

MOBILITY HUB POLICY REVIEW

2041 Regional
Transportation Plan

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2018

MOBILITY HUB

POLICY REVIEW | Background Paper
February 2018



TABLE OF CONTENTS

Table Of Contents

1.0 Introduction	1
1.1 Study Purpose	2
1.2 Mobility Hubs and The Region	4
1.3 Report Structure	6
References	6
2.0 Progress and Challenges	7
2.1 State of Mobility Hubs	8
2.2 Progress Against The Big Move	11
2.3 Case Studies	14
2.4 Stakeholder Interviews	22
2.5 Key Topics	26
References	35
3.0 Strategic Directions	36
3.1 Policy Direction	37
References	58
4.0 Mobility Hub Criteria	59
4.1 Mobility Hub Criteria	60
4.2 Defining Mobility Hub Typology By Criteria	62
4.3 Refined Mobility Hub Criteria	67
4.4 Implementation of Criteria	72
References	75

1.0 INTRODUCTION



1.1 STUDY PURPOSE

METROLINX TIMELINE

2006 Metrolinx Act, originally the Greater Toronto Transportation Authority Act

2008 Mobility Hubs Green Paper,
Mobility Hubs Backgrounder &
The Big Move Regional
Transportation Plan (RTP)

RECENT WORK

2011 Mobility Hub Guidelines

2012 Mobility Hub Profiles

2014 Mobility Hub Profiles

2016 State of Mobility Hubs Report

The purpose of this Mobility Hub Policy Review Background Paper is to provide an overview of the themes and challenges impacting mobility hubs today.

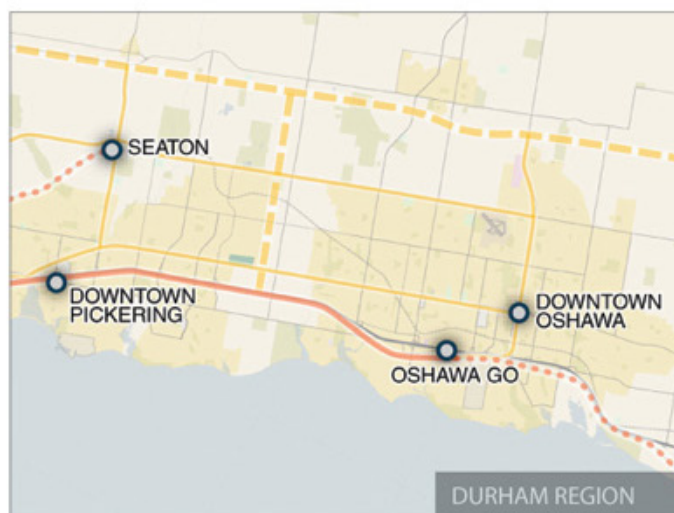
The Review provides policy guidance for the continued development of the network of mobility hubs identified in Metrolinx's Regional Transportation Plan (RTP). This document supports the technical work and policy development related to the update to the RTP and the corresponding Implementation Plan. Specific tasks include:

- Assessing progress made towards implementing mobility hubs since 2008, as well as identifying the challenges, opportunities and key issues facing mobility hubs throughout the region;
- Preparing draft policy direction and priority actions for Metrolinx, municipalities, transit agencies and others with a role in implementing the RTP; and
- Reviewing and analyzing existing typologies and criteria for identifying mobility hubs.

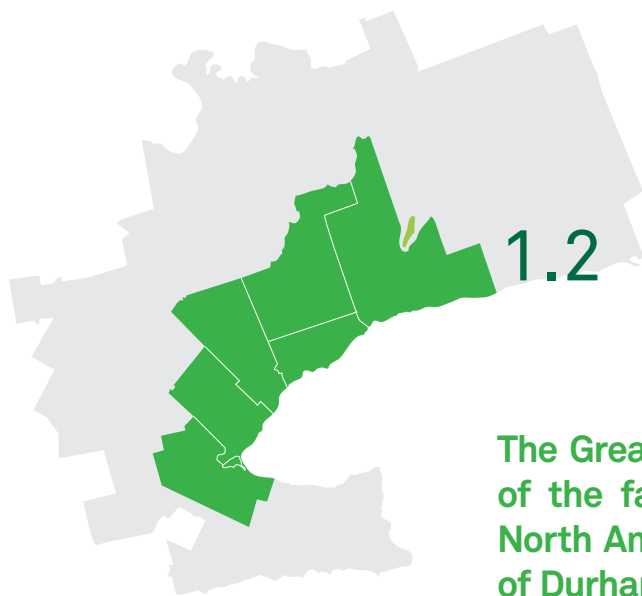
Overall, the 2008 Mobility Hub Green paper provided an effective framework for planning in and around station areas. As a result, there has been significant uptake of the planning approach and mobility hub language amongst local municipalities. Recently, provincial Growth Plan policies (Section 2.2.4) have been updated to establish new responsibilities for municipalities to undertake Major Transit Station Area (MTSA) planning including conformity with minimum density targets of 150 people and jobs per hectare for MTSA's and 200 people and jobs per hectare for Urban Growth Centres (UGCs). Municipal uptake of the mobility hub planning framework and provincial policy changes represent a key opportunity to reconsider how and by whom mobility hub studies are completed.

Moving forward, Metrolinx is in a position to assume a leadership role in informing the planning and implementation processes for mobility hubs. Additionally, as updated provincial policies place MTSA planning responsibility with municipalities this should help ensure that the necessary frameworks are in place to support transit supportive planning.

As such, the intent of this paper is to analyze the themes and challenges impacting mobility hubs today but also to consider direction for potential future updates to the mobility hub planning framework.



Mobility Hubs as identified in The Big Move, November 2008 (Source: metrolinx.com/mobilityhubs/en/map/maps.aspx)



1.2 MOBILITY HUBS AND THE REGION

The Greater Toronto and Hamilton Area (GTHA) is one of the fastest growing and most diverse regions in North America. It includes the Regional Municipalities of Durham, Halton, Peel and York as well as the City of Hamilton and the City of Toronto.

This growth propels our economy but must be properly managed for the region to continue to grow sustainably. The GTHA is expected to add approximately 110,000 new residents every year from 2011 to 2041, increasing the region's population from 6.6 million to 10.1 million residents (Metrolinx, Discussion Paper, 2016). To maintain a high quality of life and minimize the negative environmental, social and economic impacts of congestion, it is critical that the region invest in a multi-modal transportation network that meets its growing needs.

In anticipation of the addition of 3.5 million new residents and 1.8 million new jobs by 2041, the Province must be strategic about where and how to direct growth (Metrolinx, Green Paper #2, 2008). Coordinating transportation infrastructure, growth management planning and land use planning is imperative to continue to attract skilled migrants, address congestion and ensure an aging population is able to continue meeting its daily needs.

As part of Metrolinx's RTP, mobility hubs are an important tool to assist in addressing these challenges. The Big Move introduced the concept of a region connected via a network of 51 mobility hubs. An interconnected system of mobility hubs can help create a more seamlessly connected region, improve quality of life, reduce the environmental impacts associated with transportation and support a competitive and robust economy.

1.3 REPORT STRUCTURE

The Mobility Hub Policy Review is divided into four main sections:

Section 1.0 identifies the *Purpose* of this review and introduces the concept of mobility hubs within the GTHA.

Section 2.0 discusses the progress made on *Key Issues* that face mobility hubs today, as well as new challenges and opportunities expected to arise in the future. To identify these issues the section reviews mobility hub planning and implementation progress against The Big Move's Priority Actions; analyzes a series of mobility hub case studies for lessons learned; and summarizes key findings from a series of Metrolinx and municipal stakeholder interviews.

Section 3.0 proposes new *Strategic Directions* for mobility hubs. These recommendations are meant to address many of the key issues identified in Section 2.0 and are used to inform the updated mobility hub criteria and typologies in Section 4.0.

Section 4.0 discusses existing *Mobility Hub Criteria*, identifies updated refinements and proposes a new set of mobility hub typologies.

MOBILITY HUBS

Major transit station areas that are significant given the level of planned transit service and the development potential around them. They are places of connectivity between regional rapid transit services, and also places where different modes of transportation come together seamlessly. They have, or are planned to have an attractive, intensive concentration of employment, living, shopping and enjoyment around a major transit station.

Mobility Hubs are intended to create focal points within the region that connect a variety of modes of transportation and demonstrate the relationship between transit infrastructure and land use planning (Metrolinx, Discussion Paper, 2016).

1.0 INTRODUCTION

References

The citations in this section reference the following sources:

Metrolinx. Discussion Paper for the Next Regional Transportation Plan. Greater Toronto and Hamilton Area. August 2016.

Metrolinx. Green Paper #2. Mobility Hubs. February 2008.

2.0 PROGRESS AND CHALLENGES



2.0 PROGRESS AND CHALLENGES

2.1 STATE OF MOBILITY HUBS

STATE OF MOBILITY HUBS (SOMH) STATISTICS

35 Mobility Hubs have achieved or surpassed the Growth Plan's 2006 Designated Greenfield Area target of 50 people/jobs per hectare.

7 mobility hubs exceed the 250 people/jobs per hectare required to support subway service.

Mobility Hubs with 40%+ population growth from 2009 to 2014:

1. Markham Centre
2. Seaton
3. Mississauga City Centre
4. Osgoode
5. Union

Mobility Hubs with 0% or less population growth from 2009 to 2014:

1. Downtown Oshawa
2. Midtown Oakville
3. Don Mills-Steeles
4. Newmarket GO
5. Eglinton-Mt Dennis
6. Jane-Eglinton
7. Pape
8. Hamilton Luna

The following section provides a snapshot of the state of mobility hubs in 2017; suggests key challenges and lessons learned that have emerged through case studies and interviews with key Metrolinx and municipal stakeholders; and identifies key issues facing mobility hub implementation.

The coordination of land use planning and transportation planning lies at the heart of sustainable city building. One of the ways mobility hubs are intended to support smart growth is through ensuring that expansion of the transportation network is complemented by appropriate residential and employment densities. Metrolinx's State Of Mobility Hubs (SOMH) report from 2016 provides evidence that we are trending in the right direction. Between 2009 and 2014 the median growth rate across mobility hubs stood at nine percent (SOMH, 6), approximately double the region's growth rate of 4.7 percent.

Mobility hub growth rates are not consistent as some mobility hubs have experienced significant population growth, while others have stagnated or declined. For example, five mobility hubs grew by more than 40 percent between 2009 to 2014, with Markham Centre growing the most at 47 percent, while eight mobility hubs experienced negative or zero growth, with Downtown Oshawa losing the greatest share of its population, declining seven percent (SOMH, 6).

Moving forward it will be important for Metrolinx to continue to monitor population and employment growth within mobility hubs. Understanding the discrepancies in growth between mobility hubs will provide insights into the factors that may be responsible for low growth rates and offer opportunities for improvement. It will be important to ensure transportation resources are focused in areas of growing need while areas with limited population increase be provided with the necessary tools to stimulate growth, or be removed for consideration as a mobility hub.

To date, 50 of 51 mobility hubs have surpassed the GTHA's average population and employment density of 11.9 people/jobs per hectare, with an average residential and employment density of 61 people/jobs per hectare (SOMH, 5). While greater than the average GTHA density, this number is still significantly less than the minimum planned density target of 150 people and jobs per hectare required for MTSAs in the Growth Plan. Table 2.1 presents suggested land use densities by transit technology and transit mode share for mobility hubs. Conforming to these targets, while protecting stable residential neighbourhoods, will require a serious commitment to intensification.

2.0 PROGRESS AND CHALLENGES

Table 2.1: Suggested Land Use Densities by Transit Technology and Transit Mode Share for Mobility Hubs

Predominant Transit Mode	Transit Supportive Densities (Residents and Jobs Combined Per Hectare Within Mobility Hub)	Suggested Transit Mode Share (Trips Originating Within Mobility Hub)
Subway	200+ (Growth Plan for the Greater Golden Horseshoe (2017)) 250+ (Mobility Hub Guidelines (2011))	40%
<ul style="list-style-type: none"> Subways, as a transit mode, have the ability to carry the greatest number of transit riders. Land use targets should reflect the ridership levels needed to justify investment in subway infrastructure. It should be noted that traditionally, land use densities along some subway lines and stations in the City of Toronto have been moderated by high volumes of feeder transit that provide a significant proportion of ridership. 		
Light Rail Transit (LRT)	160+ (Growth Plan for the Greater Golden Horseshoe (2017)) 200-400 (Mobility Hub Guidelines (2011))	30-50%
<ul style="list-style-type: none"> Flexibility in implementation of LRT results in a greater range of applicable contexts, resulting density, and mode split targets. Targets for transit supportive densities should reflect the ultimate configuration of LRT lines. Higher targets should be set in LRT corridors with exclusive right-of-way, such as tunnels, elevated structures, or within complete signal protection, reflecting the higher passenger capacity of these lines. 		
Bus Rapid Transit (BRT)	160+ (Growth Plan for the Greater Golden Horseshoe (2017)) 100-250 (Mobility Hub Guidelines (2011))	20-35%
<ul style="list-style-type: none"> Initial implementation of BRT systems can sometimes consist of buses running in mixed-traffic with transit priority at intersections and improved customer amenities. Higher densities should be targeted for mobility hubs on BRT corridors with service on dedicated right-of-ways. 		
GO Transit Rail Network / Regional Rail	150+ (Growth Plan for the Greater Golden Horseshoe (2017)) 150+ (Mobility Hub Guidelines (2011))	10-25 % Regional Rail 30-60% Express Rail
<ul style="list-style-type: none"> Expansion, as envisioned in the RTP, includes improving service from peak-direction and period rail service to all-day, two-way service. Land use density and mode share targets should reflect the existing and planned service levels for regional rail corridors. In most cases, regional rail attracts the majority of its riders from a large catchment area beyond the mobility hub. As a result, ridership is less sensitive to the densities within the hub. 		
Bus / Streetcar	50-150 (Mobility Hub Guidelines (2011))	10-25%
<ul style="list-style-type: none"> Bus / Streetcar service is most appropriate as an access / feeder mode to higher-tier rapid transit service in mobility hubs. 		

* Density numbers adapted from The Growth Plan for the Greater Golden Horseshoe (2017) and Metrolinx Mobility Hub Guidelines (2011)

** Density numbers represent either the minimum required density to support the respective transit service or a range of appropriate maximum and minimum densities

*** Density targets from the Growth Plan for the Greater Golden Horseshoe reflect minimum planned densities for Major Transit Station Areas

2.0 PROGRESS AND CHALLENGES

STATE OF MOBILITY HUBS (SOMH) STATISTICS

Mobility Hubs with less than 3% land area dedicated to surface parking:

1. Jane-Bloor
2. Eglinton West
3. Pape

Mobility Hubs with less than 4% land area dedicated to surface parking:

4. Jane-Eglinton
5. St George

Modal share by public transit is a metric that will increase over the next five to ten years as hubs intensify and rapid transit infrastructure projects are completed. As of 2016, the average transit mode share for arriving and departing trips within mobility hubs measured 15 and 21 percent respectively (SOMH, 20). Established urban areas, such as the Queen Mobility Hub (69 percent of all arriving trips by public transit) or the Dundas West/Bloor Mobility Hub (44 percent of departing trips by public transit) support high public transit modal splits. However, the low transit modal split for morning commutes in other mobility hubs suggests that rapid transit infrastructure and population and employment densities must improve to support ridership across the GTHA.

To date, only four mobility hubs (Queen, Union, Yonge-Bloor, and Osgoode) have more than 20% of trips departing by foot in the morning. Mobility hubs should function as complete communities that provide opportunities to commute by walking or cycling. Intensification and improvements to the public realm within the first and last mile will encourage commuting via active transportation.

The amount of surface parking within mobility hubs is an indicator of existing density, land use, built form and development potential. The median land set aside for surface parking is equal to nine percent of the land area within mobility hubs. On the low end, 17 mobility hubs have less than 5 percent of their land area allocated to surface parking, alternatively 23 percent of the Leslie-407 mobility hub is allocated to surface parking (SOMH, 26).

Large areas of surface parking are not conducive to placemaking or active transportation, however, they do offer easier opportunities for intensification and are unlikely to require extensive consolidation prior to construction. It is important that this be recognized and adequate redevelopment parcels be identified.



2.2 PROGRESS AGAINST THE BIG MOVE

In 2008 The Big Move identified seven Priority Actions for establishing a network of mobility hubs throughout the GTHA.

Priority Actions 7.1- 7.7 can be summarized as follows:

- 7.1** Create a system of connected mobility hubs, including Anchor Hubs and Gateway Hubs, at key intersections in the regional rapid transit network that provide travelers with access to the system, support high density development, and demonstrate excellence in customer service;
- 7.2** Refine the list of Mobility Hubs in consultation with municipalities as the regional rapid transit system is implemented;
- 7.3** Develop a financial program to facilitate mobility hub capital improvements that increases over time to \$50 million annually;
- 7.4** Establish a special purpose, transit-related urban development capability to lead or facilitate development for mobility hubs that may have factors inhibiting their successful, integrated development;
- 7.5** Take advantage of the full range of financial and development tools available as part of a mobility hub development strategy and establish guidelines for their appropriate use;
- 7.6** Undertake a comprehensive parking study to identify best practices guidelines; and
- 7.7** Update the province's Transit Supportive Land Use Guidelines.

Table 2.2 summarizes the progress made against Priority Actions 7.1 – 7.7. Together, the Province and the affected regions and municipalities have made steps towards completing the actions listed above. These steps include revisions to regional and municipal policy to incorporate mobility hub objectives, completion of a number of mobility hub studies, planning and implementation of financing strategies in select municipalities, and updated Provincial Transit Supportive Land Use Guidelines (2012). However, modifications to current processes and outstanding actions remain, particularly related to Priority Actions 7.3, 7.4 and 7.5.

2.0 PROGRESS AND CHALLENGES

Table 2.2: Progress Against Priority Actions

Objectives and Actions	Progress since 2008
<p>Big Move Priority Action 7.1: Create a system of connected mobility hubs, including Anchor Hubs and Gateway Hubs, at key intersections in the regional rapid transit network that provide travellers with access to the system, support high density development, and demonstrate excellence in customer service.</p>	<p>The Big Move identified a system of 51 connected mobility hubs throughout the GTHA, including Anchor Hubs and Gateway Hubs. Considerable initial progress has been made on this Priority Action, however true progress will be determined based on how plans are implemented. It should be noted that the updated (2017) Growth Plan for the Greater Golden Horseshoe does not mention mobility hubs, but the plan does cite specific minimum density targets for <i>major transit station areas</i> (inclusive of mobility hubs) on <i>priority transit corridors or subway lines</i>.</p> <p>Mobility Hubs are included in the following Regional and Local Official Plans:</p> <ul style="list-style-type: none"> - City of Toronto By-Law Amendment 274 (201) - By-Law Amendment 274 to the City of Toronto's Official Plan recognizes mobility hubs and makes the commitment to develop master plans that will respect the Mobility Hub Guidelines. - City of Hamilton - Durham Region - Halton Region - Peel Region - York Region - City of Brampton - City of Burlington - City of Markham - City of Mississauga - City of Oshawa - City of Vaughan <p>Mobility Hubs are not included in the following Regional and Local Official Plans:</p> <ul style="list-style-type: none"> - Town of Milton - Town of Newmarket - City of Pickering - Town of Richmond Hill
<p>Priority Action 7.2: As the regional rapid transit system is implemented, detailed planning is undertaken for specific corridors, and municipal growth planning exercises unfold, Metrolinx may, in consultation with municipalities and transit agencies, refine the list of mobility hubs based on the definitions and criteria of the RTP.</p>	<p>Section 4 of this policy review includes proposed updated typologies and criteria for Mobility Hubs.</p> <p>Mobility Hub Studies have been completed or are underway in Toronto, Hamilton, Brampton, Burlington, Markham, Mississauga, Oakville and Vaughan.</p>
<p>Priority Action 7.3: Develop a financial program to facilitate mobility hub capital improvements that increases over time to \$50 million annually. This program would fund or leverage transit-related improvements such as converting surface parking to structured parking, strategic land acquisitions, station improvements, and local road re-alignments to facilitate integration of transportation modes, with a focus on those mobility hubs that:</p> <ul style="list-style-type: none"> - have the greatest potential to improve the performance of the overall transit system and generate a return on the transit investment; - demonstrate an ambitious and practical development plan for achieving or exceeding the land use and transportation objectives of the RTP and the minimum requirements of the Growth Plan for the Greater Golden Horseshoe; - have prepared a viable business plan that outlines the public and private financing techniques for achievement of the intended development; - have strong support from the municipality; - have high levels of existing or planned local transit service; and - demonstrate best practices in the design and function of the mobility hub. 	<p>A formal financial program to facilitate mobility hub capital improvements has not been developed. The 2013 Metrolinx Investment Strategy recommended that 5% of capital from a Transportation Trust Fund be devoted to "other transportation and mobility initiatives" including mobility hubs. (p. 56)</p>

2.0 PROGRESS AND CHALLENGES

Objectives and Actions	Progress since 2008
<p>Priority Action 7.4: Establish a special purpose, transit-related urban development capability to lead or facilitate development for those mobility hubs where it is determined that jurisdictional issues, land ownership patterns or other issues present particular challenges that would otherwise inhibit their successful, integrated development. Such capability would be structured appropriately to respond to the issues identified and could be vested with authority to manage publicly owned lands and to acquire or assemble lands needed to realize the strategic development objectives of the mobility hubs.</p>	<p>Currently, the design, planning and implementation of Mobility Hubs is led by Metrolinx (Planning and Policy). Realty Services also provides support by coordinating leasing, site acquisition and disposition, asset and property management, strategic real estate planning, land development, investment analysis and workspace planning and design. In some cases, Realty Services will work to protect land for future mobility hub development, (as with the Kennedy Mobility Hub). However, there is demand for a clearer definition of Metrolinx' role in TOD implementation and more support for implementation from the entire organization as well as the Province and Ontario Municipal Board.</p>
<p>Priority Action 7.5: Take advantage of the full range of financial and development tools available as part of a mobility hub development strategy and establish guidelines for their appropriate use. These tools may include tax increment financing, community improvement plans, area development charges, as well as value capture strategies, public-private partnerships and the possible use, as necessary, of statutory expropriation powers.</p> <p>** Priority Action 7.6: With the guidance of a multi-stakeholder roundtable, undertake a comprehensive parking study to identify best practices guidelines with respect to:</p> <ul style="list-style-type: none"> - optimum parking standards, practices and pricing policies for non-residential parking, particularly in mobility hubs; - design of parking facilities to ensure they do not act as barriers to transit or active transportation; - transitioning from free to paid parking to encourage transit and active transportation use; - separating parking costs from transit fares at mobility hubs, in order to encourage travellers to access the station by walking, cycling or local transit; and - implementation mechanisms such as municipal parking authorities. 	<p>Financing options for mobility hub development are in place or being considered in Hamilton and York Region, and more recently, the Region of Peel. According to the Region of Peel Official Plan (2016 Office Consolidation), the Region will develop and implement planning and financial tools/incentives to promote intensification in mobility hubs and major transit station areas (7.6.2.29).</p> <p>In December 2016, Metrolinx released the GO Rail Station Access Plan in response to the Provincial commitment to Regional Express Rail (RER). This plan updates the 2013 GO Rail Parking and Station Access Plan. It supports more sustainable means of connecting riders to the GO stations at the centre of many Mobility Hubs and seeks to reduce the demand on station parking.</p>
<p>Priority Action 7.7: Update the province's Transit Supportive Land Use Guidelines.</p>	<p>The Ministry of Transportation updated their Transit Supportive Land Use Guidelines in 2012. Metrolinx released its Mobility Hub Guidelines in September 2011.</p>

2.0 PROGRESS AND CHALLENGES

2.3 CASE STUDIES

As of 2017, seven mobility hub studies have been completed by Metrolinx with numerous others underway or completed by municipalities.

Mobility hub studies led by municipalities in the GTHA have been completed or are underway in Brampton, Burlington, Hamilton, Markham, Mississauga, Oakville, Toronto and Vaughan. These studies have attempted to address redevelopment opportunities and develop detailed master plans for the primary, secondary and tertiary zones. Many focus on recommendations related to built form, site design, public realm, transportation/circulation, sustainability, intensification, transportation analyses, value uplift analyses and phasing.

The following pages include case studies for the Dundas West-Bloor, Kennedy, and Midtown Oakville Mobility Hub Studies, identifying lessons learned, which along with the following stakeholder interviews (Section 2.4) are meant to inform the Key Mobility Hub Issues and Strategic Directions identified later in the report.

These mobility hubs have been chosen for case studies as they represent projects with different complexities, transit service levels, implementation timelines and urban contexts. Dundas West-Bloor is located within an established and dense urban context that predates World War Two. Since the completion of the Dundas West-Bloor Mobility Hub Study in 2011 an UP Express stop has been added to the mobility hub and major public realm and transportation improvements provided. The Kennedy Mobility hub is situated within an evolving urban context, intensifying to accommodate planned Mid-Rise development along Eglinton Avenue within the City of Toronto. In contrast, Midtown Oakville provides a strong case study for reimagining a suburban context in the face of issues associated with a maturing city: intensification, planning for higher-order transit, and attracting office development.



Rendering of the intersection of Bloor Street West and Dundas Street West (Source: Brook McIlroy).

Dundas West-Bloor

The Dundas West-Bloor Mobility Hub Study (2011) aims to more seamlessly integrate various modes of transportation within the mobility hub. These include regional rail (GO Transit), subway, streetcar and bus service, Union Pearson Express rail service and walking and cycling.

Focusing on four key areas within the primary zone (approximately 250m from Bloor GO Station) that present the greatest potential for transportation improvements and infill redevelopment, the study provides a number of recommendations to promote appropriate intensification, enhanced connectivity and to develop a stronger public realm and pedestrian environment.

A new landmark lightbox/station entrance (now built) was identified to replace the old entrance (a simple staircase leading to the platforms). The new entrance enhances station visibility providing a clear presence at street level along with

2.0 PROGRESS AND CHALLENGES

improved lighting, weather-protection, information and wayfinding, seating and ticketing areas.

Direct connections between the Dundas West TTC Station and the new Bloor GO Transit and UP Express rail platforms were identified, including an at-grade, tree-lined pathway to be integrated into a comprehensive development site to the north.

Adjacent to the existing Dundas West TTC Station, the study proposes a comprehensive redevelopment of the block that re-aligns the streetcar access (to minimize pedestrian conflict) and integrates station access within a new development to provide an entrance at the intersection of Bloor Street and Dundas Street West, along with a continuous weather protected retail main street along Dundas.

All study recommendations were supported by a detailed transportation and land value-uplift analysis conducted by Metrolinx in association with Brook McIlroy Inc., BA Group and NBLC in 2011.

Lessons Learned:

- An enhanced station presence at street level was identified along Bloor Street above and below the rail corridor. Implementation of this design has resulted in improved wayfinding and signage as well as a more enjoyable customer experience. Improvements in real and perceived safety along with enhanced station visibility are likely a factor in increased ridership within the mobility hub.
- A secondary entrance to the GO Transit and UP Express platforms from Dundas Street West was designed and constructed along a direct, landscaped and weather-protected pathway north of the Crossways development. Similar station design and improved pedestrian connections should be explored to provide a station presence at the street for other hubs, including short-term (direct, well-signed pathways) and long-term (new station facilities, connections through new development, etc.) solutions.
- An underground publicly accessible pedestrian tunnel was designed and constructed to provide direct east-west connections across the site including to the West Toronto Rail Path. As connections are provided at other mobility hubs, their location should consider direct connections between key destinations and circulation routes in addition to rail platforms. This will help minimize any real or perceived barriers related to transportation infrastructure.
- The report directs mid-rise buildings to be located at the street edge to frame the street with additional setbacks required to facilitate wider, more pedestrian-supportive boulevards. New developments transition to lower heights as they approach stable residential neighbourhoods. This approach was based upon a previously completed City Avenue Study that provided guidance on the scale and massing of development. Where possible, a similar approach to coordination between the municipal and provincial planning process should be followed for other hubs to ensure a context sensitive approach to development.

2.0 PROGRESS AND CHALLENGES

Kennedy



Rendering of the proposed transit plaza adjacent to Kennedy Station
(Source: Brook McIlroy).

Kennedy Mobility Hub is the eighth busiest transportation hub by passenger volume within the GTHA. In addition to serving as the future eastern terminus of the Eglinton Crosstown LRT, the southern terminus for the Scarborough Subway line and the western terminus for the Eglinton East LRT, the station also includes:

- A Toronto Transit Commission (TTC) bus terminal;
- A stop on the Stouffville GO Train line;
- The southern terminus of the TTC Scarborough Rapid Transit Line; and,
- The eastern terminus of the TTC Bloor Danforth subway.

The Kennedy Mobility Hub Study was prepared by Metrolinx in association with Brook McIlroy Inc., ARUP and NBLC in 2014 and includes a Master Plan that illustrates the vision for the mobility hub. The Master Plan highlights significant opportunity for transit oriented development within the station area and along Eglinton Avenue. The study focuses on the creation of strong civic spaces that integrate multiple transportation modes, evaluates various transit alignments and technology from an urban design, placemaking, site and building design, public realm, circulation, transit operation and economic development perspective with the aim to prepare a blueprint for a complete community.

A key component of the report was to distill master plan recommendations into construction guidelines that formed part of the Alternative Financing Procurement Contract for the Eglinton Crosstown LRT. Imperative to the creation of a complete community was protecting land for future development, creating the proper conditions for promoting design excellence and mitigating the potential impact of station infrastructure, such as the subway and LRT traction power substations, on development potential.

2.0 PROGRESS AND CHALLENGES

Lessons Learned:

- Existing streets form important neighbourhood connections leading to and from the station. Over time, as streets are repaired or resurfaced, consideration should be given for improvements such as increased sidewalk widths, pedestrian lighting and street trees that can help support pedestrians walking to and from the station.
- Even at full build-out, the realities of transit facilities (bus circulation, safety fencing, rail corridors) can result in unsightly conditions. At Kennedy station, a variety of unique options have been considered to minimize these visual impacts, including rooftop gardens, enhanced plaza areas for waiting pedestrians and locating buildings to screen the station area from view. Similar solutions for creating high quality customer experiences within the Kennedy Station area should be considered at other mobility hubs.
- Connectivity is about more than physical connections. An opportunity exists at Kennedy to create a consistent design language for the station lands by ensuring that the landscape strategy developed for the publicly accessible lands surrounding the station and public plaza is used to inform the public realm treatment for other station facilities such as the bus terminal and passenger pick-up/drop-off areas.
- Long term phasing strategies should be put in place to ensure that infrastructure built today does not preclude future development opportunities. Long term phasing is particularly important when identifying appropriately sited and sized development parcels. Project Specific Output Specification language was prepared for the Eglinton Crosstown LRT that identified the size of development parcels to be protected and ensured that station infrastructure such as power substations were not to be located within these lands so as not to impede their development potential.

2.0 PROGRESS AND CHALLENGES

KENNEDY STATION MOBILITY HUB MASTER PLAN

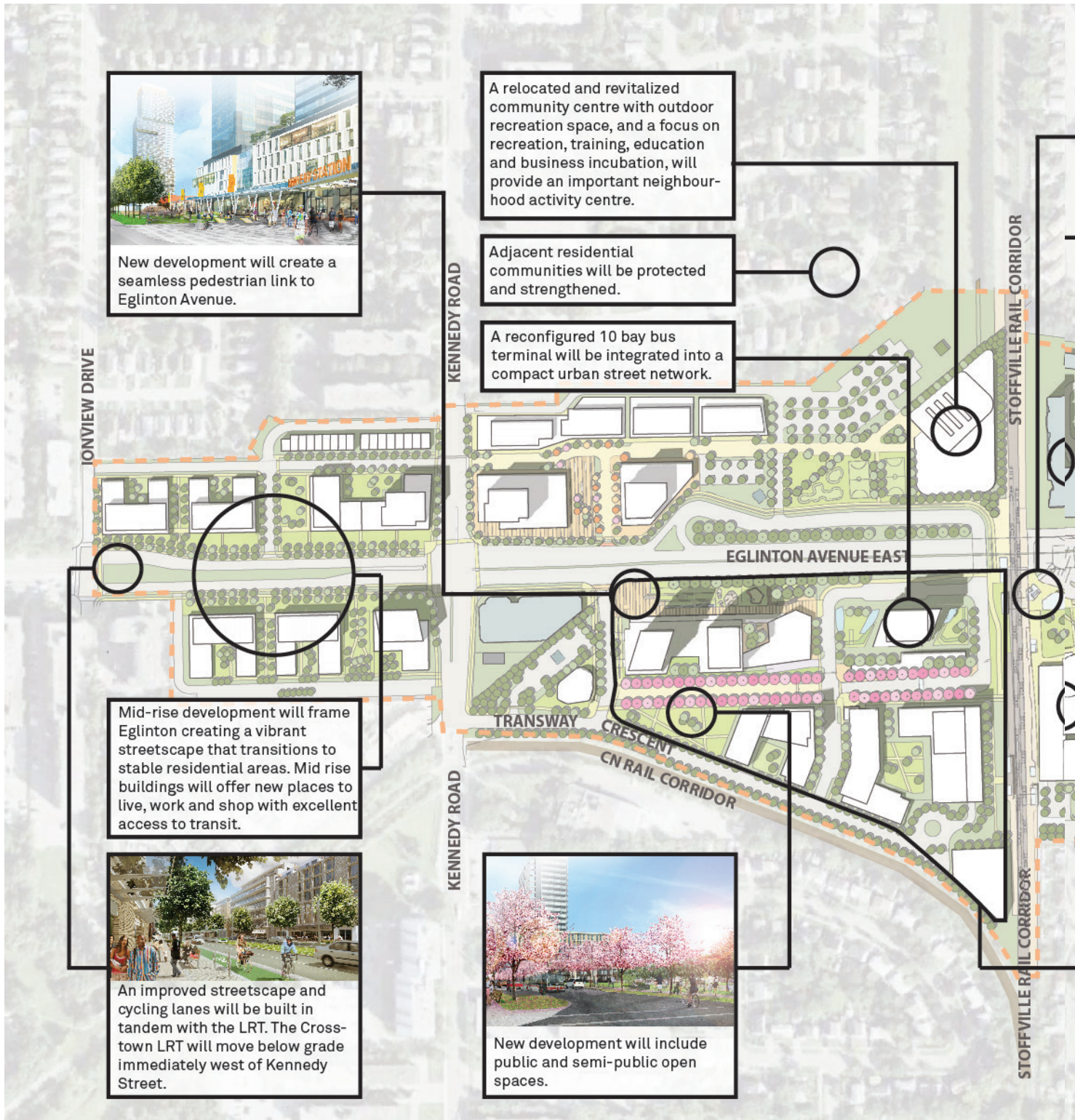
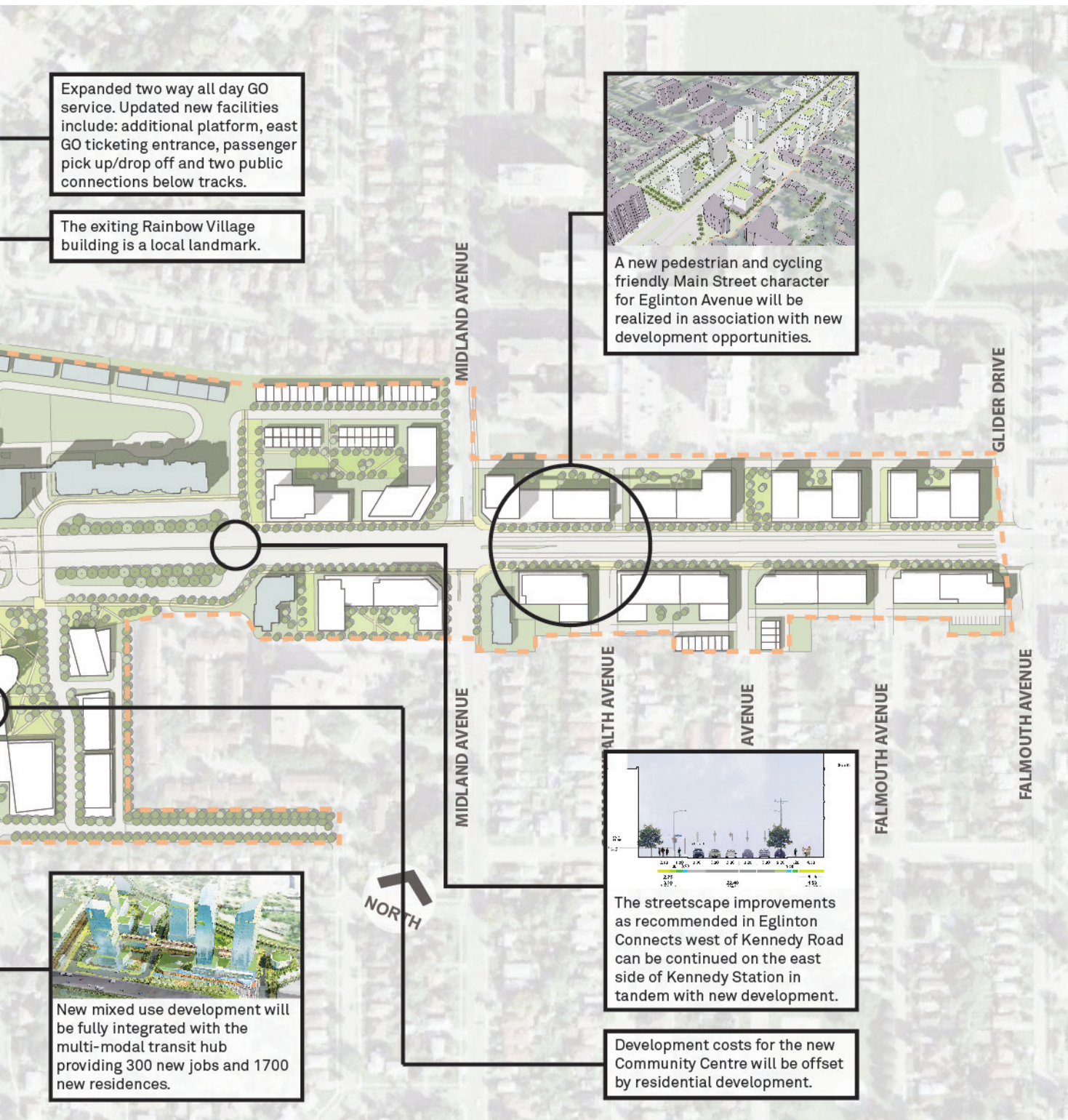


Image depicting key recommendations from the Kennedy Station Mobility Hub Study (2014)

2.0 PROGRESS AND CHALLENGES



2.0 PROGRESS AND CHALLENGES

Midtown Oakville



Master Plan Image for the Midtown Oakville Mobility Hub (Source: Midtown Oakville Mobility Hub Study).

Midtown Oakville is an Anchor mobility hub that presently includes a GO station on the Lakeshore West GO Rail line and an Oakville Transit bus loop. Future expansion plans for the hub include the provision of express rail, rapid transit, and enhanced regional rail and local bus service. To better serve a growing number of commuters, Metrolinx built a 1,000 space parking structure at the station in 2012.

Considerable planning work has been undertaken at this location including the Draft Midtown Business and Development Plan (2008), the Livable Oakville Official Plan (2011), and the Midtown Oakville Mobility Hub Study (2012). The Midtown Oakville Mobility Hub Study was prepared in 2011 by Metrolinx in association with Urban Strategies Inc., McCormick Rankin Consultants, and Cushman & Wakefield.

The study recommends extending the station east, covered pedestrian paths and ramps leading to the new station building, with adjacent retail development to serve passengers within the station area. The Study also proposes a new bus loop, Kiss 'n' Ride and pedestrian connection across the rail corridor. Strategies such as development charges, land development 'request for proposals', and partnership between municipal stakeholders have been identified as implementation tools that could help realize the vision for this hub.

Lessons Learned:

- Provide direct access to stations with minimal interruptions in flow for pedestrians. This could include well-lit, weather-protected pathways and ramps to provide direct platform access from sidewalks.
- Development constraints due to hydro corridors can be mitigated. As part of this study, alternative concepts were generated that were used by Metrolinx when working with Hydro One to determine general feasibility.
- Explore opportunities to incorporate sustainable practices into station area redevelopment, including smart building materials to conserve energy, reducing urban heat island effect through innovative building design, and adopting waste management strategies that promote recycling and reuse.
- Include a parking replacement strategy when relocating existing surface parking to improve potential for transit-oriented development along a corridor.

2.0 PROGRESS AND CHALLENGES

- The preferred station concept proved costly and complicated provided the number of various parties responsible for implementation. Greater focus on a realistic implementation strategy considering phasing, costing and a clear delineation of agreed-to roles and responsibilities would have helped mitigate complications.

Key Takeaways

The Dundas West-Bloor, Kennedy and Midtown Oakville Mobility Hubs offer lessons towards optimizing station access, enhancing customer experience, intensifying uses, developing a strong public realm and developing strategies for efficient coordination between diverse stakeholders. Key takeaways include:

- Design strategies to enhance station presence at the street level can improve wayfinding and signage and enhance customer experience. Efforts to improve perceived safety with pedestrian lighting, provide weather protected walkways and to improve station visibility can increase ridership within a mobility hub.
- Existing streets form important neighbourhood connections leading to and from the station. Over time, as streets are repaired or resurfaced, consideration should be given for improvements such as increased sidewalk widths, pedestrian lighting and street trees that can help support pedestrians walking to and from the station.
- Connectivity is about more than physical connections. Thought should be provided towards developing a consistent design language that guides the choice of landscape, signage, public realm and built form elements within the mobility hub.
- Include a parking replacement strategy when relocating existing surface parking to improve potential for transit-oriented development.
- Phasing strategies should anticipate changes in density, land use and technology over time. The design and location of station infrastructure and parking should not preclude future development or conversion.
- Overall economic feasibility needs to be a larger component of mobility hub studies. Each study results in a number of short, medium and long term economic realities related to future studies, municipal policy changes, infrastructure improvements, transitional parking areas and public realm improvements. These processes need to be considered as part of project phasing and tied to dedicated funding. Without identifying official funding mechanisms, many of the recommendations resulting from mobility hub studies are difficult to secure and implement.

2.0 PROGRESS AND CHALLENGES

2.4 METROLINX AND MUNICIPAL STAKEHOLDER INTERVIEWS

Design Review Panel

Metrolinx's Design Review Panel was created in 2013, and is drawn from leading experts and respected professionals in the design community. The Panel was created to review projects with values of \$10 million or greater within mobility hubs or at highly public-facing locations. It offers unified direction and constructive comments with the decision to 'support', 'support with conditions' or 'reject recommendations'. The Panel's effectiveness is reviewed annually and has proven to have a direct and positive impact on the quality of urban design, public spaces and both exterior and interior architecture within mobility hubs.

A series of interviews with key Metrolinx and municipal staff were held to identify progress as well as challenges and opportunities faced by mobility hubs, particularly with regards to land use planning and implementation. Specifically, staff at Metrolinx from the Planning and Policy, and Realty Services departments were interviewed while municipalities included Burlington, Mississauga, Hamilton, Vaughan, and York Region.

Observations from the Metrolinx and municipal interviews will be used to inform Section 2.5 Key Issues and the strategic policy directions, mobility hub typologies and mobility hub criteria discussed in Section 3 of the report. Observations from the interviews have been divided and summarized into themes based on Progress; Challenges; and Opportunities. These include:

Progress Identified by Stakeholders:

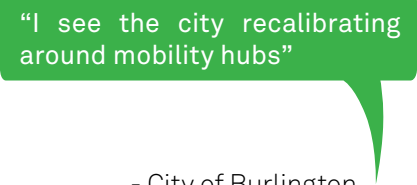
- Metrolinx's **Design Review Panel** has had a positive impact on the quality of design within mobility hubs. Improvements to mobility hubs have been made in terms of customer experience as well as consistency in design language, harmonized wayfinding and branding.
- Metrolinx and municipal partners have made significant strides in partnering on **integrated policy**. To successfully implement a network of mobility hubs across the region, close collaboration on mobility hubs must continue beyond policy and planning to include detailed design, construction and operation.



James Street North Mobility Hub

2.0 PROGRESS AND CHALLENGES

- Mobility hub **policy** is now common in municipal Official Plans and Transportation Master Plans. Most municipalities within the GTHA have completed or are undertaking mobility hub studies and secondary plans for designated mobility hubs. Mobility hub studies have been completed by Metrolinx and the municipalities of Brampton, Burlington, Hamilton, Markham, Mississauga, Oakville, Toronto and Vaughan. The development requirements and terminology for mobility hubs still varies across municipalities, and further alignment with the 2017 Growth Plan's new Major Transit Station Area (MTSA) policies will be necessary in the future.
- Municipalities and the development industry have been able to leverage the concept of mobility hubs and supporting transportation infrastructure as foci for investment. For example, the City of Vaughan's Metropolitan Centre Mobility Hub has become the heart of Vaughan's new downtown and a **focus for international and local investment**, with improvements to the mobility hub serving as a central component of marketing materials.



"I see the city recalibrating around mobility hubs"

- City of Burlington

Challenges Identified by Stakeholders:

- **Terminology:** Some transportation hubs that do not meet the full criteria for mobility hubs have been adopting the term. While this can cause confusion and potentially lessen the significance of the concept it has also provided municipalities with a good methodology for building transit-oriented development and helped engender support for greater intensification in select locations supported by public transit. For example, municipalities as diverse as Niagara Region and Clarington have initiated Station Area Plans and Secondary Plans for lands surrounding proposed GO Stations, using the objectives and guidelines for planning around mobility hubs as their study methodology. Clarification of terms can help to address the above mentioned confusion while also strengthening a municipality's ability to leverage the mobility hub concept in defense of sustainable intensification.
- Conversion of **employment lands** represent a challenge for municipalities as significant demand for residential development is putting a strain on their ability to protect employment lands while intensifying uses. Many municipalities are now searching for ways to promote mixed-use development while retaining employment uses and providing for this conversion within a time-line that supports development of the mobility hub (see sidebar in section 2.5 D for further details on land conversion).

2.0 PROGRESS AND CHALLENGES

- More formal decision making tools for identifying priority mobility hubs may be necessary. An effort to clarify terminology and **provide guidance on phasing prioritization** should be addressed.
- Balancing short and long term **parking demand** has proven to be a challenge. Parking demand can conflict with other mobility hub objectives such as placemaking, intensification and walkability. Tools to decrease reliance on surface parking such as providing improved active transportation connections; shuttle, ridesharing and car-pool services; reserved parking for shared services such as carpools; improved local transit service; and new technology should be prioritized.
- The development of **funding strategies** for local transit operations was identified as a valuable asset by municipal stakeholders. These funding strategies would improve municipalities' ability to match local transit service levels with expanded all day-two way RER service and reduce dependence on surface parking within mobility hubs.
- Municipalities suggested a need for Metrolinx to **identify land requirements** within mobility hubs that should be reserved for transportation infrastructure such as parking , sub-stations etc., as early in the process as possible to avoid the risk of appeal by land owners.
- **Joint development** within mobility hubs is an area in need of clarification and development, with Metrolinx's specific role and level of involvement requiring further definition.

Opportunities Identified by Stakeholders:

- The full impacts of **New Mobility** are not known but we do know that it will fundamentally change the region's transportation network and built spaces. Metrolinx and municipalities should closely monitor the implications of New Mobility both from a technology and policy perspective and ensure that mobility hubs are built to be flexible to accommodate the coming changes.

2.0 PROGRESS AND CHALLENGES

- The **First-Mile** and **Last-Mile** of a passenger's trip has a strong impact on transit ridership. This part of the trip is the least contained and controlled part of the journey. As such, encouraging a high level of comfort and accessibility along the first and last mile determines much of the ease and enjoyment of travel. Solutions to improve this part of the customer trip is critical. New mobility is one area that will offer opportunities to improve this portion of the passenger journey.
- Consideration should be given to **unbundling parking costs** from the price of GO Transit fares to more accurately represent the real costs associated with various modes of transportation and to encourage walking, cycling, local transit and carpooling to the station.
- Improved inter-ministry **coordination** with municipalities (e.g. alignment of density, modal and infrastructure targets, clear identification of stakeholder objectives, communication protocols and contacts, etc.) and support from Metrolinx will help municipalities better navigate the planning and implementation process. Metrolinx should clarify the **structure and process** for working with municipalities on mobility hub implementation and adopting a one window contact policy would be helpful.
- Wherever possible, mobility hub studies should be completed in advance of **environmental assessments** so that elements from the study can be included within the terms of reference. Coordination with the Transit Project Assessment Process (TPAP) is critical as mobility hub studies should anticipate requirements that will arise in the subsequent streamlined environmental assessment process.
- RER will provide much improved service along the GO Transit rail corridors leading to Union Station. However, to truly create a seamless network of mobility hubs, better **east-west connectivity** between mobility hubs, not necessarily terminating at Union Station, is critical. Improved east-west connectivity will provide direct links between new mobility hubs improving system resiliency. York Region in particular noted a need for improved east-west connectivity between regional centres such as improved transit along Highway 407.

"We need more inter-agency cooperation. It's hard when you have different provincial ministries pushing different agendas."

- City of Burlington

"[We need to make] sure that our local transit service is keeping up with the redevelopment of the mobility hub."

- City of Mississauga

2.5 KEY TOPICS

Based on the review of mobility hub progress since 2008, mobility hub case studies, stakeholder interviews, background research, local and international best practices and emerging trends, the following key topics have been identified as particularly relevant to informing mobility hub policy:

- A** Collaboration
- B** Parking
- C** New Mobility
- D** Land Use Patterns

The four topics set the foundation for the mobility hub policy directions identified in Section 3.0 Strategic Directions.

A - Collaboration

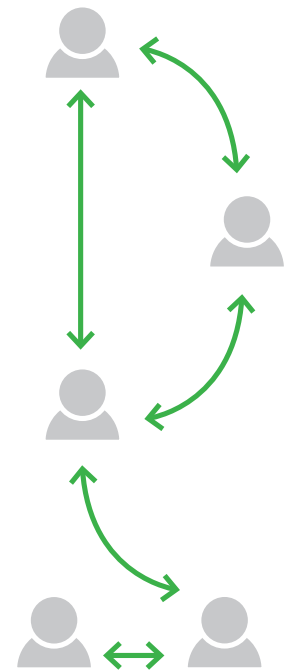
Metrolinx is responsible for planning, building and operating much of the transportation infrastructure associated with mobility hubs. Upper and lower tier municipalities have responsibility for determining land use and zoning, approving development, providing community services, and providing infrastructure such as the local and regional road network and local transit. Other stakeholders, including the development community and provincial ministries and agencies, such as Hydro One, also play a critical role in supporting mobility hub development.

Strong coordination between these groups is necessary to develop realistic and implementable visioning strategies, phasing plans, land use plans and zoning regulations that support transit oriented development in a cohesive rather than piecemeal manner. The list of areas requiring coordination is exhaustive and must consider each hub's unique characteristics and strengths. For example, a few areas requiring coordination include: environmental assessments; parking plans; local, rapid and regional transit scheduling; PRESTO services; Transportation Demand Management (TDM) initiatives; active transportation infrastructure and complete streets design; wayfinding; and design excellence.

An important method to facilitate early mobility hub coordination is the development of mobility hub studies, including master plans that illustrate the vision for the station area and surrounding lands, built on stakeholder collaboration and significant consultation. A critical success factor to **developing project buy-in** is through the use of **Technical Advisory Committees (TAC)** and **Stakeholder Advisory Committees (SAC)**, **consulted early and often** throughout the project. Mobility hub studies can be led by either Metrolinx or the municipality, but must include a detailed implementation plan that identifies next steps along with stakeholder roles and responsibilities during the policy, design, construction and operation phases.

Mobility hub studies are complex planning and design documents. One factor hindering successful development of mobility hubs is the lack of **robust implementation plans**. To achieve comprehensive phasing and implementation plans, **stakeholder collaboration should begin prior to commencement of mobility hub studies**, potentially as early as the beginning of procurement to ensure RFPs provide adequate background information on implementation needs to consultant teams. This information must consider provincial, local and regional needs along with those of private sector stakeholders.

Strong communication between Metrolinx and municipalities is critical to successful implementation. For example, municipalities are responsible for policy jurisdiction while Metrolinx is responsible for station infrastructure. Close coordination between all actors is required to ensure that **policy**



2.0 PROGRESS AND CHALLENGES

amendments such as updated land use plans, building heights, planned road and active transportation connections and public realm improvements **are integrated with station infrastructure needs.** An opportunity to improve communication may exist in creating a **one-window contact system** with a designated Metrolinx representative for communication between Metrolinx and municipalities. This idea was recommended in 2008 but has not been adopted.

Identifying champions during each phase of the project is also a critical tool to ensure the necessary political will and intergovernmental coordination required to achieve each project's objectives.

A sometimes overlooked facet of collaboration is the **coordination between transportation infrastructure and community development.** The transportation infrastructure that allows us to move throughout the GTHA can result in real and perceived barriers to developing attractive and walkable communities. This issue is of particular importance within mobility hubs, where the aim is often to build complete communities with densities and uses that support rapid transit.

A traditional lack of coordination between transportation infrastructure, land use planning and the development community has resulted in some mobility hubs being divided by large arterial roads, freeway interchanges, and public transit infrastructure that can make walking and cycling both unattractive and hazardous. For example, large bus terminals designed without pedestrian connectivity in mind can result in a poor public realm with transit stations that were intended to be multi-modal remaining relatively inaccessible to pedestrians and cyclists.



Existing transportation infrastructure serving as a real and perceived barrier at the Kennedy Mobility Hub.

Grade separations and rail corridors can also provide barriers to community building when not considered as part of a holistic community plan. As the region's transportation authority, Metrolinx has a unique opportunity to work with municipalities, the development community and other stakeholders to lead coordination between transportation infrastructure and community development that promotes an improved public realm, accessibility and opportunities for intensification adjacent to higher order rapid transit.

Improved coordination on these matters during planning and design will support the development of a strategic network of complete communities, promoting efficient use of existing and new resources and fiscal remuneration through land value uplift. This is particularly true as advances in New Mobility, combined with strong urban design and land use planning, have the potential to reshape the built environment, greatly improving accessibility from station areas to land uses such as now suburban office parks extending both the primary zone and mobility hub catchment areas.

One opportunity to improve coordination is to **create implementation entities that include Metrolinx and the municipality in which the mobility hub is located**. This entity would be responsible for implementation oversight and tasked with identifying and optimizing mobility hub objectives. Specific targets related to infrastructure, access, modal split, land use changes, intensification, amongst others, would be identified with certain provincial infrastructure funding released in stages based on meeting said targets. This funding would be complemented by municipal contributions through development charges and other investments.

Important strategies for improving coordination between transportation and community infrastructure are long term implementation and phasing plans that include transit oriented development. Where applicable, mobility hub studies should include **direction for Project Specific Output Specification (PSOS) language** to help ensure that design bids for Alternative Financing Procurement Projects (AFP) demonstrate how plans can support transit-oriented development by protecting development sites and ensuring transportation infrastructure is sited to minimize negative impacts on development and the public realm.

PSOS & AFP Processes

Project Specific Output Specification (PSOS) are developed to describe the design, construction and operation standards for projects that will be built and financed by a private sector partner. The PSOS provides the set of standards that are necessary to complete Alternative Financing Procurement Projects (AFP). AFP allows Ontario to modernize its aging infrastructure through a joint development process. The public sector will have the agency to designate the scope and purpose of AFP projects, while the private sector manages the design, construction and financing (Infrastructure Ontario, 2017).

2.0 PROGRESS AND CHALLENGES

B - Parking

Presently, parking demand drives GO Transit ridership as the traditional ridership model is to provide free parking at suburban GO Stations with riders accessing the station via private automobile. However, parking presents a significant challenge to mobility hub planning and implementation, particularly with regards to placemaking. Metrolinx is presently the largest owner of surface parking lots in North America and these lots are in demand. For example, approximately 85 percent of GO Transit parking lots are at or near their capacity. If access patterns remain the same, to accommodate accelerated ridership at GO Stations would require an increase of approximately 75-80,000 parking spaces by 2031. (2016 GO Rail Station Access Plan, 13). Despite stated desires to create walkable, pedestrian friendly communities the **present demand for parking within most mobility hubs is unsustainable and does not support many RER or mobility hub objectives** related to placemaking, intensification, minimized ecological footprints and multi-modal connectivity.

According to the 2016 GO Rail Station Access Plan, Metrolinx intends to decrease the 2031 drive and park modal split target to 36-38 percent from the 2015 rate of 62 percent (2016 Access Plan, 14). These numbers reflect all GO Transit Stations and would be lower for mobility hubs. Notwithstanding that point, the modal split by automobile within mobility hubs is also very high with a 78 percent median car modal split for trips destined to a mobility hub each morning and a 69 percent car modal split for trips departing from a mobility hub (SOMH, 19).

Moving forward, the increasing costs of auto ownership and congestion are likely to make the drive and park model less competitive. To fully capitalize on this trend likely requires **decoupling the cost of parking from transit fares**, particularly as RER service comes online. As park and drive demand decrease, more creative methods for locating parking away from the station should be considered. Providing convenient shuttle services or bike share programs between parking facilities and station buildings would help enable the use of remote parking facilities (2016 Access Plan). When relocating existing surface parking to remote locations, a parking replacement strategy can aid in improving the potential for transit-oriented

2.0 PROGRESS AND CHALLENGES

development. In the interim, while systems for shuttling passengers between the station and new lots are still under development, **providing policies to support peer-to-peer parking agreements between station users and residential or commercial lot owners can lessen the demand for surface parking and increase land value capture.**

One parking management trend that may help reduce parking demand is shared parking. Mobility hubs should **promote the use of shared parking spaces that are available to commuters during the day and to residents overnight** (2016 GO Rail Station Access Plan, p. 35). The Washington Metropolitan Transit Authority's shared parking agreements offer examples of similar strategies to promote the collective use of parking. Providing policies to support peer-to-peer parking agreements between station users and residential or commercial lot owners can also lessen the demand for surface parking and increase land value capture. While parking demand sustains, updated reserved parking strategies, or **real-time monitoring and signage tools**, can increase the efficiency of finding a parking space and reduce congestion around parking areas (2016 Access Plan). Improved monitoring, signage and reserved parking may also provide an opportunity to improve coordination between various modes of movement throughout the station area and reduced automobile congestion may also improve pedestrian safety.

The impacts of evolving mobility should be monitored closely as **new trends in transportation technology, active transportation and the sharing economy can be leveraged to lessen demand on the traditional drive and park model.** In the short term, higher capacity demand responsive shuttles and ride-sharing services can serve as catalysts for developing more efficient passenger pick-up and drop off areas designated according to a ride-sourcing service. For example, Transportation Demand Management tools can be leveraged to increase the mode share for carpooling by enforcing carpool parking more strictly and making it easier for carpool drivers and passengers to park quickly. In addition, the ongoing development of bike share programs and enhanced cycling connectivity stresses the importance of providing safe bicycle access both to stations and important institutional and employment areas within mobility hub as well as secure weather protected bicycle parking.

2.0 PROGRESS AND CHALLENGES

C – New Mobility

As noted above, new mobility trends present opportunities to transform the first and last mile of travel, built form, parking needs and station design within mobility hubs. Policy, planning and design for mobility hubs must consider the implications of this paradigm shift on public transit, congestion, sustainability, accessibility and built form.

The **planning, policy, design and implementation** of mobility hubs will have to **change to adapt to new mobility trends**. As new mobility trends evolve, opportunities for an enhanced user experience and more efficient use of space will emerge. For example, broader adoption of electric vehicles, along with associated decreases in vehicle noise and direct point emissions will likely inspire indoor/outdoor station access for electric buses and vehicles providing opportunities for improved weather protection, efficiencies in terms of seamless connections and associated amenities.

Large scale adoption of autonomous vehicles, if properly managed from a public/private perspective, hold the potential to positively transform not only station design, but also the first and last mile of travel to and from stations, increasing the reach of a mobility hub's primary zone. With the advent of public / private models of public transportation made possible through the shared economy, **mobility hubs should play an important role as a point of contact and enabler between private and public services**. New mobility models of efficiency and comfort within mobility hubs will need to be planned for to ensure that these shifts best support the existing public transportation network.

Further away from the rapid transit station, but still within mobility hubs, suburban office parks that are presently difficult to service via transit stand to benefit greatly from advances in new mobility. For example, suburban employment areas that presently lack good access from mobility hub stations could be served by shared autonomous vehicles circulating between the transit station and office parks. If done correctly, this approach offers solutions to improving access, congestion and decreasing reliance on surface parking within suburban employment centres.

Evolution of the Parking Garage by Arrowstreet Inc, Curbed (see following page)

Phase 1 demonstrates how structured parking garages will adapt to serve both autonomous vehicles and traditional cars. The efficient use of space on autonomous parking levels can permit increased floor-to-floor heights. Traditional vehicles would likely be stored on lower levels for easy access.

Phase 2 demonstrates how the same parking structure can adapt to accommodate autonomous vehicle pick-up and drop off zones. Without the need for traditional car storage space, upper levels can be adapted to serve other commercial, employment and community uses.

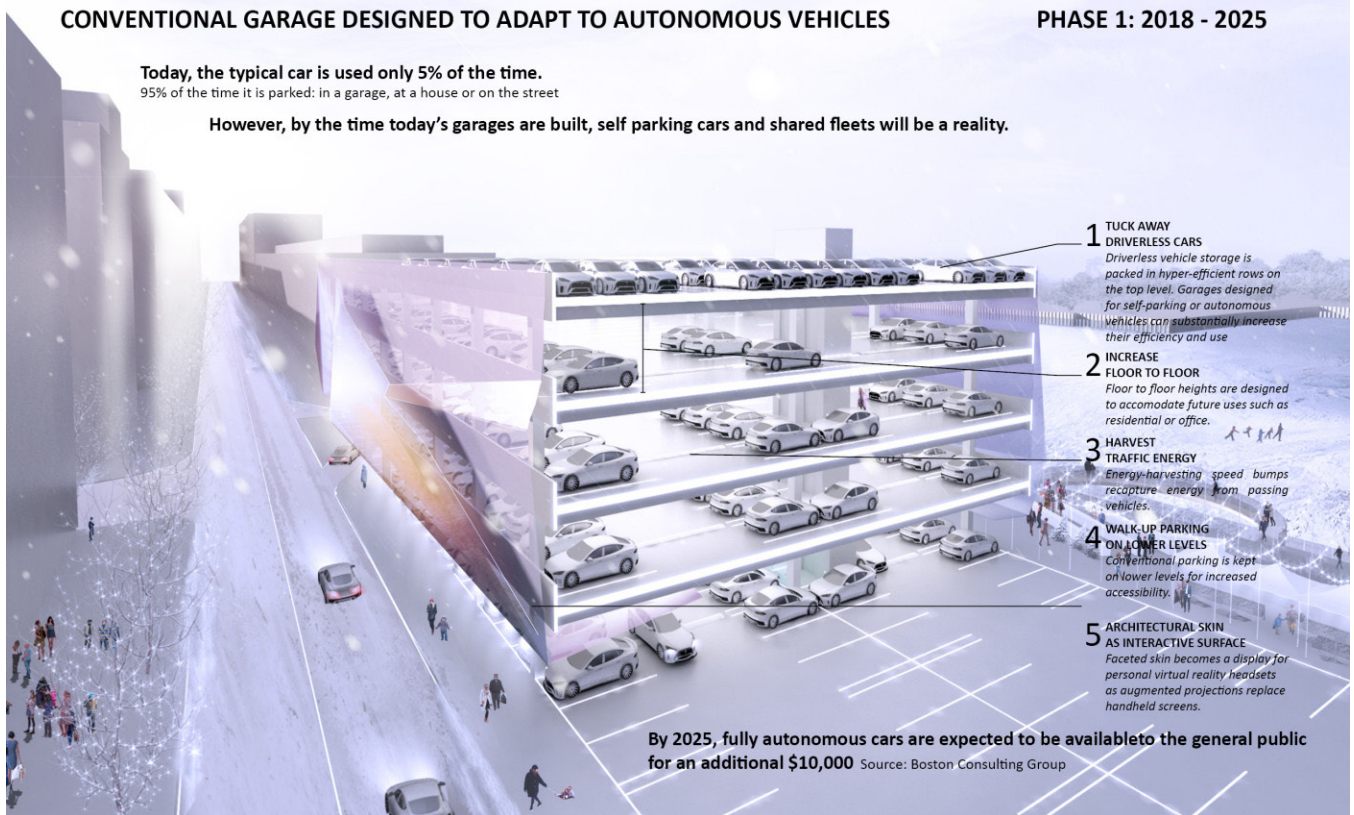
2.0 PROGRESS AND CHALLENGES

CONVENTIONAL GARAGE DESIGNED TO ADAPT TO AUTONOMOUS VEHICLES

PHASE 1: 2018 - 2025

Today, the typical car is used only 5% of the time.
95% of the time it is parked: in a garage, at a house or on the street

However, by the time today's garages are built, self parking cars and shared fleets will be a reality.

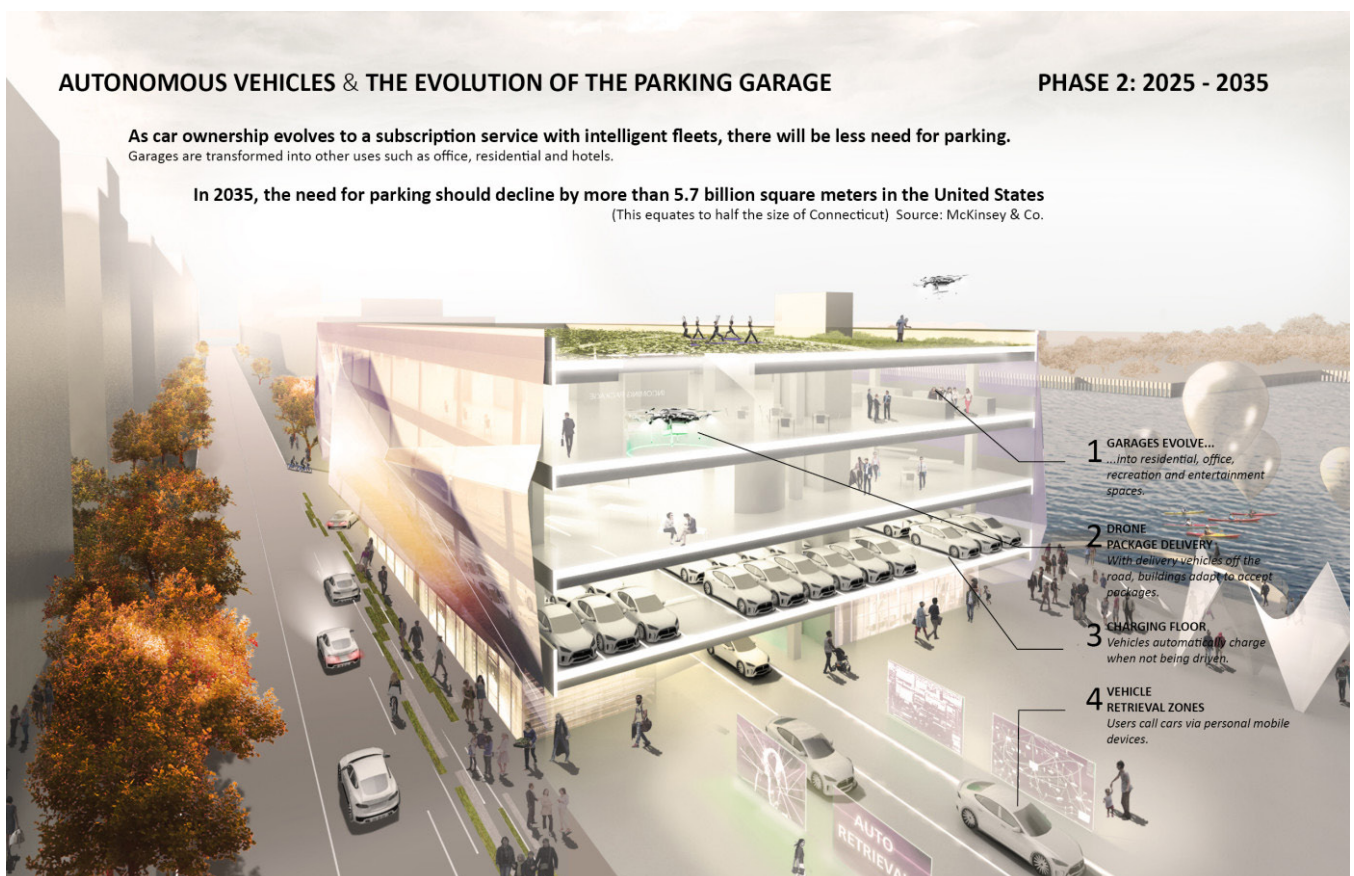


AUTONOMOUS VEHICLES & THE EVOLUTION OF THE PARKING GARAGE

PHASE 2: 2025 - 2035

As car ownership evolves to a subscription service with intelligent fleets, there will be less need for parking.
Garages are transformed into other uses such as office, residential and hotels.

In 2035, the need for parking should decline by more than 5.7 billion square meters in the United States
(This equates to half the size of Connecticut) Source: McKinsey & Co.



2.0 PROGRESS AND CHALLENGES

D - Land Use Patterns:

In 2008, the Mobility Hubs Green Paper predicted that awkward and incompatible land ownership patterns would become a major challenge for mobility hub planning. The Green Paper identified fragmented land ownership in urban areas as well as the legacy of industrial uses as obstacles to both office development, which requires large parcels of land, and mixed use development (GP#2, 12). Today, not only **land ownership patterns, but also inappropriate existing land use and outdated municipal policies, have added difficulty to the process of creating vibrant mobility hubs.** For example, in situations with existing industrial uses within mobility hubs, municipalities must grapple with the challenge of creating pedestrian friendly complete communities and encouraging active streetscapes, while also protecting important employment uses.

The 2017 update to the Growth Plan does not directly reference mobility hubs, but designates Major Transit Station Areas as “The area including and around any existing or planned higher order transit station or stop within a settlement area; or the area including and around a major bus depot in an urban core,” and prohibits land uses or built form that “would adversely affect the achievement of minimum density targets.” (2.2.4.6). This policy requirement will serve to aid municipalities in efforts to convert lands within mobility hubs to more appropriate, vibrant and active uses.

Downtown Toronto employment growth is outpacing Growth Plan forecasts, emphasizing the importance of locating office development where it is most needed and accessible (GP#2, 2). The office park model has not traditionally been well served by transit. Mobility hubs can help encourage developers to locate office developments in areas that are easily accessible by public transit and active transportation. It is important to ensure that office parks in more traditionally suburban areas are integrated with the regional transportation network in a way that makes walking and taking transit desirable. **Optimizing office employment land use patterns around transit access has an incredible potential to reduce the number of auto trips in the region.**

Additionally, to lessen dependence on the transportation network and promote more sustainable growth an important objective of mobility hub planning should be to plan for a connected network of complete communities aided through the adoption of appropriate land use patterns. Complete communities provide access to an appropriate mix of jobs, local services, a full range of housing, and community infrastructure including affordable housing, schools, recreational and open space for their residents. In addition to these services complete communities are designed to be walkable and cycling friendly with convenient access to public transportation. In effect they promote mobility hubs as 24 hour communities that serve as both origin and destination points within the transportation network.

This approach must recognize that proper mobility hub planning relies upon a **context sensitive approach to land use planning** and that some mobility hubs may be designed to have a stronger focus on employment uses while others may have a more civic or residential focus.

References

The citations in this section reference the following sources:

Infrastructure Ontario. FAQs – Alternative Financing and Procurement (AFP). Accessed 2017.

Interview with Andrea Smith. February 3, 2017.

Employment Lands Conversion

In Burlington, as with all municipalities in the Province, re-designating lands within an employment area for any other use is considered a *conversion*. Conversions are heavily protected by Provincial policy and can only be done at the time of a Municipal Comprehensive Review (MCR). This process requires an employment land budget that assesses the land supply of the entire city. As the process is lengthy, Burlington is attempting to convert much of the land around its Mobility Hubs now (Andrea Smith, 2017). More information about the specific requirements for converting lands within an employment area to non-employment uses can be found in the 2017 Growth Plan in section 2.2.5.9.



3.0 STRATEGIC DIRECTIONS

3.1 POLICY DIRECTIONS

Six mobility hub policy themes have been developed based on the key issues identified in Section Two.

Each theme is influenced by one or more of the key topics described in the previous section. The following pages include a description of each theme, tables highlighting their associated risks and opportunities and a discussion of strategic directions.



Theme 1:
Design for Flexibility



Theme 2:
First and Last Mile Integration



Theme 3:
Parking



Theme 4:
Social Concerns



Theme 5:
Collaboration



Theme 6:
Market Realities



3.0 STRATEGIC DIRECTIONS



Theme 1:

Design for Flexibility

Strong population growth, cultural shifts and technology are rapidly impacting how we move and live within the GTHA. To maximize the positive attributes of these changes, transportation infrastructure, land use policy, buildings, and public spaces should be designed to accommodate flexibility both in terms of use and function. Given the accelerating pace of change and its inevitable impact on cities and social behaviour, building design and operation should incorporate a level of adaptability. Buildings and infrastructure within mobility hubs should be able to respond to change, mitigating obsolescence and ensuring continued return on investment.

Evidenced from emerging trends, it is important that mobility hub infrastructure be designed to integrate multiple modes, prioritizing various users at different times, and that planners evaluate the benefits and costs of accommodating private transportation services. The future of mobility hubs will require being open to the large scale adoption of integrated information networks and wayfinding as well as the ability to adjust the size, placement and design of infrastructure such as pick-up and drop-off points according to short (daily commuter trends) and long-term (changes in technology and transit modes/services) time-lines.

It is impossible to accurately predict the future but we do know that change will occur. Moving forward one of the most important characteristics of successful mobility hubs will be their capacity to adapt with time, including the ability to accommodate change and the flexibility to support and shape emerging trends. The table below identifies some of the risks and opportunities.

Risks and Opportunities: Designing for Flexibility

Risks	Opportunities
Permanence as a limiting factor: Relying on design solutions that are too permanent, and may become obsolete.	Adaptable built form: Buildings should be designed to accommodate adaptive reuse, retrofit or disassembly to suit the needs of evolving uses over time.
Static programming and legislation: Mobility hubs and station buildings that are bounded by inflexible zoning, programming, lease agreements or building codes can fall out of sync with trends in shopping, entertainment and new innovations in energy efficiency.	Experimental pop-ups: Mobility hubs and station buildings can position themselves at the forefront of emerging consumer and sustainability trends by allowing themselves the flexibility to test innovations in information services, energy efficiency, and consumer preferences with pop-up stores.
Inefficient use of space: Parking infrastructure, existing and planned right-of-ways, parking regulations and other zoning codes that seem necessary today may become obsolete if not updated to address the factors facilitating change.	Harnessing new mobility: Electric vehicles, autonomous vehicles and other forms of new mobility have the potential to break down barriers between public and private spaces and indoor and outdoor spaces within mobility hubs. They offer opportunities to access presently inaccessible areas, extend the length of the primary zone, and transform how we access and use transit stations. If managed properly new mobility offers opportunities to improve seamless mobility, passenger comfort and a more efficient use of land and resources.
Associated costs: Upfront capital and operating costs versus lifecycle costs associated with adaptive reuse will need to be considered and weighed. For example, including oversized foundations to accommodate future development, avoiding the most direct transit configuration to protect for viable development parcels and additional considerations for HVAC may all have upfront cost implications but overall long term benefit.	

3.0 STRATEGIC DIRECTIONS



What was once a loading dock, now opens onto the street, creating a new public space that connects the new offices to the public realm in Overland Partners' Hughes Warehouse (San Antonio, TX).



Overland Partners created private meeting spaces within the warehouse, that use materiality to reference the building's industrial history. Similar modular spaces can be developed within mobility hub stations and other buildings to house "on demand" pop-up spaces.

Strategic Directions

1. Designing with Adaptability in Mind

Mobility hubs should be planned and designed to allow for adaption to evolving trends in technology, land use, intensification and cultural needs. This ability to adapt can be supported through:

1. Constructing **adaptable spaces**;
2. Including **flexible zoning and interim use provisions** in zoning bylaws to support phasing strategies in development;
3. Adopting **performance based building codes**;
4. Identifying **public realm, placemaking, design excellence and development requirements within** PSOS documents; and
5. Ensuring transit station designs provide **flexibility** for change as the rapid transit network is implemented.

The centre of a mobility hub is it's transit station. To ensure flexibility is included in station buildings, designers should consider features such as knock-out walls for future property acquisition and designing station areas to be easily retrofitted for expansion. Temporary facilities should be considered to meet needs in early phases while ensuring built facilities can be re-used or easily redeveloped.

An example of a building designed for retrofit is HFF's "Parking and More" design in Basel. This parking garage was designed with fully horizontal floor plates and corkscrew ramps along the exterior of the building. This condition allows for easy transition of the structure to other uses and removal of the ramps if and when market demands become supportive. Warehouses are a tried and true model for adaptable buildings that can transition along with changing market demand, as demonstrated in Overland Partners' 2012 Hughes Warehouse Adaptive Reuse project in San Antonio (ArchDaily, 2014) and the Two Kings precedent in Toronto, where flexible zoning has helped transform two former industrial warehouse districts into dynamic and vibrant mixed-use neighbourhoods.

Brick and beam buildings have proven themselves as a building typology that can make reconfiguration relatively straightforward, particularly as few interior columns, knockout walls and high ceilings allow for a multitude of uses and layouts.

2. Evolving Policy

Transportation and land use policy, parking requirements and other zoning bylaws, as well as design guidelines, will need to evolve for mobility hubs to be successful. **Flexible zoning** combined with **performance based building codes** can ensure that mobility hubs are guided, not hindered by regulations. The Canada Mortgage and Housing Corporation's case studies on Transit Oriented Development cites flexible zoning changes as a key factor for encouraging Transit Oriented Development (Ontario Association of Architects, 2009).

Metrolinx's Mobility Hub Guidelines (2011) provide strong direction regarding how evolving policy can support mobility hubs that are designed for flexibility. For example, **phasing and interim zoning bylaws timed with implementation of rapid transit infrastructure and achievement of density targets can provide guidance and certainty for developers.** This can allow for the screening out of undesirable land uses that are incompatible with the vision for the mobility hub. To ensure that bylaws and requirements are reflective of evolving needs and context, regular review periods should be provided.

For all large-scale developments within mobility hubs, Metrolinx and the municipality should consider **phasing strategies that include density and mode-share targets** connected to implementation of transportation infrastructure. Phasing plans should answer the following questions:

- What are the development density targets and mobility benchmarks, including non-auto mode splits, for each phase of development?
- How will development phases be coordinated with implementation of transportation infrastructure?
- How will the development's parking supply respond as parking requirements are reduced?

Further, a more efficient process is required to streamline mobility hub planning into municipal documents and planning processes. The present dual process means that it can take 3-6 years to approve policies minus any land owner challenges. Updated Growth Plan requirements are likely to improve the present situation.

3.0 STRATEGIC DIRECTIONS



Theme 2:

First and Last Mile Integration

In the context of mobility hubs, the First and Last Mile describes the beginning or end of a commuter's trip to or from their destination or rapid transit station. Developing a comfortable first and last mile is critical to generating transit ridership, promoting sustainable modes of transportation and improving placemaking.

Many factors should be considered for improving first and last mile conditions, these can include: strengthening the public realm; providing strong pedestrian and cycling connections; developing clear signage and wayfinding; coordinating local and regional transit services; pedestrian supportive passenger pick up and drop off design; coordinating taxis, car sharing and ride sharing apps; and adopting zoning, land use, density controls and design guidelines that support jobs and residents within proximity of regional and rapid transit.

While many strategies and design guidelines have been identified for the above stated problems, less is understood of the potential impact of New Mobility options on the First and Last Mile. Transportation Network Companies such as Uber and Lyft, car sharing services, electric vehicles, autonomous vehicles and improved network connectivity have significant capacity to reshape the First and Last Mile. Exciting new opportunities are evolving to better shape integration between transportation modes, conversion of surface parking to higher and better uses, improved weather protection and access to destinations, such as employment areas.

Risks and Opportunities: First and Last Mile Integration

Risks	Opportunities
<p>Real or perceived barriers: A poor public realm and barriers caused by transportation infrastructure can make station buildings inaccessible to pedestrians.</p>	<p>Improvements to the public realm such as wayfinding and signage, landscaping strategies, weather protection, sidewalk widths, pedestrian lighting and street trees: Overall site design and landscaping improvements can make the commuter's journey to the station more walkable and enjoyable while ensuring barrier free access.</p>
<p>Electric vehicles: Site planning will need to consider the future of new mobility to ensure decisions made today do not detract from the ability to adapt to future innovations.</p> <p>"Fare-paid" zones and the technology to enforce them will have to be reviewed and monitored as the line between the public and private realm becomes further blurred with opportunities for improved connectivity facilitated by electric vehicles. This could include providing internal access for electric buses or could be extended to internal Passenger Pick Up and Drop Off (PPUDO) services for private electric vehicles.</p>	<p>Electric vehicles: Vehicles such as buses, personal vehicles, trains and other motorized services may no longer be restricted to exterior spaces. This may lead to improvements in passenger comfort, efficiency, transfers, and retail and public space opportunities.</p>
<p>Autonomous vehicles: A publicly led model for shared autonomous vehicles can offer opportunities to decrease congestion and provide improved accessibility to destinations within mobility hubs. The absence of a strong publicly led regulatory and coordinating body for autonomous vehicle use, combined with high levels of private ownership could lead to increased congestion and poorer accessibility.</p>	<p>Autonomous vehicles: New technologies offer opportunities to make surface parking, PPUDO and structured parking more efficient thus decreasing the amount of station land required for parking.</p> <p>Some suburban office parks within mobility hubs presently lack good access. This access could be improved through a publicly led model of autonomous vehicles circulating between the station and office park. If implemented well, this approach offers opportunities to decrease congestion and lands required for parking. More efficient use of land offer further opportunity to design pedestrian first places.</p>

3.0 STRATEGIC DIRECTIONS

Strategic Directions

1. Placemaking

Placemaking and an attractive public realm are critical to improving first and last mile connections. Planners and designers should consider all opportunities, including New Mobility, to improve walking and cycling connections and to promote the use of transit and improved public spaces.

Placemaking strategies, including the design of pedestrian plazas and waiting areas, landscaping, public art and clear signage can improve navigation and customer comfort. Particularly important to improving placemaking will be **ensuring a consistent design language through the use of materials, plantings, signage and wayfinding, public spaces and built form**. Metrolinx's RER Project Planning and Design Review Panel should form a critical component of any placemaking strategy for first and last mile connections within mobility hubs.

2. Customer Experience

Customer experience is integral to the First and Last Mile travel experience. For public transportation to be competitive with the comfort provided by the private automobile, the transition between station buildings and surrounding lands must be an enjoyable experience and should incorporate new thinking and technology that improves the user experience whether that be related to wayfinding, signage, retail, efficiency or placemaking.

Integrated network communication should be used to facilitate smoother transitions between public transit providers and the passenger by offering more efficient options to coordinate transit trips with the arrival or departure of privately managed shared vehicles. **The future of vehicular transportation will be autonomous, electric, connected and shared.** Integrated network communication systems can improve PPUDO design by coordinating a complex ballet of shared and public vehicles as they arrive and depart from 'gates' around the station without conflict. By integrating network communication services for ridesharing, convenient on-demand services could lead fewer people to drive alone and park, reducing parking demands at rapid transit stations and travel destinations. Employment areas within mobility hubs, not just the station itself, will need to accommodate efficient and comfortable PPUDOs.

3. Design for Electric Vehicles

Electric vehicles such as buses, personal vehicles, trains and other motorized services will have an **increased ability to operate indoors** without negatively impacting air quality or noise levels. Building and station design within mobility hubs should consider **integration for electric vehicles between the public and private realm including indoor / outdoor space** to improve the first mile and last mile experience.

4. Autonomous Vehicles

A publicly integrated system of autonomous, electric, connected and shared vehicles offers opportunities to **decrease lands required for parking both within the station area and on privately owned lands** within the mobility hub. These vehicles also offer opportunities to expand the reach of the first mile last mile to areas, such as office parks, that have traditionally had poor accessibility by public transit or walking and cycling.



Precedent for multi-use, adaptable parking structures: Event at the 111 Lincoln Road mixed use parking garage by Herzog & de Meuron - See Theme 3 Opportunities. (Miami, FL)



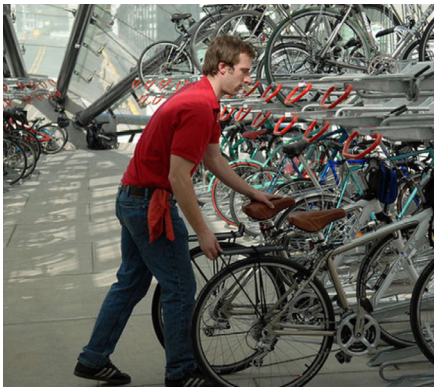
Theme 3:

Parking

Parking demand is a significant driver of transit ridership within mobility hubs, particularly for terminus stations. On the other hand, identifying large parcels of land for surface parking encourages single occupant vehicle use and is likely to result in land use patterns that discourage access by other more sustainable transportation modes.

New mobility is one area that will provide new tools to help address the parking challenge. While new mobility may provide interesting tools and technologies it is only one of a multitude of methods that planners, designers and policy makers must draw from for solutions. Other methods that must be adopted include encouraging more transit supportive land uses and densities, improved coordination between local and rapid transit, greater active transportation infrastructure and improving the first and last mile experience.

Risks and Opportunities: Parking



KPG Design's Bikestation in Washington, DC transforms bicycle parking and servicing into a key architectural highlight on the landscape.

Risks	Opportunities
Lack of Coordination Between Local and Rapid Transit: A lack of coordination between transit schedules will contribute to a greater reliance on private vehicles as a more comfortable method for commuters to access mobility hubs.	Improved Coordination Between Local and Rapid Transit: Improved scheduling coordination will provide more convenient and comfortable access to mobility hubs via public transit. A strong focus on seamless connections can result in improved comfort, efficiency and convenience.
Decoupling Parking Costs: Decoupling parking costs from the costs of transit use will increase individual users parking costs but should not increase the average cost per transit trip. Can negatively impact transit ridership if not supported by mitigating measures.	Decoupling Parking Costs: More accurately reflects transportation mode costs. Costs used to subsidize parking can be reallocated to support other more sustainable modes of transportation and encourage a more balanced modal split. The decoupling of parking costs may result in an overall reduction in transit fare.
Emerging Technology: Monitoring strategies and a clear decision making framework is required to ensure that adoption of emerging technologies provide a strong benefit to cost ratio.	Emerging Technology: Adopt Real-Time Monitoring and Signage Tools to increase the efficiency of finding a parking space and reduce congestion around parking areas. Hubs should increasingly incorporate emerging technology in automated stacking, piloted valet parking and apps that help users retrieve their vehicle.

Risks	Opportunities
Parking Replacement Strategies: May be expensive and insufficient.	Parking Replacement Strategies: Providing policies to support peer-to-peer parking agreements between station users and residential or commercial lot owners can lessen the demand for surface parking.
Unplanned obsolescence: Mobility hubs should avoid wasting capital expenditures to build excess supply of structured parking that may become obsolete or that are too rigid to adapt to the needs of autonomous vehicles or other uses.	Adaptable parking structures: Building flexible parking structures that can be adapted to meet evolving needs and house different uses over time
Congested roadways due to empty cars in a private ownership scenario: Without an incentive to either park at mobility hub stations or share vehicles, autonomous vehicles may end up spending at least double the time on the road by returning to their point of origin to avoid paying parking fees.	Coordinated, intelligent parking systems for autonomous vehicles: Mobility hubs can make the act of parking autonomous or electric vehicles effortless and attractive and provide other incentives for people to embrace new technology in a more sustainable and resilient manner.
Transportation demand management (TDM) strategies and active transportation infrastructure becomes an afterthought: Until recently, TDM strategies have too often been added to mobility hubs reactively rather than identified proactively as part of mobility hub planning and design.	TDM strategies and active transportation infrastructure becomes a centerpiece: TDM strategies can be leveraged to increase the mode share for carpooling and alternative modes of transportation. Transforming bicycle parking into a signature piece of architecture; using bicycles to test stacked or mechanized parking on a smaller scale.
Shared Parking: Requires upfront planning and contractual agreements.	Shared Parking: Shared parking agreements available to commuters during the day and residents or other users in the evening can lessen the costs of providing parking and increase lot utilization.



Art installation inside the 111 Lincoln Road parking garage (Miami, FL).

3.0 STRATEGIC DIRECTIONS

Strategic Directions

1. Coordination Between Local and Regional or Rapid Transit

Improved scheduling coordination between local transit services and regional or rapid transit, coupled with increased funding for local transit operators on routes destined to mobility hubs, will lessen demand for parking. This is particularly relevant as plans for Regional Express Rail are implemented.

Decoupling at least a portion of the cost of parking from transit fares and using the added revenue to support local transit should be explored.

2. Embrace Emerging Technology

Metrolinx must stay current on policy, best practices and the adoption of emerging technology for parking management. Real-time monitoring and signage tools along with advances in automated stacking and mobile applications can increase the efficiency of finding a parking space and reduce congestion around parking areas.

As private vehicles become autonomous, electric, connected and shared, Metrolinx can be a leader in the emerging technology space improving both the efficient use of land and convenience for users. **Clear monitoring strategies and a decision making framework for embracing emerging technology within mobility hubs will need to be identified.**

3. Adopt Parking Replacement Strategies as a Central Component of Mobility Hub Studies

Provide policies to support peer-to-peer parking agreements between station users and residential or commercial lot owners to lessen the demand for surface parking within mobility hubs. This approach can also lead to improvements to the public realm and increases in land value capture as surface parking is relocated beneath new developments. Remote parking facilities should be supported by convenient shuttle services and bike share programs.

4. Adopt Design for Flexibility Principles in the Design of All Parking Infrastructure

Mobility hub parking infrastructure should be adaptable enough to meet evolving needs and accommodate different uses over time. The design of parking structures should be human focused, incorporating desire lines and pedestrian modeling, as well as flexible to encourage increasing levels of pedestrian circulation and services. Parking design should also include bicycle friendly infrastructure that enhances the public realm and is inviting to both cyclists and pedestrians.

Theme 4:



Equitable Access

To most fairly serve people across the GTHA, mobility hubs should support equitable freedom of movement including equal access to employment opportunities and destinations. This equitable freedom of movement includes access for the elderly, people with disabilities and the economically disadvantaged.

Studies have shown low rates of transit usage among seniors in Canada, who cite lack of transit service as a reason (StatCan, 2009). A reluctance to ask for mobility assistance can exacerbate symptoms of social isolation among seniors (StatCan, 2009), while a lack of technological literacy is also becoming a more common barrier to public transit use as the network becomes more dependent on mobile applications. To address concerns associated with equitable access, mobility hubs should become inclusionary spaces, exceeding Accessibility for Ontarians with Disabilities Act (AODA) requirements by ensuring that buildings within them are designed to address a variety of physical, economic and technological abilities.

Risks and Opportunities: Equitable Access

Risks	Opportunities
Pricing families out of mobility hubs: Without appropriate checks on rising housing prices, especially near transit, residential units near transit may become too expensive for the people who need them the most.	Affordable housing: Adoption of affordable housing policies and tools within mobility hubs can support access to public transit for a range of incomes and ages.
Developing unforeseen financial barriers within new payment systems: By requiring customers to top up Presto cards with a debit or credit card, potential exists to exclude users from transit discounts. This has the greatest impact on users that would derive the greatest benefit from the discount.	Barrier-free payment system: Ensuring mobility hubs provide opportunities for transit users to top up Presto Cards using cash rather than requiring a debit or credit card will make transit more accessible for the GTHA's low income and homeless population. This method has been successfully implemented on systems like Ventra in Chicago, Charlie in Boston and SmartTrip in Washington, DC.

3.0 STRATEGIC DIRECTIONS



Boston area transit users can view their Charlie Card balance when paying on a bus, and load their card with cash at no additional cost. (MBTA 2017)

Risks	Opportunities
Technological Literacy: Rapid adoption of technology without considering their impacts on accessibility could leave potential users excluded from station infrastructure.	Universal access in design and technology: Seniors and the physically challenged should be able to interact with transportation infrastructure within mobility hubs as comfortably as any other user. By applying performance based universal design accessibility standards to new transportation technology, mobility hubs can help facilitate the removal of technological and physical barriers within the transit system.

Strategic Directions

1. Provide a Range of Social Amenities

As holistic places, mobility hubs should incorporate a number of public amenities in the pursuit of greater social inclusion. This can include day-care centres, health clinics, immigration services, food pantries, and after-school programs. Specialized seating areas and improved visibility and audibility for wayfinding and information systems in stations and throughout mobility hubs can encourage greater use among seniors and people with disabilities

2. Encourage Accessibility by Design

Ensuring accessibility by design in all station and mobility hub structures will play a crucial role in creating equitable places. Interactive information systems, like the New York subway’s “On-the-Go” kiosks can provide updates on convenient routes, delays and servicing. Interfaces for kiosks should be simple and friendly to users who are less adept with technology.

Inclusionary Zoning

“Inclusionary zoning typically requires or encourages private developers to construct some proportion of new residential development as affordable housing...The initial price or rent of the affordable units is set by terms of the program and first occupancy is limited to income-eligible households. Restrictions are also placed on subsequent occupants and on rent increases and resale prices...” Successful case studies for inclusionary zoning policies include the city of Palo Alto, the state of New Jersey, France, and the city of Vancouver. (City of Mississauga, 2016, p.20)

Theme 5:

Collaboration

Metrolinx, provincial ministries and agencies, municipalities, and the private sector face the complicated task of working together to create centres of mobility that capitalize on transportation investments while providing the highest benefit to local populations and economies. Key to the successful implementation of mobility hubs is collaboration between stakeholders and a detailed understanding of market realities.

To get the most out of mobility hub investments, objectives must be clearly aligned between stakeholders. This requires close collaboration between land developers, land use and transportation planners, and a number of provincial ministries whose policies have direct influence on successful implementation. Well organized, open lines of communication are essential to improving the planning, construction and operation of mobility hubs. Ties between implementation actors should be lasting through numerous phases of planning, delivery and management as mobility hubs will need to be monitored and reshaped over time to fit evolving demographic, technological and economic landscapes.



Risks and Opportunities: Collaboration

Risks	Opportunities
Infrastructure Investment: Public and private sector infrastructure investment without the municipal planning process in place to accommodate supportive land uses and densities will result in a poor use of resources.	Strategic Infrastructure: Public and private sectors will receive the greatest benefit from strategically placed infrastructure under conditions that optimize use and placemaking capacity.
Clarity of Process: Lack of scheduling coordination between local and regional transportation providers and transportation network companies, such as car-sharing services, can exacerbate a reliance on the private automobile and increase land requirements for parking. Likewise mandates between transportation providers and municipal planners need to be better aligned.	Collaboration: Improved collaboration between various levels of government, transportation providers, and the private sector offers opportunities to collaborate on shared objectives and costs, helping to optimize transportation investment.

3.0 STRATEGIC DIRECTIONS

Strategic Directions

1. **Clarity and Consistency through Clear and Transparent Communication**

Communication with municipalities can be simplified by providing one contact person through a **one window process** that can coordinate responses from Metrolinx, and/or the Ministry of Municipal Affairs, to reduce confusion and mixed messaging. Communicating the direction of mobility hubs and establishing clear expectations amongst the public are essential elements of developing a coordinated approach to mobility hubs.

2. **Develop Stakeholder Buy-In**

A critical success factor to developing project buy-in is through the use of **Technical Advisory Committees (TAC)** and **Stakeholder Advisory Committees (SAC)** and thorough and informative **public consultation** strategies. These groups should meet regularly and be identified early in the mobility hub master plan process.

3. **Identify Political Champions**

Identifying champions during each phase of the mobility hub project is a necessary tool to ensure that adequate political will and intergovernmental coordination is available to achieve project objectives.

4. **Pursue Joint Development**

One opportunity to improve coordination is to **create implementation entities or a MOU** comprised of the municipality, Metrolinx, the local transit provider and the private sector in which the mobility hub is located. This entity or MOU would be responsible for implementation oversight and tasked with identifying and unlocking mobility hub objectives. Specific targets related to infrastructure, modal splits, intensification, amongst others, would be identified with certain provincial infrastructure funding released in stages based on meeting said targets. Provincial funding would be complemented by municipal contributions through development charges and other investments.

Other areas of potential focus for the entity may include developing:

- Policies that support those goals;
- Real estate development staff integrated with station planning staff;
- Processes to give developers certainty and a reason to be involved; and
- Supportive local zoning.

5. Phased and Interim Zoning By-laws

Municipalities, in consultation with Metrolinx, can **develop phased and interim zoning bylaws and designations for mobility hub areas, timed with implementation of rapid transit infrastructure and achievement of density targets to provide guidance and certainty to developers.** This provides options for phasing out undesirable land uses and development incompatible with the vision for the mobility hub.

For all large-scale developments, phasing strategies should be required in development plans and include density and mode-share targets connected to implementation of transit and transportation infrastructure. The phasing plan should answer the following questions:

- How will development phases be coordinated with implementation of mobility infrastructure, including rapid transit?
- How will the development's parking supply respond as parking requirements are reduced?

Phased zoning can provide for regular periods of review of interim bylaws and requirements to ensure they are reflective of development needs and context. Interim use provisions should be included in zoning bylaws to support phasing strategies in development. This will allow for uses that otherwise may not be permitted in the ultimate phase of development, but are required for the viability of initial development stages. Interim uses should be justified on a case-by-case basis and include timelines and an ultimate development plan to ensure consistency with land use and transportation objectives.

3.0 STRATEGIC DIRECTIONS



Theme 6:

Market Realities

The Greater Toronto and Hamilton Area has one of the most robust real estate markets in North America. However, from a real estate market perspective not all mobility hubs are performing equally well. Markets such as downtown Toronto and Markham Centre are growing quickly with excellent market demand. Between 2009 and 2014 five mobility hubs experienced population growth of more than 40 percent, with Markham Centre growing the fastest at 47 percent. At the same time, other mobility hubs are experiencing challenges in developing market demand. For example eight mobility hubs experienced negative or zero growth between this same period.

To continue to grow our region responsibly it may be important to stimulate these slower markets. A framework for considering short and long term development opportunities and constraints is needed that holistically considers:

- Barriers created by transportation infrastructure;
- Providing a strong public realm;
- Trade-offs of public investment to stimulate private markets; and
- Expediting the approvals process to attract development.



Transportation Infrastructure as a Community Builder (Olympic Sculpture Garden, Seattle, WA)

Risks and Opportunities: Market Realities

Risks	Opportunities
<p>Barriers created by Infrastructure: If not planned and designed properly transportation infrastructure can serve as a barrier and hinder placemaking. Safe, comfortable and accessible movement of all modes must be considered in the planning and design of transportation infrastructure.</p>	<p>Integrated Infrastructure: Plan transportation infrastructure as part of the overall mobility hub ensuring that it is integrated with the community offering multiple civic uses such as the Olympic Sculpture Garden in Seattle (see previous page).</p>
<p>Measures to Expedite the Approvals Process: The implementation of a more efficient and / or automated system requires more client and staff training, and sometimes involves high upfront implementation costs for the municipality.</p> <p>Monitoring is required to ensure that a reduction in approval times is not the result of a decrease in the quality of planning and design decisions.</p>	<p>Development Permit System: Adopting a Development Permit System that integrates zoning, site plan and minor variance approvals into one application and approvals process within mobility hubs may expedite the approvals process decreasing costs to development and promoting housing affordability. It should be noted that this method of planning approval may have negative implications on achieving design excellence.</p> <p>Specific mobility hubs may serve well as a test case pilot project for adoption of a development permit system.</p>
<p>Measures to Expedite the Approvals Process (cont.): Requires considerable resources and study upfront.</p> <p>May not be possible to tailor an appropriate zoning by-law to suit a larger mature context.</p> <p>May limit a municipalities ability to require developers to pay all costs associated with development.</p> <p>May removes ability to seek Section 37 community amenity contributions.</p>	<p>Pre-designate and pre-zone land: To permit a greater range of housing types, higher densities, more compact or infill development on underutilized sites, reduced unit size, etc. Community opposition is addressed comprehensively at the outset rather than on a case-by-case basis.</p>

3.0 STRATEGIC DIRECTIONS

Risks	Opportunities
<p>Reduction of parking requirements: Decreases in single occupant vehicle parking must be countered with considerations for improvements to other methods of transportation including bicycle parking and other cycling infrastructure, public transit, passenger pick-up-drop-off and improved pedestrian infrastructure.</p>	<p>Reduction of parking requirements: New mobility technology, such as autonomous vehicles, may reduce requirements on land and costs associated with parking. Furthermore, reduced parking requirements in developments near mobility hubs makes sense as a method to promote walkability and transit use.</p>
<p>Community Improvement Plans (CIP):</p> <p>Requires investment in grants or loans within the CIP project areas.</p> <p>May be difficult to achieve in some municipalities and may require the Province to provide funding for CIP improvements in areas requiring stimulation.</p>	<p>Community Improvement Plans (CIP): A CIP is a tool that allows a municipality to direct funds and implement policy initiatives toward a specifically defined project area such as a mobility hub. CIPs may:</p> <ul style="list-style-type: none"> ◦ Enable municipalities to provide grants and loans to stimulate private sector investment in targeted areas of the community. ◦ Promote revitalization and placemaking to attract tourism, business investment and economic development opportunities. ◦ Promote brownfield cleanup and redevelopment. ◦ Make more effective use of infrastructure
<p>Public Investment:</p> <p>Requires government investment, long term vision and greater control.</p>	<p>Public Investment: Plan public investment and infrastructure to create and/or enhance development potential . Cases in the GTHA where public investment has been followed by private investment include Waterfront Toronto's Canary District and the area surrounding Weston Station.</p>

Strategic Directions

1. Transportation Infrastructure Should Serve Multiple Objectives

Mobility hub studies should **require infrastructure investment to achieve a range of functional goals**. Infrastructure investment should be considered as part of a holistic mobility hub plan serving to catalyze adjacent development and encourage multi-modal transportation.

2. Consider Pre-Designating and Pre-Zoning Land

EglintonConnects is an example of a project that reviewed how to best leverage public infrastructure investment to support city building objectives. As a major avenue in the City of Toronto, one of the City's objectives along the LRT was to promote mid-rise intensification and an improved public realm. As a result, one of the recommendations from the study was to put in place as-of-right mid-rise zoning along the corridor, providing certainty to the development community and simplifying the development approvals process.

3. Fast-Track the Development Approval Process

The development approval process can be expedited through measures such as adopting a development permit system and pre-designating and pre-zoning lands to permit a greater range of housing types, higher densities, more compact or infill development on underutilized sites. GTHA municipalities should work with Metrolinx to encourage development by providing incentives such as height and density exchanges, flexible zoning and through mechanisms like bonds, debentures and possibly tax increment financing (TIF).

4. Prepare Community Improvement Plans

A CIP is a tool that allows a municipality to direct funds and implement policy initiatives toward a specifically defined project area such as a mobility hub. **Section 28 of the Planning Act gives municipalities (provided they have enabling policies in their Official Plans) the ability to prepare CIPs**. CIPs can direct public investment and infrastructure to create and/or enhance development potential, leveraging transportation investments to create engaging, active, accessible and inviting spaces.



Rendering depicting mid-rise intensification along Eglinton Avenue in Toronto, ON (Source: EglintonConnects)

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4.0 MOBILITY HUB CRITERIA

4.0 MOBILITY HUB CRITERIA

ACRONYMS

Acronyms used in this section of the study include:

- RTP – Regional Transportation Plan
- GTHA – Greater Toronto and Hamilton Area
- MTSA – Major Transit Station Area
- VGOs – Vision, Goals and Objectives
- UGC – Urban Growth Centre
- LRT – Light Rail Transit
- BRT – Bus Rapid Transit
- p+j – persons and jobs
- ITS – Intelligent Transportation Systems

4.1 MOBILITY HUB CRITERIA

What is a mobility hub?

When The Big Move was first created, many supporting documents were prepared on numerous topics, including that of mobility hubs. In 2008, Metrolinx prepared the Mobility Hub Backgrounder, which provided a definition for mobility hubs as well as a set of criteria used to identify mobility hubs throughout the GTHA. The Mobility Hub Backgrounder defines mobility hubs as follows:

“Mobility hubs are major transit station areas with significant levels of transit service planned for them in the RTP, high development potential, and a critical function in the regional transportation system as major trip generators. They are places of connectivity where different modes of transportation - from walking to high-speed rail - come together seamlessly and where there is an intensive concentration of employment, living, shopping and/or recreation. In addition to serving as places to arrive, depart and wait for transit, successful mobility hubs have the potential to become vibrant places of activity and destinations themselves.”

It is apparent that the overarching direction for mobility hubs is one that includes *connectivity*, through seamless convergence of different modes of transportation, and *integration*, of the transportation functions with efficient and sustainable land uses, leading to *vibrant places of activity and destinations themselves*.

Why update mobility hub criteria?

These overarching directions remain centrally relevant to the planning and design of mobility hubs. Over the past 8 years there have been some significant changes to the planning framework that suggest some updates may be warranted. An update would allow mobility hub policies and directions to:

- Align better with the Growth Plan, with consideration to MTSA policy, and planning responsibilities and resources for municipalities and Metrolinx;
- Reflect the Frequent Rapid Transit Network included in the 2041 Regional Transportation Plan;
- Assist in refining the list of mobility hubs based on the definitions and criteria of the updated RTP. The Big Move Action 7.2 stated “As the regional rapid transit system is implemented, detailed planning is undertaken for specific corridors, and municipal growth planning

exercises unfold, Metrolinx may, in consultation with municipalities and transit agencies, refine the list of mobility hubs based on the definitions and criteria of the RTP”;

- To reflect the Draft 2041 RTP, which includes the priority action to update the Mobility Hub Guidelines and network of mobility hubs;
- To reflect the proposed 2041 Frequent Regional Transportation Plan, and updated 2017 Growth Plan, including the opportunity to review the network of mobility hubs so that it is consistent with mobility hub criteria and categories as necessary; and,
- To reflect the reality that municipalities are now proposing new mobility hubs in their plans.

Since 2008, there has been progress in the adoption and implementation of mobility hub policies and directions resulting in an opportunity to assess the successes and to identify areas of improvement. The applicability of criteria used to identify mobility hubs is one aspect presently under review. While the 2008 mobility hub criteria are still relevant, opportunities exist to revise or expand them to reflect:

- Alignment with the 2017 Growth Plan;
- Progress in mobility hub development since 2008 - both municipal and Metrolinx/provincial policy, and actual development (transportation investment, land development, population/employment growth, etc.) ;
- Promotion of new strategic policy areas;
- A potential need to narrow the number of mobility hubs to focus attention and resources, especially provided that under the updated Growth Plan municipalities are required to delineate the boundaries of MTSAs in a transit-supportive manner; and
- Emerging trends that have become evident through the review of completed mobility hub studies.

It is anticipated that many MTSAs will not meet the threshold to be considered a mobility hub. Going forward, providing delineation between MTSAs and mobility hubs will be an important role for Metrolinx. Refining hub typologies and criteria will assist in providing direction for this process.

This section of the report presents the review of the existing typologies and criteria that are being used to define and/or identify mobility hubs within the GTHA. Its intent is to identify potential refinements to the existing criteria to be used to identify and confirm the locations of mobility hubs.

4.2 DEFINING MOBILITY HUB TYPOLOGY BY CRITERIA

Since the approval of the mobility hub criteria and typologies in 2008, there exists industry awareness of mobility hubs as well as the criteria that define them. With the update to Metrolinx's RTP comes an opportunity to expand and refine the original mobility criteria and metrics used to evaluate whether a station area should be considered a mobility hub. This definition has become even more important with the introduction new policy related to MTSA's and Priority Transit Corridors within the Provincial Growth Plan.

Section 4.2 looks at the existing mobility hub typologies while Section 4.3 examines where existing mobility hub criteria can be refined to address changes in best practices and achieve a more fine-grain approach to defining mobility hubs.

When considering criteria it is important to start with what defines a mobility hub type. First and foremost, the transportation function defines the mobility hub type reflecting the reality that all mobility hubs are located around existing or planned rapid transit and are considered MTSA's. The transportation function of a mobility hub can be defined as an entry point, transfer point or destination point. Based on descriptions provided in the *Mobility Hub Guidelines*, the transportation function of a mobility hub is noted as follows:

Entry

- High proportion of outbound trips in the morning peak; and
- Typical amenities include local transit terminals, commuter parking, bicycle parking, related facilities.

Transfer

- Major transfer point in the regional rapid transit network with transfer between two or more rapid transit lines and other transit services;
- Often connects multiple transit operators; and
- Large portion of traveler activity within this hub consists of traveler movements within the rapid transit station(s).

Destination

- Major destination in the regional rapid transit network with concentration of employment, recreation and institutional uses;
- Typically served by a high number of rapid transit lines; and
- High proportion of inbound trips in the morning peak, with potential to achieve a greater inbound/outbound balance.

The following sections describe how the transportation function can be used to refine the definitions of the mobility hub types.

Existing Mobility Hub Typologies

In the 2008 RTP, 51 mobility hub locations were identified through the existing seven screening criteria. These 51 mobility hub locations were separated into two categories: anchor hubs and gateway hubs. Anchor hubs were defined as MTSAs associated with an UGC (as defined in the Province's Growth Plan for the Greater Golden Horseshoe). Gateway Hubs were defined as MTSAs that are located at an interchange of two or more current or planned regional rapid transit lines with anticipated high levels of ridership.

From the perspective of the transportation function of the mobility hub types, the Anchor Hub functions as an **Entry**, **Transfer** and **Destination** point. The Gateway Hub functions mainly as a **Transfer** point, but may also serve as a **Destination** point. A further description of the existing mobility hub types and the criteria used to define them follows.

Anchor Hubs

As defined in the Mobility Hubs Backgrounder, "Anchor Hubs are primary transit station areas in an urban growth centre. They have a role as a major international gateway. They contain current or planned major regional destinations such as major institutions, employment centres, town centres or regional shopping centres. They have significant potential to attract and accommodate new growth and development. They have the potential to act as anchors of the regional transportation system." The functionality of this type of hubs is to address transportation connectivity and interactions, acting as a place to get to or a place to go from. Specific criteria that were used to define this type of hub in 2008 are noted in Table 4.1.

4.0 MOBILITY HUB CRITERIA

Table 4.1 Existing Anchor Hub Criteria

Criteria
Located in urban growth centre
Contains major regional destinations (e.g., major institutions, employment centres, town centres, regional shopping centres, etc.)
Potential to attract and accommodate new growth and development
Potential to act as an anchor of the regional transportation system

Gateway Hubs

As defined in the Mobility Hubs Backgrounder, “Gateway Hubs are major transit station areas that are: located at the interchange between two or more current or planned regional rapid transit lines as identified in the RTP; have 4,500 or more forecasted combined boardings and alightings in 2031 (in the morning peak period); and, are forecasted to achieve or have the potential to achieve a minimum density target of approximately 10,000 people and jobs combined within 800 metres.” The functionality of this types of hub is to facilitate the transfer from one mode to another, from one transit line to another. Specific criteria that were used to define this type of hub in 2008 are noted in Table 4.4.

Table 4.2 Existing Gateway Hub Criteria

Criteria
Interchange between two or more regional rapid transit lines
Has 4,500 or more forecasted (2031) boardings and alightings in the morning peak period
Meets density target of 10,000 people and jobs combined within 800m

New Mobility Hub Typology (Urban Character)

While mobility hubs have been defined as Anchor Hubs and Gateway Hubs since the completion of the RTP in 2008, introducing a set of new typologies (urban character) may be beneficial to address:

- Overlap between existing Anchor Hub and Gateway Hub criteria;

4.0 MOBILITY HUB CRITERIA

- The introduction of new MTSA and Priority Transit Corridor Policies and targets in the 2017 Growth Plan necessitates the need to update the mobility hub typologies and criteria to ensure clarity, consistency and strategic alignment; and
- Opportunity for new categorization to better guide prioritization.

New typologies for consideration include: Established Hubs, Priority Hubs and Local Hubs.

Established Hubs are those hubs that already meet the targets and/or minimum thresholds used to measure a criterion and hence is successful as a mobility hub. In those instances, while immediate planning and implementation is not required, they will be monitored to ensure that their state as a mobility hub continues to improve, whether through transit infrastructure changes, additional transit capacity, service improvements, or intensification.

Priority Hubs are those hubs that have yet to reach the targets and/or minimum thresholds identified through the criteria. However, the major deciding metric is that it is served by an existing and/or in delivery frequent rapid transit project. Metrolinx' focus should be on progressing these Priority Hubs to bring them to the next level of mobility hub – the Established Hub.

Local Hubs are those hubs that function mainly as a Destination point. The intent of the Local Hub is to identify those hubs that are in less dense, local areas, yet occur where people will gather. At these hubs, trips will be generated but the focus is on social interaction, community connectivity and complete communities. People will come to the hub but will feed back into the broader community. The functionality of this type is to attract people to it and to draw people together. Rapid transit infrastructure at these hubs is in the longer planning horizon. Additional potential criteria that could be used to define this type of hub are noted in Table 4.3.

Table 4.3 Additional Criteria and Metrics for Local Hubs

Criteria	Supporting Metrics	Targets/Thresholds
Limited local/regional transit interchange	# of transit providers	Maximum two transit corridors
Land use plans when reflective of Complete Communities	Qualitative assessment of surrounding neighbourhoods	
Supported by a connected Complete Streets network	Qualitative assessment of surrounding neighbourhoods	

4.0 MOBILITY HUB CRITERIA

Potential Application of Urban Character and Transportation Functions as Typologies

Having a more fine-grain categorization of the mobility hubs by transportation function and urban character should assist in priority setting with respect to identifying infrastructure and planning needs for mobility hubs. A potential example of how this classification could work is summarized below.

Table 4.4 Urban Character and Transportation Function Matrix

		TRANSPORTATION FUNCTION		
		Entry	Transfer	Destination
URBAN CHARACTER	Established	Priorities could include: <ul style="list-style-type: none"> Protecting for existing transportation functions Supporting connectivity to alternate transportation modes 	Priorities could include: <ul style="list-style-type: none"> Encourage more diverse land-uses Protect and improve existing transfer times 	Priorities could include: <ul style="list-style-type: none"> Support existing community and neighbourhood functions Protect facilities associated with existing destinations
	Priority	Priorities could include: <ul style="list-style-type: none"> Encourage increased PPUDO use with well defined easy to access facility Plan for frequent rapid transit implementation 	Priorities could include: <ul style="list-style-type: none"> Support existing community and neighbourhood functions Protect and plan for future transfer times 	Priorities could include: <ul style="list-style-type: none"> Support existing community and neighbourhood functions Supporting connectivity to alternate uses
	Local	Priorities could include: <ul style="list-style-type: none"> Support existing community and neighbourhood functions Provide adequate service to support off peak activities. 	Priorities could include: <ul style="list-style-type: none"> Prioritize community uses in and around the hub Protect and plan for future transfer times 	Priorities could include: <ul style="list-style-type: none"> Support a mix of destination uses surrounding the station area Support a fine grain network of streets surrounding the station area

Following the procedure set out in 2008, the 51 existing and potentially new mobility hub locations could potentially be assessed with the refined criteria (metrics) identified in Section 4.3. Mobility Hubs that meet targets and/or minimum thresholds will be categorized as Established Hubs. Mobility Hubs that have a Committed Rapid Transit Priority Project with approved funding will be categorized as a Priority Hubs. The mobility hubs that are more localized in nature and do not have committed rapid transit investment, will be categorized as Local Hubs.

4.3 REFINED MOBILITY HUB CRITERIA

Mobility hub criteria were established to enable the identification of potential mobility hub locations within the region. The Mobility Hub Backgrounder identifies seven key characteristics used to assess points of contact throughout the region for their potential as mobility hubs. Based on pending updates to the RTP, progress in mobility hub development, and updates to provincial and municipal policy, there is a need to review the applicability of the existing criteria and to determine additional considerations. Following the identification of a revised criteria list, specific metrics to measure each of these criteria are described.

What Has Been Defined (Existing Criteria)

In 2008, the Mobility Hub Backgrounder identified a list of seven key criteria that would evaluate the potential for an UGC, an existing transit station or a regional destination to be a potential mobility hub candidate identified as either a Gateway Hub or an Anchor Hub. These existing criteria are described in further detail below.

1. Hosts two or more modes of higher order transit

Major transit station areas that are located at the interchange between two or more current or planned regional rapid transit lines as identified in the RTP. Within the Greater Toronto and Hamilton Area (GTHA), modes of higher order transit can include: the subway, rail service, bus rapid transit, light rail transit. The mobility hub facilitates the transfer between these modes of higher order transit with the provision of a station.

2. Is forecast to accommodate significant transit ridership

The hub is identified to have 4,500 or more forecasted combined boardings and alightings in 2031 (in the morning peak period).

3. Has market demand to attract supportive levels of mixed-use, intensive development

These areas are generally forecasted to achieve or have the potential to achieve a minimum density target of approximately 10,000 people and jobs combined within 800 metres of the transit station.

4.0 MOBILITY HUB CRITERIA

4. **Is strategically located within the GTHA**

Anchor hubs are primary major transit station areas in an *UGC*. In addition, Pearson Airport and Union Station are identified as anchor hubs due to their role as the GTHA's primary international gateways.

Anchor hubs have strategic importance due to their relationship with *urban growth centres* and / or their role as major international gateways.

5. **Is a unique destination**

Anchor hubs contain current or planned major regional destinations such as major institutions, employment centres, town centres or regional shopping centres.

6. **Has potential for different types of development**

The mobility hub has significant potential to attract and accommodate new growth and development.

7. **Transformative**

Anchor hubs have the potential to transform the regional urban structure and act as anchors of the regional transportation system.

What's New (Proposed Refinements)

While the 2008 mobility hub criteria are still relevant, they can be expanded to reflect updates to the Vision, Goals and Objectives in the updated RTP, progress in mobility hub development since 2008 and new strategic policy areas.

Updated criteria considerations were discussed at an internal workshop held with the Project Team and Metrolinx staff and are described in further detail below. As part of this mobility hub policy review, three areas of refinement were identified. These recommendations were compared against each other to ascertain whether there were overlaps in the criteria and to determine the ones most applicable based on guidance provided through stakeholders and changes in mobility hub policy direction.

Prior to the description of the updated criteria, Table 4.5 identifies the existing mobility hub criteria, including both relevant existing and new recommended considerations. The table identifies whether the criterion remains as existing or is recommended to be refined. It is of note that each criterion is relevant to the identification of the mobility hub; however, the specific metrics that will be used to evaluate each criterion can be prioritized based on the classification of a hubs transportation and urban character.

Table 4.5: Potential Revisions to Existing Mobility Hub Criteria

No.	Criteria	Recommendations
1.	Hosts two or more modes of higher order transit	Additional focus on whether a station provides multi-modal transportation connectivity
2.	Is forecast to accommodate significant transit ridership	Review of appropriate forecasted transit ridership levels for criteria thresholds to reflect new horizon of 2041
3.	Has market demand to attract supportive levels of mixed-use, intensive development	Maintain existing definition
4.	Is strategically located within the GTHA	Maintain existing definition
5.	Is a unique destination	Maintain existing definition
6.	Has potential for different types of development	Additional focus on whether there is a potential to promote land intensifications and diversification of uses
7.	Transformative	Additional focus on whether there is opportunity to promote and encourage active living

Considerations for the recommendations in the chart above are summarized in greater detail below.

The criteria of hosts two or more modes of higher order transit is recommended to include a refined focus on **Provides multi-modal transportation connectivity**.

The mobility hub is the focal point between all modes of travel. In addition to hosting two or more modes of transit it also offers multiple transfer opportunities between pedestrians, cyclists and cars. Transit is highly accessible through the provision of high levels of service frequency, short wait times, short walking distances and integrated schedules. Pedestrians and cyclists have their own network that facilitates movements into and out of the hub and within the hub area. The hub is also serviced by nearby major transportation corridors to support the services that will be inherent to the hub. The hub also needs flexibility to accommodate new mobility services (e.g., mobility-as-service models, connect first mile, last mile feeders with public transit) with more traditional forms of transportation. In addition, to whether or not two or more modes of higher order transit are planned, consideration should be given to the planning phase and funding commitment of the proposed frequent rapid transit project.

4.0 MOBILITY HUB CRITERIA

The criteria of “Has potential for different types of development” is recommended to include a refined focus on **Promotes land use intensification**.

The hub becomes a location where one can live, work and play. In addition to accommodating both residents and employers, it obtains status as a unique visitation or tourist destination and combines a unique mix of land uses. Intensification densities should be aligned with provincial targets as well as the municipal comprehensive review process required for MTSA density conformity with the Growth Plan

The criteria of Transformative is recommended to include an additional focus on **Encourages active living**

The diversity of existing or planned land uses are integrated within the hub and its surrounding areas such that the land use and public realm encourages support for pedestrian and cycling connections while also facilitating vehicle access resulting in increased social interaction and connectivity.

Metrics to Measure the Revised Mobility Hub Criteria

For each of the proposed criteria, supporting metrics were identified to aid in identifying the mobility hub locations for prioritized planning and are summarized in Table 4.6 including targets/thresholds suggested as recommended minimums pending further analysis and consultation.

4.0 MOBILITY HUB CRITERIA

Table 4.6: Supporting Metrics

No.	Criteria	Suggested Metrics	Proposed Threshold	Date Source
1.	Hosts two or more frequent rapid transit lines	# of existing and planned intersecting frequent rapid transit corridors	Minimum of 2	2041 Regional Transportation Plan - 2041 Frequent Rapid Transit Network
2.	Is forecast to accommodate significant transit ridership	# of existing and forecasted transit boardings and alightings (morning peak period) Existing and forecasted combined population and employment density within the mobility hub	Minimum of 4,500 For subway: 200 residents and jobs combined per hectare For LRT/BRT: 160 residents and jobs per hectare For GO Rail: 150 residents and jobs per hectare (Based on highest order of frequent rapid transit existing or planned for the mobility hub)	2016 Transportation Tomorrow Survey GGH Model V4 2016 Census 2041 Population and Employment Forecasts
3.	Has market demand to attract supportive levels of mixed-use, intensive development	# of people and jobs within 800 metres	Minimum 10,000 total forecasted by 2041	Intensification Studies for residential and non-residential development
4.	Is strategically located within the GTHA	Designated an Urban Growth Centre	Yes	2017 Growth Plan for the GGH
5.	Is a unique destination		Qualitative Review based on land-uses and urban character	Field Analysis
6.	Has potential for different types of development	Existing and planned major regional destinations, such as major institutions, employment centres, town centres and regional shopping centres	Two regional desitinations or one significant regional destination such as a university	Municipal Official Plans, Secondary Plans and submitted Development Applications
7.	Transformative	Contains land with redevelopment potential within the mobility hub	20 percent of land offers potential for intensification or redevelopment	Municipal Property Assessment Corporation (MPAC) data

4.4 IMPLEMENTATION OF CRITERIA

Implementation of Criteria

The criteria as presented in the previous sections are newly introduced as recommendations only. Metrolinx, and other stakeholders, will be reviewing and revising the Mobility Hub criteria and typology as necessary, considering the recommendations provided. Stakeholder engagement will be key in verifying the criteria and associated metrics. As part of the process, it will be important to confirm that the proposed metrics are attainable and have past and current data available.

Upon confirmation of criteria and metrics, Metrolinx may initiate analysis of the existing 51 mobility hubs. The intent of this analysis would be to use the criteria to direct future mobility hub planning by determining the categorization of each hub, *whether as a Priority Hub, Established Hub or Local Hub* and to set priorities accordingly.

Recording and Monitoring

Any Mobility Hub Criteria report will need to be a living document that will be reviewed periodically to ensure that the definitions, goals, objectives, criteria and metrics meet the needs of the RTP, municipal land use planning, transportation services, customer expectations and emerging technologies.

The metrics supporting the Mobility Hub Criteria represent a desirable set of indicators for monitoring the success or performance of designated Mobility Hubs. Collection of the proposed metrics will be assembled from a number of sources and it is recognized that additional data collection is required by Metrolinx programs or staff.

A detailed Metrics Data Collection Program needs to be defined and implemented by Metrolinx. The collection of the proposed metrics may be performed annually or as expansion of any of the following activities when it occurs: Mobility Hub expansion, introduction of new or expanded transit service or major land use planning direction for surrounding Mobility Hub influence areas.

Performance reviews should be conducted every 4 to 5 years to align with the release of updated Mobility Hub Profiles and new census data. These reviews will provide Metrolinx with an understanding of the effectiveness of the Mobility Hubs as well as provide a platform for periodic updates to RTP Policies and Operations.

Test Case for Applying the Criteria

Burlington GO Mobility Hub

The Burlington GO Mobility Hub is the subject of an ongoing mobility hub study. This mobility hub incorporates one existing priority transit corridor and 2 proposed frequent rapid transit network (FRTN) corridors, which include the Brant Priority Bus and the Harvester/Speers/Cornwall Priority Bus lines. The Burlington GO Mobility Hub meets or is projected to meet most of the 7 revised mobility hub criteria, either through existing or planned metrics. The planned mixed use, high density development adjacent to planned FRTN corridors is expected to accommodate significant increases in transit ridership, encourage a variety of transit supportive development and promote land use intensification. The Hub's proximity to HWY 407 and the QEW situates it within a strategic location in the GTHA and a planned active transportation network provides improved infrastructure for multi-modal connectivity.

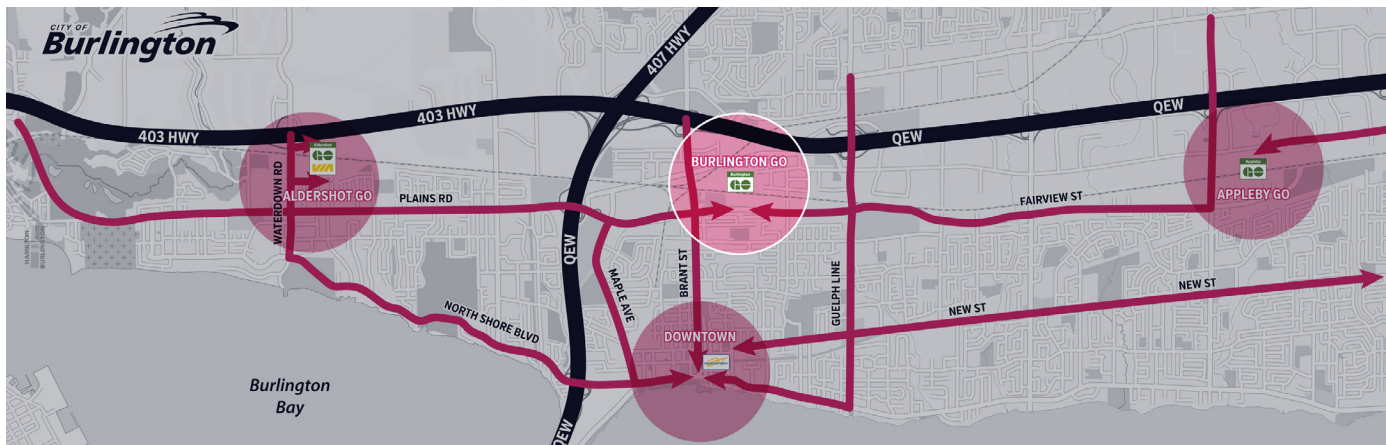
Under the new proposed classification system the Burlington GO Mobility Hub best meets the criteria to be considered a **Priority Entry Hub**.



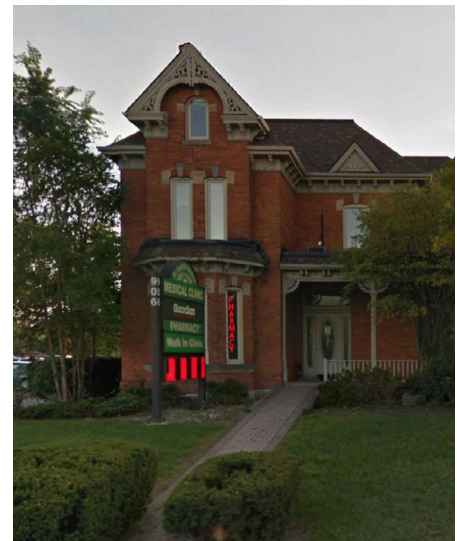
Burlington GO Study Area

No.	Criteria	Metrics
1.	Hosts two or more modes of higher order transit	<ul style="list-style-type: none"> 3 planned or existing rapid transit corridors 3 transit routes with high frequency 48% Walk Score (2016 SOMH) Less than 500 metres from Brant Street
2.	Is forecast to accommodate significant transit ridership	<ul style="list-style-type: none"> 479 boardings and alightings (2011) 2 transportation service providers (Burlington Transit and GO Transit)
3.	Has market demand to attract supportive levels of mixed-use, intensive development	<ul style="list-style-type: none"> 6,062 people and jobs (2011); this number is expected to grow
4.	Is strategically located within the GTHA	<ul style="list-style-type: none"> Downtown Burlington (south on Brant St) is identified as an Urban Growth Centre # of people and jobs accessible within # Less than 1km from the QEW
5.	Is a unique destination	<ul style="list-style-type: none"> Does not meet this criteria

4.0 MOBILITY HUB CRITERIA



No.	Criteria	Metrics
6.	Has potential for different types of development	<ul style="list-style-type: none"> A high level estimate shows that at least 70% of land within the study area has short to mid-term development potential
7.	Transformative	<ul style="list-style-type: none"> Existing density is 30 residents and jobs per hectare (2016 SOMH) Planned density is 300 people and jobs per hectare Existing secondary school within Mobility Hub boundary



Edwin Freeman House, Burlington

REFERENCES

The data for this section was obtained from the following sources:

- Mobility Hubs Development of a Regional Transportation Plan for the Greater Toronto and Hamilton Area (Green Paper #2, February 2008)
- The Big Move (November 2008)
- The Big Move Backgrounder, Mobility Hubs (December 2008)
- Mobility Hub Guidelines (2011)
- State of Mobility Hubs (November 2016)

ACKNOWLEDGMENTS

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