# MOBILITY HUBS DEVELOPMENT

OF A REGIONAL TRANSPORTATION PLAN FOR THE GREATER TORONTO and HAMILTON AREA

FOR CONSULTATION



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### A Message from the Chair

February, 2008



Rob MacIsaac, Chair, Metrolinx

When Metrolinx launched its process to develop a comprehensive Regional Transportation Plan (RTP), we recognized that one of our biggest challenges would be framing the discussion in a way that is meaningful to the people who use our transportation system. Improving service for customers is our primary objective, and it is very important that they understand what decisions are being considered and how those decisions will affect them.

The need to engage "real people" was very much on our minds as we prepared this, the second in our series of Green Papers, focusing on mobility hubs.

"Mobility hubs" is hardly a household phrase. But the concept of central places that link different modes of transportation – as well as other things such as shopping, entertainment, recreation and family services – is fundamental to the RTP.

Mobility hubs are about making it easier to move from one mode of transportation to another, anchoring seamless, convenient connections across the region.

They're also about improving the relationship between transportation and land use. There's no point building a mobility hub in the proverbial "middle of nowhere." In order for them to work, mobility hubs need to be located close to many people, whether they are at work, at home, or at play. In other words, they need to be liveable, attractive places.

Most people would agree that mobility hubs are a good idea. But where, how and what we build will take careful consideration. That's what this Green Paper is all about.

We want to hear from as many people as possible, telling us what they think will or will not work, as well as giving us any ideas they have to make mobility hubs a reality and a success.

The more input we get, the better we will be able to determine what approach to take, not just for mobility hubs but for every component of the RTP.

Ultimately, our goal is to do a better job of planning and funding infrastructure decisions, to make sure the transportation system is coordinated, seamless and sustainable across the region.

This is a tremendous opportunity, with tremendous potential benefits:

We can make this a more liveable region by improving people's mobility and giving them more quality time with their families;

We can position our economy as a strong competitor on the world stage by making sure that businesses get their supplies and their products to market with ease; and

We can protect and enhance our environment by reducing greenhouse gas emissions and air pollution.

Achieving these benefits will not be easy. It is going to take leadership, planning, cooperation and determination. Most of all, it is going to take thoughtful consideration, based on realistic, pragmatic information.

That is why we need your input – to make sure our vision for this region's transportation system, including the creation of mobility hubs, will meet your needs.

Thank you for taking the time to read and comment on this Green Paper. We look forward to hearing your views.

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Rob MacIsaac Chair, Metrolinx

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### **Executive Summary**

In order for the Greater Toronto and Hamilton Area (GTHA) to have a more coordinated, integrated transportation system, it will need to include a number of focal points – "mobility hubs" that will help connect the entire transportation network together.

These mobility hubs are key components of the Regional Transportation Plan (RTP) now being developed by Metrolinx – a comprehensive strategy for a seamless transportation system in the urban area encompassing Hamilton, Toronto, Peel, Durham, Halton and York Regions.

To be truly effective, however, mobility hubs need to be much more than transportation facilities. While they must connect the various modes of transportation – public transit (buses and rail), cycling, walking, automobiles, etc. – they must also be centres of activity, encompassing entertainment, shopping, recreation, family services and other amenities.

As well, effective mobility hubs must be located in places where significant numbers of people live and work – meaning that land use in the surrounding areas is a crucial factor. As such, any discussion around mobility hubs must also consider land use planning – the two are intrinsically linked.

This connection between mobility hubs and land use is especially important when it comes to public transit, which depends on supportive land-use concentrations (i.e. plenty of residential and business space) around key stations. Currently, transit service across most of the GTHA is inadequate to drive major land-use decisions. Further, traditional suburban population and employment patterns are too dispersed to support efficient transit. These concerns must be addressed as plans for mobility hubs move forward.

As for what the mobility hubs will look like, that, too, is open for discussion. Not all mobility hubs are alike, and one of the main challenges of the RTP process will be to establish a hierarchy and distinguish the roles between different types of mobility hubs to create the most effective network.

This Green Paper, the second in a series released by Metrolinx as it develops the RTP, will set out the key issues around mobility hubs that need to be considered in order to determine where and what should be built. Input from stakeholders and the general public will help guide Metrolinx proposals around mobility hubs, as a vital part of the overall transportation vision for this region.

### Key Questions

When developing plans for mobility hubs in the context of the RTP, a number of questions need to be considered:

What is the optimal structure for mobility hubs in the GTHA to promote transit use? Are fewer, bigger hubs better?

What are the key characteristics and components for mobility hubs of different types?

What are the biggest impediments to ensuring mobility hubs function well? Lack of market demand? Lack of money? Institutional or planning barriers? No one in charge?

What is the desirable improvement program for mobility hubs of different types?

Who can best lead the development of mobility hubs? Which hubs should be a priority and could best demonstrate the potential of mobility hubs?

### **Mobility Hub Vision**

When thinking about mobility hubs for the GTHA, certain characteristics need to be kept in mind. A mobility hub is:

A place of connectivity, where different modes of transit, from walking to high-speed rail, come together seamlessly;

A place in the urban region where there is an attractive, intensive concentration of employment, living, shopping and enjoyment around a transit interchange;

Easily accessible for those who begin or end their trip on foot or riding bicycles;

A place where the transit rider is treated like a coveted consumer, with choices about how he or she moves around the region; and

A safe, convenient, attractive place where the city interacts with its transit system.

All of this should occur within an urban setting designed for the way people and families would like to live, work and enjoy themselves.

At the same time, the mobility hub is only one part of the equation. Because the transit system is the key connector to and between mobility hubs, the mix of land uses in the surrounding area is crucial to making it a destination conducive to transit choice. In other words, when developing the mobility hub concept for the GTHA, we need a fundamental shift in thinking – away from land use patterns designed primarily for cars.

That is why mobility hubs are so important. They are the connection points in a transit-oriented metropolis – a concept very different from the car-based cities and towns we see today.

### **Growing to Mobility**

By the year 2031, some 2.8 million new residents and 1.4 million new jobs are to be added to the GTHA. To create a transportation system that can handle this growth and ensure greater transportation choices for our current population, mobility hubs will be important connection points. The question is: where should these mobility hubs be created?

Mobility hubs can range in size and character. A number of locations have been identified as possibilities based on their current attributes, but each has its pros and cons. These locations are detailed in Appendix A.

### **Urban Growth Centres**

The Government of Ontario's *Places to Grow* initiative identified 17 urban growth centres within the GTHA. It is within these urban growth centres that the greatest concentrations of jobs and housing, as well as other destinations and attractions, are to be focused. Many, but not all, of those growth centres contain one or more higher-order transit station, defined as being served by subway, GO Transit train, light rail transit (LRT), and bus rapid transit (BRT). Each centre varies greatly in terms of current density, growth potential and measure of urbanity.

### **Existing Transit Stations**

This region now contains many higher-order transit stations, including 69 Toronto Transit Commission (TTC) subway and Scarborough rapid transit stations, 56 GO stations, and numerous Viva and similar stations. Each of these stations serves a different transit function and exists in a very different urban context.

### **Regional Destinations**

There are also several other key regional destinations that must be considered. In determining what kinds of mobility hubs make the most sense in various locations, we need to think about which stations, and the areas around them, can make the greatest contribution to a highly mobile region, and what characteristics those places should have.

### **Challenges to Creating Mobility Hubs**

While most people agree that mobility hubs are a good idea, creating them is a complex undertaking. As development of the RTP moves forward, it will need to address current realities and solve impediments.

Among the challenges a mobility hub plan will need to address:

**Improvements to the transit system** – Development, employment and lifestyle decisions cannot be forced; if people are going to locate their activities in a certain place, there must be compelling reason for them to do so. One of those reasons must be an attractive public transit system – attractive enough to compete with the car. Significant changes in the frequency, speed, convenience and comfort of the transit system across the region – or at least in a larger number of travel corridors – will be necessary to change movement behaviour to the extent that it changes land use decisions.

**Parking** – Few places in the region offer the majority of people a viable alternative to the car as a means of getting to work, particularly outside central Toronto. As a result, office clusters and other employment concentrations have responded by locating in the most car-accessible places – primarily along the 400-Series Highways. The very scale of such parking areas discourages walking. Transit agencies have also contributed to the parking problem, as ridership is frequently heavily dependent on Park-and-Ride lots, which create significant parcels of surface parking – a great under-utilization of land – adjacent to transit stations. To be successful, mobility hubs must respond to demands for parking as inexpensively as possible so as to attract development, while at the same time discouraging parking so as to foster a better concentration of amenities at and around the mobility hub.

**Land ownership** – Land ownership in potential mobility hub locations in the region is either fractured into multiple ownerships (which usually results in residential development) or held by large, single users such as shopping centres or transit agencies which are most concerned about the availability of parking for their patrons. Successful mobility hubs need large sites suitable and attractive for office and mixed-use development, using public land, where available, as a lever. The public sector may need to be much more interventionist to secure developable land or complete existing public areas in advance of transit investment.

Lack of alignment between transit facilities and urban development – In some places, higher-order transit stations do not have any adjacent land uses, and vice versa, some key activity areas such as town centres do not have higher-order transit access. This lack of alignment between transit facilities and urban development raises some issues for implementing potential mobility hubs. Some difficult choices must be addressed in the RTP, and by the area municipalities, to resolve these land-use/transportation discontinuities.

**Existing transit infrastructure frustrating place-making** – In and around many of the urban growth centres, the very transportation infrastructure that makes the area accessible inhibits the ability to make it a desirable destination. For example, large arterial roads and freeway interchanges can make walking unattractive and biking hazardous, while rail tracks require minimum setbacks and are often lined with industrial uses. Acres of concrete and asphalt are an obvious detriment to good place-making. New transportation capital investment needs to achieve a range of functional goals, including facilitating adjacent development encouraging walking and cycling. Some regulatory requirements may need to be reviewed to allow the kinds of development that would allow mobility hubs to address past shortcomings.

### Potential Mobility Hubs in the Greater Toronto and Hamilton Area

Restructuring the region from a car-oriented urban area to a transit-supportive multi-centric metropolis is not simply a question of linking 17 urban growth centres with 52 lines and connecting over 100 higher-order stations. Not all of the centres are of equal importance – there is a significant hierarchy of centres of different sizes. Not all of them have the location, land or market to accommodate or provide the anticipated demand.

Properly designating the number, hierarchy, function and location of the centres, destinations, and stations that will form the basis of the RTP is fundamental to the success of the plan.

In identifying potential mobility hub locations, a number of characteristics need to be considered, including:

- Hosts one or more modes of higher-order transit;
- Is considered for enhanced transit service;

- Has an inter-regional destination or draw;
- Has market demand to attract supportive levels of mixed-use, intensive development;
- Has land available for different types of development in and around mobility hub;
- Is strategically located within the region;
- Is a unique visitation or tourism destination;
- Exhibits potential for place-making.

Based on this criteria, a review of the subway, GO and Viva stations, plus other major destinations, produces approximately 50 locations to be explored as potential mobility hubs. Collectively, they comprise the important places in the region that the future transportation network must connect.

### Mobility Hub Structure

Once the regional structure and hierarchy of mobility hubs is determined, objectives can be established for the optimal character and structure of the hubs themselves. Those characteristics could include:

- Employment space, a key determinant of local transit demand. Obtaining the necessary residential densities in growth centres, while challenging, is less difficult than encouraging the concentration of new offices.
- A combination of major retail, civic, cultural, entertainment, health centre destinations within their basic employment and housing mix.
- Serious attempts to deal with parking in the most space- and cost-efficient way.
- High transit use and overlapping networks of connections with the surrounding area, including local transit routes feeding into the hub, bicycle lanes and trails and pedestrian routes all providing fluid service into the hub.
- An environment that creates a convenient and pleasurable experience (as opposed to the merely functional environment of so many current transit stations). The immediate area around the station can be designed and developed to provide a heightened sense of arrival and departure.
- A compact design, allowing the concentration of a range of uses and destinations readily accessible on foot.
- All aspects designed with a care and attention that reflects well on the quality of brand and generates consumer loyalty to it. Information technology can play a key role, facilitating a compelling transit experience through regional transit integration, real time information, variable pricing, branding and loyalty rewards.

The detailed design of mobility hubs, the seamless integration of the station, the network of contributing streets, spaces, pathways and trails, the sense of place, the comfort and convenience of the transit user – all contribute to attracting transit users and providing a competitive amenity to that of the private car.

### **Implementation**

There is no doubt of the desirability to, and feasibility of, creating a system of successful mobility hubs across the GTHA, linked by higher-order transit, with each becoming a destination in its own right. However, there are serious market, organizational, financial and policy impediments to their creation. Mobility hubs will not just happen by themselves.

In developing the RTP, strategic decisions will be needed on whether bold or incremental changes will help facilitate mobility hubs and the network they serve.

Consideration must be given to:

Policy decisions – providing a legislative and regulatory framework for mobility hubs, such as a "mobility hub" designation with associated policies on employment, parking, walkability, etc.;

Financing – generating the necessary investments and revenue;

Parking strategies - such as the creation of parking authorities and/or consolidation of existing parking facilities;

Sustainable development - such as promoting area and regional "green" policies and/or ambitious tree-planting programs;

Demonstration hubs – identifying and advancing all mobility hubs in parallel or setting out four to six key accelerated mobility hubs; and

Leadership – determining whether municipalities should be responsible for mobility hub development, and establishing protocols for private sector engagement.

### Moving Forward

Some potential mobility hubs consist now of little more than vast parking areas, single-storey structures and empty lots. Creating a vision of their future that can convince the skeptical investor is important. In some cases, it may be necessary for the public sector to initiate development by locating a major public building or facility as a catalyst for private development.

A comprehensive approach towards the design of transportation facilities can correct past shortcomings and ensure new investment is conducive to transit-oriented development. Most cities and towns are eager and able to make the necessary commitments.

Global research indicates that this era is clearly one of integrated land-use and transportation development. There are many examples from around the world, and while other cities' experiences do not exactly mirror the situation here, they can help spark ideas. From bold regional strategies to details of station design, there are plenty of examples of the successful integration of transit systems with land use development, and insight into the role that mobility hubs play in that integration.

Overall, the political will, planning framework and targeted capital investment necessary to overcome the impediments of the past have to be focused on creating mobility hubs – as the cornerstones of an integrated, seamless, sustainable transportation system across the region.

### WE WANT YOUR INPUT...

To participate in the Regional Transportation Plan consultations, please visit our website at:

### www.metrolinx.com

You can also get in touch with us by fax, e-mail or regular mail:

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### **1** Introduction

### **1.1 About This Paper**

This paper is based on the premise that the integration of land use and transit decisions is an essential strategy for increasing mobility across the Greater Toronto and Hamilton Area (GTHA). It describes mobility hubs and their unique roles in improving the customer experience of taking transit in the GTHA, as well as those key hubs with the greatest capability to achieve a sustainable regional urban structure and a significant shift to increase in the portion of travel made by walking cycling and transit. The paper presents the suite of attributes and features that mobility hubs can offer, and seeks your input into the ideas proposed.

This Green Paper identifies the key issues we need to understand...

- 1. An effective transit system depends on supportive land-use concentrations around key stations.
- 2. Current transit service across most of the GTHA is inadequate to drive major land use decisions.
- 3. Too few of our transportation assets have fully developed surrounding land uses.
- 4. Traditional suburban population and employment patterns are too dispersed to support efficient transit.
- 5. Mobility hubs are the strong, defining places where an intensity of land uses and destinations interact with high quality, customer-oriented transportation service.
- 6. Not all mobility hubs are alike establishing a hierarchy and distinguishing roles of different types of mobility hubs will create the most effective network.



Figure 1 St. Pancras International Train Station, London, UK.

...and seeks to address the following key questions:

- 1. What is the optimal structure for mobility hubs in the GTHA to promote sustainable transportation use? Are fewer, bigger hubs better?
- 2. What are the key characteristics and components of mobility hubs?
- 3. What are the biggest impediments to ensuring mobility hubs function well? Lack of market demand? Lack of money? Institutional or planning barriers? No one in charge?
- 4. What is the desirable improvement program for mobility hubs of different types? How can they enhance pedestrian and cycling opportunities, and the opportunity to live close enough to walk or cycle more often?
- 5. Who can best lead the development of mobility hubs? Which hubs should be a priority and could best demonstrate the potential of mobility hubs?

### 1.2 Towards a Regional Transportation Plan

Metrolinx was created by the Government of Ontario to develop and implement transportation plans for the metropolitan region containing the City of Toronto, the four surrounding regional municipalities (Durham, Halton, Peel and York) and the City of Hamilton. One of the primary objectives of Metrolinx is to create a Regional Transportation Plan (RTP) – a strategic, long-term vision for a coordinated transportation system across the entire region. The RTP will also serve as a guideline for infrastructure investment decisions. Mobility hubs are not a traditional component of transportation master plans. As the places where land use and transportation decisions intersect, they are, however, increasingly recognized as a key component of the successful management of growth and movement in a dynamic metropolitan region. The contribution of mobility hubs to the RTP will be assessed by overlaying the three lenses to be applied to all of the Green Papers: how they will improve people's quality of life and health; how they will reduce transportation's impact on the physical environment; and how they will support a competitive, robust economy.

The RTP will be completed by the fall of 2008 and will emphasize balanced initiatives that ensure access by all residents and visitors to a full range of transportation choices across the metropolitan area. At the same time, the RTP and communications program will provide valuable information to citizens, system users, transportation providers and other stakeholders at the local level.

During the RTP development, various options – and combinations of options – will be discussed and assessed. They will form the basis of meaningful consultation with the public, stakeholders, advisory groups, and Metrolinx staff and board.

The development of the RTP will include a series of seven consultation papers on key topics. This Mobility Hubs Green Paper relates to the Active Transportation Green Paper, which details ways in which walking and cycling can support overall mobility objectives, and leads towards the Transit Green Paper, which will outline the transit network and system of transit modes that will link the mobility hubs. Each of the Green Papers will be followed by White Papers, then by a Draft RTP. All of these documents will be posted on the Metrolinx website and the Environmental Bill of Rights registry for interactive input from the public and stakeholders. Results from web-based consultation, focus groups, and meetings will feed directly into the RTP.

## 2 A Vision For New Mobility

### 2.1 How Do You Know You Are in a Mobility Hub?

Anyone who has had to walk down a bleak and busy street to a cold and windy bus stop – with nowhere to find shelter or buy a paper or a cup of coffee – to wait anxiously, uncertain of when the next bus will arrive, while comfortable commuters whiz by in their cars knows what a mobility hub should be.

A time-pressed parent experiences a mobility hub when she walks past the urban village market centre, where her child is in a daycare located beside her partner's workplace, to catch the high-speed GO train into Markham Town Centre. The student who cycled to a weather-protected bike station leading directly to a platform where he can see the time of the next train to Kipling Station will understand. The IT expert who works part of the day in Midtown Oakville and part at the Mississauga City Centre depends on the cluster of employment around the hubs and the easy connections between them. It would be impossible to drive between the centres so efficiently. The worker who can take a wheelchair right onto a subway train for the ride to a job in downtown Toronto fully appreciates what a mobility hub can be. The seniors who can dial up a mini-bus in their neighbourhood to take them directly to the Burlington GO station where they set off for a matinee with their friends in Hamilton – picking up supper on the way home – appreciate having everything connected and know how easy mobility hubs make their lives.



Figure 2 Connections between local and regionnal transit at a GO Transit station in Mississauga.



Figure 3 A busy mobility hub in Denver, Colorado.

### **Mobility Hub Vision**

A mobility hub is a place of connectivity, where different modes of movement, from walking to high speed rail, come together seamlessly. A mobility hub is a place in the urban region in which there is an attractive, intensive concentration of employment, living, shopping and enjoyment around a transit interchange. A mobility hub is easily accessible for those who begin or end their trip on foot or riding bicycles. It is a place where the transit rider is treated like a coveted consumer, with choices about how he or she moves around the region. It is a safe, convenient, attractive place in which the city interacts with its transit system.



Figure 4 An intermodal station in Madrid, Spain.

Mobility Hubs can range in size and character. The concept includes different types of mobility hubs, such as urban growth centre, unique destinations, major gateways/intermodal stations, and higher-order transit stations.

Types of Mobility Hubs	
Primary Hubs – significant regional city centres	These are significant regional city centres that have the potential for the highest levels of population and employment densities, and that generate the highest levels of travel demand to and from these centres (greatest critical mass), which include subway stations and may include some urban growth centres as defined in <i>Places to Grow</i> , depending on their scale, character, transit service and function.
Secondary Hubs – major activity centres	Major regional destinations and/or functionally important gateways that have inter-regional connections, such as airports, emerging centres, universities and colleges, major parks and stadiums, and regional shopping centres.
Tertiary Hubs - major transit station	All stations located on a higher-order transit line not included in previous definitions.

### **Exhibit 1: Types of Mobility Hubs**

### 2.2 Components of a Mobility Hub

Mobility hubs have gained greater prominence in transportation planning over the past few years with the understanding that matching urban development patterns and multi-modal transportation, while giving priority to local transit, pedestrians and cyclists, is critical to ensuring efficient, sustainable regional transportation patterns. The mobility hub concept goes beyond conventional transportation infrastructure to incorporate a broader objective of creating centres with both seamless connections between multiple types of transportation and a sense of place for the user. Mobility hubs are well-established concepts in many centres around the world, where land use, transportation and human interaction come together. Mobility hubs can evolve such that transportation becomes an integrated component of both city building and place-making. Successful mobility hubs are places which have elements of six key ingredients, illustrated in Exhibit 2. Not all hubs are alike in scale and function or will contain each of these ingredients to the same degree, but all will have some elements.



### **Exhibit 2: Ingredients of a Successful Mobility Hub**

The influence sphere of a mobility hub has three distinct components. The **transit station** is at the core, served by at least one higher-order transit line. It is surrounded by the immediate vicinity of buildings, public spaces and streets which together with the station comprise the **mobility hub** – where people can easily access a range of activities, services and amenities. Finally there is a broader area of influence outside of the hub, the **catchment area**, which also supports and benefits from the hub and connects it with the conventional street system. The catchment area is the area in which most users of the mobility hub live or work. Exhibit 3 illustrates the concept of differing geographies and relationships within and beyond the mobility hub.



### Exhibit 3: Components of a Mobility Hub

To be a success, the RTP must consider the critical infrastructure additions to the network of transit systems available, as well as the ease and convenience of the entire transport trip, to and from home, the office, school or other destinations. The great advantage of the car, and the reason it is so popular, is that it offers freedom of movement that is versatile, adaptable and comfortable. The car allows ease of movement, not only between two points, an origin and destination – but also among any number of places – all in the convenience of a single mode. While cost and journey time considerations will increasingly act to reduce the relative advantages of the automobile, a competitive transportation system must find a way to offer attractive, comparable or superior levels of service and convenience, focused on increased choice of modes at mobility hubs, and the network that connects them.

The system of mobility hubs will become an important unifying component of the RTP, serving as the foundation of a connected system. The environmental benefits of reducing dependence on the private car and increasing walking, transit and cycling must combine with the economic benefits to businesses and individuals of easy movement around the region with little waste of time and money as a result of congestion. All of this should occur within an urban setting designed for the way people and families would like to live, work and enjoy themselves.

There is an alternative to the trends of congestion, sprawl, limited transit options, declining air quality and economic inefficiency for our thriving, dynamic successful region. This alternative is based on sustainable development and a supportive business environment that offers a way for people and families to move easily about our growing metropolis. Mobility hubs are one of the key building blocks of the RTP. The issues that articulate those objectives in this paper are set out in Exhibit 4.

### 2.3 Objectives for Mobility Hubs

In order to achieve more walkable, complete communities envisaged in Ontario's Places to Grow initiative, transit must be supported by appropriate land use planning and design, including a vibrant public realm with a concentration or density of activities (e.g. jobs, shops, schools, and recreation) within convenient access by walking, cycling and transit. The creation of a network of successful mobility hubs is central to the RTP as one of the ways to achieve this connection between land use structure and transportation investment. Mobility hubs are the point of contact not only between transit lines, but between transit and the surrounding city. Well-designed stations must make both the transfer between transit modes as seamless as possible and the relation to the urban context as convenient as possible. A mobility hub is the core not only to the development, uses and activities around it, but also to the supporting networks of local transit service, and biking and walking trails that connect it to its catchment area. The success of a strategy for implementing mobility hubs can be assessed against the following objectives, organized by the three lenses of the RTP - people, the environment and the economy.

#### **Objectives for Mobility Hubs – Three Lenses**

#### People

- Create attractive, pedestrian-friendly, convenient places around stations which combine opportunities for living, working, education, shopping and recreation by promoting well-designed, mixed-use, intensive development
- Maximize the convenience, comfort and enjoyment of the transit experience by improvements to the stations, their environment and the connectivity between modes

• Improve the attractiveness and safety of walking and cycling, within and to mobility hubs

Reduce the amount of time spent travelling to work and school by providing optimal live/work opportunities

#### The Environment

- Improve air quality by reducing the reliance on automobiles and by prioritizing walking, cycling and local transit networks
- Regenerate the natural and built environment around stations by reducing surface parking areas and related surface run-off and heat gain, and by encouraging 'green' building and development
- Reduce external trip generation by promoting a diverse, intensive mix of uses within mobility hubs
- Promote the most sustainable urban structure by reducing pressure for urban sprawl by focusing future growth in mobility hubs
- Showcase planning and design that account for interactions between air, land and water systems, living organisms, built structures, and the effects of human activity

#### The Economy

- Foster concentrations of employment by providing attractive, competitive locations around convenient and accessible places
- Easily connect people and jobs by providing concentrations of housing and employment near transit stations
- Reduce wasted time and expense on congested roads and highways by providing alternative means of transportation
- Improve economic productivity by encouraging more creative, dynamic, and collaborative clusters in mixed-use office districts
- Enhance land values in vibrant downtowns with more valuable long-term investment sites
- Support tourism activities by providing ready access to services and attractions
- Promote the most efficient use of infrastructure
- Create a financial synergy between transit infrastructure and development: one provides incentives for the other

### **Exhibit 4: Objectives for Mobility Hubs – Three Lenses**

### 2.4 Old and New Mobility

If the transit system provides the connectivity between mobility hubs, it is the mix and intensity of land uses in the hub itself that establishes the destination and the environment conducive to transit choice. A transformational shift in thinking is required to strengthen this critical relationship between land use and mobility. A regional land use pattern designed primarily for cars, characterized by some parts of the GTHA, creates barriers to developing efficient high-capacity transit. GO Transit, however, is a success in that it is well-used despite the fact that surrounding land uses are not as supportive as they could be. The very scale of automobile infrastructure, with its wide arterial highways, roads and associated parking lots, frustrates movement by local bus, by bike or by foot. A dispersed, separated, single-use, low density urban structure cannot provide the concentration, connectivity and encouragement of demand that will offer the convenience, service levels and ridership to present compelling alternatives to the use of the car for those who have a choice. In remaking the transportation system, we have to transform and design the urban region that surrounds and services it. That is why mobility hubs are so important; they are the places that a system of mobility will connect. These places are very different from the car-based cities and towns we see today. The comparative attributes of such 'old' and 'new' mobility, illustrating the scale of transformation necessary, are listed in Exhibit 5.

#### Old Low-density Medium- and high-density Single uses Mixed-use Separated uses Integrated uses Low population High population Low employment High employment Wide arterial roads Network of streets Large parking lots Strategic parking structures Little weather protection Weather moderation Mall-oriented shopping Street-oriented shopping Not accommodating to Accessible people with disabilities Discourages walking Pedestrian-friendly Discourages cycling **Bike-friendly** No adjacent services/ Adjacent shops and institutions services No information Real-time information Single mode Multi-modal

### Exhibit 5: Mobility Hubs: Transformational Agenda

### 2.5 Growing to Mobility

An analysis of the percentage of people who use transit (known as the 'transit-modal split') shows the mobility implications of transforming from the old to the new regional urban structure. Data shows the level of transit service that is, as a consequence, economically possible. Exhibit 5 shows that in the relatively densely built central Toronto, some 55 per cent of people going to work use transit during peak periods; in the outer regions the average is only four per cent. More alarmingly, only one per cent use transit to travel between the outer regions, which will become an increasing share of the total trip demand. The move to a system based on effective mobility hubs therefore requires a comprehensive approach that addresses the relationship between transportation, land use and environmental planning. The imperative for such a transformation to a more transit-supportive urban region is provided by the remarkable rate of population growth that the GTHA will experience over the next quarter century. *Places to Grow* forecasts some 2.8 million new residents and 1.4 million new jobs to be added to the GTHA by the year 2031. If mobility hubs are the places at which land use and transportation intersect, how do we determine which are the best places to accommodate that growth so as to foster optimal levels of mobility?

The GTHA now contains numerous higher-order transit stations - 69 Toronto Transit Commission (TTC) subway and Scarborough rapid transit stations, 56 GO stations and numerous Viva and similar stations - as critical places in the future transit network. (A higher-order transit station is defined as one served by subway, GO train, light rail transit (LRT), or bus rapid transit (BRT)). Each of those stations serves a different transit function and exists in a very different urban context. There are also several other key regional destinations that must be considered. Which types of stations and the areas around them can make the greatest contribution to a highly mobile region? What characteristics should those places have? What are the basic amenities that should be provided at every higher-order station? This report offers a framework and criteria for making those judgments, in addition to strategies on how each type of station can be planned appropriately.

### 2.6 Implementing the Goals of the Growth Plan

In 2006, the province of Ontario released *Places to Grow* – *A Growth Plan for the Greater Golden Horseshoe*. The overall policy framework of the *Growth Plan* seeks to achieve complete communities, with transit-supportive land use and a vibrant mix of jobs, housing and services. Under the plan's policies, a significant portion of new population and employment growth over the next decade and beyond will be accommodated in existing urban areas, such as downtowns, under-utilized areas along major roads and transit corridors, and around transit stations. The plan promotes intensification – making more efficient use of land through a better concentration of people and jobs, which not only adds vibrancy and social activity to the area, but also makes infrastructure to service the area more affordable.

As part of a suite of policies to meet these goals, the *Growth Plan* identifies 25 urban growth centres, of which 17 are within the GTHA, shown in Exhibit 6. Within these centres, a higher concentration of jobs and housing, as well as other destinations and attractions, will be focused. The plan sets minimum density targets for these areas in order to ensure high levels of walking, cycling and transit usage. In addition, the plan's policies encourage growth in other types of intensification areas such as brownfields, greyfields, downtowns, along corridors and around major transit station areas. The *Growth Plan* provides policy direction on the location of major office developments which are specifically directed to urban growth centres, major transit station areas, as well as other areas with existing frequent transit, or existing or planned higher-order transit service. All of these various intensification areas – including urban growth centres, intensification corridors, and major transit station areas – provide opportunities for developing mobility hubs.

An analysis of the transit modal shares of some of the existing urban growth centres, as examples of a kind of mobility hub, demonstrates that the higher the location's density, the more transit-supportive it is, resulting in a higher share of trips being taken by transit. By looking at this sample of mobility hubs, it shows that significant changes will be required over the next decades to make the region's urban structure much more transit-supportive. Exhibit 6 indicates the current effectiveness of those urban growth centres in encouraging transit use. It shows that many are far below desirable transit modal shares which range from 30 per cent to 50 per cent of trips by transit.



Exhibit 6: Transit Modal Shares for Urban Growth Centres

Source: 2001 TTS and IBI

A basic strategy to direct the greatest possible share of new regional growth to the centres with the greatest development and transit potential will enable them to move up the curve of mobility illustrated in Exhibit 6 and capitalize on the importance of strategic location. Density is important for a mobility centre's success. Bigger, more mixed-use and denser centres are better for transit, as they generate the critical mass of trip demand that can support higher-order transit, and, in turn, attract more ridership.

The Growth Plan establishes minimum density targets for urban growth centres, creating an ideal start point for mobility hub development. The five Toronto urban growth centres have a minimum density target of 400 people + jobs per hectare (ha); centres in the rest of the GTHA have been given a target of 200 people + jobs/ha. Such targets are ambitious, as can be seen from Exhibit 6, but have been successfully achieved in some well-functioning, existing potential mobility hubs. Nonetheless, reaching those targets in certain centres will require a concentrated and coordinated effort of planning and targeted investment. The concept of mobility hubs encompasses much more than the urban growth centres - it includes other key destinations and inter-modal transfer points. The urban growth centres themselves exhibit great variation in current size and future potential, but they are clearly essential building blocks of the new mobility.



## Exhibit 7: Urban Growth Centres in the GTHA (adapted from *Places to Grow*)

Mobility hubs must be places in which other regional transit lines connect. They must enable easy and effective local transit, biking and walking within the immediate station catchment area. That ease of mobility, both regionally and within the catchment area, is of critical importance. Locally derived transit users originate within a relatively tight area around high-capacity transit stations – generally about 85 per cent of GO train users live within five kilometres (km) of the station. For TTC subway users, the concentration is even higher, typically between 0.5 and 1.0 km. Maximizing the transit capture within the catchment area must be one of the critical objectives of the RTP. The creation of higher density districts around stations that are supportive of active transportation and capable of being served by local transit systems is a critical component of regional transit planning.

### 2.7 Matching Transit Investment and Land use: MoveOntario 2020

The MoveOntario 2020 initiatives set out a comprehensive set of 52 potential transportation investments that will radically change the supply of new transit to the GTHA region, shown in Exhibit 8. These new investments are focused on the provision of improved higher-order transit.

Exhibit 8 also indicates the relationship of the MoveOntario 2020 Plan initiatives to the urban growth centres identified in Places to Grow. The layering of these two key provincial initiatives provides a departure point for determining the optimal mobility hub strategy. Each MoveOntario 2020 initiative provides an opportunity to identify potential mobility hubs that should be appropriately planned and designed to achieve high modal shares for walking, cycling and transit. Realizing the greatest potential for mobility hubs involves combining a number of layers; not only linking the centres in the optimal way, but also ensuring that those centres maximize their ability to generate ridership, reduce automobile usage, and encourage trips on foot and by bicycle. Again, not all important places on the transit system are urban growth centres, and not all urban growth centres are well-served by transit, but these intended concentrations of accessibility and land use present good starting points. Not all centres have the same ability to generate demand.

Therefore, not all centres require or can support the same level and type of transit service. The most efficient and cost-effective RTP will be that which best corresponds to the patterns of future demand generated by that complex constellation of different centres. Different forms of urban transit have different abilities to accommodate different levels of demand. A subway line can most efficiently carry between 15,000 and 40,000 people per hour in the peak direction. An LRT or BRT on exclusive right-of-way can carry 5,000 to 15,000 people. A bus on a mixed-traffic street can carry up to approximately 2,000 people per hour in the peak direction. Those very different carrying capacity ranges correspond, in turn, to the very different quantity of trips generated by different concentrations of land use. For example, a hub with 20,000 jobs and a 25 per cent modal split to transit could be expected to generate some 700 trips in the peak hour, peak direction in a corridor - well within the capacity of a bus route. A hub with 50,000 jobs and a 50 per cent transit modal split could generate over 4,000 transit trips in the peak hour, peak direction, requiring LRT or BRT capacity levels.



Exhibit 8: MoveOntario 2020-Networks and Centres

### 3 Challenges to Creating Mobility Hubs

There are many opportunities to improve the planning and design of existing and potential mobility hubs in the GTHA. For example, even station areas that are most maturely developed along the Yonge Street subway line could significantly improve their attractiveness to transit users through more seamless interfaces between modes, greater convenience to riders, walkers and bicyclists, and better connections to their catchment areas. However, the greatest challenges are to be found at the other end of the spectrum, where many well-located potential mobility hubs in the suburban areas are undeveloped or seemingly stalled in their ability to achieve the desired development mix and intensity. As well, the associated modal splits and several important destinations lack higher-order transit service. Even with the high levels of population and employment growth projected, not all developing centres or higher-order transit stations can readily become fully contributing mobility hubs. It is important to understand what the primary impediments are to their successful development.

Mobility hubs challenges	
Transit service level and integration	Infrequent, uni-directional, peak hour only; lack of fare integration and schedule coordination
Parking	Extensive, free or very inexpensive, single-use, market-essential for development
Awkward land patterns	Small, separated sites; industrial patterns of land use
Lack of alignment between transit facilities and development	Transit facilities not in or central to developed centre
Large infrastructure	Conflicts with place-making; frustrates active transportation; lack of pedestrian-scaled urban connectivity; ugliness; barriers to connecting urban fabric
Lack of market	Low employment space demand; exclusive focus on residential
Difficulty of development	Fractured ownership; "not in my backyard" local opposition; non-proven market

### 3.1 Inadequate Transit Service Level



Figure 5 Kids waiting for the next train.

There is a world of difference between all-day, bi-directional, frequent, high-speed transit service – such as that provided on the subway – and relatively infrequent, slower speed, sometimes uni-directional, and/or peak-hour-only transit service typically offered in much of the rest of the region, in influencing the locational decisions of real estate investors, employers and those deciding where to live. It is not an exaggeration to state that for most of the GTHA, other than the well-served areas of Toronto, current transit provision does not have a significant bearing on investor decisions and land use patterns. Even public agencies have too frequently located major institutions, such as health centres and courthouses, in relation to old rather than new mobility.

Development, employment and lifestyle locational decisions cannot be forced; they must be attracted by a compelling mobility package. The real test of transit is the ability to compete with the car. The most successful mobility hubs will be those served by all-day, higher-order transit of sufficient service quality to determine individual and corporate locational decisions. Overall, a step change in the frequency, speed, convenience and comfort of the transit system across the city-region – or at least in a larger number of travel corridors – will be necessary to change movement behaviour to the extent that it changes land use decisions. All public institutions must, in turn, contribute to the creation of mobility hubs when deciding where to locate major facilities.

**Exhibit 9: Mobility Hubs Challenges** 

### 3.2 The Pre-Eminence of Parking



Figure 6 An example of a large surface parking lot at a GO Transit station in Brampton.

Few places in the region offer the majority of people working there a viable alternative to the car as a means of getting to work. As a result, office clusters and other employment concentrations have responded by locating in the most car-accessible places - primarily along the 400-Series Highways. These locations also offer the extensive and relatively inexpensive land necessary to park all of those employees' cars. Free surface parking is the market standard for employment outside of central Toronto. Parking demand in suburban, highway office locations often averages in excess of four spaces per 100 m<sup>2</sup>, which requires providing more asphalt than office space. As an example, consider a substantial developed centre, with 20,000 jobs in perhaps 400,000 m<sup>2</sup> of office space. Even if the modal split can be increased in a well-functioning mobility hub to 30 per cent, and even if 20 per cent walked or biked to work and the remainder car pooled with two people per car, the majority of those not travelling by transit or active transportation would still require some 4,000 parking spaces.

The very scale of such parking areas sets up an environment that discourages walking. The operating behaviour of transit agencies can also contribute to the parking problem at a station, as ridership is frequently heavily dependent on facilitating Park-and-Ride, which creates significant parcels of surface parking – a great under-utilization of land – adjacent to transit stations. The only 'silver lining' of such extensive parking areas is their availability for future transit-oriented development. This is the reality of parking, which has undoubtedly contributed to the difficulty many of the potential mobility hubs have found in trying to attract high-density office development. Mobility hubs must respond to the residual demand for parking as inexpensively as possible so as to attract development, while discouraging it so as to foster concentration. The long-term solution is both carrot and stick: to strongly discourage development of large trip generators, outside of mobility hubs; to reduce parking demand through improved transit mobility; to reflect the real cost of parking in price and rent; to provide necessary parking in space- and demand-efficient consolidated locations; and to change the parking operating model for transit providers.

### 3.3 Awkward Land Ownership Patterns



Figure 7 An entertainment complex surrounded by large surface parking lots near Mississauga's intermodal hub.

Office development typically carries higher risks than residential development and tends to proceed, particularly in suburban locations, in larger complexes and office parks rather than as single buildings. In this way, a controlled, marketable office environment can be created. Large land holdings that can meet such commercial development expectations are rare in established urban areas and near transit stations. Land ownership is either fractured into multiple ownerships, in which case the default development decision almost invariably favours residential, or held by large single users such as shopping centres or transit agencies which are most concerned with the availability of parking for their patrons. Many mobility hubs also suffer from the legacy of uninviting industrial sites lining many of the rail corridors. Other land use categories – retail, residential, entertainment – are important and less demanding, but have less strategic significance.

The successful mobility hub needs to offer and prepare large sites suitable and attractive for office and mixed-use development, using public land, where available, as a lever. The public sector may need to be much more interventionist and secure land ready for development or complete existing public assemblies in advance of transit investment.

## 3.4 Lack of Alignment Between Transit Facilities and Urban Development



Figure 8 A GO Transit station located outside of downtown Burlington.

Situations exist where higher-order transit stations are not located within the focus of commercial, civic and residential activity such as downtowns. This is true for a number of potential mobility hubs along the Lakeshore GO line. At Oshawa, Pickering, Burlington and Oakville, for example, the historic cores of those settlements are located kilometres away from the GO station. As a result of the physical separation between the land uses and the transit station, there is a lack of convenient pedestrian access and transit connectivity which poses a challenge to improving the customer experience in such places. In other words, in some places major land use activities are not directly in the transit station area or potential mobility hub, although it may be in its catchment area.

Some innovative problem-solving and leadership will be needed in the RTP, and by the area municipalities, to resolve these land-use/transportation discontinuities. Is it possible or cost-effective to move an existing transit station and other infrastructure, such as rail tracks, to serve an area of activity directly? What is the vision and plan for the area around the transit station? How else could the downtowns be better served and connected by transit and other options? What are the costs and benefits of addressing such discontinuities? What are the options for improving the customer experience in such places?

## 3.5 Transportation Infrastructure Frustrates Place-Making



Figure 9 A typical suburban intersection that is not conducive to pedestrians.

In and around many existing centres, the very transportation infrastructure that makes the centre accessible inhibits the ability to capitalize on that accessibility. Big arterial roads and freeway interchanges can make walking unattractive and cycling hazardous. Rail tracks require minimum setbacks and are often lined with residual industrial uses. Multi-modal interchanges require bus terminals and access ramps that frustrate adjacent development. Free-flow transit priority, an operational necessity for efficient service, implies features like grade-separations and slip lanes which are often hard to balance with good urban design. Transit operators often want lots of inexpensive surface parking. Functional concrete and asphalt represent a detriment to the amenity and environment necessary for good place-making, discouraging development and making it easier to build elsewhere. Transit agencies themselves have been guilty of inhibiting associated development in the location and design of a station and its inter-modal connections. For example, Toronto's Downsview Station, which serves large lands ready for development, is almost impossible to build close to.



Figure 10 View of below-grade infrastructure at Madrid Principe Pio.

The solution is to ensure that the new transportation capital investment undertaken achieves a range of functional goals, with a view to the facilitation of adjacent development and the encouragement of walking and cycling. Hopefully, the scale of contemplated investment may, in many cases, be sufficient to overcome past shortcomings. A relaxation of some of the regulatory impediments to overbuilding transit facilities and towards mixed-modal development would again allow some mobility hubs to address these problems.

For example, Principe Pio in Madrid has introduced below-grade infrastructure, providing simple and convenient connections between transportation modes and freeing up key development parcels and public realm opportunities around the station. The numerous examples of European and U.S. mobility hubs in which the transit function is over- and under-built or closely edged by mixed-use complexes raises the question of why such development is so restricted here.

### 3.6 Getting Started



Figure 11 A centrally-located mobility hub in Denver.

In their current state, some potential mobility hubs consist of little more than vast parking areas, single-storey structures and empty lots. Creating a vision of their future that can convince the skeptical investor is important. Just as important is knowing where to start. If the market recognition of the area is undeveloped, it may be necessary for the public sector to initiate development by locating a major public building or facility as a catalyst for private development. Several cities have been successful with variations of this strategy in their downtowns and the optimal techniques for suburban station sites are worth exploring. The North York Centre sets a good precedent for leading the creation of a substantial mobility hub, having advanced civic, cultural and public space development by securing private investment on under-used public land. Major publicly funded projects should be required to be developed near existing mobility hubs.

A set of tools can be developed to guide the development of higher-order transit stations into mobility hubs. This should include setting zoning regulations, a comprehensive parking strategy, identifying potential development for the catchment area, and developing a station area master plan to ensure that new transit facilities have the potential to achieve the desired modal splits and live/work opportunities.

These impediments to the creation of effective mobility hubs outlined above must be taken seriously if successful hubs are to be developed as key elements of the overall transportation system. Under current conditions, the competitive advantage of greenfield sites that lack these disadvantages is comparatively much stronger.

The news, however, is not all bleak. The quantity of new urban growth projected for the GTHA is, of itself, transformational if properly planned. The clear and exclusive direction of large office buildings and major publicly funded buildings to transit-served locations set out in *Places to Grow* will change the balance of competitive advantage vis-à-vis highway locations. The dramatic improvement of transit service proposed will increase modal splits and moderate the negative implications of parking requirements. A comprehensive attitude towards the design of transportation facilities can correct past shortcomings and ensure new investment is conducive to transit-oriented development. Most cities and towns are eager and able to make the necessary commitments.

Overall, the political will, planning framework and targeted capital investment necessary to overcome the impediments of the past have to be focused on creating mobility hubs. This is a common problem faced by any city wanting to significantly change travel behaviour in its area. Before setting out the specific dimensions of the mobility hubs strategy for the GTHA, it is worth reviewing the experience of the rest of the world for any assistance in realizing this potential.

### **4 Examples From Other Places**

The urban world has been experiencing a remarkable renaissance in transit development. Global research indicates that leading jurisdictions recognize the importance of integrated land-use and transportation development. Examples are numerous and none exactly replicate the situation in the GTHA, but they can help spark ideas that may have merit here. Some work has been done locally in integrating transportation services and modes through Moving the Economy, a Toronto-based non-governmental partnership. Moving the Economy's New Mobility HUB Project focused on partnership development and the 2006 launch of a demonstration site at Exhibition Place which linked GO and TTC with other modes and networks, including bicycle- and car-sharing, improved bike parking, wireless Internet, and local area maps. This section examines ideas that go beyond linking transportation service providers, to the potential land use and mixed development that will build the most robust and successful mobility hubs. The examples from the rest of the world are structured in terms of the problems and opportunities we face in the GTHA. From bold regional strategies to details of station design, this section highlights some of the best examples of the successful integration of transit systems with land use development, and the role that mobility hubs play in that integration. First, this section will explore the role of mobility hubs within successful regional transportation networks. Second, it will consider how different stations have structured themselves as effective hubs. Finally, it will highlight attractive station designs and their effect on mobility patterns.

### 4.1 Shaping a Transit-Supportive Region

How best do we structure a region-wide hierarchy of centres and corridors? What is the role of the mobility hub within that region? The following examples from Madrid, Germany, Oregon and the United Kingdom highlight the important role that mobility hubs play in creating a successful regional transportation network. Instead of funnelling all traffic through one central station or having a number of divergent service providers, the creation of a network of higher-order stations that integrate different transportation modes offers more choices to system users, and is better equipped to deal with their individual needs.

### Threefold Integration of Transportation Network – Madrid, Spain

Madrid is hailed as one of the great success stories of coordinated regional public transit. The turning point leading to that success was the introduction of its integration policy. Ridership had been decreasing for over a decade when the integration of transit services across the region was introduced in 1986. It has been rising steeply ever since, with the number of annual trips currently almost double what they were 20 years ago. The integration is threefold: 1. administrative integration, with the constitution of the regional transportation body -Consorcio Regional de Transportes de Madrid; 2. modal integration, with the creation of modal exchange stations ("intercambiadores"); and 3. fare integration, with the creation of one travel pass for all modes. The creation of inter-modal exchange stations (i.e. mobility hubs) significantly expands mode and route choices for the user, creating a complementary and integrated transportation system.



### Integrating Different Transit Operators – Bremen, Germany

On a regional scale, effective transit investment requires successful coordination between service providers. In Bremen, Germany, an umbrella association brings together 35 transit operators in the 4800 km<sup>2</sup> region including local/regional rail, buses and trams. This means one ticket, one tariff, one information system for all transport modes, and one integrated smart card for transit, car-sharing, and banking needs. Mobility hubs play a key role in the integration of this system by being strategically located throughout the city with links to trams, buses, car-share, cycling networks, and taxis. Each hub is equipped with an electronic journey planning/ticket kiosk which provides real-time information. The success of this strategy of creating useful intersections points between various modes is evidenced by the city's impressive 60 per cent sustainable transportation modal split made up of 17 per cent public transport, 20 per cent walking, and 23 per cent cycling.



Figure 13 Different modes of transit in Bremen.

## ABC Localization Policy: Matching Origins and Destinations – Den Haag, Netherlands

The Municipality of Den Haag has been successfully operating the ABC Localization Policy since 1990. The policy strives to match different types of businesses to appropriate locations in terms of mobility and access. Locations are divided into three typologies: Type A is close to major railway stations, employment densities are high, parking capacity is limited, and access to the motorway network is not important; Type B is close to non-major transportation stations (i.e. local trains/buses), employment densities are lower, parking capacity is higher, access to the motorway network is improved; Type C has low-quality transit access, low employment densities, limitless parking, and is close to a motorway intersection.

To exemplify, businesses that attract a high number of visitors, such as the head office of a bank, should locate at a Type A location, while businesses that require a large volume of trucking and shipping, such as a warehousing company, should locate at a Type C location.



Figure 14 Den Haag Central Station.

### Coordinating With the Regional Growth Plan to Link Transit Service to Growing Areas – Portland, Oregon

A regional transportation plan requires coordination between regional growth initiatives and land use policy, in order to link transportation service to and among areas that are growing. This symbiotic relationship also appropriately designates development densities and typologies to those areas. Portland, Oregon, has successfully linked transportation and land use planning with its Transportation System Plan, adopted in 2002. There are over 600 transit projects planned or underway in their sophisticated multi-modal system. This emphasizes a strong link between transportation and land use. The lesson here is that transit investments must be strongly linked not only to current demand, but also to future demand, in areas in which development parcels can be assimilated and transit-oriented development communities can be planned.



Figure 15 A bus and LRT in Portland.

## Comprehensive Centre and Network Planning – London, UK

The Greater London Authority recently issued a Transport Strategy for the London region. As can be seen from the proposed plan, the strategy involves linking centres within the urban area with high capacity/speed transit. They have also prepared a mobility hub planning template, having recently introduced the concept of a Public Transit Accessibility Level (PTAL), from which flows a series of minimum development policies to be undertaken in the vicinity of a higher-order transit station.



Figure 16 Central London.

### 4.2 Establishing an Effective Mobility Hub

What is the optimum make-up of a mobility hub in terms of the mix of uses and activities, scale and connectivity? How can hubs be most effective where they are located, and take advantage of the prevailing characteristics of the area? The three hubs identified here – Denver's Union Station, St. Hilaire, a suburban mobility hub outside Montreal, and downtown Saint Paul's planned transit hub site – highlight the fact that there is no single formula for station design that applies universally. Each mobility hub must respond to its local context, while bringing forth the general principles of offering choice to the user, and facilitating simple and easy use of the system.

### Using a Station Master Plan to Develop an Effective Mobility Hub – Denver, Colorado, Union Station

The City of Denver is currently implementing its Master Plan for the transformation of the Union Station into a multi-modal transportation hub, a centre for public life, and a prominent historic gateway to the city. The transformation will provide for local and regional rail and bus service, secure bicycle parking facilities and services, a well-designed, safe and convenient pedestrian circulation network with links to green spaces, parking facilities and car rental service. The plan also calls for mixed-use, transit-oriented development surrounding the station, including a mix of residential, retail and office space, and vibrant public spaces. Integrating these elements into one Master Plan sets forth the necessary focus to put this plan into action. The station area Master Plan allows the city to create an area that capitalizes on its heritage and natural features, while integrating the mix of land uses necessary to create a hub that is significant enough to be the central focus point of a region.



Figure 17 Station Master Plan for Denver.

### Connecting Different Transit Modes – St. Paul, Minnesota, The Hub

St. Paul is in the process of creating a significant new transit hub downtown, linking a new LRT station with existing bus and skyway connections with a signature redevelopment site. Bus and LRT transit stations in the vicinity are relocating directly adjacent to the hub, making it easier to transfer between routes and modes, and providing a single direct connection between three of the busiest stations downtown. This system is geared toward the people using the service, and the priority is to make transit use as simple and pleasant as possible. The station will feature a new public square to provide focus for activities in and around the station. This example illustrates that cities are increasingly focusing on improving connections. Bringing different service providers to the same station achieves that goal.



Figure 18 Illustration of transit hub in St. Paul.

## Responding to the Local Context – St. Hilaire, Quebec, Village De La Gare

Not all transit stations, small or large, are capable of being transformed into major centres. Village de la Gare, a community 40 km outside of Montreal, Quebec, is a wonderful example of a suburban area that is making effective use of a commuter rail line leading into Montreal's downtown core. The local municipality joined with a local developer to plan a medium-density, low-rise community that will be home to 15,000 residents when completed. The station offers bicycle parking, car parking for commuters in the catchment area, and local bus service. Non-motorized transportation is prioritized by the design of ample sidewalks, narrow streets, bicycle paths, and greenery buffering the sidewalks from passing cars. The development incorporates local retail, green space, community facilities, and a primary school. Nearly half of the new residents cite proximity to transit as their #1 reason for moving to this community. The modal split is remarkably almost 50/50. This example shows that it is not only the central urban areas that are capable of creating hubs. If appropriately designed to provide choices, suburban mobility hubs can draw people from near and far.



Figure 19 Housing in St. Hilaire.

### 4.3 Designing For Function and Experience

What are the elements of an attractive sense of place within a mobility hub? How does the experience that one has while passing through a station affect transportation choices? Are there any special design features of the transit station, the surrounding place and the interface between the two that we can learn from? A key priority for the RTP is to create a system that is both functionally effective and user-friendly. This requires offering convenient amenities within the station area. This section highlights best practices from Atocha Station in Madrid, Millennium Park in Chicago, Fruitvale Station in the Bay Area and 16th Street Station in San Francisco.

## Focusing on the Experience – Madrid, Spain, Atocha Station

Atocha Station in Madrid acts as both a hub and a destination. In addition to the multi-modal transportation system, the oldest section of the station has been transformed into a high-quality public space featuring a tropical garden, shops and cafés. This shows that transit stations can serve more than utilitarian functions. As natural places in which people can meet and connect, they help create attractive and enjoyable spaces.

The Madrid system makes great use of intermodal stations – 'intercambiadores' – that are effective gateways between regional and local systems, and focal points of development and community structure.



Figure 20 Interior of Atocha Station, Madrid.

Combining a Unique Destination With a Mobility Hub – Chicago, Illinois, Millennium Park Millennium Park is a prime example of a mobility hub that serves as a destination itself. In the last decade, the park has been transformed from a massive surface parking lot and rail yard into a focal point of civic life, a centre for commuting and mobility, and one of the biggest tourist attractions in the city. Residents and visitors are offered a variety of transit options to, from, and within the park. Also offered are access to underground parking facilities, frequent buses and trains, a full-service bicycle parking facility, and a network of beautifully landscaped walking paths. The hub was designed to integrate seamlessly with the park, making a trip to work one of the most enjoyable parts of the day.



Figure 21 Millennium Park, Chicago.

### Integrating Safe and Secure Bicycle Parking With Hub Design – San Francisco, California, Fruitvale Station

Fruitvale Station, San Francisco Bay Area, is a mobility hub located in a medium-density, mixed-use, transit-oriented development. Notable among its amenities is an indoor, supervised bike station that offers free parking for 200 bicycles and a full-service repair facility, where commuters can have their bikes fixed while they work. The fact that the station is under surveillance offers people peace of mind, knowing their bikes will not be stolen or damaged.



Figure 22 Fruitvale Station, San Francisco.

### Designing to Integrate Transportation Modes – San Francisco, California, 16th Street Station

Designing for mobility can be as simple as creating a bicycle ramp. In San Francisco's 16th Street Station, a bicycle-friendly element was added to the existing stairwell to encourage cyclists to use transit. This feature is planned to be added to all stations in the city.



Figure 23 Bicycle ramp at 16th Street Station.

### 5 Mobility Hubs in the GTHA

### 5.1 The Role of Mobility Hubs in the RTP

Restructuring the region from a car-oriented urban area to a transit-supportive, multi-centric metropolis is not simply a question of linking potential hubs with 52 lines and connecting over a hundred higher-order stations. Not all of hubs are of equal importance - there is a significant hierarchy of hubs of different sizes. Not all of them have the location, land or market to accommodate or provide the anticipated demand. Not all of them are served by higher-order transit or provide for the connection between different transit modes. There is a wide variation in the density, use and mix of the catchment areas supporting the mobility hubs. Several of the system's strategically important stations do not have a significant land-use presence, but play a critically important transit functional role as more supportive or secondary hubs. While not as significant as primary hubs, their ease of mobility is nonetheless important.

Although the anticipated population and employment targets to the year 2031 are substantial, there is still a finite amount of development activity within the GTHA - activity with its own market and locational imperatives. This development activity will take place differentially over the 30-year horizon. Strategically identifying the mobility hubs with the greatest potential of enabling the desired metropolitan structure and directing infrastructure investment and growth toward them, will be critical to the success of managing growth and mobility within the GTHA. An additional issue is also critical. While much of the growth projected by Places to Grow for the GTHA is estimated to be captured by mobility hubs and other intensification areas, policies inducing a higher percentage of growth, particularly employment growth, may be necessary to generate effective transit demand. All higher-order transit stations deserve some mobility enhancements and a supportive development policy context, stretching as they predominantly do along the transit corridors between more significant mobility hubs.

Properly designating the number, hierarchy, function and location of the centres, destinations, and stations that will form the basis of a network of mobility hubs is fundamental to the success of the RTP. The most efficient metropolitan form would likely be a polycentric web surrounding a still dominant Toronto centre, with a limited number of large mobility hubs that are exceptionally well-connected with higher-order and high-speed mobility links between them. Each such mobility hub would be substantial in intensity and scale with a strong mix of employment and housing, generating sufficient demand to warrant higher-order transit and attracting reverse commutes with the downtown and balanced interaction with other hubs.

As with any urban structure, there is also likely to be a hierarchy of additional hubs that needs to be considered (intra-regional, regional, local-serving), all of which become part of the mobility network. The question for the RTP is how many, or few, major hubs should service the optimal network. Three models could be reviewed, as shown in Exhibit 10.

The selection of a regional hierarchy will emerge over the course of developing the RTP, based on optimizing the efficiency of the transit system it supports. The identification and encouragement of mobility hubs of different types would be supported by clear metrics to evaluate their success. Mobility hubs within Toronto should be expected to achieve a modal split of 50 per cent and a jobs/people target of 400/ha and even higher levels in central Toronto. Accelerated mobility hubs should set a modal split ambition of at least 50 per cent and a jobs/people target between 200 and 400/ha. Other mobility hubs should aim to achieve the Places to Grow intensification target of 200 people/jobs/ha and a modal split of 30 per cent. These are ambitious targets; each mobility hub will need to be assessed for its ability and required program to achieve them.

Targets should also be set in each mobility hub for the modal split to active transportation – since ultimately maximizing sustainable mobility is concerned with reducing auto-use – particularly rush-hour single-occupancy auto use – by whatever means available. Central Toronto is achieving an impressive 30 per cent active transportation modal split. Equally ambitious targets are necessary for the region's other mobility hubs.

### Options For a Regional Hierarchy of Mobility Hubs

A dispersed polycentric model	All mobility hubs are given equal consideration
A focused polycentric model	Central Toronto and a limited number (perhaps six to eight) of higher-order mobility hubs are designated as accelerated mobility hubs
A hyper polycentric model	Central Toronto and the accelerated primary mobility hubs are reinforced by a policy package designed to incent growth in those centres and limit it elsewhere

Exhibit 10: Options for a Regional Hierarchy of Mobility Hubs

### 5.2 Mobility Hub Candidates and Characteristics

Before determining how the galaxy of urban growth centres, higher-order transit stations and significant destinations can best contribute to improving overall mobility in the GTHA, it is important to understand their key characteristics and underlying potential. An evaluation of the total set of subway, GO, and Viva stations, and other major destinations, was undertaken on the basis of the following criteria to determine which of these places in the GTHA are more than transit stations and are truly mobility hub candidates. The criteria set out in Exhibit 11 were employed in the evaluation. These criteria imply a distinct hierarchy and categorization, since not all centres and other points of connectivity in the GTHA meet, or will meet, these criteria equally well. What they represent are the considerations that will affect decisions related to the investment and priority program.

### **Mobility Hub Criteria**

<ul> <li>Hosts one or more modes of higher-ord</li> </ul>	ler transit
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- Is considered for enhanced transit service
- Has an inter-regional destination or draw
- Has market demand to attract supportive levels of

mixed-use, intensive development

- Has land available for different types of development in and around mobility hub
- Is strategically located within the GTHA
- Is a unique visitation or tourism destination
- Exhibits potential for place-making

### Exhibit 11: Mobility Hub Criteria

The appendix assesses the urban growth centres, higher-order transit stations and other key destinations against these criteria. Fifty potential locations emerge that collectively constitute the important places in the region that the future transportation network must connect. These conclusions are summarized in Exhibit 12 which outlines the different groups of mobility hubs and their characteristics, and applies the program of potential improvements discussed later in Section 5.4.

Group		Characteristics	Target Metrics	Program			
Primary	Central Toronto	Regional centre, many transit stations, full inter-modal capacity, multiple destinations, very high jobs/people/ha, significant place	400+ people/jobs/ha; 60 per cent transit modal split; 30 per cent active transportation among area residents	Full program of mobility hub improvements centered around renovation of Union Station, with station improvements at all downtown stations			
	Subway centres	Major centres, several transit stations, inter-modal capacity, high people/jobs/ha, several destinations, sense of place	400 people/jobs/ha; 50 per cent transit modal split; 30 per cent active transportation among area residents	Public destinations, public space, substantial retail, full bicycle station, car-share station, daycare			
	Urban growth centres with critical mass	City centres, one or more transit stations, inter-modal capacity, medium jobs/people/ha, several destinations, civic presence, major retail	200-400 people/jobs/ha; 30 per cent transit modal split; 25 per cent active transportation among area residents	Major public destinations, public space, substantial retail, full bicycle station, car-share station, daycare			
Secondary	Emerging centres: First tier	Town/smaller city centres, one or more transit stations, inter-modal capability, several destinations, retail, some civic presence, significant development potential	200 people/jobs/ha; 30 per cent transit modal split; 20 per cent active transportation among area residents	Destinations, major public space, ubstantial retail, full bicycle station, ar-share station, daycare			
	Emerging centres: Second tier	Town/smaller city centres, one or more stations, some destinations, retail development potential	200 people/jobs/ha; 30 per cent transit modal split; 15 per cent active transportation among area residents	Retail presence, full bicycle station			
	Unique destinations	tions Universities, colleges, airports, shopping As appropriate Customized					
Tertiary         Gateways/ Inter-modal stations         Inter-regional and/or inter-modal interchange station		As appropriate	Full bicycle station, car-share station				
Higher-order stations on higher-order transit line			As appropriate	*Signage, lighting, weather-protection, service and area info boards, kiosks where possible, pedestrian access, bike lanes, bicycle parking, specialized parking standards, station area supportive development zoning, station area master plans.			
*All stations inclu	ding those in mobi	lity hubs would receive this program.					

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### Exhibit 12: Mobility Hubs: Characteristics, Target Metrics and Programs

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Figure 24 Commuters at Union Station.

Figure 26 Mississauga City Centre.

#### **Central Toronto**

By the year 2031, the region will still be dominated by the largest single centre, central Toronto. While mature in scale, mix and modal-split, this centre is still growing vigorously and benefiting from increasingly improved transit service. Central Toronto contains the most important hub in the region, Union Station, but the numerous other subway stations in the centre have important contributory roles to play.



Figure 25 Yonge & Eglinton, Toronto.

#### **Subway Centres**

The second group comprises subway centres, which can accommodate very high levels of mixed use, walkable densities. For example, both Yonge-Eglinton and North York Centre are substantial in scale, exhibit reasonable jobs/people mix, and attract high levels of transit use by virtue of their higher-order current and future transit service. These relatively mature mobility hubs are functioning well in terms of modal splits and critical mass of development and have some, albeit limited, opportunities for expansion. Nonetheless, their function as mobility hubs can be enhanced through improved connection to catchment areas and between transit modes.

### **Urban Growth Centres With Critical Mass**

The third group of primary hubs includes Scarborough, Etobicoke, Mississauga and Hamilton. These centres, particularly Mississauga and Hamilton, have significant scale in residential and retail development, but under-perform in transit usage due to the lack of a commensurate employment base and, for most, the absence of immediately adjacent higher-order transit. However, significant transit improvements are underway or contemplated to serve the centres, and others could be explored. All of these centres have very significant capacity for new development, although policy and practical interventions are required to optimize that potential.



Figure 27 Langstaff GO station, Richmond Hill.

## Emerging Centres – Urban Growth Centres With Medium Densities

A large group consisting of emerging centres can be identified. Each has its own set of reasons for its current lack of critical mass – lack of market demand, distance from the higher-order transit station, poor land arrangements, infrastructure impediments, and/or inadequate catchment area. Most of them have low modal splits. There are, however, some promising first-tier centres that do have the necessary economic, land, locational, environmental or other attributes for success as substantial mobility hubs. They can be ranked by these characteristics and by their estimated year 2031 size into first- and second-tier sub-groups.



Figure 28 Pearson International Airport.

#### **Unique Destinations**

The fifth grouping is made up of the unique destinations. Most significant of these is Toronto Pearson International Airport, unserved now by higher-order transit, which is not only the destination for the GTHA's air travellers but also a major employer in its own right and at the heart of the second largest concentration of jobs in the region. In addition, there are several unique places in the region that have many of the characteristics of mobility hubs but not all of which are currently served by higher-order transit. Exhibition Place is a major occasional destination, dependent upon its unique pattern of events. Parc Downsview Park has the accessibility to support a significant destination, although its future role awaits definition. A new Pickering Airport would become an important hub, as could Hamilton International Airport. Certain major shopping centres, such as Yorkdale Shopping Centre, can also be considered as destinations.

The journey-to-education trip is a critical part of transportation demand. Significant expansion of higher education is being contemplated in the GTHA. York University is currently a major transit demand generator by virtue of its educational function, and may increasingly become a more rounded mobility hub with the extension of the Spadina line and complementary development. A number of other major educational institutions, the University of Toronto at Mississauga, the University of Toronto Scarborough Campus, the University of Ontario Institute of Technology/Durham College in Oshawa, McMaster University and several community colleges are all important growing destinations. These could become the core of more substantial development-driven demand, although there appears to be no clear, cost-efficient means of providing higher-order transit to several of them.



Figure 29 GO Transit station in Mississauga.

### **Higher-Order Stations**

There are several stations on the higher-order system that, while located in an intensification corridor, lack any of the attributes of a full mobility hub, and are unlikely to attain them. But these still can be improved to increase their service to the overall system and to their riders and neighbourhood.



Figure 30 TTC Kipling Station, Toronto.

### **Gateways/Inter-Modal Stations**

Within the general group of higher-order stations, several stations, such as Kipling, York Mills or the proposed Renforth Station do or will play an important role as gateways, providing connections between major regional transit systems and/or transit modes.

The RTP will have to assess the optimal hierarchy of centres from a transit operation perspective, and which deficiencies in each of the potential candidate growth centres can be most effectively remedied. The maps of urban density in years 2001 and 2031 (Exhibits 13 and 14) give a good sense of the current topography of demand in the future region under 'business as usual' conditions. Although the growth centres are increasingly identifiable, the overall pattern of growth is still dispersed. This gives rise to several questions. Are fewer, larger mobility hubs preferable? Which hubs have the greatest market opportunity? Which are most cost-effective in terms of transit and related infrastructure investment? Should major hubs be connected by express transit lines as in many other metropolitan areas? Which mobility hubs could be prioritized as demonstration sites? How is growth most effectively directed to these centres and diverted from greenfields? How can the development industry be meaningfully engaged in this discussion? All these questions need to be answered within the context of the bigger themes of the RTP.



### Exhibit 13: Regional Jobs/People Density 2001

Source: Statistics Canada and IBI Group



### Exhibit 14: Regional Jobs/People Density 2031

Source: IBI Group

### 5.3 The Structure of Mobility Hubs

Once the regional structure and hierarchy of mobility hubs is determined, objectives can be established for the optimal character and structure of the hubs themselves. Those characteristics can be listed as follows.



Figure 31 World Exchange office, Ottawa.

### The Key Role of Employment Space

Employment space is the key determinant of local transit demand in a mature mobility hub. Obtaining the necessary residential densities in growth centres, while challenging, is less difficult than encouraging the concentration of new office development. Successful mobility hubs should have a balance of jobs and housing that can encourage reverse commutes, thus balancing load levels and taking advantage of unused capacity. They also minimize total parking demand and potentially capture one or more trips of a multi-job household. Each mobility hub needs to ensure available land supply, parking strategy and infrastructure readiness, and must also determine the most effective policy and incentive framework to support employment growth.



Figure 32 Ice skating at Millenium Park, Chicago.

### The Need for Multiple Destinations

The most efficient and attractive mobility hubs will combine major retail, civic, cultural, entertainment, and health centre destinations within their basic employment and housing mix. Such facilities add ridership to the system in ways that are complementary to the dominant pattern of peak-hour use. One of the major shortcomings of the transit system in the suburbs is the lack of consistent demand outside of the rush hours that can support and attract an increasing volume of riders throughout the day. New public, cultural and institutional buildings should be directed to mobility hubs to take advantage of, and support, their improved transit service.



Figure 33 A parking structure in Toronto, fronted by an attractive, pedestrian-friendly streetscape.

### **Resolution of Parking Strategy**

Even after significant raising of modal splits, the needs of suburban development for market-required parking must be satisfied in plausible ways if the development potential of large mobility hubs is to be realized. A successful mobility hub will be characterized by serious attempts to deal with parking provision in the most space- and cost-efficient way, through limitation of overall supply and phasing out of existing surface parking, use of hydro and other unusable rights-of-way, provision and public management of collective parking structures. Parking structures built without the benefit of a long-term strategy for station area development could frustrate future development efforts. Creating transportation management associations and mandating station area master plans to help implement effective transportation and parking demand arrangements will be of critical importance.



Figure 34 New York City.

### **Connections to the Catchment Area**

An effective mobility hub will generate substantial transit demand given its density and mix of uses. Its success is supported by overlapping networks of connections with the surrounding area. Local transit routes feeding into the hub, bicycle lanes and trails, and pedestrian routes can all provide fluid service into the hub. That catchment area is generally quite contained, typically within a 0.5 to one km radius of a subway station and a three-to-five km radius of a GO station. Particularly around GO stations, the primary travel mode to the station is now by car, as demand surrounding suburban hubs is typically dispersed in low-density, separated districts. An innovative, responsive feeder transit system is needed to capture much of that demand, along with local mobility alternatives such as taxi and car-share programs. Catchment area transit strategies offer one of the biggest opportunities for the implementation of user-activated services, different vehicle modes and experimentation with different forms of local service delivery. Alternatives to the transit agency provision and to the typically large buses provided could take the form of shuttle vehicles operating under taxi-type area franchising.



Figure 35 The attractive interior of Grand Central Station, New York.

### **Creating a Place**

A successful mobility hub will transform the functional environment of so many current transit stations into a convenient and pleasurable experience. The immediate area around the station can be designed and developed to provide a great sense of arrival and departure even for the most jaded commuter – the grandeur of Grand Central Station at one extreme or the pleasant environment of suburban rail stations around older cities like London, Paris and New York at the other, come to mind. New European systems have typically developed 'transit plazas' around new mobility hubs, consisting of a well-designed public space supported by shopping and services. Other jurisdictions have used the phrase 'transit village'. Both express the idea that transit and the surrounding city are intimately, not just functionally, connected.



Figure 36 Pearl District TOD station, Portland.

### Compact and Walkable

The optimal mobility hub will be as compact as possible, allowing the concentration of a range of uses and destinations readily accessible by foot. This will benefit everyone, but particularly seniors, people with disabilities, and parents with small children. Walking is the least acknowledged, but most effective way of getting around within a mobility hub. A supportive pattern, density and mix of uses are essential. Substantial distances are already travelled on foot in the region where the environment is conducive to walking. Some 30 per cent of workers who live in downtown Toronto now get to their place of employment on foot. Many transit stations will need to be redesigned with active transportation in mind. Creating and fostering an environment conducive to walking is not just a question of getting the big moves right; the micro-environment of pedestrian priority in streetscape and key crossings, landscaping, weather-protection and activity is equally important.

An active transportation strategy not only supports the hubs – it adds benefits to the surrounding neighbourhoods themselves, as they can access the retail, service and employment opportunities focused around the station.



Figure 37 Real-time information, New York's Penn Station.

#### Advertisement For the System

The station is, along with the transit vehicle itself, the best (or the worst) advertisement for any transit system. Stations have to be designed to provide a high quality of functional access; they should be a statement about the values of the transit operators and their respect for their ridership. All aspects should be designed with care and attention that reflects well on the quality of brand and generates consumer loyalty to it. The role of information technology to support that behaviour change, facilitating a compelling transit offer through regional transit integration, real-time information, variable pricing, branding and loyalty rewards, should not be underestimated. In a modern city, transit is a consumer product just like any other for those with choices. The majority of those consumers must be attracted to the new transit system.

### 5.4 The Design of a Mobility Hub

The detailed design of mobility hubs, the seamless integration of the station, the network of contributing streets, spaces, pathways and trails that can be accessed by all citizens, the sense of place, the comfort and convenience of the transit user – all of these detailed elements have a considerable influence on attracting transit users and providing a competitive amenity to that of the private car. The following list indicates the scale of the design opportunities within a mobility hub.

These facilities provide benefits for the transit user. They can also, if well-designed, be a source of branding and identity for both the system and the individual station. The advertisement and media revenue opportunities are considerable, particularly if applied system-wide so that standards, consistency and brand are most easily controlled.

There are also great opportunities to incorporate good green design, public art, and architectural and urban design excellence. A feature could be made of a high environmental standard of building design as part of the messaging of the overall transit system, by adopting Leadership in Energy and Environmental Design (LEED®) as a requirement for all transit-related development. (LEED® is the nationally accepted benchmark for design, construction and operation of high-performance green buildings.)

While a minimum program of facilities and services should be available at every higher-order station, not all stations or growth centres will have the physical environment or market support for the full range of such features as listed in Exhibit 15.

The Design of a Mob	ility Hub
At the station	<ul> <li>Clear, easy, convenient access to stations for all</li> <li>Good signage</li> <li>Good lighting</li> <li>Weather-protected, heated waiting areas</li> <li>Washrooms/change rooms</li> <li>Bicycle stations</li> <li>Real-time service information</li> <li>Service kiosks with refreshments, papers, etc.</li> <li>Local destination map/information</li> <li>Internet connectivity</li> <li>Place-making and public art</li> <li>Travellers' aid/telephones</li> <li>Virtual workplace</li> <li>Safe environmental design</li> <li>Car-share program</li> </ul>
Around the station	<ul> <li>Transit plaza</li> <li>Transit links to nearby destinations</li> <li>Convenience shopping (dry cleaning, flowers, etc.)</li> <li>Daycare</li> <li>Pleasant open space</li> <li>Cultural, educational, entertainment, institutional uses</li> <li>Convenient connections between modes (weather-protected pedestrian walkways, shuttle buses)</li> <li>Cafés/restaurants</li> <li>Grocery store</li> <li>Personal services (banking, etc.)</li> <li>High Occupancy Vehicle preferred parking Plug-ins for electric vehicles</li> <li>Facilities for delivery of goods</li> </ul>

Exhibit 15: The Design of a Mobility Hub

### 6 Creating Successful Mobility Hubs: Options for Action

There is no doubt of the desirability and feasibility of creating a system of successful mobility hubs across the GTHA, linked by higher-order transit, with each becoming a destination in its own right. However, there are serious market, organizational, financial and policy impediments to their creation. They will not happen by themselves. This section sets out the strategy for creating those hubs, and the roles to be played by various public sector governments and agencies, as well as by the private sector.

	Incremental	Bold				
Policy framework	<ul> <li>Policies in <i>Places to Grow</i> on urban growth centres, intensification corridors, major transit station areas, employment lands, and transportation</li> <li>Current regional/area official plan revision processes</li> <li>Current employment and residential distribution</li> </ul>	<ul> <li>Mobility hub hierarchy and differentiation</li> <li>'Mobility hub' designation with associated policies on minimum densities, employment, parking, concentration of destinations, walkability, connections to catchment area</li> <li>Greater concentration of employment and residential in strategic mobility hubs</li> <li>Regulation and severe disincentives to development outside of mobility hubs</li> <li>Metrolinx formal planning role in areas immediately around hubs</li> <li>Station area master plans required for all higher-order transit stations</li> <li>Moderation of regulatory impediments that result in sprawling transit facilities lacking adjacent mixed-use facilities</li> </ul>				
Financing mobility hubs	<ul> <li>Current regional/municipal infrastructure processes plus Metrolinx investments</li> <li>Use of planning tools such as Section 37, Community Improvement Plans</li> </ul>	<ul> <li>Designation of Community Improvement Plan areas to use area development charges and expropriation powers</li> <li>Designation of Tax Increment Financing districts</li> <li>Value-capture strategies</li> <li>Application of Metrolinx revenue tools to finance transportation and mobility hub investments</li> <li>Support of local transit services in catchment areas</li> <li>Explore opportunities for public-private partnerships</li> </ul>				
Parking strategy	<ul> <li>Reduced and maximum parking requirements</li> <li>Payments in lieu of parking</li> <li>Parking consolidation</li> <li>Park-and-Ride lots relocated and/or structured</li> <li>Creation of parking authorities</li> </ul>	<ul> <li>Radical reduction in parking demand through catchment area transit, active transportation, transit management associations, mixed-use development</li> <li>Separate pricing of transit fares and parking charges (eliminate free parking)</li> <li>Provincial tax and assessment policy to restructure parking market and eliminate 'free' parking</li> </ul>				
Sustainable development	Promote area and regional 'green' policies	<ul> <li>Require LEED ® Gold for all transit-related development</li> <li>Radically reduce surface parking areas</li> <li>Promote pervious paving and enhanced storm water management</li> <li>Promote ambitious tree planting and other greening programs around stations</li> <li>Utilize renewable energy sources where possible</li> <li>Locate new public institutions in or adjacent to mobility hubs</li> </ul>				
Leadership	<ul> <li>Municipally led mobility hub implementation</li> </ul>	<ul> <li>Creation of 'expertise centre' at Metrolinx</li> <li>Establishment of transit-oriented development agencies at municipal/regional/Metrolinx level</li> <li>Protocols for private sector engagement as enabling developer</li> <li>Support for strategic site assembly</li> </ul>				
Demonstration hubs	• All mobility hubs advanced in parallel	<ul> <li>Identification of four to six key accelerated mobility hubs</li> <li>Provision of start-up costs and expertise resources by Metrolinx</li> <li>Inter-governmental facilitation by Metrolinx</li> <li>Site acquisition and infrastructure funding strategies</li> </ul>				

### **Exhibit 16: Mobility Hub Implementation**

### 6.1 Policy Framework For Implementation

Places to Grow provides the overall planning direction for the city-region and clearly provides direction for more complete, transit-supportive land use planning and design. Regional and area municipal Official Plans are currently being refined to bring them into conformity with Places to *Grow*. Those policies, which will fundamentally support the development of mobility hubs, must be further defined and strengthened, and the overall objectives of the RTP reflected. In particular, the Growth Plan policy directions on ensuring that office employment development is located where there is higher-order transit instead of locations only served by roads and highways must be further articulated in those new Official Plans and be sufficiently robust as to direct such activity to mandated locations. Similarly, all public bodies must ensure that any new major capital facilities for health, education and provincial government services are always located in or immediately adjacent to mobility hubs.

The province, the regions and the municipalities will also have to seriously consider the strategic hierarchy of mobility hubs. There has been a tendency at the local level to support more centres than the regional economy can competitively develop or that the transit system can efficiently serve. All centres and stations should provide improved mobility, but a difficult yet nonetheless essential triage identifying the different tiers of hubs of different size and function, and the appropriately associated investment, will be necessary. This hierarchical strategy should be reflected in new local planning policy. At the same time, all stations should strive for a minimum of attributes - minimum densities, mixed developments, parking maxima, appropriate applications of development charges or tax incentives, and an area plan to inform development.

Consideration should be given to establishing a 'mobility hub' designation, similar to the London, U.K. PTAL or U.S. Transit Oriented Development specifications. Appropriate policies regarding minimum density and use targets, sustainable parking strategies and related urban design ambitions could be located in a provincial planning policy statement, where it would provide guidance for municipalities and the Ontario Municipal Board.



Figure 38 Example of a visioning workshop.

### 6.2 Financing Mobility Hub Creation

In areas where potential mobility hubs are underdeveloped because the market has not yet perceived their locational advantages as superior to non-transit locations, a variety of municipal financial techniques should be explored to aid in their start-up. The tax increment financing (TIF) legislation recently enacted by the Government of Ontario provides one potentially highly effective development tool. TIFs are a technique for anticipating the property tax benefits that will accrue as a result of increased development caused by infrastructure investments and for capturing that anticipated revenue to help fund that infrastructure. Few TIF districts have yet been created in the GTHA but their potential financial contribution could be substantial in a case where strategic transit or related investment can unlock a potential market.

Municipalities have other tools available. They can create Community Improvement Plans for designated areas and use the consequent legislative powers to facilitate expropriation where warranted, as well as to establish a customized Development Charge for that district. Difficult strategic choices are necessary for how to structure such charges and other value-capture techniques – whether to increase them to recoup infrastructure investments and thus risk alienating development, or to lower them relative to the surrounding areas, risking a reduction in the required revenue stream.

In addition, municipalities can use the provisions of Section 37 of *The Planning Act* to secure funds or transit-related facilities in exchange for granting change of use or increases in height and density. Given the relatively undeveloped character of many of the centres and associated station areas, this section could be effectively deployed. However, care must be taken by area municipalities to avoid inadvertently creating 'planning inflation', in which land values and the 'base permission' for Section 37 purposes rise in the anticipation of mobility hub creation.

Metrolinx is currently preparing an Investment Strategy which will consider the role of such local financing opportunities in addition to system-wide funding choices.



Figure 39 Congestion charge zone in London, England.

### 6.3 Dealing With Parking

The imperatives of parking provision are a major restraint on the ability to develop many mobility hubs as employment and retail centres. Both the provincial and municipal governments can play a major role in changing the economics of parking. Consideration should be given at the provincial level to differential assessment and taxation policies that tilt the financial balance away from surface parking towards various forms of structured parking. Area municipalities must be vigilant in developing and enforcing maximum parking provision limits for new development, They must facilitate the redevelopment of surface parking lots even if that results in a reduction in parking provision for existing buildings. Tightening the parking market, along with the steady elimination of free parking across the GTHA, would create a revenue stream that is essential to support more expensive but land-efficient parking structures.

Great potential exists for municipalities, often in partnership with transit agencies, to develop major parking structures as a common pool for a mobility hub. The Toronto Parking Authority and its predecessors have been exemplary in this regard both downtown and in North York Centre. Public parking agencies that can provide parking for both new development and transit operations could be established in other centres. Such agencies would have the ability to amortize parking creation costs over a longer time period than individual private parking suppliers and could be supported by structuring parking 'payments-in-lieu' for new development. In that way, municipalities can offer prospective development investors an available supply of parking within the mobility hub and control its long-term pricing.

Some change in operating behaviour by the major transit agencies may also be necessary. Currently, effectively free parking is frequently offered as an inducement to transit riders, its cost incorporated in the overall operating costs of the service. This leads to large, single-use surface parking areas surrounding many of the stations, inhibiting their development as mobility hubs. Strategies for reducing and/or eliminating free parking at mobility hubs should be explored using a phased approach. The elimination of free parking must be complemented by enhanced local transit service (including more frequent local transit service in off-peak hours) and incentives for using alternatives to single-occupancy private cars to get to the mobility hub (such as differential charging depending on the number of passengers in the vehicle).

The design and management of parking facilities must also reflect the new mobility as well as 'safe design'. Priority should be given to high-occupancy vehicles, energy-efficient vehicles, energy-recharge stations, bike stations, and car-share companies – all in advance of single-occupancy cars.



Figure 40 Structured parking facility in Munich, Germany.

### 6.4 Who Should Lead Mobility Hub Creation?

Developing a mobility hub is not always easy, even when the economic and land-owning conditions are favourable. It requires considerable understanding of development, sophistication in inter-government and agency relations, skill at relating to surrounding communities, as well as an appetite for risk and 'deal-making'. Many of the undeveloped mobility hubs are located in smaller municipalities which may lack great experience in such complex, large-scale urban land development. Other hubs are endowed with large land assets, but which are owned by a transit agency that regards transit operation as being its core business, rather than urban development.

Consideration should be given to strengthening transit-oriented development capability in a number of ways. If area municipalities have the capability to undertake the lead role in the detailed enabling and development of their mobility hub or hubs, they may still lack some of the financial start-up resources to hire or retain the expertise necessary to advance the mobility hub concept to the point where it can become attractive for public and/or private development. A start-up program to help or partner with municipalities in this early stage of mobility hub business and development planning might be effective.

A useful example of a municipality leading mobility hub creation has been set by York Region, which has established the York Region Rapid Transit Corporation with a dual mandate to implement the VIVA initiative and to foster and promote transit-oriented development. The Corporation can develop opportunities for city building around existing and proposed transit stations, converting stations from their traditional roles as terminals into mixed-use facilities, and uses alternate financing procurement strategies to encourage efficiency in the design and execution of new transit projects. The design, construction, operations, maintenance and financing of new bus routes and stations can be bundled into one project, and packaged for private sector involvement. This strategy encourages efficiency, transfers appropriate risk to the private sector, and allows the Corporation to introduce incentives for completing projects on time and on budget.

Transit agencies in other countries have established their own development companies, capable of undertaking the development of lands owned by the agency and of acting as coordinating developer for a wider area. In a variant of this approach, some agencies – RailTrack in the U.K., for example – take a slightly less direct development role. They procure an 'enabling developer' in a structured partnership with the private sector to take control of appropriate projects at an early stage. The Toronto District School Board recently established a real estate development subsidiary, which also could be regarded as a precedent.

Consideration should be given to establishing a region-wide urban development agency that would be responsible for advancing development around mobility hubs and charged with managing the real estate assets of current transit agencies to that end. Consolidation of such property assets would have several benefits. It would allow the focus of expertise on transit-oriented development and it would facilitate partnering with a range of private sector financing and development interests. The role of the private sector in helping realize mobility hubs is critical, since the hubs will consist of the integration, sometimes in the same building, of both transit infrastructure and substantial private development.

### 6.5 Demonstration Mobility Hubs

Nothing in the transit development and land use innovation world succeeds like successful examples. The GTHA needs to demonstrate how initial mobility hubs can be created and what great examples they will be for the city-region. Historically, the hubs developed by the TTC along the Yonge Street line, with the concentrations of mixed-use development and their weather-protected inter-modal stations, set a standard for the world. Now the rest of the world provides inspiration for us.

As shown in the appendix, many of the mobility hubs, identified previously in Exhibit 5, are already underway. A good understanding of what steps are necessary to realize their full potential exists at the municipal and regional level. Others, however, could benefit from more direct assistance from Metrolinx through the RTP.

Consideration should be given to identifying a limited number (perhaps four to six) mobility hubs across the GTHA that might benefit from an informational, financial and 'trouble-shooting' program led by Metrolinx. These hubs could act as demonstration sites, and act as pilots for testing the concept of mobility hubs and the necessary partnerships. Such a program might include:

- Financial support for start-up soft costs in the preparation of project-scoping business and development plans;
- The provision of centralized specialist expertise on real estate development, property tax-based development incentives, Alternative Project Financing and related matters; and
- Inter-governmental and inter-agency facilitation.



Figure 41 North York and Downtown Toronto.

## Appendix A: Mobility Hubs Candidates and Characteristics

Mobility hub candidates	Region	Current intermodal capability	Planned intermodal capability	Current transit modal split	Current station characteristics	Current state of hub maturity	Regional planned function	Current development pattern as transit supportive	Major institutional destinations	Major destinations, draws, distinctive features	Key place-making elements	Potential for growth
Qualifiers		GO train, GO bus, local transit, ferry, VIA rail, regional trails, local bicycle routes	Move2020, other regional or local planned infrastructure	Transit as a proportion of total trips (where available)	transit shelter; transit building; integrated centre	mature, emerging, planned	centre, downtown, transit centre	yes, planned, no	hospitals, university, colleges, government services, city hall (0-5)	retail, cultural, entertainment (0-3)	public spaces, markets, natural features, landmarks, community focal points	high, medium, low
Central Toronto												
Central Toronto	Toronto	Subway, LRT, GO train, GO bus, ferry, VIA rail, bus, bicycle trails, PATH system, bus terminal	GO train	55-60 per cent	Centre	Mature	Downtown	Yes	5	3	Yes	High
					Subway C	entres						
North York Centre/Sheppard	Toronto	Two subway lines, GO bus		25-30 per cent	Centre	Mature	Centre	Yes	2	3	Y	High
Yonge-Eglinton Centre	Toronto	Subway	LRT	40-45 per cent	Centre	Mature	Centre	Yes	0	2	Yes	Medium
Urban growth centre	s with critic	al mass										
Downtown Hamilton	Hamilton	GO train, GO bus, inter-city bus, B-line express bus	GO train, LRT, VIA rail	10-15 per cent	Building	Mature	Downtown	Yes	4	3	Yes	High
Etobicoke	Toronto	Subway, GO train,	LRT	20-25 per cent	Building	Emerging	Centre	Planned	2	0		High
Mississauga City Centre	Peel	GO bus, regional bus terminal	BRT	5-10 per cent	Building	Emerging	Downtown	Planned	3	3	Yes	High
Scarborough Centre	Toronto	LRT, GO bus, inter-city bus	LRT	15-20 per cent	Centre	Emerging	Centre	Yes	2	3	Yes	High
			E	merging Centres	– urban growth	centres with m	edium densiti	ies				
Brampton	Peel	GO train, GO bus, VIA rail	LRT, GO train, BRT	5-10 per cent	Building	Emerging	Downtown	Yes	2	1	Yes	Medium
Burlington	Halton	GO train, GO bus, VIA rail		0-5 per cent		Mature	Centre	No	1	1	Yes	Low
Markham/Markville Centre	York	GO train, Go bus, VIVA terminal	BRT	0-5 per cent	Shelter	Planned	Centre	Planned	2	2	Yes	High
Milton	Halton			0-5 per cent								
Newmarket Centre	York	GO train, Go bus, local transit hub, VIVA terminal	VIVA	0-5 per cent	Shelter	Emerging	Downtown	Planned	2	1	Yes	High
Oakville Midtown	Halton	GO train, GO bus, VIA rail	BRT, GO train	0-5 per cent	Building	Planned	Centre	Planned	0	1	No	High
Oshawa	Durham	VIA rail, GO train, GO bus, bicycle trails	GO train, BRT	5-10 per cent	Shelter	Emerging	Centre	No	3	2	Yes	Medium
Pickering	Durham	GO train, GO bus	GO train, BRT	0-5 per cent	Shelter	Planned	Centre	Planned	3	1	No	High
Richmond Hill / Langstaff Gateway	York	GO train, GO bus, VIVA terminal	Subway, VIVA, BRT	10-15 per cent	Shelter	Planned	Centre	Planned	1	1	Yes	High
Vaughan Corporate Centre	York	GO bus, VIVA	Subway, VIVA station	0-5 per cent	Shelter	Planned	Centre	Planned	0	1	No	High

Mobility hub candidates	Region	Current intermodal capability	Planned intermodal capability	Current transit modal split	Current station characteristics	Current state of hub maturity	Regional planned function	Current development pattern as transit supportive	Major institutional destinations	Major destinations, draws, distinctive features	Key place-making elements	Potential for growth
Gateways/int	er-modal statio	ns										
Don Mills Station	York	VIVA terminal, TTC			Shelter	Emerging	Transit centre	Planned	0	0	No	Low
Finch	Toronto	Subway, GO bus, VIVA terminal	BRT		Centre	Mature	Transit centre	Yes	0	1	No	High
Kennedy	Toronto	Subway	LRT		Shelter	Emerging	Transit centre	No	0	0	No	High
Kipling	Toronto	Subway, GO train	LRT		Building	Emerging	Transit centre	No	0	0	No	Medium
Renforth	Peel/Toronto		BRT/LRT			Emerging	Transit centre	No	0	0	No	Low
Unique Desti	nations											
Parc Downsview Park	Toronto	VIVA terminal, subway			Building	Planned	Centre	Planned	0	1	No	High
Exhibition Place	Toronto	Streetcar, GO train, bicycle station			Shelter	Emerging	Centre	Planned	1	1	Yes	Medium
McMaster University	Hamilton	GO bus, B-line			Shelter	Planned		Yes	1	0	No	High
York University	Toronto	VIVA terminal, GO bus, TTC bus	Subway, BRT		Shelter	Emerging	University centre	Planned	1	0	Yes	High
Toronto Pearson International Airport	Toronto	Downtown bus service, TTC bus	Air/Rail Link, BRT		Shelter	Planned		Yes	0	1	No	High
Pickering airport	Durham		Go train			Planned						
Hamilton International Airport			A-line									
UOIT	Durham	Durham transit			Shelter	Planned		Yes	1	0	No	High
UTM	Peel	GO station in proximity			Shelter	Planned		Yes	1	0	No	High
UTSC	Toronto				Shelter	Planned		Yes	1	0	Yes	High
Mohawk College			A-line									

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## **Appendix B: Photo Credits**

Photo Name	Source	Description
01 St Pancras Station - London	Stéphane Goldstein	St. Pancras International Train Station, London
02 Mississauga GO station	http://www.flickr.com/photo_zoom.gne?id=436778665&size=o Gene Wilburn	Buses arriving at a GO train station in Mississauga
03 Denver TOD	Jeff Wood - Reconnecting America	Passengers waiting for a tram at a busy mobility hub in Denver, Colorado
04 Madrid Avenida de America - intermodal	http://www.flickr.com/photo_zoom.gne?id=357184702&size=l Daqualla Manera	Madrid Avenida de America station - an intermodal hub
05 Kids waiting for GO train	http://www.flickr.com/photo_zoom.gne?id=2070703106&size=o Nikki Woodson Blair	Kids waiting for a GO train
06 Brampton GO parking lot	http://www.flickr.com/photo_zoom.gne?id=284159163&size=l Faded Photograph	A GO parking lot in Brampton
07 Mississauga Square One Mall	http://www.flickr.com/photo_zoom.gne?id=172335406&size=l Jessie Boy	A movie theatre surrounded by large surface parking lots in the Mississauga City Centre
08 Burlington	http://www.flickr.com/photo_zoom.gne?id=922343070&size=o Yvie	A GO station located outside of downtown Burlington
09 Brampton	Urban Strategies	A typical suburban intersection in Brampton
10 Madrid Principe Pio	http://www.flickr.com/photo_zoom.gne?id=51290182&size=o Miguel Abanico	Madrid Principe Pio station

Photo Name	Source	Description
11 Image of Denver transit	http://www.flickr.com/photo_zoom.gne?id=299725752&size=l Kevin Hoyt	Passengers waiting to board a tram at a busy mobility hub in Denver, Colorado
12 Madrid graph	José Manuel Vassallo http://siteresources.worldbank.org/INTTRANSPORT/ Resources/336291- 1171658979314/3465102-1175712481687/Madrids_ Presentation_FINAL.pdf	Graph of annual transit trips in Madrid
13 Bremen good	http://www.flickr.com/photo_zoom.gne?id=390699783&size=l James Aslaksen	A bus and tram in downtown Bremen
14 Den Haag	http://www.flickr.com/photo_zoom.gne?id=475460100&size=l Alper Cugun	Pedestrians walking outside of Den Haag Central Station
15 Portland train and bus	http://www.flickr.com/photo_zoom.gne?id=372986553&size=o Aaron B. Hockley	A bus and LRT in Portland
17 Denver Colorado	http://www.denverinfill.com/images/blog/2006-11/2006-11-11_cew4.jpg denverunionstation.org	Illustration of Station Master Plan for Denver
18 St Paul Good	Urban Strategies	Illustration of transit hub in St. Paul
19 St Hilaire	http://www.gomaison.com/gomaison/promotion/domus/2006/unifamilial/a.asp Gomaison.com	Residential streetscape in St. Hilaire
20 Atocha Station Madrid	Barry Hogard http://www.flickr.com/photo_zoom.gne?id=514028852&size=l	Interior of Atocha Station in Madrid, with plenty of natural lighting and vegetation
21 Chicago Millenium Park	http://www.flickr.com/photos/pabloe/163723008/ Pablo Est	A busy Millennium Park, Chicago

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Photo Name	Source	Description
22 Oakland, Fruitvale Station TOD	http://www.flickr.com/photos/paytonc/1321716227/	View of Fruitvale Bike Station in San Francisco area
23 Bike parking 16th station san fran	http://www.flickr.com/photo_zoom.gne?id=1394203524&size=o Doc Pop	Bicycle ramp at 16th Street Station, San Francisco
24 Toronto Union Station Commuters	http://www.flickr.com/photo_zoom.gne?id=102363603&size=1 Paul Amiko	Commuters waiting to board GO train at Union Station
25 Yonge & Eglinton	Hambly & Wooley	A bustling sidewalk near Yonge & Eglinton, Toronto
26 Mississauga City Centre	http://www.flickr.com/ photo_zoom.gne?id= 172335694&context= photostream&size=l Faded photograph	View of City Hall and new condos at Mississauga City Centre
27 Richmond Hill Langstaff GO station	http://www.flickr.com/photo_zoom.gne?id=163572647&size=o Alex Indigo	Passengers waiting for a train at Langstaff GO station, Richmond Hill
28 Pearson Airport	Urban Strategies	Customers walking inside a terminal at Pearson International Airport
29 (Same as 02)	http://www.flickr.com/photo_zoom.gne?id=436778665&size=0 Gene Wilburn	Buses arriving at a GO train station in Mississauga
30 Kipling	http://www.flickr.com/photo_zoom.gne?id=362063466&size=l Swire Chin	Bus platform at <b>Kipling</b> <b>Station, Toronto</b>
31 Ottawa office world exchange	Steve Brandon	View of <b>World Exchange</b> office buildings, Ottawa
32 Ice skating at Millenium Park, Chicago	http://www.flickr.com/photo_zoom.gne?id=2060988034&size=l Bryan Fenstermacher	Busy skating rink at Millenium Park, Chicago

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Photo Name	Source	Description
33 T-O-Parking-Structure copy	Urban Strategies	A parking structure in Toronto, fronted by an attractive, pedestrian-friendly streetscape
34 New York City	http://www.flickr.com/photos/mckln/1289818017/ David Woo	Pedestrians walking in New York City
35 Grand Central Station, New York	http://www.flickr.com/photo_zoom.gne?id=452608083&size=l Nate Luzod	The attractive interior of Grand Central Station, New York
36 Portland Pearl District TOD station	Jeff Wood - Reconnecting America	A tram near Pearl District TOD station, Portland
37 Real-time info New York Penn Station	http://www.flickr.com/photo_zoom.gne?id=717073295&size=l Spike	View of real-time information on departure boards, New York's Penn Station
38 Visioning workshop	Urban Strategies	Participants in action at a visioning workshop
39 London congestions charge	http://www.flickr.com/photos/kgradinger/538037312/ Kyle Gradinger	View of congestion charge zone in London, England
40 Salvatorplatz carpark Munich.jpg	Urban Strategies	A structured parking facility in Munich, Germany, which incorporates attractive design features
41 Toronto skyline hubs	http://www.flickr.com/ photo_zoom.gne?id= 1430326040&context=set-72157602133242099&size=l	Aerial view of North York and Downtown Toronto at sunset

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