽⁵⁾	Council		Yes		Parking equipment maintenance and repair	
Montreal	1,763,000	22,214	Yes	Board			Mobility Agency	None, enforcement by police (civilisés)	Yes
Ottawa	1,017,000	6,737	Yes	Council		Yes		On-street & off-street revenue and equipment, ticket processing	
Regina	195,000	1,250	Yes	Council		Yes		Enforcement	
Thunder Bay	108,843	3,178	Yes	Board ⁽⁶⁾			Yes	Revenue collection some off-street	
Toronto ⁽⁴⁾	2,794,000	53,000	Yes	Board			Yes	Revenue collection	
Vancouver	662,248	20,930	Yes	Board			Yes	None	
Vaughan	323,000	325	Yes	Council		Yes		Pilot pay and display	
Winnipeg	749,607	5,971	Yes	Board			Yes	None	
Windsor	229,000	4,355	Yes	Council		Yes		Enforcement	

¹Limited locations.

²Downtown spaces only.

³For municipal parking departments or sections, snow ploughing, lot sweeping, hydro, enforcement, professional services and other services may be performed or covered by other municipal departments with the associated costs not allocated to the parking function.

⁴Toronto Parking Authority currently offering their expertise & services to manage other public and private lots under 3rd party agreements.

⁵The primary functions of parking operations & enforcement are self funded through fees and fines, but other functions and related costs performed by other depts. are not allocated to the Mississauga parking budget.

⁶Thunder Bay Parking Authority under Development & Emergency Services Division of the City.

⁷Cornell Community Centre parking garage with 307 spaces and 3 hour "free" validated parking after which, pay parking begins.



5.3.2 RECOMMENDATION FOR A MUNICIPAL PARKING ORGANIZATIONAL STRUCTURE

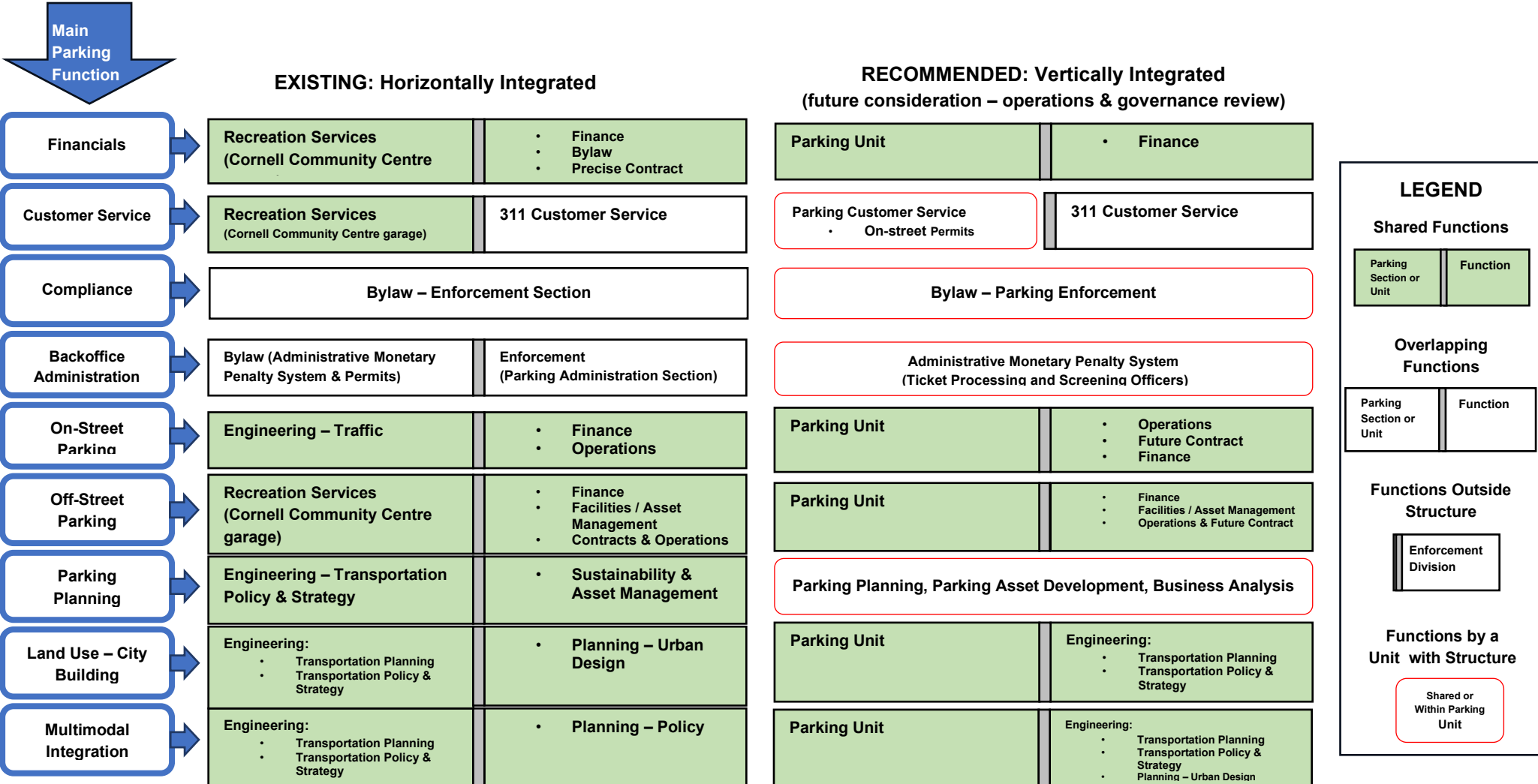
It is recommended that the City continue to operate as a horizontally integrated organizational structure and eventually evolve and adjust over time as the municipal parking needs and supply increase, resulting in becoming a larger municipal parking portfolio. Based on this study, at this time, a transition to a vertically integrated parking organizational structure, as shown on **Exhibit 5-8** should also be considered as part of a future review of municipal parking operations and governance structure, raising the profile of parking in the City as a policy tool for urban development and city building that:

- Efficiently manages parking supply through TDM (Transportation Demand Management).
- Supports a more compact, multi-modal community for influencing mobility.
- Encourages the use of alternative travel modes and reduces motor vehicle use.
- Connects decision-making with minimum parking requirements (zoning bylaw), on-street parking bylaws, funding (future paid on-street parking), and shared parking opportunities with the private sector (particularly off-street parking).

It is important to note that while the City could continue operating with the Municipal Parking governance model, it does not preclude the City from engaging in private partnerships following the P3 (Public-Private Partnerships) and private sector parking governance models to increase public parking supply.



Exhibit 5-8 - Existing & Recommended Parking Organizational Structure



5.3.3 RATIONALE FOR A VERTICALLY INTEGRATED PARKING ORGANIZATIONAL STRUCTURE

The rationale for the City to consider the creation of a new vertically integrated parking organizational structure (as part of a future review of parking operations and governance) is to:

- Maintain accountability/decision-making with City Council.
- Create a business unit with a leadership role in influencing parking strategy, planning, supply, demand and parking fees.
- Create a “one-stop shop” for parking strategy, planning, services, products and issues.
- Balance parking as both a service and an important tool for city building to influence behaviour and support multi-modal transportation network, transit and TDM (Transportation Demand Management).
- Establish a future goal of making parking self-sustainable through user fees for revenue-generating parking activities, while non-revenue parking activities would continue to be funded by the tax base.
- Achieve seamless coordination and decision-making for new on-street parking, off-street parking facilities, pursuing joint development opportunities, shared parking partnerships, etc. (especially for parking structures as they are costly to build and maintain).
- Maintain a cooperative approach with other City departments and divisions in attaining the City’s corporate goals and objectives.

It is recommended that should the City consider a new vertically integrated organizational structure as part of its future review, Parking & Mobility may have the following main responsibilities, subject to the City’s internal decision:

- Establish a budget and financial plan for parking initiatives.
- Manage on-street parking and coordinate with Traffic Operations and Bylaw.
- Manage the Overnight On-Street Residential Parking Permit Program.
- Develop policies and procedures for recreational vehicle parking.
- Maintain electric vehicle / micro-mobility charging infrastructure
- Provide input into the Official Plan and Secondary Plan parking-related policies.
- Develop parking design guidelines and parking standards, including the City’s own facilities.



- Provide comments for Zoning bylaw amendments and Committee of Adjustment and driveway widening applications.
- Review parking studies and lead area-specific Parking Strategies and Parking Management Plans.
- Assist with accessibility policies and standards related to parking.
- Develop and manage parking data management related to parking supply, demand, and utilization across the City.
- Investigate appropriate parking technologies to improve parking management at City facilities and key development areas.
- Apply and monitor Parking Key Performance Indicators (KPIs) as the City transitions to paid parking.
- Coordination with other departments on matters that impact parking, such as TDM.

5.4 GOVERNANCE AND FINANCE PRINCIPLES

Markham’s transition to a vertically integrated organizational structure for parking is to be initiated by the City, with the pace of transition also determined by the City. To guide this process, the following parking governance and finance principles were developed in consultation with City staff. These principles were presented to and endorsed by Council at the September 17, 2024, Development Services Committee (DSC) Meeting.

Governance Principles

- Support the Parking Vision to “Create adaptive area-specific policies, standards, and programs that align with the City’s commitment to providing residents, visitors, and businesses with an efficient, safe, equitable, reliable, and convenient transportation system and support the City’s transformation into a more sustainable, multi-modal, and livable city.”
- Balance between revenue optimization and community benefits in meeting the City’s strategic objectives.
- Maintain City control over planning, operations, and financial objectives.
- Optimize the integration of parking into the overall multi-modal transportation network.
- Develop parking policies, procedures, and guidelines that provide accountability, traceability of decisions, and openness.

Finance Principles

- Provide public parking services where revenue covers all parking costs with no contribution from the property tax base.



6 PARKING FINANCIAL ASSESSMENT

This section outlines the importance of financing municipal parking services and how the future operations and infrastructure should be funded.

It is important that the City adopt an approach to funding and financing parking, especially as ongoing parking operations, maintenance, infrastructure, technology, and future capital expansion all become increasingly costly.

6.1 Importance of Parking Finance

The City of Markham faces a few key issues, including:

- Parking is costly to provide, operate and maintain, but drivers rarely pay.
- Land is increasingly costly, and surface lot parking is increasingly too costly to be feasible.
- Development Charges revenue may be insufficient for the construction of new major public parking facilities and technologies.
- According to Bylaw & Regulatory Services, parking enforcement ticket revenues are not currently sufficient to cover operating expenses (and confirmed by data in **Exhibit 6-1**).
- Future surpluses from parking ticket revenues and any future paid parking program should be directed towards the cost of parking capital and operations.

The objectives of the financial assessment are to determine the following:

- Should the City invest in creating more public parking supply?
- If the City creates more public parking supply, should it be user-paid and self-funded or tax-supported through property tax?

To better understand parking finances, it is important to note the parking expenses, revenue, and loss (or profits) from the City's existing parking operations.

The City of Markham currently has low paid parking revenues generated after the first 3-hours of free parking at the Cornell Community Centre parking garage. From the minutes of the former Markham Parking Advisory Committee meeting minutes of September 7, 2012 it was estimated that to provide free parking at the Cornell Community Centre parking garage would cost \$660,000 per year, which equates to approximately of over \$7.9 million (\$660,000 x 12 years) in revenue loss since the garage first opened in 2012 (2012 to 2024). After deducting revenues from operating expenses, **Exhibit 6-1** shows that the parking garage operates at an average loss over the past 10 years of nearly \$44,000 per year.



The other current major source of parking revenue is parking violations. **Exhibit 6-2** shows for 2019 (pre-COVID) total parking revenue of \$3.6 million, with approximate parking enforcement expenses of approximately \$11.4 million for a total loss of \$7.8 million. Monthly residential overnight parking permits generated a limited total revenue of \$150,000 in 2019.

A best practice of many municipalities is that parking services should be financially self-sustaining through revenues that offset operating expenses, and if any surplus, contribute to major capital expenses, such as parking facilities. As outlined in **Section 5.4**, Markham Council has adopted a governance and finance principle to “provide public parking services where revenue covers all parking costs with no contribution from the property tax base.”

Exhibit 6-1 Cornell Parking Garage Expenses, Revenue & Losses 2014 – 2023

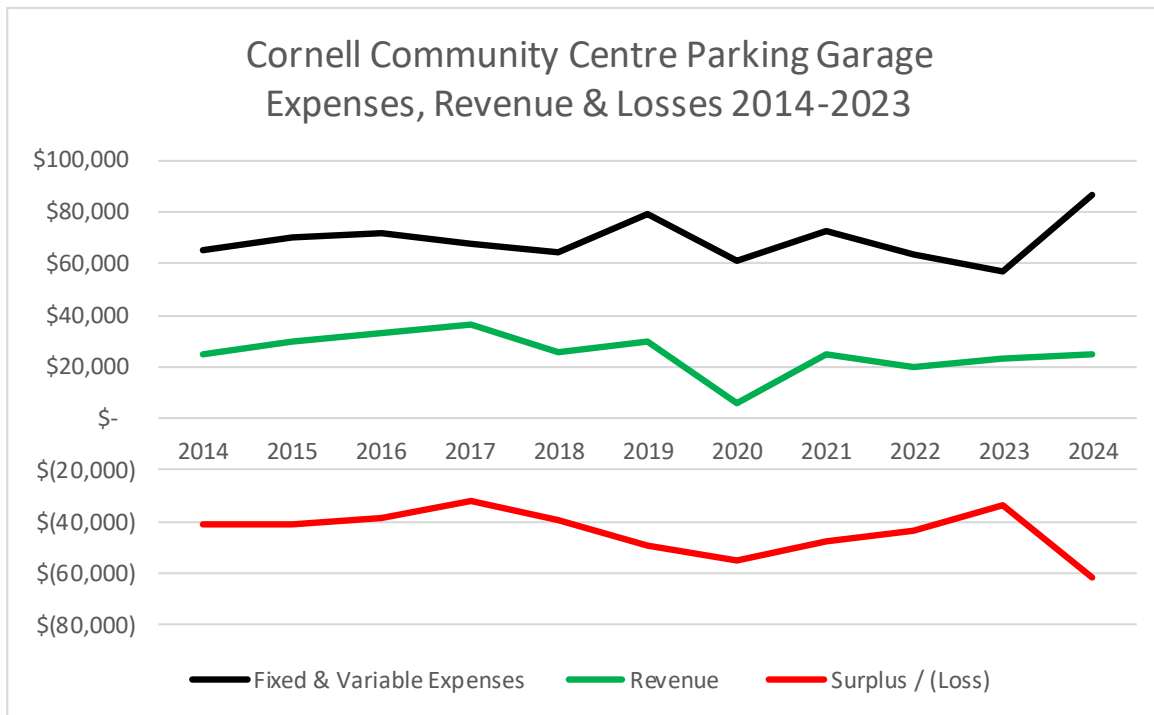
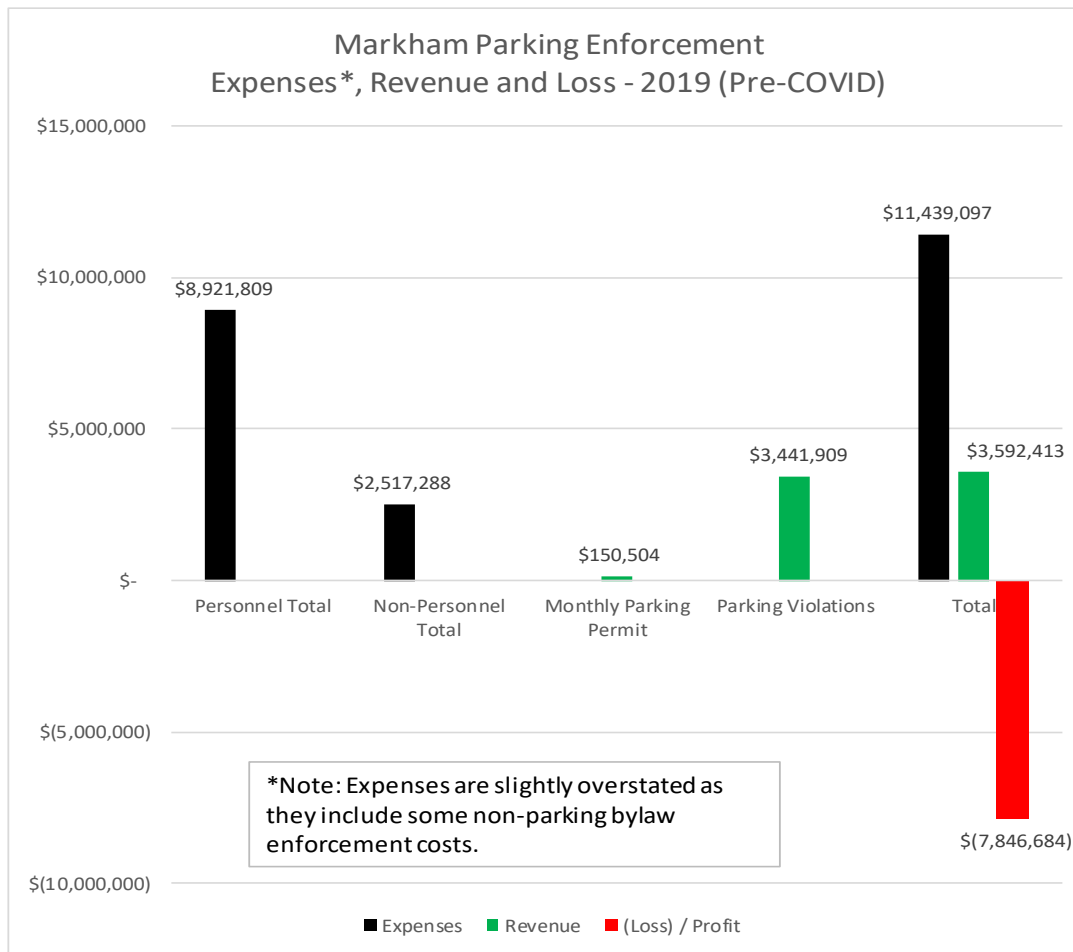


Exhibit 6-2 - Markham Parking Enforcement Expenses and Revenue, 2019



6.2 Elements and Assumptions of Parking Financial Model

The common public perception that parking should be “free” does not consider the costs associated with providing and maintaining the parking. The cost of parking spaces in new parking facilities includes land acquisition, design and construction, lighting, power, signage, access control, safety and security, fencing, landscaping, parking planning, and insurance. The cost of parking spaces in existing parking facilities includes the ongoing maintenance costs of snow and litter removal, power sweeping, resurfacing, landscaping, line painting, lighting, and insurance. Additional costs include marketing, promotion, and enforcement. Free parking during certain time periods increases enforcement costs as additional patrols are required.

In some cities, parking enforcement revenue is used to support the entire parking program and operations, including enforcement costs. When parking is “free,” the costs must be covered from sources such as taxes, and it is not possible to build reserves to



fund future capital projects. However, Development Charges are fees collected from developers at the time of building permit issuance and help to pay for the cost of the infrastructure required to provide municipal services to new developments.

6.2.1 ELEMENTS OF THE FINANCIAL MODEL

Deciding whether to construct an above-ground or below-ground parking structure or large surface lot requires a financial evaluation to determine:

- The parking markets served (For example, retail customers, monthly employees, and shared parking).
- The walking distances to and from surrounding land use.
- The best location for the parking structure.
- The type of parking structure (For example, above-ground precast concrete, prefabricated steel beam or underground).
- The parking fees. Fees should be charged based on market rates and should support a reasonable payback period, normally between 25 and 35 years.
- Forecasts of parking demand and supply.
- Non-financial considerations such as City’s policy to encourage more environmentally sound modes of transportation.
- Potential partnerships with compatible land use interests.

A financial model was prepared for a hypothetical 1,000-space parking facility, with options being above grade, and underground, and a surface lot. **Exhibit 6-3** shows the elements that drive the parking financial model, including capital cost and payback period (years).



Exhibit 6-3 Elements of a Parking Financial Model

Elements of a Parking Model	Description
Demand (parking users) – Short and Long-Term	<ul style="list-style-type: none"> The volume of parking users by type (transient vs. monthly)
Supply (Spaces)	<ul style="list-style-type: none"> Based on demand or availability
Revenue (Fees)	<ul style="list-style-type: none"> Based on demand (volume of parking users, by type) and pricing (rates) Fine-tuning different rates – monthly parking vs. transient parking Incremental pricing increases (based on the parking market)
Cost – Capital and Operating	<ul style="list-style-type: none"> Based on supply Type of parking facility (on-street, surface lot, underground, above ground) Ongoing operating and maintenance expenses Capital costs of surface and structured parking
Finance	<ul style="list-style-type: none"> Funding sources (user fees, Payment-in-Lieu, development charges, tax contribution) and tax incentives promoted through the Province’s Smart Growth initiatives Return on Investment – including “breakeven point” Payback period (years)

6.2.2 CRITICAL ASSUMPTIONS OF THE FINANCIAL MODEL

The critical assumptions used in the financial model are shown on **Exhibit 6-4**. This is a high-level financial assessment and is subject to future detailed business case analysis to address marketplace changes regarding parking demand and supply analysis, costs of land and construction, possible shared parking partnerships, competitive parking fees, parking equipment and technology cost, risk management assessment and other changes.



Exhibit 6-4 Parking Financial Assessment Assumptions

Criteria	Assumption
Capacity	1,000 spaces
Land Area	1 acre
Land Required for Surface Lot	6 acres (approx. 172 parked cars per acre)
Occupancy Rate	Moderate (60%) over an entire year
Turnover Rate	1.5 vehicles per day
Capital Cost	
Land Cost per Acre	\$6,000,000 per acre
Total Construction Cost	Above ground (precast concrete): \$70,000 Above ground (prefab galvanized steel):\$40,000 Underground: \$100,000 Surface Lot: \$7,000 Life Cycle:40 years (structures);15 years (surface)
Capitalized Expenses	12.5% of total construction for engineering, design, consulting, permits and other expenses
Parking Equipment Cost	\$521 per space (Life Cycle: 10 years)
Parking Guidance System	\$750 per space (Life Cycle: 10 years)
Operating Cost	
Maintenance Cost per space / year	Parking Garages: \$350 Surface Lot: \$200
General & Administrative Cost	15% of revenue per year
Bank Processing & Other Costs	10% of total costs per year
Corporate Overhead Percentage of Total Revenue	5% per year
Revenue (Parking Fees)	
Weekday Daytime Daily Max	\$17.50 (Existing Cornell CC & Hospital)
Weekday Daytime Hourly	\$4.00 (50% of \$8 per hour rate at Cornell CC & Hospital)
Weekday Evening Flat (Hourly)	\$5.00 (\$3.00)
Weekend Flat (Hourly)	\$15.00 (\$3.00)
Monthly Permit	\$200 per month



6.3 FINANCIAL EVALUATION OF PARKING FACILITY OPTIONS

The framework for the financial evaluation of a new parking facility requires an assessment of:

- Investment Costs
- Operating Assumptions
- Revenue Assumptions, and
- Operating Costs.

Exhibit 6-5 provides a financial summary of four options to deliver a 1,000-space parking facility:

- Above grade precast concrete structure
- Above grade steel beam prefabricated structure
- Underground structure
- Surface lot requiring 6 acres of land (based on the standard of approximately 172 parked vehicles per acre)

Exhibit 6-5 Financial Summary of Parking Garages and Surface Lot Options

Facilities	Parking Spaces	Facility Type	Capital Cost	Annual Revenue	Annual Operating Cost	Net Cost Recovery	Payback Period (Years)
Parking Structure (multi-level)	1,000 spaces (1 acre = \$6M)	Concrete	\$86.3M	\$5.7M	\$1.3M	\$4.4M	19.6
		Prefabricated (Galvanized Steel)	\$52.6M	\$5.7M	\$1.3M	\$4.4M	11.9
		Underground	\$120.0M	\$5.7M	\$1.3M	\$4.4M	27.2
Surface Lot	1,000 spaces (6 acres = \$36M)	Surface Lot	\$45.4M	\$5.7M	\$1.2M	\$4.5M	9.9
Assumed parking fees: Cost per hour: \$4.00 Cost per day: \$17.50 Monthly Permit: \$200							



6.3.1 PARKING STRUCTURES & SURFACE LOT

Exhibit 6-5 shows that the capital costs of building parking structures are high ranging from \$52.6 million for a prefabricated above ground structure, \$86.3 million for a precast concrete above ground structure and \$120 million for an underground garage. The surface lot capital cost is \$45.4 million due to the large amount of costly land (6 acres) to accommodate 1,000 parking spaces. The payback period varies from 11.9 years (above-ground prefabricated structure), 19.6 years (above ground precast concrete) to 27.2 years (underground). The payback period is affected by the time required to build the garage. The above-ground concrete and pre-fab structures would be built faster than the underground garage so the payback period would start sooner. A more detailed table can be found in **Appendix A**.

The large surface lot (6 acres) has estimated land costs of \$6 million per acre and the shortest payback period of 9.9 years, however, using such a large parcel of prime land for surface parking is impractical.

Parking structures are expensive and require significant capital investment. The revenue stream from parking fees is important for contributing to capital and ongoing operating costs. Before deciding whether to build a parking garage, a full business case and detailed financial analysis are required. The up-front investment and associated borrowing costs, loss of investment income, or opportunity costs must be weighed against future operating costs and revenue cash flows (i.e. the net present value of the investment must be considered).

Exhibit 6-6 shows an above ground pre-fabricated steel beam parking garage at the Centennial GO Station in Markham and **Exhibit 6-7** shows an above ground precast concrete parking garage in Mississauga. Underground parking garages are constructed of concrete structures.



Exhibit 6-6 Prefabricated Steel Beam Parking Garage - Centennial GO Station, Markham



Exhibit 6-7 Precast Concrete Parking Garage - Clarkson GO Station, Mississauga



6.3.2 ON-STREET PARKING

Best practices in parking recognize that on-street parking are premium spaces due to close proximity to local businesses and services, while off-street parking spaces are more for long term parking, such as employee parking, and should be priced lower than the premium spaces.

Free on-street parking is often taken up by nearby business owners, employees, and residents, when a better use of those parking spaces would be for customers and visitors.

Paid parking, at the right price, is a tool to manage parking demand and achieve high parking space turnover (which increases the total parking supply without having to build new parking lots and garages).

When parking occupancy and turnover are low (i.e. many empty spaces) free parking is acceptable. However, when parking occupancy and turnover are high (i.e. very few empty spaces), then paid parking is recommended. Candidate locations for on-street paid parking in Markham include:

- Main Street Markham
- Main Street Unionville, and
- Markham Centre.

Part of an on-street paid parking program involves “pricing parking right,” which means the lowest price that will leave one or two vacant spaces on each block face (average of 2 spaces of every 8 spaces vacant). People will see that convenient parking is available, as the only thing worse than paying for parking is having no parking available. The objective is to keep 85% of parking spaces occupied all the time.

Parking can be controlled by Pay By Licence Plate (PBLP) or Pay & Display (P&D) machines (approximately 1 machine for every 8-10 spaces per block face), such as the example shown in **Exhibit 6-8**, Pay by Mobile Phone app and ongoing enforcement.



Exhibit 6-8 Pay by Licence Plate Machine, Oakville



It is important to strike a balance between parking users, merchants and parking policies that create vehicle turnover. With a Pay By Licence Plate system, it is possible to provide parking users with 20 minutes of free parking twice per day. The parker decides how to use the two units of free parking time, which may be back-to-back or on separate occasions, such as one in the morning and one in the afternoon. This type of application permits customers making quick purchases, such as a cup of coffee or picking up dry cleaning, to do so without paying for parking and without staying on-street for a longer period than necessary. Depending on the parking vendor, this may also be possible with a mobile payment app using a QR code similar to the app used for people going through security at airports.

With paid parking, parking revenues should be reinvested in improvements (roads, sidewalks, street furniture, planters, promotional banners, special events, etc.) for the 3 local Markham historical downtown areas. **Exhibit 6-9** shows the revenue generated from 50 paid on-street parking spaces for each of the 3 historical business areas in Markham with a short payback period of 1.3 years due to annual net cost recovery (or profit of \$144,000 per year per business area) that can contribute to financial sustainability. This income can offset parking management and operating costs, reducing the burden on taxpayers. A more detailed table can be found in **Appendix B**.



Exhibit 6-9 Financial Assessment of On-Street Paid Parking

Facilities	Parking Spaces	Community	Capital Cost	Annual Revenue	Annual Operating Cost	Net Cost Recovery	Payback Period (Years)
On-Street Paid Parking	50	Main Street, Markham, Main Street, Unionville, or Markham Centre	\$184,200	\$237,500	\$93,200	\$144,300	1.3
Parking Fees Cost per hour: \$4.00							

6.3.3 OVERNIGHT RESIDENTIAL PARKING PERMITS

There is increasing demand for on-street overnight parking across the City resulting from recent changes to the Planning Act (formerly Bill 23) which allow up to 3 residential units to be established per single family detached, semi-detached and townhouse dwelling. Official plan policies and zoning bylaws to enable such additional residential units cannot be appealed, and existing policies and bylaws that prohibit such units are void. Additionally, no more than one parking space is required for each residential unit.

Without provision for additional parking, the increased density may increase the demand for on-street overnight residential parking and lead to a shortage of available parking spaces in the City of Markham. Consequently, it becomes imperative for the City to address this issue proactively and consider appropriate measures through a study to mitigate the potential parking challenges arising from the increased density by examining potential inventory of all municipal streets that may accommodate additional overnight on-street parking, financial implications (operating and capital costs and revenue from a paid permit program), impact on the existing street network (i.e. snow plowing, bicycle lanes, roadway geometrics, etc.) and many other factors.

A high-level financial assessment was undertaken to estimate the capital cost, operating cost, revenue, and cost recovery of a hypothetical overnight Residential Permit Program (RPP) with 1,000 parking spaces across the City of Markham, as shown on **Exhibit 6-10**. For 1,000 parking permit spaces at the current monthly permit fee of \$61, the net cost recovery is hugely profitable with an annual net cost recovery of \$269,500 and short payback period of 11 months (0.92 years). The surplus (profit) from such a program can make the entire RPP self-funded (i.e. no tax support) as well as support alternative sustainable mobility initiatives (i.e. cycling, multi-use paths, carpooling, car sharing, etc.). A more detailed table can be found in **Appendix C**.



Exhibit 6-10 Financial Assessment of Overnight Residential Parking Permits

Facilities	Parking Spaces	Capital Cost	Annual Revenue	Annual Operating Cost	Net Cost Recovery	Payback Period (Years)
Overnight Residential Parking Permits	1,000	\$248,000	\$394,600	\$125,000	\$269,500	0.92 (11 months)
Parking Fees: per current monthly permit of \$61.00						

Given the expectation for increasing demand, a more extensive overnight residential parking permit program could be self-sustainable and not requiring any contribution from the tax base.

6.4 RECOMMENDATIONS FOR FINANCIAL PARKING OPERATION

As outlined in **Section 5.4**, Markham Council has adopted a governance and finance principle to “provide public parking services where revenue covers all parking costs with no contribution from the property tax base.” Further to this, recommendations regarding paid parking are as follows:

- The City Parking fees should reflect market conditions (supply and demand).
- The City should use annual parking ticket revenue to cover all enforcement costs, including parking ticket processing. Any surplus revenue should be placed into the reserve account to pay for new capital projects.
- The City should regularly increase its parking fees to keep pace with inflation, and,
- The City should develop a fee-setting strategy to meet specific parking utilization objectives. The strategy could include setting parking fees that vary by location, time of day, and special event type.

6.4.1 RISK MITIGATION

It is important to acknowledge that there are risks associated with constructing new parking facilities. For example, if the expected parking demand is not realized for any reason, the lower revenue will negatively impact the payback period, causing a burden on the City. A high-level risk and mitigation assessment is provided in **Exhibit 6-11**.



Exhibit 6-11 Municipal Parking Risk Mitigation

Risk	Mitigation
If the expected parking demand is not realized, the negative revenue will create a financial burden on the City and taxpayers.	Conducting proper financial analysis for each candidate's paid parking area.
If the City creates an oversupply of parking, this can increase auto travel, increase congestion, and be detrimental to sustainability and multi-modal objectives.	Monitoring parking demand and adjusting supply through future-ready design.
There is a risk that paid parking may have an adverse economic impact on businesses in some locations.	Conducting market studies to identify areas vulnerable to paid parking. Conduct follow-up studies in paid parking areas to collect lessons learned, which should be applied in future implementation.
Should the City not expand its current overnight on-street residential parking, it would risk not accommodating parking demand for some secondary units without on-site parking. It is assumed this would be limited to existing developments in Parking Zone 4.	New development areas should right-size parking supply, and these areas should be planned with appropriate infrastructure to encourage non-auto travel and connection.
Not providing municipal public parking and reducing Zoning By-Law requirements may result in an insufficient amount of public parking. This may negatively impact the viability of local businesses/services and citizen participation in public activities resulting in community dissatisfaction by both businesses and the public.	Quarterly monitoring of parking occupancy at all parking facilities and reporting on corrective actions, such as, aggressive deployment of TDM measures (transit, carpooling, cycling and walking) and if the latter is not enough, then undertake business case analysis to increase public parking supply, including shared parking opportunities with the private sector
Challenges meeting the City's environmental sustainability and climate change objectives caused by increased congestion by motorists "circling" to find parking spaces that may or may not be available due to lack of supply.	Aggressive marketing and promotion of TDM measures (transit, carpooling, cycling, and walking).



7 IMPLEMENTATION PLAN

An implementation plan was developed to guide the City in the implementation of the recommended parking policies. Twelve key actions were identified, representing twelve initiatives to be pursued by the City. Since implementation will require significant resources and coordination, it is important to prioritize the key actions and assign a timeframe for each. Prioritization of the key actions considered:

- Early deliverables
- Funding opportunities
- Logical sequencing
- Time sensitivity and immediate needs
- Synergy with other studies
- Emerging trends
- Resource availability
- Foundational actions

Council approval will be required for the City to initiate each action item. Apart from the studies that are currently underway (Transportation Master Plan, Parking and TDM standards update), the City has not yet allocated resources to the implementation of the CWPS policies. Initiation of action items, roles and responsibilities will be managed by the City following the completion of the CWPS.

Five Key Actions are recommended for completion in the short term (5 years), six are recommended for completion in the long term (beyond 5 years), and one action is identified for ongoing action. The City will continuously monitor and identify opportunities to advance long-term actions, as appropriate, through the annual budget process.

The implementation plan is provided below.



Action 1: Incorporate the Parking Zones Map into the Official Plan

Action Items	Policy Implemented	Further Study Required	Priority
Action 1.1 Parking Zones Map <ul style="list-style-type: none"> Introduce the Parking Zones as a new Map in the Official Plan or a new schedule in the Zoning By-law 	Policy 1.1	-	Short Term (0-5 years)

Action 2: Update Parking and TDM Standards

Action Items	Policy Implemented	Further Study Required	Priority
Action 2.1 Parking Requirements <ul style="list-style-type: none"> Determine vehicular parking requirements in accordance with the Parking Zones, including no parking minimums in Zones 1 and 2 to comply with Part III 16 (22) and Part V 34 (1.1) of the Planning Act (formerly Bill 185). Determine vehicular parking requirements for affordable housing Expand shared parking requirements to include sharing between 2 or more lots Amend the Comprehensive Zoning By-law 2024-19 	Policy 1.1 to 1.3	✓	Short Term (0-5 years)
Action 2.2 TDM Guideline <ul style="list-style-type: none"> Prepare TDM Guidelines for developments, including: <ul style="list-style-type: none"> List TDM measures and descriptions Identify Minimum TDM requirements for developments in accordance with the Parking Zones Develop Methodology for earned parking reductions (for example, points system per TDM measure) Determine Maximum earned parking reduction per Parking Zone Replace the Markham TDM Plan Terms of Reference (June 2023) with the new TDM Guideline Incorporate TDM requirements into the Zoning By-law 	Policy 2.1, 2.2	✓	Short Term (0-5 years)
Action 2.3 EV Parking Requirements for Residential Uses <ul style="list-style-type: none"> Set 100% EV-ready requirements for all resident and visitor parking in new developments capable of supporting a Level 2 charger (Citywide) Update the Zoning By-law to incorporate EV parking requirements 	Policy 8.1	-	Short Term (0-5 years)
Action 2.4 EV Parking Requirements for Non-residential Uses <ul style="list-style-type: none"> Conduct a study to set EV-ready parking requirements for non-residential parking in new developments based on best practices, and to align with federally mandated ZEV Sales Targets (100% by 2035) Update the Zoning By-law to incorporate EV parking requirements 	Policy 8.2	✓	Short Term (0-5 years)



<p>Action 2.5 Micromobility Zoning By-law Requirements</p> <ul style="list-style-type: none"> • Determine Zoning by-law bicycle parking requirements for each Parking Zone, with higher requirements in Parking Zones 1 and 2 • Develop Zoning by-law e-bike charging requirements • Develop Zoning by-law requirements for end-of-trip facilities • Develop Zoning by-law requirements for adopted micromobility devices, if desired • Amend the Comprehensive Zoning By-law 2024-19 	Policy 9.4, 9.5	✓	Short Term (0-5 years)
<p>Action 2.6 Parking Standards for Major Trails</p> <ul style="list-style-type: none"> • Develop appropriate vehicle and bicycle (or micromobility) parking standards for major trails based on demand <ul style="list-style-type: none"> • For example, the Recreation Sites and Trails B.C. (a branch of the BC Ministry of Environment and Climate Change Strategy) recommends a standard of 1.5 vehicle parking units per 1 km of trail, with a minimum of 10 units. • Incorporate the trail parking standards in the new TMP or update the ATMP 	Policy 10.2	✓	Short Term (0-5 years)

Action 3: Review the Residential Overnight On-street Parking Permit Program

Action Items	Policy Implemented	Further Study Required	Priority
<p>Action 3.1 Residential Overnight On-street Parking Permit Program</p> <ul style="list-style-type: none"> • Conduct a residential on-street parking permit study, including: <ul style="list-style-type: none"> • Estimate quantity of parking spaces on entire on-street network (using City's Geographic Info System) considering roadway geometrics, space requirements (stall length & width), driveways, sight lines, bus stops, fire hydrants, bicycle lanes, driveway apron parking, etc. • Develop eligibility criteria for purchasing a permit • Identify and select technology for permit purchase, signage, and enforcement • Determine the impact of residential overnight on-street parking permits on City operations and additional costs of parking enforcement and on-street snow plowing • Develop a detailed business plan including development of financial model of demand/supply, revenue (monthly user fees), capital & operating costs, and payback period. 	Policy 5.1	✓	Short Term (0-5 years)



Action 4: Develop a Micromobility Parking Strategy

Action Items	Policy Implemented	Further Study Required	Priority
<p>Action 4.1 Micromobility Device Adoption</p> <ul style="list-style-type: none"> Determine the City’s policy on the adoption of micromobility devices in the new TMP If micromobility devices are adopted in the City: <ul style="list-style-type: none"> Prepare and maintain a citywide inventory of micromobility parking facilities Determine appropriate locations for on-street micromobility parking, micromobility hubs, and charging: <ul style="list-style-type: none"> Coordinate with the curbside management study and the EV strategy Determine an appropriate enforcement protocol, addressing: <ul style="list-style-type: none"> Unobstructed sidewalks Designated micromobility parking locations Work with the City’s parking enforcement to determine the appropriate roles and responsibilities for micromobility parking enforcement 	Policy 9.1 to 9.3	✓	Short Term (0-5 years)

Action 5: Develop a Curbside Management Guideline

Action Items	Policy Implemented	Further Study Required	Priority
<p>Action 5.1 Curbside Management Guidelines</p> <p>Conduct a study to develop the citywide Curbside Management Guidelines</p> <ul style="list-style-type: none"> Conduct an inventory of existing curbside uses to identify challenges and opportunities <ul style="list-style-type: none"> Classify the City’s streets into corridor types, with consideration for the six corridor types suggested in the CWPS Identify the priority of curbside uses for each corridor type, with consideration for the curbside priorities suggested in the CWPS Identify appropriate curbside management tools that may be used in each corridor type Develop performance monitoring and evaluation criteria to inform future changes to the Curbside Management Guidelines The following details may be considered in the scope of the Curbside Management study: <ul style="list-style-type: none"> Conduct a curbside inventory, jurisdictional scan, and public feedback to inform the development of Markham’s curbside management principles. <ul style="list-style-type: none"> Conduct a citywide assessment of existing curbside utilization, space allocation, access for users, parking management, and enforcement. Collected data can be used to analyze and illustrate the varied contexts and gaps facing the City’s current curbside operations, space allocations, infrastructure, parking management approach, conflicts between users, permits and pricing. Conduct an inventory of existing and proposed transportation policies, initiatives, programs including the City’s Official Plan and Zoning By-law to establish strategic alignment with curbside management across all Parking Zones in Markham. 	Policy 4.1 to 4.4	✓	Short Term (0-5 years)



<ul style="list-style-type: none"> • Conduct a jurisdictional scan of current and best practices related to curbside management, including but not limited to flex zones on-street parking, dynamic pricing, shared mobility device storage, courier delivery and goods movement, signage, and priority parking programs. • Consider feedback from existing curbside users to understand the challenge of increasing competition between various user groups and their baseline expectations when creating new curbside functions and services. Input data should be considered from a wide range of stakeholders such as residents, retail, local businesses, transit, parking authorities, mobility providers and delivery services including ride-hailing, car share, bike/scooter share and freight. 			
<p>Action 5.2 Delivery Zones or Permits</p> <ul style="list-style-type: none"> • Conduct internal and external stakeholder engagement to investigate the need for on-street delivery zones or permits • If needed, identify candidate locations for potential on-street delivery zones or permits, conduct a pilot program at the selected location(s), and review the results of the pilot • If appropriate, develop an on-street delivery zone or permit program including: <ul style="list-style-type: none"> • Eligibility criteria for the designation of zones, in alignment with the Curbside Management Guidelines • Criteria for eligible delivery vehicles and permit renewal (if applicable) • Place and time allocation of curb space for deliveries, with consideration for technology to enable flexible curbside use • An appropriate enforcement protocol with the City's parking bylaw enforcement 	Policy 5.3	✓	Short Term (0-5 years)
<p>Action 5.3 Supplemental Parking for Employment Areas</p> <ul style="list-style-type: none"> • Conduct internal and external stakeholder engagement to investigate the need for supplemental on-street parking in employment areas • If needed, establish on-street parking in alignment with the Curbside Management Guidelines 	Policy 5.4	✓	Short Term (0-5 years)



Action 6: Develop a Municipal Parking Management Plan

Action Items	Policy Implemented	Further Study Required	Priority
<p>Action 6.1 Paid Parking</p> <ul style="list-style-type: none"> Identify candidate locations for paid parking in Zones 1 and 2 based on area-specific assessments of public parking demand, free parking opportunities nearby, land use context, transportation network context, and stakeholder input Determine an appropriate enforcement protocol with the City's parking bylaw enforcement Prepare a detailed business plan for on-street and off-street parking infrastructure projects, including P3 parking projects Business plans should include the following: <ul style="list-style-type: none"> The parking markets served (e.g., retail customers, monthly employees, and shared parking) Demand/supply forecasts User fees based on market rates Type of Parking Revenue and Access Control System (PRACS) for paid parking, e.g. mobile app, on-street pay by licence plate machines, unattended gated pay-on-foot technology for gated surface and parking garages Financial model, including capital and operating costs, return on investment and payback period For partnerships, develop a memorandum of understanding for each party <ul style="list-style-type: none"> Shared parking agreement document should be beneficial and fair to all parties (City and private sector) and outline all terms and conditions, including financial contributions, contract duration, exit clause, etc. For new municipal off-street parking facilities, consider: <ul style="list-style-type: none"> Type of structure (above grade, below grade, in-cast or pre-cast concrete or prefab galvanized steel beams) Future-ready design features (transitional parking with level floors, appropriate ceiling heights and column spacing for conversion to other land uses) (See also Policies 4 and 5 Curbside Management and On-street Parking Plan) 	Policy 3.1, 3.2	✓	Long Term (5+ years)
<p>Action 6.2 Short-term On-street Parking</p> <ul style="list-style-type: none"> Identify candidate locations for short-term paid and unpaid on-street parking in Parking Zones 1 and 2 based on area-specific assessments of public parking demand, long term parking opportunities nearby, paid parking opportunities nearby, land use context, transportation network context, and stakeholder input Determine the appropriate parking time limits for each location Determine an appropriate enforcement protocol with the City's parking bylaw enforcement (See also Policy 3 Transition from unpaid to paid public parking in Parking Zones 1 and 2) 	Policy 5.2	✓	Long Term (5+ years)



Action 7: Create Parking Management Plans for Heritage Areas

Action Items	Policy Implemented	Further Study Required	Priority
<p>Action 7.1 Parking Management Plans for Heritage Areas</p> <ul style="list-style-type: none"> Prepare Parking Management Plans for Heritage Areas, including the following: <ul style="list-style-type: none"> Determine study area (Main St. Markham, Main St. Unionville, Yonge Corridor, etc.) Engage stakeholders Conduct Parking demand analysis and supply recommendations Develop Parking management strategies, including event planning Determine appropriate Enforcement protocol with City parking bylaw enforcement Develop financial assessments including consideration for paid parking (paid parking, fee structure, capital and operating cost, cost recovery) Where appropriate, develop the parking design (layout) 	Policy 1.4	✓	Long Term (5+ years)

Action 8: Develop a Municipal Electrical Vehicle (EV) Parking Management Plan

Action Items	Policy Implemented	Further Study Required	Priority
<p>Action 8.1 Public EV Charging Infrastructure</p> <ul style="list-style-type: none"> Identify priority locations for public charging infrastructure based on area-specific assessments of demand for EV chargers, existing public charging infrastructure nearby, land use context, transportation network context, opportunities to promote EVs and sustainability, and stakeholder input Determine fees for EV charging, if applicable Provide public charging infrastructure in collaboration with Alectra in priority locations 	Policy 8.4	✓	Long Term (5+ years)
<p>Action 8.2 EV Strategy</p> <ul style="list-style-type: none"> Conduct a study to expand the EV strategy for City-owned and operated EV parking facilities (on- and off-street) <ul style="list-style-type: none"> Set EV-ready and/or electric vehicle supply equipment installation (EVSE-installation) requirements Pursue incentives, payment, and revenue generation to cover costs Ensure equity when expanding EV parking facilities Ensure new installed chargers are Open Chargepoint Protocol (OCP) compliant Set consistent charging rates across the City to ensure vehicle turnover Reduce payment confusion Develop wayfinding and standard signage for EV parking areas Consider accessible EV parking design Consider world-wide best practices for on-street charging 	Policy 8.5	✓	Long Term (5+ years)



Action 9: Review Smart Parking Technology

Action Items	Policy Implemented	Further Study Required	Priority
<p>Action 9.1 Parking Technology</p> <ul style="list-style-type: none"> Technology should be developed for the following parking and curbside functions: <ul style="list-style-type: none"> Demand-based pricing Digital platform for enforcement and ticketing Flexible curbside use Smart loading solutions for commercial loading zones Shared public/private parking supply Dynamic pick-up/drop-off and reservations for car-sharing and e-deliveries Parking guidance in Parking Zones 1 and 2 For each parking and curbside function identified, undertake the following steps: <ol style="list-style-type: none"> Undertake market scan and technology review to select the appropriate technology Develop functional specifications Pilot new functions and seek partners and funding sources such as the Ontario Vehicle Innovation Network (OVIN) Procure system Monitor and expand functions and geography as appropriate 	Policy 6.1 to 6.7	✓	Long Term (5+ years)

Action 10: Develop a Parks and Trails Management Plan

Action Items	Policy Implemented	Further Study Required	Priority
<p>Action 10.1 Determine 'High Priority' Locations</p> <ul style="list-style-type: none"> Develop criteria to identify 'high priority' trailheads and major parks, with consideration for: <ul style="list-style-type: none"> The Parks Canada Trail Classification Guide Nearby parking opportunities Feasibility and cost to establish on-street parking Connection to active transportation infrastructure Stakeholder input Location in a Parking Zone Determine 'high priority' trailheads by reviewing the existing and proposed Markham Trail network and applying the defined 'high priority' trail criteria Determine 'high priority' major parks by reviewing the City of Markham's Parks Plan and applying the defined 'high priority' trail criteria 	Policy 10.1, 10.2	✓	Long Term (5+ years)



<p>Action 10.2 Operations</p> <ul style="list-style-type: none"> • Prioritize seasonal parking lot maintenance at ‘high priority’ areas to maximize parking availability • Monitor parking in ‘high priority’ areas and implement adequate enforcement measures including: <ul style="list-style-type: none"> • On-street parking restrictions to mitigate impacts on nearby neighbourhoods • Penalties for parking violations such as graduated fines 	Policy 10.2, 10.3	-	Long Term (5+ years)
<p>Action 10.3 TDM</p> <ul style="list-style-type: none"> • Coordinate with York Region Transit to improve transit access to ‘high priority’ trailheads and major parks • Implement wayfinding and trip planning tools to expand first and last-kilometre choices. For example, wayfinding apps can guide users to access trails via connected regional/local trails, public transit, and nearby parking • Encourage carpooling and alternative modes by promoting existing apps such as ‘Pop-a-ride’ or creating a City parks and trails app 	Policy 10.2	✓	Long Term (5+ years)
<p>Action 10.4 Infrastructure</p> <ul style="list-style-type: none"> • Identify suitable ‘high priority’ trailheads and major park locations and implement: <ul style="list-style-type: none"> • Parking facilities (new or expansion of existing) • Passenger pick-up and drop-off facilities • Amenity nodes at high-priority trailhead parking lots, where feasible, using the City of Markham’s Pathways and Trails Master Plan where appropriate <p>Centralized parking hubs to allow shared parking with other uses through partnerships with private parking lots and/or City-owned lots</p>	Policy 10.2	✓	Long Term (5+ years)
<p>Action 10.5 Technology</p> <ul style="list-style-type: none"> ○ Identify ‘high priority’ trailheads and major parks that are suitable for: <ul style="list-style-type: none"> • Online parking availability information • Parking reservation system ○ For each function identified, undertake the following steps: <ol style="list-style-type: none"> 1. Undertake market scan and technology review to select the appropriate technology 2. Develop functional specifications 3. Pilot new functions and seek partners and funding sources such as OVIN 4. Procure system <p>Monitor and expand functions and geography as appropriate</p>	Policy 10.2	✓	Long Term (5+ years)



Action 11: Develop a Connected and Autonomous Vehicles (CAV) Parking Plan

Action Items	Policy Implemented	Further Study Required	Priority
<p>Action 11.1: CAV Preparedness</p> <ul style="list-style-type: none"> • Conduct a study for CAV preparedness, including: <ul style="list-style-type: none"> • Develop a regulatory framework for AV and CAV use that will: <ul style="list-style-type: none"> ○ Determine the level of CAV preparedness for the City (A, B or C) <ul style="list-style-type: none"> ○ Level A – AV only zone (automated parking systems, reduced space) ○ Level B – CAV Infrastructure preparedness (Roadside Units (RSU), painting, signing, etc.) ○ Level C – Do Nothing ○ Develop appropriate design standards to accommodate CAVs in municipal and private parking facilities ○ Explore the need for charging infrastructure for CAVs ○ Explore parking fee structure for CAVs ○ Explore opportunities to pilot Level B preparedness through the OVIN Demonstration Zone <ul style="list-style-type: none"> ○ Identify priority corridors to pilot license plate recognition (LPR) technology based on area-specific assessments and needs ○ Identify priority corridors to pilot curbside sensors for real-time communication of street-parking availability to CAVs 	Policy 7.1, 7.2	✓	Long Term (5+ years)

Action 12: Conduct Education Campaigns

Action Items	Policy Implemented	Further Study Required	Priority
<p>Action 12.1: Retrofitting Existing Buildings with EV-ready Parking</p> <ul style="list-style-type: none"> • Develop communications materials to educate property managers and landowners on how to plan for EV-ready parking • Conduct an education campaign targeting property managers and landowners 	Policy 8.3	-	Ongoing
<p>Action 12.2: Retrofitting Existing Buildings with Micromobility Parking</p> <ul style="list-style-type: none"> • Develop and distribute communications materials to educate property managers and landowners on how to include micromobility parking and charging in existing developments 	Policy 9.6	-	Ongoing



8 MONITORING PLAN

A monitoring plan was developed for internal use by the City to monitor the progress of the CWPS implementation plan, to ensure that action items are completed promptly, and that issues are identified and addressed by corrective actions as needed.

It is recommended that the City designate a coordinator to monitor the progress of the CWPS implementation plan. The coordinator is responsible for initiating the monitoring plan, making ongoing updates as action items are completed, conducting annual reviews, and recommending corrective actions as needed. The coordinator is also responsible for annual reporting to the directors of the identified lead departments to provide a status update and recommendations for next steps.

To aid in the monitoring of the recommended key actions, a suggested CWPS Key Actions Tracking Form is provided in **Exhibit 8-1**.



Exhibit 8-1 CWPS Key Action Tracking Form

Key Action Items	Lead Department	Status (Complete, on-track, delayed), Explanation	Corrective Action	Timeline
1. Incorporate the Parking Zones Map into the Official Plan				
2. Update Parking and TDM Standards				
3. Review the Residential Overnight On-street Parking Permit Program				
4. Develop a Micromobility Parking Strategy				
5. Develop a Curbside Management Guideline				
6. Develop a Municipal Parking Management Plan				
7. Create Parking Management Plans for Heritage Areas				
8. Develop a Municipal Electric Vehicle (EV) Parking Management Plan				
9. Review Smart Parking Technology				
10. Develop a Parks and Trails Parking Management Plan				
11. Develop a Connected and Autonomous Vehicles (CAV) Parking Plan				
12. Conduct Educational Campaigns				



Additionally, regular reviews are recommended to ensure that the City adheres to the parking governance and finance principles. The following monitoring actions are recommended:

Internal Governance Review

- Review the parking governance structure every 3 to 5 years based on the growth of parking demand and supply in the City and determine if the governance structure meets the parking vision and principles.
- Develop a protocol to improve coordination and integration among the various City departments and sections to minimize duplication of effort and streamline parking projects and tasks.
 - Establish an internal staff coordinating committee that meets regularly on major projects addressing parking TDM.
- Prepare an internal report to evaluate if City initiatives adhere to the parking vision and principles.

Annual Review on Municipal Parking Assets

- Prepare an annual report for City Council on the performance of all municipal parking assets including on- and off-street parking. The report should include:
 - A description of the parking system usage, key performance indicators (KPIs) including parking supply, utilization, fees, user satisfaction, patterns and trends.
 - Changes made in the last year on the parking system and the impacts of those changes.
- Recommendations for future actions.

Finance Review

- Evaluate public and private parking fees across the GTHA to ensure that Markham's parking fees are within the market range. This evaluation should be conducted annually or semi-annually.
- Work with the City's Finance department to develop the annual parking budget program and capital needs plan. This process should define operating and capital needs as well as budget adjustments.
- Pursue P3 (public-private partnership) opportunities when planning for additional municipal parking supply in Parking Zones 1 and 2 based on detailed business plans.



Appendices



Appendix A Financial Comparison of Parking Garage Types & Surface Lot

City of Markham - Comparison of Parking Garage Types & Surface Lot PARKING FINANCIAL MODEL - Mar. 2024	Above Ground Parking Structure (Concrete)	Above Ground Parking Structure (Prefab Steel)	Underground Parking Structure	Surface Lot
Type of Parking Facility	Structure	Structure	Structure	Surface
Total Parking Spaces	1,000 Spaces	1,000 Spaces	1,000 Spaces	1,000 Spaces
Land Area	1 Acres	1 Acres	1 Acres	6 Acres
Average Parking Spaces Per Level	167	167	250	1000
INVESTMENT				
Construction/Installation Cost per Space:				
Above Ground Cost per space	\$70,000/Space	\$40,000/Space	\$0/Space	\$7,000/Space
Underground Cost per space	\$0/Space	\$0/Space	\$100,000/Space	\$0/Space
Equipment Cost per Space (incl. parking guidance)	\$1,599/Space	\$1,599/Space	\$1,599/Space	\$1,599/Space
Land Cost per Acre	\$6,000,000/Acre	\$6,000,000/Acre	\$6,000,000/Acre	\$6,000,000/Acre
Total Construction Cost	\$70,000,000	\$40,000,000	\$100,000,000	\$7,000,000
Equipment Cost (incl. parking guidance)	\$1,599,075	\$1,599,075	\$1,599,075	\$1,599,075
Land Cost	\$6,000,000	\$6,000,000	\$6,000,000	\$36,000,000
Capitalized Expenses	\$8,750,000	\$5,000,000	\$12,500,000	\$875,000
Total Capital Cost	\$86,349,075	\$52,599,075	\$120,099,075	\$45,474,075
OPERATIONS				
Day Segments				
Daytime Weekdays	29.8%	29.8%	29.8%	29.8%
Evening Weekdays	41.7%	41.7%	41.7%	41.7%
Weekends	28.6%	28.6%	28.6%	28.6%
Paid Utilization				
Daytime Weekdays	60.0% Occupied	60% Occupied	60% Occupied	60% Occupied
Evening Weekdays	30.0% Occupied	30% Occupied	30% Occupied	30% Occupied
Weekends	50.0% Occupied	50% Occupied	50% Occupied	50% Occupied
Turnover Per Occupied Space				
Daytime Weekdays	1.5 Veh/Space	1.5 Veh/Space	1.5 Veh/Space	1.5 Veh/Space
Evening Weekdays	1.0 Veh/Space	1.0 Veh/Space	1.0 Veh/Space	1.0 Veh/Space
Weekends	1.5 Veh/Space	1.5 Veh/Space	1.5 Veh/Space	1.5 Veh/Space
Average Duration of Stay				
Daytime Weekdays	6.0 Hours/Veh	6.0 Hours/Veh	6.0 Hours/Veh	6.0 Hours/Veh
Evening Weekdays	2.0 Hours/Veh	2.0 Hours/Veh	2.0 Hours/Veh	2.0 Hours/Veh
Weekends	3.0 Hours/Veh	3.0 Hours/Veh	3.0 Hours/Veh	3.0 Hours/Veh
Ticket Types				
Weekday Daytime Daily Max Rate	\$17.50	\$17.50	\$17.50	\$17.50/Veh/Permit
Weekday Daytime Hourly Rate	\$4.00/Hour	\$4.00/Hour	\$4.00/Hour	\$4.00/Hour
Weekday Evening Flat Rate	\$5.00	\$5.00	\$5.00	\$5.00/Veh/Permit
Weekday Evening Hourly Rate	\$3.00/Hour	\$3.00/Hour	\$3.00/Hour	\$3.00/Hour
Weekend Flat Rate	\$15.00/Veh/Permit	\$15.00/Veh/Permit	\$15.00/Veh/Permit	\$15.00/Veh/Permit
Weekend Hourly Rate	\$3.00/Hour	\$3.00/Hour	\$3.00/Hour	\$3.00/Hour
Monthly Permits	\$200.00/Veh/Mo/Permit	\$200.00/Veh/Mo/Permit	\$200.00/Veh/Mo/Permit	\$200.00/Veh/Mo/Permit
Revenue by Day Segment				
Daytime Weekdays	\$4,036,500	\$4,036,500	\$4,036,500	\$4,036,500
Evening Weekdays	\$393,900	\$393,900	\$393,900	\$393,900
Weekends	\$830,700	\$830,700	\$830,700	\$830,700
Monthly Permits	\$480,000	\$480,000	\$480,000	\$480,000
Total Revenue	\$5,741,100	\$5,741,100	\$5,741,100	\$5,741,100
Daytime Weekdays	70%	70%	70%	70%
Evening Weekdays	7%	7%	7%	7%
Weekends	14%	14%	14%	14%
Monthly Permits	8%	8%	8%	8%
OPERATING COSTS (Excluding CAPITAL Contribution to Reserve)				
Maintenance Cost per Space per Year	\$350/Space/Year	\$350/Space/Year	\$350/Space/Year	\$200/Space/Year
Bank Processing Fees Rate	2.0% of Revenue	2.0% of Revenue	2.0% of Revenue	2.0% of Revenue
Smartphone Purchase Rate	0.0% of Vehicles	0.0% of Vehicles	0.0% of Vehicles	0.0% of Vehicles
Smartphone Convenience Fee Rate	\$0.25/Vehicles	\$0.25/Vehicles	\$0.25/Vehicles	\$0.25/Vehicles
General and Administrative Cost Rate	15.0% of Revenue	15.0% of Revenue	15.0% of Revenue	15.0% of Revenue
Maintenance Cost	\$350,000	\$350,000	\$350,000	\$200,000
Bank Processing Fees	\$114,822	\$114,822	\$114,822	\$114,822
General and Administrative Costs	\$861,165	\$861,165	\$861,165	\$861,165
Total Operating Cost	\$1,325,987	\$1,325,987	\$1,325,987	\$1,175,987
NET COST RECOVERY	\$4,415,113	\$4,415,113	\$4,415,113	\$4,565,113
Net Cost Recovery Margin	77%	77%	77%	80%
PAYBACK PERIOD	19.56 Years	11.91 Years	27.20 Years	9.96 Years

Appendix B Paid On-Street Parking - Main St. Markham, Main St. Unionville & Markham Centre

City of Markham - Paid On-Street Parking - Main St. Markham, Main St. Unionville, Markham Centre			
All Figures in 2024 Canadian Dollars - Mar. 2024	Main St., Markham	Main St., Unionville	Markham Centre
Capital Cost	-	-	-
<u>Stationary Equipment</u>	-	-	-
-	-	-	-
Installation - of signs (labour)	\$450	\$450	\$450
Signage - static	\$750	\$750	\$750
Signage - uchannel post cost	\$975	\$975	\$975
Pay by Licence Plate Machine	\$54,000	\$54,000	\$54,000
Installation of Pay by Lic. Plate Machines	\$6,000	\$6,000	\$6,000
On-Street Parking Guidance - Cost for lane counting	\$30,000	\$30,000	\$30,000
On-Street Parking Guidance - Cost for Digital Display signs	\$24,000	\$24,000	\$24,000
On-Street Parking Guidance - Cost of Stall (battery pucks)	\$3,750	\$3,750	\$3,750
On-Street Parking Guidance - Cost per Software Licence	\$15,000	\$15,000	\$15,000
On-Street Parking Guidance - Installation Cost for Blocks	\$12,500	\$12,500	\$12,500
Total Capital Cost (including installation & 25% Contingency)	\$184,281	\$184,281	\$184,281
Number of Stalls	50	50	50
<u>Operational Drivers</u>			
Operating Days per Week	7.0	7.0	7.0
Operating Days per Year	364	364	364
Number of Compliant Vehicles per Day	169	169	169
Number of Non-Compliant Vehicles per Day	42	42	42
<u>Enforcement Revenue</u>			
Capture Rate	10%	10%	10%
Number of Ticketed Vehicles Per Day	4	4	4
Number of Ticketed Vehicles Per Year	1,538	1,538	1,538
Fine Amount for First Day Payment	\$50.00	\$50.00	\$50.00
Total Fine Revenue per Year	\$79,293	\$79,293	\$79,293
Meter Revenue Per Year	\$158,184	\$158,184	\$158,184
Gross Revenue per Year	\$237,477	\$237,477	\$237,477
<u>Operating Cost</u>	-	-	-
<u>Financing Annual Cost (incl. HST)</u>			
Interest Rate	8%	8%	8%
Useful Life of Equipment (Years)	10	10	10
Capital Cost	\$184,281	\$184,281	\$184,281
Pre-Tax Financing Payments per Year	\$27,463	\$27,463	\$27,463
HST	\$3,570	\$3,570	\$3,570
Financing Charge per Year	\$31,034	\$31,034	\$31,034
Coin Collection Cost per Year	\$3,298	\$3,298	\$3,298
Wireless cost for machine monitoring per year	\$780	\$780	\$780
Maintenance Cost per Year	\$5,319	\$5,319	\$5,319
Percent of Revenue via Coins	20%	20%	20%
Coin Processing Cost per Year	\$544	\$544	\$544
Percent of Revenue via Credit Cards	80%	80%	80%
Deposits per Year via Credit Cards	\$189,982	\$189,982	\$189,982
Credit Card Service Charge per Year	\$11,399	\$11,399	\$11,399
<u>Enforcement Cost</u>			
Additional Annual Tickets Issued Per year	1,538	1,538	1,538
Number of Additional FTE Hours required to issue tickets per YEAR	513	513	513
Tickets Issued per week	30	30	30
Labor and Benefits Cost per Hour	\$54.00	\$54.00	\$54.00
Enforcement Labor and Benefits Cost per Year	\$27,682	\$27,682	\$27,682
Allocated Enforcement Vehicle Lease Cost per Year	\$1,127	\$1,127	\$1,127
Parking paper tickets for handhelds cost per ticket	\$154	\$154	\$154
Corporate Overhead Percentage of Revenue	5%	5%	5%
Corporate Overhead Cost per Year	\$11,874	\$11,874	\$11,874
Total Operating Cash Cost per Year	\$93,209	\$93,209	\$93,209
Net Cost Recovery (Surplus or Profit)	\$144,268	\$144,268	\$144,268
Net Cost Recovery Margin	61%	61%	61%
PAYBACK PERIOD	1.28 Years	1.28 Years	1.28 Years
	15.3 Months	15.3 Months	15.3 Months

Appendix C Markham - On-Street Overnight Residential Parking Permit Based on 1,000 Spaces

City of Markham - On-Street Overnight Residential Parking Permit	
All Figures in 2024 Canadian Dollars - Mar. 2024	
Capital Cost	-
Installation - of signs (labour)	\$9,000
Signage - static	\$15,000
Signage - uchannel post cost	\$19,500
Permit Management Software Purchase Licence	\$150,000
Permit Management Software Training	\$5,000
Contingency (25%)	\$49,625
Total Capital Cost	\$248,125
Number of Stalls	1,000
Operational Drivers	
Operating Days per Week	7.0
Operating Days per Year	364
Number of Compliant Vehicles per Day	475
Number of Non-Compliant Vehicles per Day	25
Percent Occupancy - Monthly Permits	50%
Monthly Rate Vehicle Turnover	1.0
Percent Compliance	95%
Monthly Permit Rate	\$61.00
# of Monthly Parkers per day	500
Enforcement Revenue	
Capture Rate	10%
Number of Ticketed Vehicles Per Day	3
Number of Ticketed Vehicles Per Year	910
First Day Payment Percentage of Ticketed Vehicles	75%
Fine Amount for First Day Payment	\$50.00
Maximum-Rate Collection per Vehicle Less GST and PST	\$43.67
First Day Fine Revenue per Day	\$81.88
Post-First Day Payment Percentage of Ticketed Vehicles	25%
Fine Amount for Post-First Day Payment	\$85.00
Maximum-Rate Collection per Vehicle Less GST and PST	\$75.22
Post-First Day Fine Revenue per Day	\$47.01
Total Fine Revenue per Day	\$128.90
Total Fine Revenue per Year	\$46,919
Monthly Permit Revenue Per Year	\$347,700
Gross Revenue per Year	\$394,619
Operating Cost	-
Financing Incremental Monthly Cost (HST)	
Interest Rate	8%
Useful Life of Equipment (Years)	10
Capital Cost	\$248,125
Pre-Tax Financing Payments per Year	\$36,978
HST	\$4,807
Financing Charge per Year	\$41,785
Credit Card Processing Cost	
Percent of Revenue via Credit Cards	100%
Deposits per Year via Credit Cards	\$394,619
Credit Card Service Rate per Transaction	\$0.10
Average Transaction Size	\$61.00
Credit Card Service Charge Rate	4%
Credit Card Service Charge per Year	\$16,432
Enforcement Cost	
Additional Annual Tickets Issued Per year	910
Additional Tickets Issued Per Day	3
Number of Additional FTE Hours required to issue tickets per YEAR	303
Tickets Issued per week	18
Labor and Benefits Cost per Hour	\$54.00
Enforcement Labor and Benefits Cost per Year	\$16,380
Allocated Enforcement Vehicle Lease Cost per Year	\$667
Annual Software licence and maintenance fee	\$30,000
Parking paper tickets for handhelds cost per ticket	\$91.00
Corporate Overhead Percentage of Revenue	5%
Corporate Overhead Cost per Year	\$19,731
Total Operating Cash Cost per Year	\$125,085
Net Cost Recovery (Surplus or Profit)	\$269,534
Net Cost Recovery Margin	68%
PAYBACK PERIOD	0.92 Years
	11.0 Months