

GETTING ON TRACK WITH GREEN GROWTH:

EXPLORING THE PLANNING OF TRANSIT- ORIENTED COMMUNITIES

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No words could truly describe the depth of gratitude that I feel for having gotten to where I am now. Tremendous thankfulness goes out to all those who supported me through a tumultuous time and helped to keep me going. I will never forget that you shaped my life in a very important and special way.

To Professor Jose Etcheverry, thank you for taking the time to extend your knowledge and advice to develop this research paper.

To the inspirations of my life - my parents - the sacrifices you once made for me have led to everything that I am today and the pursuit of a dream. My strength has been all for you.

FOREWORD

The area of concentration that has guided my learning in the Master of Environmental Studies Planning Program is titled *Urban Growth and Transit-Oriented Planning*. The components that form this area of concentration are: *Planning for Urban Growth and Land Development*; *The Urban Form and the Land Use - Transport Link*; and *Planning for Transit-Oriented Communities*.

Overall, my research paper has contributed to each of these components. The cases studied for this research - The Cambie Corridor Planning Program and the Eglinton Connects Study - have been conducted to guide land development and accommodate growing populations. The case studies have supported my first component by adding to my learning of the growth management planning process and relevant policy framework within two major Canadian metropolitan areas. Moreover, a focus on multiple planning disciplines and supporting policy uncovered practices, challenges, and synergistic opportunities.

In particular, I aimed to examine projects that intersect land use and transportation planning in order to support my second component. The research advanced my learning through the assessment of planning initiatives that exhibit fundamental smart growth ideals, and which direct for the reurbanization of underutilized areas.

Lastly, my third component - planning for transit-oriented communities - is addressed the most in-depth by framing the main research question, and forms the most substantial portion of this paper. The paper has allowed me to undertake a detailed study of best-practices in transit-oriented planning, from policy and design, to the lessons learned from

such endeavours. Additionally, this paper provided me with the chance to conduct a thorough investigation of a recent experience in Toronto, assisting to realize my objective to study the Toronto context of planning for transit-oriented communities.

Note: *It is important to note that the research paper evolved into a study of planning for transit-oriented communities in Vancouver and Toronto, and does not cover additional geographies. Maintaining a Canadian context was perceived to offer the greatest comparability. Resource and time constraints were additional factors in this decision, which also led to scoping the investigation to one project in each City. The Cambie Corridor Planning Program and Eglinton Connects Study were selected for their recent occurrence, similar scale and suburban context, access to documents and interviewees, as well as their goals as transit-oriented planning ventures.*

ABSTRACT

This paper explores the planning of Transit-Oriented Communities with a focus on two of Canada's most populous cities - Vancouver and Toronto. The current state of practice is investigated through case studies of the Cambie Corridor Plan in Vancouver and the Eglinton Connects Study in Toronto, aiming to uncover perspectives, challenges and success factors of these projects. Moreover, the research explores how sustainability beyond conventional Transit-Oriented Development practices is incorporated into the case studies, and whether these areas may result in what could be considered 'Green Transit-Oriented Development' – a term used for an enhanced ultra-environmentally friendly form of Transit-Oriented Development (TOD).

The paper finds that these cities do well in terms of planning for Transit-Oriented Communities with the above projects, and transit-oriented planning efforts are supported by a solid policy framework at the regional and provincial levels. Both cities selected planning at the corridor scale as the preferred approach, as well as an emphasis on the shift to predominantly mid-rise development. Common initial challenges were exhibited in both cases, mainly in terms of partner collaboration and public engagement. Yet in the end, the establishment of strong partnerships and public involvement are also perceived as key success factors. Political support is recognized as a strongly influential factor, which can either stifle planning projects such as Cambie and Eglinton, or encourage them to become transformational opportunities. The influence from varying levels of political support is particularly illustrated with the ways the cities pursue sustainability. Beyond conventional transit-oriented development practices, the ambition and bold greening standards of Vancouver will see that the Cambie Corridor results in LEED gold development. In addition, Vancouver has capitalized on the anticipated redevelopment to ensure the integration of energy planning and promote a corridor serviced entirely by a low-carbon district energy network. Conversely, the Eglinton project displayed a mandate span that was limited in terms of advancing sustainability initiatives, and neither green building development nor energy planning were a part of the Study scope. Advanced green building is reliant upon incentives from the Toronto Green Standard Tier 2 achievements and the potential for district energy was seemingly overlooked. Thus, the paper concludes that Vancouver presents a leading example of synergistic planning that directs transit and low-carbon supported density, and better exhibits a green TOD-like endeavour. Finally, Toronto and other cities could learn from Vancouver and strive to improve sustainability goals, cultural commitment, and enabling planning policy.

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CHAPTER 1: INTRODUCTION AND RESEARCH METHODS

1.1 INTRODUCTION

Two of the greatest urban concerns of our time are climate change, and (particularly in North America), sprawling development patterns. Urban areas are recognized as major contributors of greenhouse gases (GHG), and as urban populations rise, so will the pollution of our environment (especially if GHG mitigation strategies are not implemented). The built form of cities is an important consideration, and sprawl in particular is associated with an abundance of negative environmental, social, and economic impacts, as summarized below:

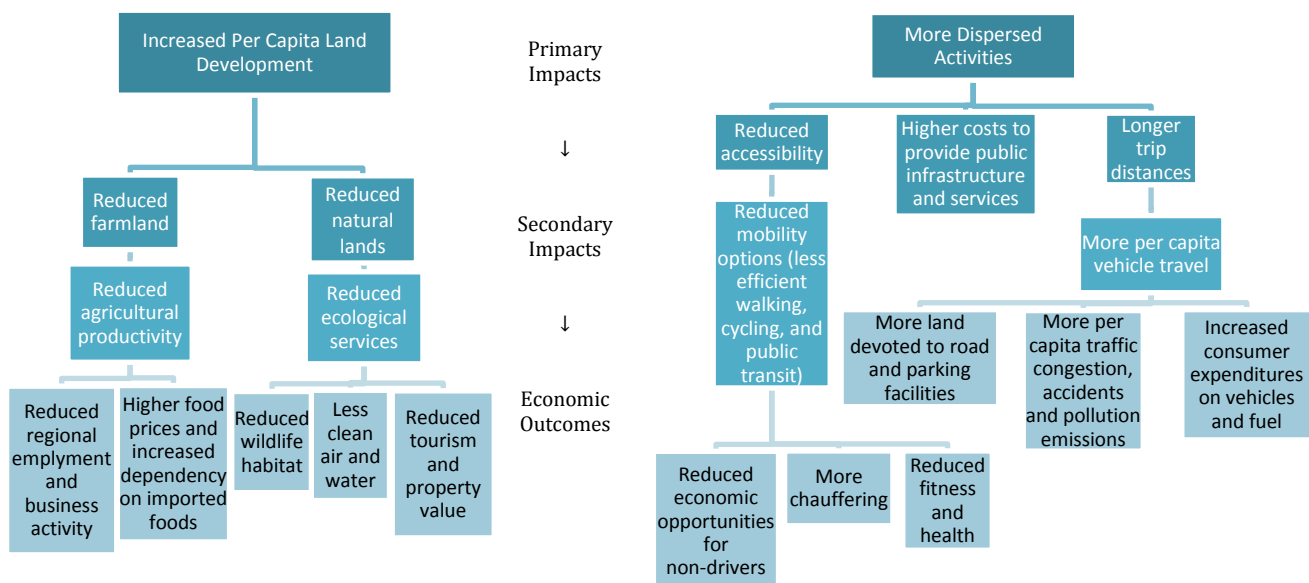


Figure 1: Sprawl Impacts, as illustrated by Litman (2015).

The concerns over climate change, and sprawl can be addressed with strategies stemming from Green Urbanism: A planning ideal that seeks to minimize the negative effects of urban development and achieve cities that exist more harmoniously with the environment, as well as to increase their capability of self-sustenance for the long-term. With the potential of this planning approach in mind, cities are focusing increased attention on reducing their carbon footprint and the many negative effects noted in Figure 1. A key part of Green Urbanism, is the concept of building Transit-Oriented Communities and Development: a practice which focuses on integrating transit and land development to facilitate minimized travel by car throughout the community. Another recently coined term - Green Transit Oriented Development (TOD) - aims to incorporate additional green design and technologies to further reduce the carbon footprint beyond that of conventional TOD.

This paper will explore the current state of practice for planning transit-oriented communities in Canada. The cities of Vancouver and Toronto are investigated, with a focus on two recent land use planning endeavours; the Cambie Corridor Plan, and the Eglinton Connects Study. These planning experiences are explored to uncover perspectives, challenges and success factors. Additionally, this study aims to understand if and how sustainability beyond conventional TOD is addressed in these cases, and whether the projects analyzed demonstrate elements that may lead them to produce what could be considered "Green TOD".

Research Question

The main purpose of this paper is to explore the planning of two transit-oriented communities in Canada, and the overarching research question is:

- ❖ What is the current state of practice for the planning of transit-oriented communities in Vancouver and Toronto?

The two secondary questions that frame and guide this research are:

- What are the perspectives, challenges and success factors from the Cambie Corridor and Eglinton Connects projects?
- Are green urbanism strategies beyond conventional TOD pursued, and do they exhibit the potential to generate what could be considered "Green TOD"?

1.2 METHODOLOGY

This research was carried out through a mixed-methods approach that included both primary and secondary data analysis. The full methodology comprised: a literature review, and analysis of two case studies supported by policy and document review, along with expert interviews.

A literature review was carried out focusing on the main concepts and practices that form the basis of this paper. The academic literature, books and independent documents on topics relevant to transit-oriented planning and development were consulted to synthesize contextual background and best-practice principles. Similarly, the concept of Green Urbanism was explored to provide a broader context and understanding of sustainable development strategies. Furthermore, the idea of "green TOD – as a form of ultra-environmentally friendly TOD" - is used as a research guiding term that serves as a focusing lens under which to assess the case studies.

A case study approach within a Canadian context was selected to guide the research, and focuses on two of the nation's largest metropolitan cities - Vancouver and Toronto. Key policies that lead the urban growth of each were explored, focusing on the planning frameworks covering land use, transportation and sustainability. This focus spans the regional agendas under which the cities operate, as well as their individual local guiding plans.

More specifically, the most recent transit corridor plans of Vancouver and Toronto were examined as means to explore the current state of transit-oriented-planning in two of Canada's largest cities, and whether they possess characteristics of green TOD. The cities' latest undertakings are corridor planning projects of comparable scales, in areas outside the downtown core, that comprise established residential neighborhoods with pockets of underutilized industrial lands.

The Cambie Corridor Planning Program and Eglinton Connects study were investigated through a review of project plans and municipal documents to understand their guiding planning vision and objectives, and to uncover any additional greening strategies. In addition, interviews for each municipality were conducted personally or collected from secondary sources during February and March of 2015. In total, 6 interviews - 3 per city - inform this paper (see Appendix 1 for interview questions). The interviews were carried out in-person or by telephone. Additionally, an interview sourced from a magazine was also utilized. Interviewees questioned include city planning staff involved in the corridor projects and staff within the sustainability departments of the City of Vancouver and City of Toronto. Participants were asked a series of semi-structured questions based on transit-

oriented planning practices and additional sustainability initiatives of each city. Overall, the experts' perspectives offer insight into the planning process, challenges, success factors, and takeaways of the experiences. The findings are summarized as part of sections *The Cambie Corridor Plan* and *The Eglinton Connects Study*, and help to reinforce project findings, while offering important supplementary data.

It must be noted that public documents related to the case studies are very limited. Therefore, it is worth emphasizing that the research relies greatly on the responses gathered from interviews. Moreover, due to the fact that these planning projects are only recently completed or are still in progress, the scope of the paper is limited to the investigation of the planning process up to the development of policy and regulation.

The paper is organized into five chapters. The introductory chapter contains background information such as the research purpose and guiding question, along with the methods employed to produce this paper. The second chapter comprises a literature review that focuses on: The Land Use-Transport Relation; Transit-Oriented Planning and Development; and "Green TOD. Chapters three and four presents the case studies of Vancouver and Toronto, covering the relevant policy framework of each, as well as the planning approach and perspectives of the Cambie and Eglinton projects. Lastly, the final chapter discusses and compares the two case study findings, offers recommendations, and concludes the paper.

CHAPTER 2: LITERATURE REVIEW

This chapter provides a review of the literature pertinent to the main issues, concepts and practices explored for this paper. The review will serve to provide background context for the key subtopics of this paper (The Land Use-Transport Relation; Transit-Oriented Planning and Development; and "Green TOD") and its case studies.

2.1 THE LAND USE-TRANSPORT RELATION

The relationship between land use and transport has arguably been a central factor in shaping the urban form throughout the last century, especially in North America. The second World War is often cited as a demarcation point which particularly highlights a stark change in land development and mobility trends, raising a great deal of attention for the connection between them. As the spatial structure of cities evolves, the land use-transport link remains an important consideration (Suzuki et al., 2013).

Figure 2 below presents the way in which transportation and land use are inextricably linked.

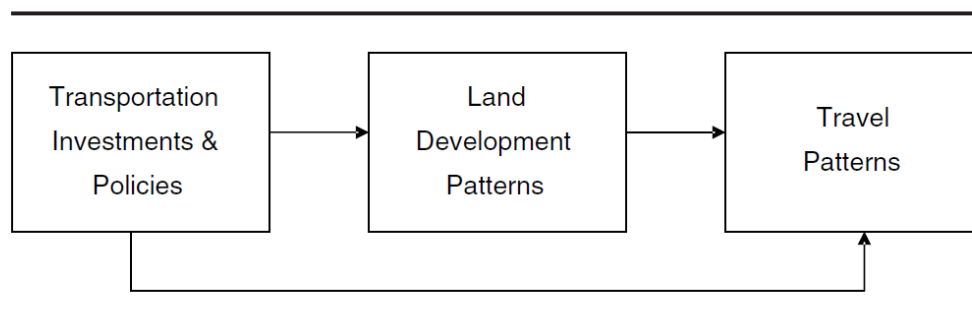


Figure 2. Basic links between transportation and land use, as depicted in Handy (2005).

Additionally, a feedback loop can be added to the above diagram which demonstrates the potential influence that the resulting travel patterns can have on transportation investments and policies noting that the process of influence is in fact cyclical.

Traditionally, urban centers were the core of most regions, and they maintained concentrated populations surrounded extensively by open spaces such as farmland. In the foreword to *The New Transit Town* by Dittmar and Ohland (2004), Calthorpe describes a time when suburban districts alongside the streetcar extended out from the urban centers, exemplifying a coevolution of urban development and transit. However, he also states that the balance of this pattern was significantly disrupted after World War II, greatly by sprawling development patterns.

Today, sprawl is a common label for the low-density, auto-oriented spread of metropolitan regions, characterized by pervasive, dispersed development outside of compact urban and village centers, usually along highways and occurring even in rural countrysides (Handy, 2005). Hodge and Gordon (2013) explain that the suburban metropolitan environments that abound today can be attributed to three main factors. Firstly, they state the influence of increasing populations from wartime return, and subsequent baby boom. The expansion of national economies of Canada and the USA is also pointed out, along with a pent-up demand for housing. However, growth in the use of the automobile is described as the most significant factor of all, in terms of its key role in shaping the urban form.

Filion et al. (2010) echo this remark, affirming that the leading factors contributing to sprawl have been the North American-wide postwar prioritization and adaptation of the urban form to the automobile, along with growing housing space consumption. They also note that over time, as densities have declined from the inner city to the inner suburbs and to the outer suburbs, this has been mirrored by increasing reliance on the car, which today has become almost ubiquitous throughout suburbia. Further reasons for these trends are that the peripheral areas of cities could most easily accommodate and house rising populations; lands in the outer urban fringes were appealing to homeowners and businesses for its lower costs; and the car as well as highways yielded a private, convenient, and fast option for travel to the urban outskirts, which were often not accessible or ill-served by old public transportation systems (Hodge and Gordon, 2013; Renne & Wells, 2007).

Moreover, Coleman et al. (2005) add that highways have not only been a large contributor to the scale of suburban growth we see today, in the sense that the accessibility to their surrounding lands has enabled these built forms to grow, but the nature of suburban areas has greatly influenced travel patterns. Coleman et al. (2005) conclude that it is widely evident that the separation between land uses in low-density developments have made transit and walking a significant challenge, while driving has become a necessity.

2.2- TRANSIT-ORIENTED PLANNING AND DEVELOPMENT

Transit-Oriented Planning

The concerns over the drastically increased land consumption and auto dependence of recent decades has evidently spawned a desire to shift to a more contained built environment and land development process, as well as the goal to encourage societies to travel by less impactful modes. Renne & Wells (2007) describe that "as congestion has increased and citizens have complained, there has been a major movement by planners and policy makers to combat North American automobile dependency by promoting transit use, walking, bicycling, and land use changes" (p.3).

However, transit-oriented planning has been apparent in numerous cities much before arriving at the forefront of North American planning as a substitute to highway investments and built environments that prioritize the car. According to Suzuki et al. (2013), Copenhagen, Denmark, is an early textbook example of growth management with the integration of transit and land use. They depict a highly celebrated strategy - *The Finger Plan* - established in 1947, where "local planners identified corridors to channel overspill growth from urban centers early in the planning process. Rail infrastructure was built, often in advance of demand, to steer growth along desired growth axes"(p.4).

Another case that has garnered global attention is Curitiba, Brazil, which is widely recognized as a model example, and is commended for its innovation with Bus Rapid Transit and aggressive urban growth framework (Lindau, Hidalgo & Facchini, 2010). At the time of its inception, an exclusive commitment to the use of busways was decided to offer a more practical and affordable solution by comparison to subways or light railways

(Macedo, 2004). Curitiba has also induced remarkable regeneration of the urban fabric, which has taken the form of "transit-first" major corridor development, comprising a decentralized balance of residential, commercial and public transport access (Macedo, 2013). Suzuki et al. (2013), state that the success of these model international cities is attributed to a strategic urban growth vision from the outset, with coordinated land use and transit planning.

These examples are certainly comparable to the planning ideals that have more recently developed in North America. The investment in public transit systems is viewed not only as a solution to increase the use of transit (by encouraging a shift from driving to transit), but also as a means of facilitating the potential for the intensification of development, which is expected to assist in curbing sprawl (Victoria Transport Policy Institute, 2015; Appleby, 2005; Handy, 2005. Filion et al. (2010) describe a logic similar to that of the impacts of highways, in the way that relative accessibilities are changed, as well as travel times and costs may be reduced. They explain that by facilitating greater accessibility, a transit system might influence or perform as a catalyst, in terms of where in the region development occurs, just as highways have done. This effect has the potential for the redistribution of development, rather than a net centralized gain, which in turn, can help to increase ridership on transit.

In the 1990's, Newman & Kenworthy (1996) noted an increasing popularity in transit planning, along with a greater awareness of the range its linked benefits. The benefits of investing in transit, as opposed to auto-centric spaces, have been deemed as follows: greater economic benefits; the ability to leverage market forces to generate more efficient

densities near stations; a corridor orientation which allows ease of infrastructure provision; the reduction of energy related emissions; and a greater availability of public space, as transit systems require significantly less space than highways and car parking - allowing for the renewal of many under-utilized auto-centric areas.

Indeed, there has certainly been a resurging interest in transit investments, with an abundance of cities worldwide in pursuit of transit-oriented planning, such as: Singapore, Stockholm, Amsterdam, Bogota, Mexico City, Perth, Melbourne, Portland, Washington, DC, Montreal, Toronto, and Vancouver (Thomas & Bertolini, 2015; Suzuki et al., 2013).

Transit-Oriented Development

With time, global success stories and the potential benefits to be gained from transit-oriented planning has also led to the emergence and pursuit of the transit-oriented development (TOD) concept. TOD embodies a set of principles and design elements that are based on the relation between alternate modes of travel and the built environment. Additionally, TOD has emerged in response to societal aspirations to combat sprawl, as mentioned previously, and thus is promoted to encourage more compact development as well as urban renewal.

The Victoria Transport Policy Institute (2015), summarizes a well-rounded definition of TOD:

"Transit Oriented Development (TOD) refers to residential and commercial centers designed to maximize access by transit and non-motorized transportation, and with other features to encourage transit ridership. A typical TOD has a rail or bus station at its center, surrounded by relatively high-density development, with progressively lower-density spreading outwards one-quarter to one-half mile, which represents pedestrian scale distances".

Numerous benefits have been associated with the pattern of TOD, as described below:

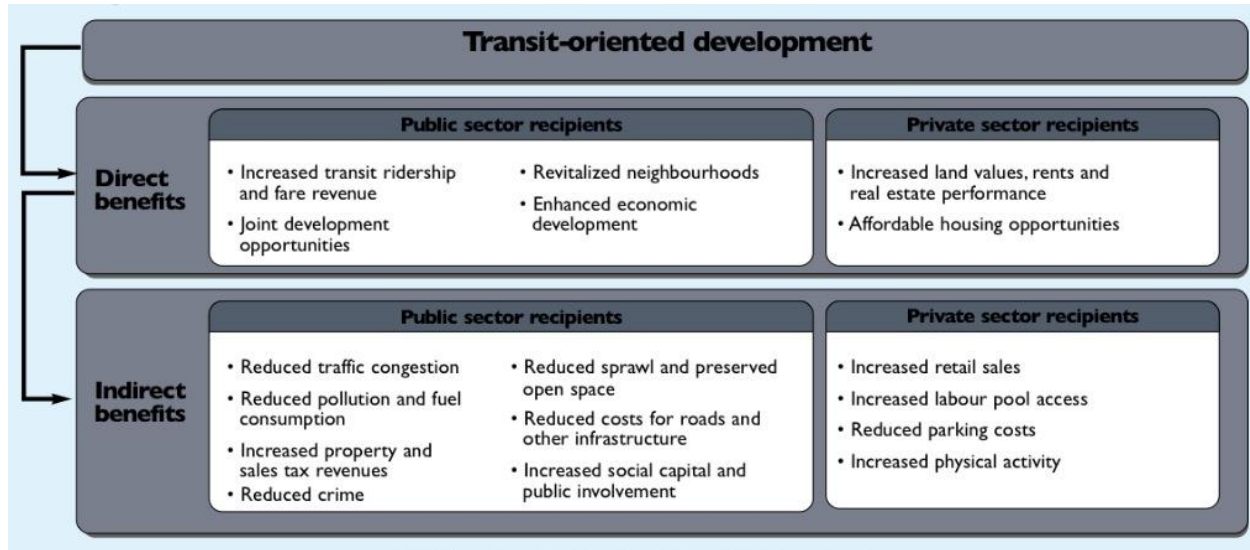


Figure 3. Potential benefits of transit-oriented development, as reported by the Canadian Urban Transit Association (2004).

Further to the benefits noted above, the practice of planning for TOD is also a crucial matter for the economic viability of transit investments, and thus is sometimes also referred to as *transit-supportive development*. Filion (2009), maintains that since transit systems are expensive endeavours, these investments must be supported with high passenger volumes to be cost-effective. He suggests that unless transit is supported with effective land-use policies, transit systems may become financially unsustainable.

Therefore, while planning for TOD can occur at the scale of the region, the corridor, the station area, and the land parcel (see Figure 4), these separate levels of planning should be coordinated to achieve the most successful outcomes (Centre for TOD, 2010).

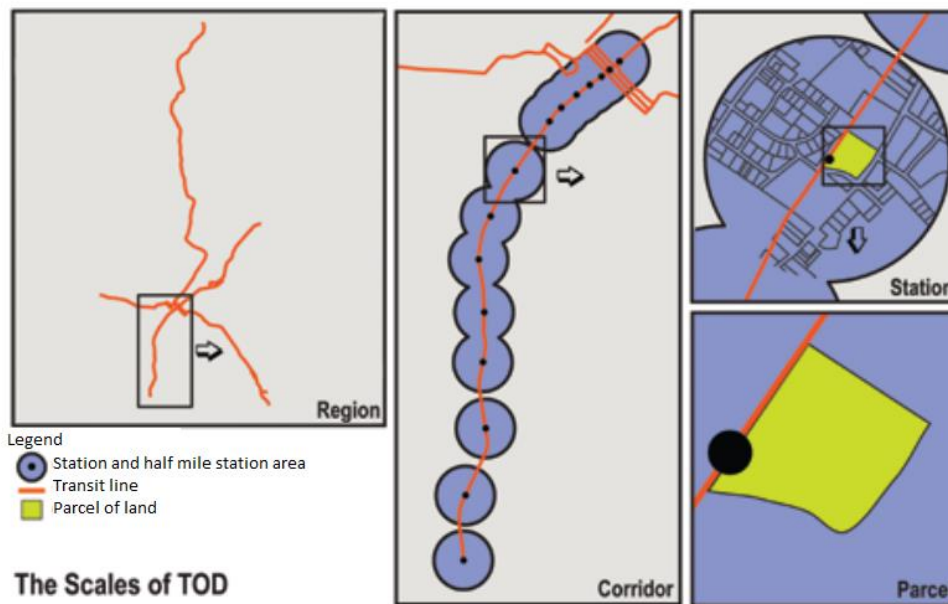


Figure 4. The Scales of TOD, as illustrated by the Centre for TOD (2010).

Linking together destinations and origins with a transit network is essential to addressing regional mobility demand and helping to garner transit patronage (Arrington & Cervero, 2008). At the more localized scales, it is also important that TOD exemplifies an urban form that facilitates travel by modes alternative to the automobile (Renee & Wells, 2007). The elements known as "the three Ds" — Design, Diversity, and Density — are considered to support the trip to and from transit as well as minimize the necessity of a vehicle by providing the facilities and daily needs within close proximity, thereby allowing the remainder of trips by walking or cycling (Cervero and Kockelman, 1997).






Firstly, designing an attractive public realm, pedestrian and cyclist-friendly roadways, along with quality transit passenger facilities, are greatly influential in enticing people to get out of their cars, and attracting residents to choose transit-oriented neighborhoods (Brons et al., 2009; Metropolitan Transportation Commission (2010). The establishment of a diverse combination of land uses tends to decrease the likelihood of vehicular travel as well (Cao et al., 2009). The concentration and close proximity of residential and employment densities to transit stations is another significant factor found to result in

greater use of transit and reduced trips by automobile (Cervero, 2007; Jun, 2008). A study by Arrington and Sloop (2010) confirms the aforementioned, adding that parking management (in the way of reducing the availability of parking and increasing parking costs) strongly contributes to travel behaviour and should be implemented as a supplemental incentive. Overall, the elements of design, density and diversity in the built environment helps to provide alternate mode choices. Alternate options serve to meet the demand for those wishing to locate in less auto-oriented areas, and while a complete substitution of the car cannot be expected, offering options is found to increase the frequency of non-motorized trips to supplement motorized trips (Guo et al., 2015). Based on these essential "three Ds", Renne (2009) makes key distinctions between the elements that represent true TOD, rather than development that is merely adjacent to transit but remains auto-oriented:

| Transit Oriented Development | Transit Adjacent Development |
|--|--|
| <ul style="list-style-type: none"> • Grid street pattern • Higher densities • Limited surface parking and efficient parking management • Pedestrian- and bicycle-oriented design • Mixed housing types, including multi-family • Horizontal (side-by-side) and vertical (within the same building) mixed use • Office and retail, particularly on main streets. | <ul style="list-style-type: none"> • Suburban street pattern • Lower densities • Dominance of surface parking • Limited pedestrian and cycling access • Mainly single-family homes • Segregated land uses • Gas stations, car dealerships, drive-through stores and other automobile-focused land uses. |

Figure 5. Transit-Oriented Versus Transit-Adjacent, reproduced from VTPI (2015).

In aid of cities aiming to undertake TOD initiatives, various guidelines and best practice criteria have been created. For instance, the City of Ottawa (2007) promotes transit-supportive land uses, directed as land uses that:

-  Establish high residential and/or employee densities
-  Create travel outside of the am/pm peak periods
-  Promote reverse-flow travel
-  Attract and generate pedestrian traffic
-  Provide extended hours of activity

As part of a performance-based definition, the Centre for Transit-Oriented Development (2007) suggests that projects should:

- Increase “location efficiency” so people can walk and bike and take transit
- Boost transit ridership and minimizes the impacts of traffic
- Provide a rich mix of housing, jobs, shopping, recreational, and transportation choices
- Generate revenue for the public and private sectors and provide value for both new and existing residents
- Create a sense of place

TransLink (2012), Metro Vancouver's regional transportation authority, has also established a series of six goals to aim for - "the D's of design" - each with a set of sub-strategies to foster transit-oriented communities:

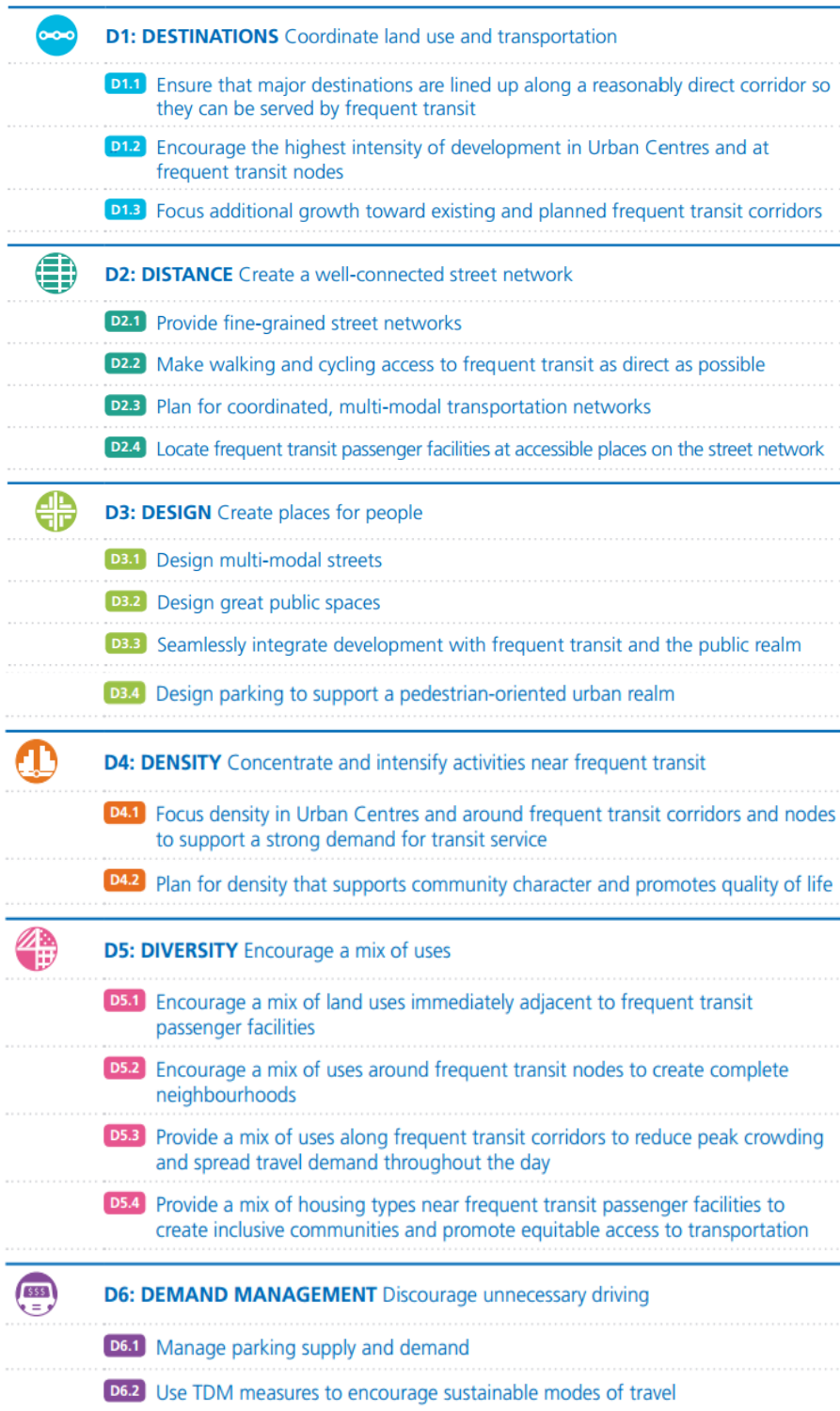


Figure 6. Transit-Oriented Communities Design Guidelines, reproduced from TransLink (2012).

2.4 "GREEN TOD" – AN ULTRA-ENVIRONMENTALLY FRIENDLY TOD

Green Urbanism may offer numerous environmental benefits through green architecture and sustainable community design. Various stationary sources present opportunities for capitalizing on natural resources, the efficient use and reuse of materials, as well as the provision of low-impact development within neighborhoods. The concept of “Green Transit-Oriented Development” stems from the idea of enhancing conventional TOD by combining it with additional elements of Green Urbanism strategies.

The term has been coined by Cervero and Sullivan (2011) and can be described as “a new ultra-environmentally friendly version of TOD”. This form of planning is emerging most notably in several European cities, and appears to be catching on internationally. The notion is centered around the potential to offer co-benefits and the delivery of energy self-sufficiency and zero-waste living, along with TOD and sustainable mobility.

| TOD | Green urbanism |
|--|--|
| Mobile sources | Stationary sources |
| <ul style="list-style-type: none"> • Transit design: world-class transit (trunk and distribution); station as hub; transit spine • Non-motorised access: bike paths; pedestrian ways; bike-sharing/car-sharing • Minimal parking: reduced land consumption; building massing and impervious surfaces • Compact development mix of uses | <ul style="list-style-type: none"> • Energy self-sufficient: Renewably powered – solar, wind, organic waste converted to biogas; energy efficiency; district heating/cooling; combined heat and power • Zero waste: recycling and reuse; methane digesters; rainwater collection for irrigation and grey water use; bioswales • Community gardens and open space: composting; tree canopies; water-table recharging • Buildings: green roofs; orientation (optimal temperatures); insulation; glazing; air-tight construction; low-impact and recycled materials |

Figure 7 presents the suggested array of environmental features and benefits that Green TODs may embody, according to those displayed by TODs and Green Urbanism individually.

Figure 7. Environmental features and benefits of Green TOD, as presented by Cervero and Sullivan (2011).

In addition, Cervero and Sullivan (2011) have identified a synergistic relationship with Green TODs, whereby this form may perform in a superior manner. For instance, they suggest that occupants of conventional developments exhibited 29 to 35 % higher CO₂ emissions, in comparison to those residing in Green TODs. Other examples of synergies this study uncovered include:

- Higher Densities – the increased densities attributed to transit-supportive development may also serve to lower heating and cooling expenses due to shared-wall construction.
- Mixed Land Uses – a variety of destinations and activities within close proximity not only encourage walking, cycling and transit, but also provide other opportunities such as helping to balance the heating and energy needs of residential, office, and commercial sites.
- Reduced surface parking and impervious surfaces – TOD areas can allow for a substantial decrease of these surfaces and their replacement with green spaces for socializing, recreation, gardens and home-grown produce. These alternatives help to reduce heat-island effects, water pollution, and emission from produce transport.
- Solar energy production at stations – power may be generated from the installation of, for example, photovoltaic panels or small wind turbines at transit areas and facilities. This energy may be fed to nearby properties, or utilized to charge hybrid and electric vehicles.

Overall, the main idea is that where there is often a disconnect between planning fields and practices, which can result in a diminished performance of urban development, the concept of combining conventional TOD with added green urbanism measures reflects the potential for increased benefits.

The next chapters will present the case studies of the Cambie Corridor Planning Program in Vancouver, and the Eglinton Connects Study in Toronto. The transit-oriented planning efforts of each will be discussed, and added green urbanism measures will be explored as well.

CHAPTER 3: THE CASE OF VANCOUVER

This chapter studies the case of Vancouver in planning for transit-oriented communities, through a review of the Vancouver policy framework and the Cambie Corridor Planning Program.

3.1 VANCOUVER POLICY FRAMEWORK

The City of Vancouver has a long-standing tradition of pursuing leading sustainability strategies. Although its historical narrative may be partially attributed to topographical constraints, an equally strong influence has been exemplified by forward-thinking institutional forces. Vancouver has not only created an adaptive path for self-sufficient growth within its geographic boundaries - Vancouver has set the goal of becoming the greenest city in the world by 2020. The following section presents the policy framework guiding this ambitious endeavor, with a particular focus on transit-oriented planning and green infrastructure initiatives.

3.1.1 Regional Context

At the regional scale, the Greater Regional Vancouver District has had a long-standing vision of urban growth led by the coordination of land use and transportation planning. Additionally, protecting the environment and responding to climate change impacts are prominent goals:

"Since 2002 Metro Vancouver has formally put sustainability at the core of its operating and planning philosophy and advanced its role as a leader in the attempt to

make the region one which is explicitly committed to a sustainable future" (Metro Vancouver, 2011, p.1).

The key policy documents which provide an urban growth and development framework to support these directions are the Metro Vancouver Regional Growth Strategy (2011), and the Transport Plan (2008) by the regional transit agency TransLink. Both of these plans set out long-term strategies to 2040 that complement one another and emphasize the importance of coordinating land use and transportation early, in order to promote growth within the Urban Containment Boundary and encourage sustainable transportation choices such as walking, cycling, and transit. A strong focus is placed on steering development to urban centres and areas well-served by transit. Frequent transit development areas in the Regional Growth Strategy are identified as network of corridors serving to organize urban growth and link development where bi-directional transit is provided at least every 15 minutes during all times of the week.

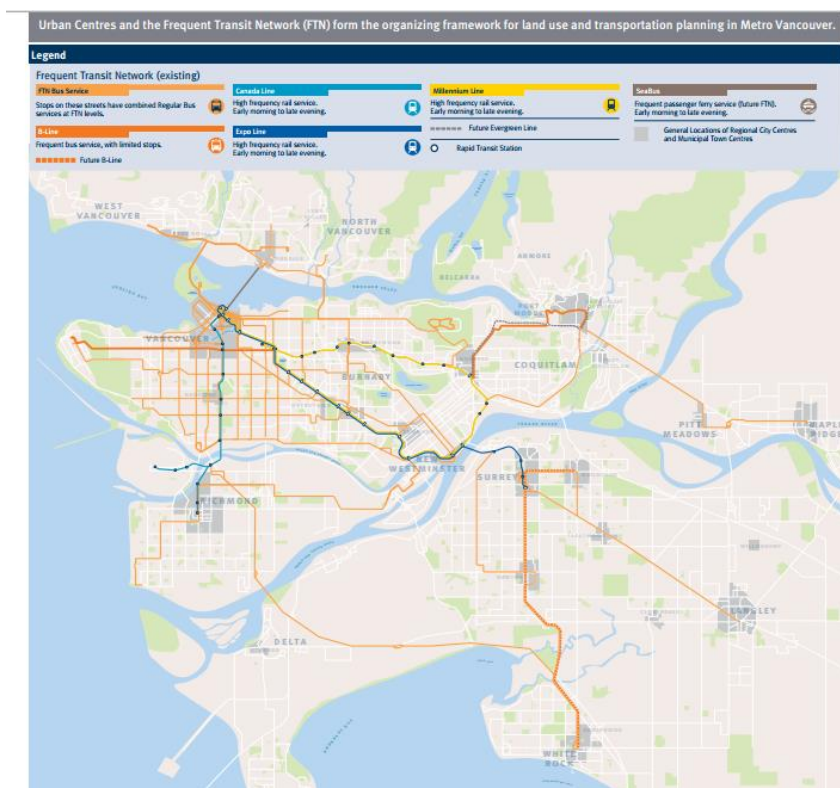


Figure 8. Regional framework for land use and transportation planning in Metro Vancouver, reproduced from TransLink (2008).

3.1.2 The Greenest City 2020 Action Plan

The Greenest City 2020 Action Plan (2012) is a globally recognized policy that has received numerous awards. The Plan sets out a medium-term agenda to 2020, as well as a longer-term vision up to the year 2050. The main strategy of the Plan is to lead in climate action by tackling the city's carbon footprint, waste management and ecosystems. This is collectively addressed by a series of ten smaller plans, with an emphasis on measurable goals and targets to 2020, comprising: A Green Economy; Climate Leadership; Green Buildings; Green Transportation; Zero Waste; Access to Nature; Lighter Footprint; Clean Water; Clean Air; and Local Food.

The City of Vancouver also released an implementation update report for the Greenest City 2020 Action Plan. The report illustrates that all goals and targets have seen positive improvements from the established baseline data. Progress highlights to date include (2014a):

- A 7% decrease in community greenhouse gases since 2007
- A 21% decrease in vehicle km driven per person since 2007
- A 36% increase in neighbourhood food assets since 2010
- 37,000 new trees planted since 2010

Of particular importance to the purpose of this case study are the Plan's Green Building and Green Transportation subsections. According to the Plan, 55% of Vancouver's emissions come from buildings, while transportation is attributable for a noteworthy 37%. As such, one significant goal is to lead the world in green building design and construction. The applicable targets are to:

1. Require all buildings constructed from 2020 onward to be carbon neutral in operations.
2. Reduce energy use and greenhouse gas emissions in existing buildings by 20% over 2007 levels, by 2020.

The success of Vancouver in achieving this goal received recent recognition as “Best Green Building Policy” by the Federation of Canadian Municipalities and the World Green Building Council (City of Vancouver, 2015c).

In the way of Green transportation, the City aims to make walking, cycling, and public transit the preferred transportation options. Targets for this goal include:

1. Make the majority (> 50%) of trips by foot, bicycle, and public transit. (*Achieved April 2015*)
2. Reduce average distance driven per resident by 20% from 2007 levels, by 2020.

3.1.3 Green Buildings Policy for Rezoning

The goal to lead the world in green building design and construction has been further supported with the City's Green Buildings Policy for Rezoning (City of Vancouver, 2015). Since 2008, the City of Vancouver maintains that all development applications made for rezoning are subject to a specified set of sustainability requirements. Projects must pursue building criteria that are aligned with the Leadership in Energy and Environmental Design (LEED) for New Construction program (City of Vancouver, 2014b). Over the years, the policy has been upgraded incrementally, to the most current requirement that all buildings become certified to the LEED GOLD standard (see Figure 9).

LEED® Requirements for Rezoning

| For applications received | LEED® level | Minimum Points | Energy Points | Water Points | Register/Certify * |
|--|------------------------------------|----------------|-------------------------------|------------------------------------|----------------------|
| <i>between</i> June 10, 2008 and Feb. 28, 2010 | Silver <i>equivalent</i> | 36 points | 3 optimize energy performance | 1 water efficiency 1 stormwater | no |
| <i>between</i> Mar. 1 and July 31, 2010 | Silver <i>equivalent</i> | 36 points | 3 optimize energy performance | 1 water efficiency 1 stormwater | register |
| <i>between</i> Aug. 1 and Jan. 31, 2011 | Gold <i>equivalent</i> | 63 points | 6 optimize energy performance | 1 water efficiency 1 stormwater | register |
| <i>from</i> Jan. 31, 2011 | Gold certified | 63 points | 6 optimize energy performance | 1 water efficiency 1 stormwater | register and certify |

Figure 9. LEED Requirements for Rezoning, reproduced from City of Vancouver (2014b).

An added condition of this policy supports the district energy (DE) plans of the City. All rezoning projects located on sites within neighbourhood energy areas must either connect to an existing neighbourhood energy system, or be designed in a manner that ensures a compatible connection to a future system (City of Vancouver, 2014b). DE is discussed further in the next section of the paper, which covers the Cambie Corridor Planning Program — a key planning project underway in Vancouver.

3.2 THE CAMBIE CORRIDOR PLANNING PROGRAM

The Cambie Corridor Planning Program is the most recent endeavour to cultivate transit-oriented communities in the City of Vancouver. This section investigates the Cambie Corridor project, and presents the findings of the planning approach and perspectives.

3.2.1 Overview

The Canada Line is a Metro Vancouver rapid transit line with a main service route running mostly the length of Cambie Street from Vancouver to Richmond. The Cambie Corridor is identified as the area surrounding Cambie Street, south of the Vancouver downtown core from the South Fraser River, and alongside the four Canada Line Stations that exist within the Vancouver municipal boundary (see below).

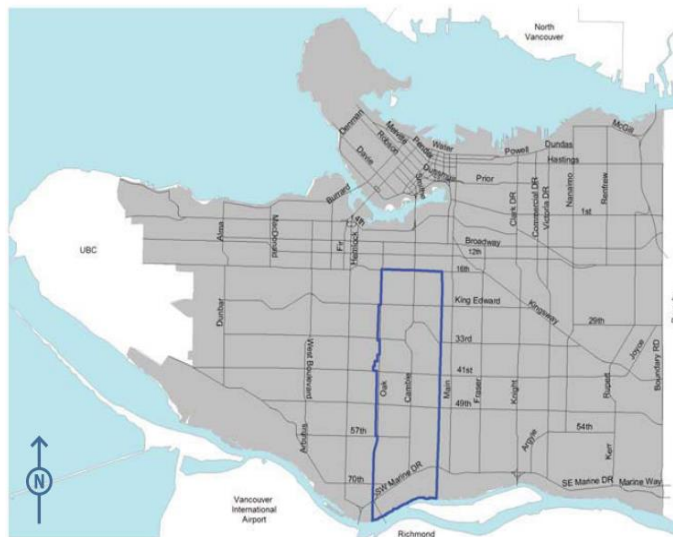


Figure 10. Geographic context of Cambie study area (City of Vancouver, 2015d).



Figure 11. Detailed Cambie Corridor study area (City of Vancouver, 2015d).

This Corridor is recognized as an important opportunity to foster a transit-oriented community around the Canada Line stations, and to revitalize the existing surrounding neighbourhoods for the accommodation of future growth. The City of Vancouver has acted on these opportunities by undertaking a land use planning exercise, and developing The Cambie Corridor Planning Program to ensure guided future development (City of Vancouver, 2013).

The project vision entails providing competitive travel alternatives to driving, as well as shaping the corridor area to offer convenient access to the daily needs of residents. The Cambie Corridor is guided by the goal to incorporate a denser mix of housing and workspace, along with key amenities such as shopping, local gathering places, improved parks, community facilities, and civic spaces, all strategically focused in neighbourhood centres, existing shopping areas, and areas located in close proximity to transit stations. Additionally, a distinct emphasis is placed on the strategy to integrate cleaner energy methods alongside the densification process (City of Vancouver, 2011).

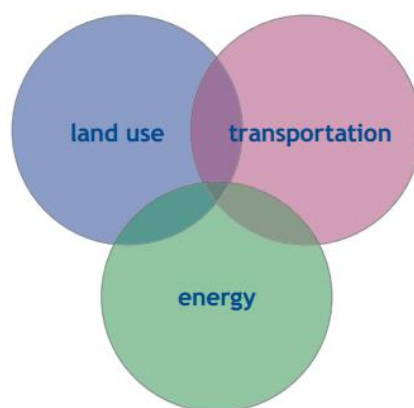


Figure 12. Venn diagram representing the opportunities and integrated approach of the Cambie Corridor Plan (City of Vancouver, 2011).

The following is the set of overarching goals for the Cambie Corridor (City of Vancouver, 2013):

- ❖ Provide land use that optimizes the investment in transit
- ❖ Create a complete community
- ❖ Create a walkable and cycleable corridor of neighbourhoods seamlessly linked to public transit
- ❖ Focus community activity around transit stations and areas with strategic opportunities for sustainability, renewable energy, and public amenities
- ❖ Provide a range of housing choices and affordability
- ❖ Balance city-wide and regional goals with the community and its context
- ❖ Ensure job space and diversity

The program was developed as a three phase plan, illustrated in the adjacent figure. Phase one comprised the above mentioned group of guiding principles, along with the establishment of a unique interim re-zoning policy for the sites immediately surrounding transit stations. Phase two (black areas of Figure 13) expanded on the policy taking into account the totality of the length of the corridor geography. At present time, the third phase (grey areas of Figure 13) is being carried out and will continue into the spring of 2017. It involves the study and updated policy of what are labelled the



Figure 13. The three phases of the Cambie Corridor Planning Program (City of Vancouver, 2015d).

"Transit-Influenced Areas". These are primarily low-density residential areas contained within a five to ten minute walk of the transit line. The third phase is intended to respond to options and opportunities of the corridor neighborhoods beyond the core transit area (City of Vancouver, 2009). Overall, this final phase aims to provide a more in-depth plan for select focus areas, as well as to deliver a public benefits strategy and public realm plan (City of Vancouver, 2015d).

Energy in Focus

The City of Vancouver reports the heating and cooling of buildings as the top contributor to Vancouver's greenhouse gas (GHG) emissions (City of Vancouver, 2015a). With the target of Vancouver's Greenest City Action Plan to reduce carbon emissions 33% by 2020, and the latest bold plan to depend 100% on renewable energy by 2050, the growth "carbon-friendly actions" and district energy projects are crucial to the success of these ambitions (City of Vancouver, 2012); City of Vancouver 2015b). District energy supplies heating and cooling from a centralized plant, to several individual buildings through piping (Baber pres, 2014). The City's Sustainable Energy Strategy focuses on pursuing district energy – referred to as Neighbourhood Energy Systems (NES) – in high-density, mixed-use neighbourhoods to significantly reduce greenhouse gas emissions; NES are flexible and compatible with various low-carbon energy sources, including those that are ill-suited for the individual building scale (City of Vancouver, 2015a).

In October of 2012, Vancouver introduced the Neighbourhood Energy Strategy, with two key stipulations (City of Vancouver, 2014c):

1. Connection of new buildings to systems where existing NES are established or under development
2. Ensure that buildings are constructed with NES-compatible hydronic heating systems in medium to high density areas that do not currently have a NES, but are likely to in the future

Moreover, the Strategy guides the City's approach to neighborhood energy in the following manner (Baber, 2014; Crowe, 2012):

1. Targeting areas with the greatest CO₂ reduction potential

The viability for NES in Vancouver was identified by an energy study which considered criteria including: areas of the City that are serviced by existing steam heat systems; current and projected development density; major development projects; and locales utilizing natural gas heating that could be connected to NES in future. The priority areas selected are the Downtown, the Cambie Corridor and Central Broadway as depicted below.

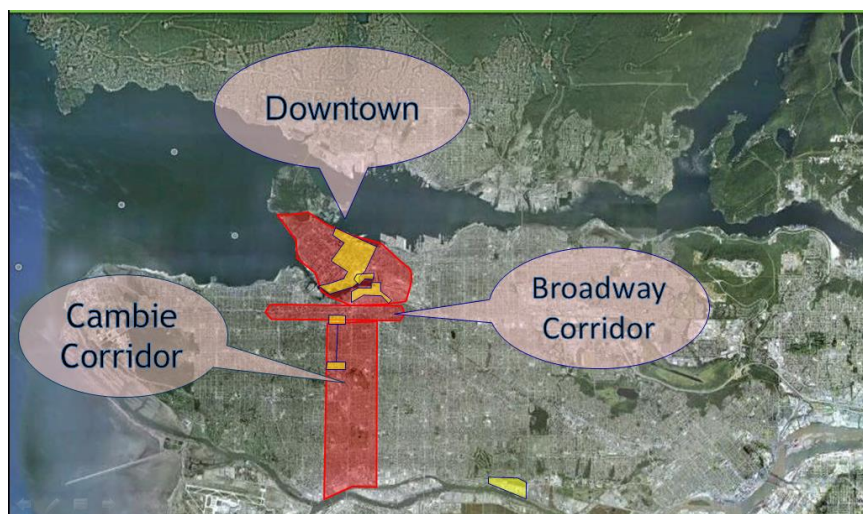


Figure 14.
Neighbourhood Energy
Strategy - Priority
Areas Identified,
reproduced from Baber
(2014).

2. Utilizing a flexible combination of enabling tools

- Energy Centre Guidelines— a policy framework that guides the evaluation and clarification of requirements for new or renewable energy centre projects, enabling the implementation of low-carbon energy supply technologies.
- Regulatory and Contractual Tools— may include the granting of an exclusive franchise right to a utility provider, rezoning policy and service area bylaws.
- Cost Competitiveness Measures— to help achieve customer rates that are cost competitive with business as usual, the City proposes a number of options including adjustment to property tax policy for NES utilities, access to senior government grants and capital funding mechanisms.
- Connection Policy Tools— since NES typically require the investment of capital before buildings are connected, policy tools – such as zoning policy and service area bylaws – are required to help reduce risk sufficiently to enable projects to be financed.

3. Minimizing City financial risk and exposure

By identifying areas of the city where NES is seen to be economically viable, risks are mitigated. These areas identified are characterized by densities capable of supporting the investment in infrastructure in a way that costs are competitive with traditional electricity and heating methods. Rate stability greater than that of traditional energy commodities is achieved by district energy utilities, as they utilize low-carbon energy sources.

A Cambie Neighbourhood Energy Strategy

A unique and tailored strategy was undertaken for the Cambie Corridor for the creation of its own dedicated neighbourhood energy strategy. As part of the Plan, the City of Vancouver engaged in a partnership with the University of British Columbia (UBC) to study the potential for district energy in the area. According to the UBC School of Architecture & Landscape Architecture (2011), prospective thermal energy densities were calculated for the various neighbourhoods of the corridor and compared against an existing model neighbourhood energy system, the South East False Creek utility. The findings were of a

similar range to the threshold of this benchmark grid. Therefore, the conclusion drawn was that all parts of the study corridor possess the capacity to support a new future district energy network. This has sparked the incorporation of policy to uphold the implementation of having the entire corridor serviced by way of renewable neighbourhood energy (City of Vancouver, 2011).

3.2.2 Planning Approach and Perspectives

This section summarizes the findings derived from dialog with planners of the City of Vancouver. The aim is to highlight key insights and perspectives pertinent to the planning process, as well as the resulting present plan to date for the Cambie Corridor study.

A New Look at Urbanism in Vancouver

The Cambie Corridor project became a pivotal transition planning exercise for Vancouver and is considered a leading example of the kind of urbanism the City wants to advance. Previously, the common practice was characterized by an individualized station area planning approach, where a study is undertaken for the area surrounding a single station. This was the initial direction for Cambie, which was proposed to be carried out “one-station-at-a time”, with an expected timeline of six to eight years to complete all four of the station areas. With the aim of a more timely and efficient process, the planning approach was reconsidered in order to allow for greater coordination to synergistically address opportunities and challenges. A corridor planning lens, whereby all areas surrounding and between stations are considered simultaneously, was selected for synchronizing the review

of land use, amenities, services and infrastructure throughout the length of Cambie (City of Vancouver, 2009).

According to Brent Toderian, Vancouver's Director of Planning, beyond the extended time that would have been required to conduct the original study, a nodal context did not appropriately consider the street and transit line:

"It didn't think about the corridor as a corridor, but saw the corridor as a series of individual areas. And it didn't necessarily think about change along the Corridor in the areas in between the stations" (Spacing Vancouver, 2012).

Brent Toderian adds that the preferred method is to recognize the transit-related commonalities and consistent principles along its length, but also recognize the unique identity of the station areas. Thus, the program was restructured with this in mind, and corridor planning will continue to be pursued in Vancouver, building off of the Cambie Corridor program (Spacing Vancouver, 2012).

Another aspect that makes the Cambie Corridor Plan unique is the emphasis that the City has placed on promoting mid-rise buildings. With the exceptions of the Marine Landing and Oakridge Town Centre station areas which are characterized by the greatest concentration of urban uses and densities, in contrast to the surrounding suburban residential neighbourhoods, the corridor is envisioned with mid-rise buildings as the predominant building form. The overall focus on mid-rise buildings is an explicit transition away from the leading high-rise development that has exemplified the downtown core area to date (City of Vancouver, 2013).

Transit-Oriented Planning and Best Practices

Throughout the Cambie Corridor project, the following high-level principles have continued to guide the planning process, and are considered strongly influential factors for success (City of Vancouver, 2009):

- I. Provide a variety of ways for the range of residents, property owners, community and stakeholder groups, businesses and city-wide and regional interests to participate in creating and reviewing proposals.
- II. Ensure that the opinions of both those in the directly affected area and those in the wider community are addressed.
- III. Engage the broad public recognizing the diversity of people and neighbourhoods within the corridor and the relationship of the Corridor to the much broader City and regional context.
- IV. Seek common ground that balances the 'interests' and 'uniqueness' of the neighbourhoods along corridor with their responsibility as part of the City and region.
- V. Ensure the broad public is kept informed through the City website, newsletters and other mediums.

Mobility

Vancouver's land use policy aims to encourage travel alternatives to the private automobile along Cambie and throughout the City. With the intent to support cleaner forms of mobility, the Cambie Plan promotes walking, cycling and transit. Moreover, the objectives of the Cambie Corridor have been aligned with Vancouver's Transportation Plan, which prioritizes these transport modes in the aforementioned descending order. However, it is important to note that the order should not be perceived as a rival between travel patterns. Rather, one planner explains the idea behind this hierarchy has surfaced from the acknowledgement that "every transit trip starts and ends with your feet". Therefore, in this

way, it is anticipated that this practice will yield augmented transit ridership (City of Vancouver, 2009).

Energy

The establishment of connections across disciplines is a highly significant aspiration for the Vancouver planning community, and served as a central planning principle for the delivery of the comprehensive Plan. Brent Toderian, notes:

*"We've prided ourselves for years in Vancouver, on integrating land use and transportation thinking better than most cities, and I think this Plan takes that to a new level. Beyond that though, this Plan signifies for us a new definition for success – the robust integration of land use, transportation **and energy**" (Spacing Vancouver, 2012).*

In addition to building and transportation-related energy consumption, planning for the district energy scale and neighbourhood energy systems is a forward-thinking strategy that will considerably contribute to further alleviating the City's energy grid. The success of the Southeast False Creek neighbourhood energy utility (shown in Figure 15), Vancouver's first renewable district heating system, has been particularly influential and sparked a strong interest in the prospect of district energy systems. It serves mainly mid-rise development, and demonstrates the potential of district energy, as an expanding system within the community that yields a 50% decrease in greenhouse gas emissions.

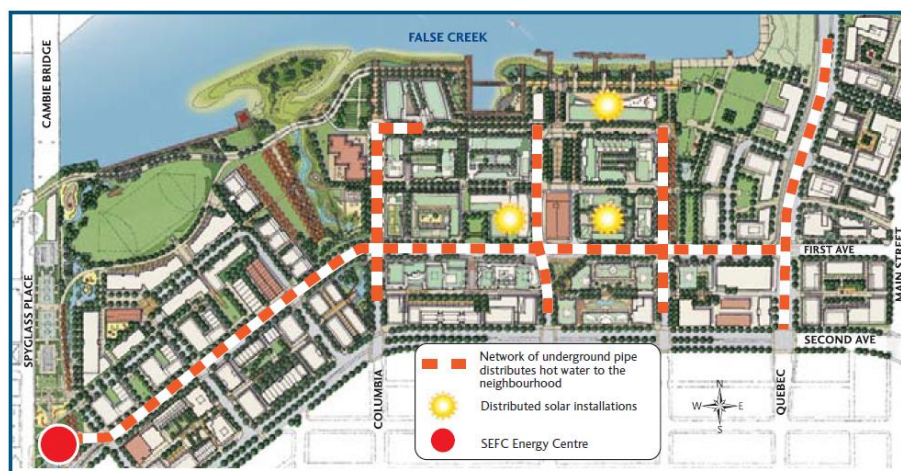


Figure 15. The Southeast False Creek Neighbourhood Energy Utility network (City of Vancouver, 2010).

Moreover, planners perceive district energy as a particularly synergistic opportunity when combined with transit-oriented planning. Firstly, the integration of transit and policy encourage the development of higher density neighbourhood which is crucial for the economic viability of a district energy project. Furthermore, mixed use development, which is another characteristic of transit-oriented development, is prudent for the efficiency of a district energy system. Different types of land uses, which often exhibit varying energy peaks, produce a neighbourhood that draws a steadier amount of energy in a day compared to a monotypic neighbourhood. Finally, the transit line itself provides a right of way, which can facilitate the energy distribution network of a district energy system.

As such, this has been embodied in the Cambie Corridor Plan, which states:

"Mixed use, compact communities such as the Cambie Corridor provide an ideal, indeed necessary, context for district energy systems, as peak energy demand for businesses and residences tend to occur at different times of day, helping to maximize energy system efficiency" (City of Vancouver, 2011, p.120).

In the case of the Cambie Corridor, the City has identified considerable potential for the implementation of neighbourhood energy. For instance, an old hospital campus steam system is set to be converted to a low-carbon energy source. Furthermore, numerous substantially sized development proposals will aid to catalyze the introduction of additional systems for the Cambie Corridor area (C40 Cities, 2013). Thus, the City maintains a strong commitment to its district energy ambitions, and is presently undertaking a competitive procurement process in order to identify a utility proponent.

Challenges

The most noteworthy challenges experienced with the Cambie Corridor Program revolved around the availability of resources for the project, along with the application of the recently formed Neighbourhood Energy Strategy.

A lack of sufficient resources is described as an issue that ultimately delayed the undertaking of the Cambie project. The initiative was in a preliminary stage when the planning division began exploring the idea of carrying out the study with a new scheme - the previously mentioned corridor approach. Upon deciding that this was the best direction to take, moving away from the first concept required a larger sum of funding than what was available at that time. Although the Canada Line was already being constructed, it was recognized that the work would not have been able to be conducted properly. Interestingly, the choice was made to commit to the re-conceptualization of the endeavour, postpone the launch of the program until after construction, and secure an adequate allocation of resources.

The disadvantage that came to light with this situation was the inability to proceed with development proposals for the corridor, which hindered the delivery of transit-supportive projects along Cambie. This could have also potentially produced lower ridership levels. In a sense "the planning was behind", but these circumstances were overcome with the tactic of introducing an interim re-zoning policy at the first Phase of the program (Spacing Vancouver, 2012). The deliberation of applications against established conditions and guiding principles was enabled for sites directly located at transit stations, until the Cambie policy was expanded, so as not to uphold the advancement of the corridor.

In relation to the incorporation of neighbourhood energy in the planning and policy of the Cambie Corridor, some difficulties arose particularly in dealing with public reception. Perspectives from the development community expressed apprehension over the cost of building district systems and maintaining competitive rates. A focus of consultation on this issue and *listening* also revealed instances of narrow levels of understanding regarding low-carbon technologies. Of particular concern and confusion was the requirement imposed to build for these technologies under the scenario of an area that does not yet have a neighbourhood energy system in place. This was addressed through the establishment of legal agreements toward the implementation of compatible NES building design, in order to ease the distress of financial risk in the interim to the district energy network development (Baber, 2014).

Final Remarks on the Cambie Corridor

The importance and benefit of integrating land use and transportation planning is undoubtedly acknowledged and promoted in Vancouver. In this case, the Cambie Corridor portrays an example where land use planning activities were undertaken subsequent to the construction of transit, and following the opening of the Canada Line. However, it should be duly noted that this was only chosen in order to be able to later pursue a corridor planning approach. A holistic and multi-level way of thinking is not always reflected in plans, and the Cambie project was a chance to better illustrate this (Spacing Vancouver, 2012).

The corridor program is recognized for aiming to change local area planning in Vancouver into a multi-scalar lens that better considers the regional scale down to the building and even the sidewalk scale. This planning approach will be continued with further city-wide

corridor assessments and Cambie is clearly seen to have spawned a positive outcome.

Thus, when contemplating the timing of land use planning projects in support of transit, it is certainly achievable to separately carry out a positive land use plan afterward and this need not be a discounted method. Still, if at all possible, the superseding message is that the ideal technique should remain to align the two schemes, establishing a cogent vision and supporting guidelines ahead of market demand.

Another important tactic is the combination of energy planning alongside the land use and transit strategy. Challenges are to be expected as a result of new endeavours but the City of Vancouver has made evident its commitment and acknowledgement of the benefits that can be drawn from forward-thinking strategies. The potential benefits should be a driver for overcoming any challenges and pushing forward a greater presence of district energy in the urban fabric. Higher-order transit is without a doubt a strong leverage in this scheme. In relation to this, additional leverage points are deemed to be rapid paces of land development, as well as the fact that the City controls land use and building codes (Baber, 2014)

In all cases, a final lesson to keep in mind whether in terms of land use-transit ventures or energy initiatives is that recognizing individual local context is imperative and a "one size fits all" framework is not an appropriate practice. A strategic approach should be employed, and flexibility is vital for effective implementation.

The next chapter will follow with a study on the case of Toronto, and provide insight to the recently completed Eglinton Connects Study.

CHAPTER 4: THE CASE OF TORONTO

This chapter studies the case of Toronto in planning for transit-oriented communities, through a review of the Toronto policy framework and the Eglinton Connects planning project.

4.1 TORONTO POLICY CONTEXT

This section details the policy framework under which the City of Toronto operates. For the purposes of this paper, there is a primary focus on the complementary regional land use and transportation plans established by the Province of Ontario. As well, the *Avenues* strategy of the Toronto Official Plan plays an important role in promoting transit-oriented planning in the City. This section also spans the Toronto Green Standard, a unique scheme that Toronto created to encourage and help move toward greener development.

4.1.1 Regional Context

The Growth Plan for the Greater Golden Horseshoe

The Province of Ontario has adopted the Growth Plan for the Greater Golden Horseshoe to guide its development-control objectives. The overall vision set out is one of building vibrant, complete communities that are compact and transit-supportive.

The Growth Plan (2012) puts forth great importance on the objective of increasing densities within the existing built-up area, as a mechanism to align new development in a way that optimizes transit and other infrastructure investments to support future growth.

This intensification strategy is particularly steered to urban growth centres, intensification corridors, and major transit station areas (see figure 16), as well as brownfield sites and greyfields.



Figure 16. Places to Grow concept as portrayed by the Ministry of Infrastructure (2012).

The Provincial government not only envisages that the development of land at transit-supportive densities will be crucial, transit-oriented street configurations are mandated as well. "Compact urban form and intensification efforts go hand-in-hand with more transit: not only do they support each other, they are all necessary [and] this correlation is fundamental to where and how we grow " (p.13). Within these parameters, the Growth Plan also directs that a mix of jobs and housing must be provided in order to allow people to work close to where they live.

Furthermore, in terms of mobility infrastructure to support growth, public transit and active transportation are emphasized in section 3.2.3, which states that:

- Public transit will be the first priority for transportation infrastructure planning and major transportation investments; and,
- Municipalities will ensure that pedestrian and bicycle networks are integrated into transportation planning to –
 - a) provide safe, comfortable travel for pedestrians and bicyclists within existing communities and new development
 - b) provide linkages between intensification areas, adjacent neighbourhoods, and transit stations.

The Big Move

The Province of Ontario established the agency Metrolinx to create and implement a long-term Regional Transportation Plan for the Greater Toronto and Hamilton Area (GTHA) and in 2008, *The Big Move* was adopted with an \$11.5 billion commitment (Metrolinx, 2012). The Big Move (2008) guides the investment in the region's transportation, recognizing the increased congestion and overburdened transit systems resulting in grave degradation to the environment, quality of life, and economy of the GTHA. Moreover, the Big Move complements and helps to realize the transport and urban growth visions set out by the Growth Plan, aiming to regenerate communities and promote alternate modes of travel to the car.

A major strategy is to triple the length of the rapid transit network, as shown in Figure 17.

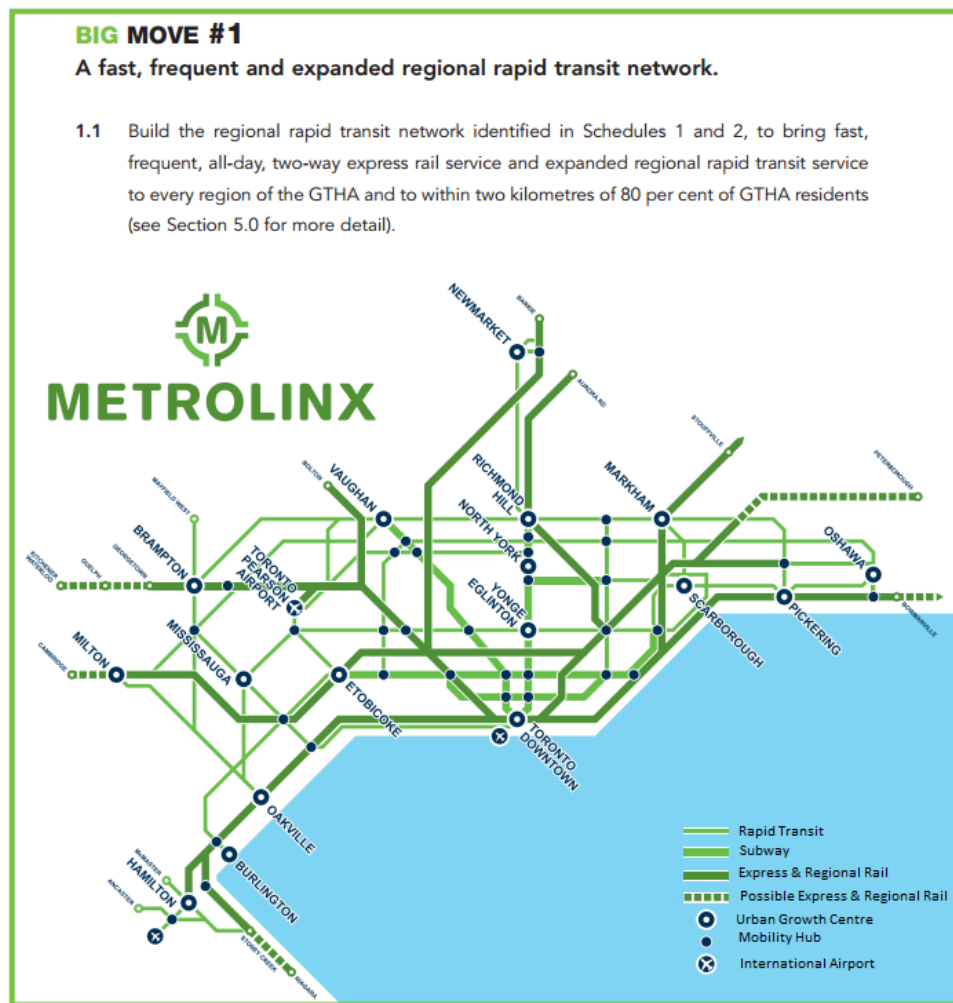


Figure 17. The Big Move – Strategy #1 – Build a comprehensive regional rapid transit network, reproduced from Metrolinx (2008).

Overall, the 25-year outlook of the Plan intends to; reduce the daily distance people drive by a third, provide less congestion for 50% more people in the region, as well as to have a fifth of trips to work on bicycles or walking, and a third by transit.

4.1.2 The Avenues Strategy

The Official Plan has set out a structure which directs growth to areas that are well served by transit, road networks and which have significant opportunities for redevelopment.

Among the areas that have been identified as having the greatest potential are the *Avenues*.

The *Avenues* are important corridors along major streets where reurbanization is anticipated and encouraged to create new housing and job opportunities while improving the pedestrian environment, the look of the street, shopping opportunities and transit service for community residents (City of Toronto, 2010). The *Avenues* policies exist in order to steer their appropriate reurbanization. One of the most important characteristics is that *Avenues* should follow *Mixed Use* policy. *Avenue* studies are meant to provide a vision and implementation plan to show (City of Toronto, 2010, p. 2-15):

- How the streetscape and pedestrian environment can be improved
- Where public open space can be created and existing parks improved
- Where trees should be planted
- How use of the road allowance can be optimized and transit service enhanced

4.1.3 The Toronto Green Standard

The Toronto Green Standard (TGS) reflects the environmental consciousness of the City, and aims to achieve more sustainable sites and buildings. The program is a defined set of performance measures established to generate greener new construction.

Initiated in 2006, TGS began as a single series of criteria that could be followed voluntarily. In 2009, the TGS was expanded with the introduction of a second level of criteria, resulting in the two-tier system that exists today (Toronto City Planning, 2014). Currently Tier 1 has been designated as mandatory, pursuant to the *Planning Act* of Ontario, for all development applications made beyond January 31st, 2010, and thus is implemented through Site Plan

Approval. As an enhanced level of performance, Tier 2 has been made a voluntary classification. However, participation at the Tier 2 level for applications received as of May 1st, 2009 offers the potential to collect up to a 20% refund of the fees paid in development charges to the City (Canada Green Building Council, 2014).

"For a typical high rise condominium being constructed in Toronto this equates to on average 0.5 million dollars refunded to award green, efficient new construction that places less of a burden on the City's infrastructure and improves quality of life for residents" (Toronto City Planning, 2014, p.1). This is among the highest financial incentives for green building in NA (Toronto City Planning, 2014).

Altogether, TGS is designed to address Toronto's main local priorities and concerns - its five key "environmental pressures": air quality; greenhouse gas emissions, energy efficiency and climate change; water quality and efficiency; urban ecology; solid waste. These categories correspond to the minimum requirements of Tier 1. Tier 2 maintains supplementary requirements in the core target areas of: urban heat island effect reduction; energy efficiency and commissioning; water efficiency; and light pollution reduction. In addition, another three "optional" targets must be selected from the following: electric vehicle infrastructure; bike share; renewable energy supply; no potable water for irrigation; ecological site restoration; tree planting off-site; reuse of existing building walls, floors, roof; regional materials sourced within 800km (Toronto City Planning, 2014).

As part of a recent 2013 review, the TGS has been updated and expanded, responding to implementation challenges found in recent versions. Flexibility has been improved and more options are now provided for developers and building owners, to encourage greater

enrolment. Moreover, the City has aimed to better align the TGS performance measures with the LEED program since several targets may contribute toward credits for LEED Gold certification. However, it is important to note that TGS and LEED requirements must be treated separately, and that while some overlap may exist, the pursuit of one does not equate to achievement of the other. In order to assist in the understanding of similarities and differences, a summary comparison report has been produced to help guide new projects (Canada Green Building Council, 2014).

The next section delves into the transit-oriented planning and green development practices of Toronto through the case study of the Eglinton Connects project.

4.2 THE EGLINTON CONNECTS PLANNING STUDY

The Eglinton Connects Study is a recently completed land use planning exercise that will guide the creation of transit-oriented communities in the City of Toronto. This section investigates the Eglinton Connects Study, and presents the findings of the planning approach and perspectives.

4.2.1 Overview

As mentioned previously, Metrolinx's RTP outlines that intensification corridors are to be evaluated and guided toward a transit supportive development of higher density and mixed-uses. Eglinton Avenue is not only identified as an intensification corridor on the regional scale, for the most part it is also designated as an Avenue in the City of Toronto Official Plan (City of Toronto, 2014a; City of Toronto, 2010). Based on the importance of the corridor and the future arrival of a new LRT line, a recommendation was made that

Toronto's City Planning Division Avenue Study budget be assigned to the undertaking of a two-year Eglinton Study (Toronto City Planning, 2011).

The "Eglinton Connects Study" (EC Study) was initiated to coincide with and complement the Eglinton Crosstown LRT, a \$5 billion project under construction by Metrolinx that will span 12 Wards from Weston Road to Kennedy subway station (City of Toronto, 2014a; City of Toronto, 2014d). This endeavour involved a collaborative effort between the City and the two transit agencies Metrolinx and TTC; A City EC planning team was tasked with assessing the corridor and making recommendations to produce an updated planning framework, as well as revising station design plans, and co-ordinating with the TTC for the Site Plan Control process (Toronto City Planning, 2011).

Throughout the EC Study, the City also pursued public consultation during 2012 and 2013, utilizing 14 different promotion techniques ranging from a website, social media and e-updates to mailed flyers, radio and full-page newspaper ads. In addition, more than 60 public and stakeholder consultation events were held, which led to the engagement of over 5000 people (City of Toronto, 2014b).

Ultimately, the City has set forth the aim to take advantage of the new transit infrastructure and to guide a transformation of the Eglinton corridor with the following vision:

"Eglinton Avenue will become Toronto's central east-west avenue – a green, beautiful linear space that supports residential living, employment, retail and public uses in a setting of community vibrancy. Its design will balance all forms of mobility and connect neighbourhoods and natural valley systems to the larger city and the region." (City of Toronto, 2014d, p.16)

The corridor is anticipated to undergo long-term intensification and exemplify a transit-oriented community, accommodating over 100,000 new people and jobs. Moreover, while there are currently approximately 78,200 recorded transit riders per day, this number is expected to increase to 170,000 by 2031 (City of Toronto, 2014c). In order to support this future growth, according to the vision set out for Eglinton, the City has decided to contribute \$100 million toward enhancing the streetscape. Together, these transit and public realm investments have a potential to yield \$10 billion of private sector investment through the construction of new buildings alone (City of Toronto, 2014d).

To direct new development along the EC Study corridor, the components of travelling, greening, and building Eglinton were considered, culminating in 21 recommendations and best-practices that are to be employed (City of Toronto, 2014e). These are highlighted below in Figure 18:

| Travelling | Greening | Building |
|---|--|---|
| Create a Complete Street | Implement Three Primary Greening Typologies | Encourage Mid-Rise Buildings on Eglinton through As-of-Right Permissions |
| Provide Wide Sidewalks | Create a Network of Green & Open Spaces | Maximize Opportunities for Mid-Rise Development on Shallow Lots |
| Build Protected Cycling Lanes | Grow Great Trees | Integrate Crosstown Station Sites with New Development |
| Reallocate Road Space to Meet Future Needs and Mobility Mix | Relocate Hydro Below-Grade | Plan for Intensification in Focus Areas and Mobility Hubs |
| Maintain Parking Supply | Connect Eglinton to Trails and Ravine System | Expand Community Services and Facilities, Including Green and Open Spaces, in Tandem with Development |
| Extend Network of Rear Lanes | Green Transit Infrastructure | Encourage Street-Related Retail |

| | | |
|----------------------------------|---------------------------|--|
| Implement Streetscape Typologies | Plan a Public Art Program | Implement Additional Performance Standards to Support Local Character Areas and Heritage |
|----------------------------------|---------------------------|--|

Figure 18. The Eglinton Connects Plan's 21 recommendations and implementation strategies, reproduced from the City of Toronto (2014e).

Another important element of the EC Study is the recommendation that the build out of the Eglinton corridor should be tracked and examined over time. A monitoring program was created comprising a set of indicators based on the objectives of the EC Study, for the purpose of assessing the development progress of Eglinton and the level of success of the plan, along with the need for adaptations to it (City of Toronto, 2014e).

4.2.2 Planning Approach and Perspectives

This section summarizes the findings derived from personal communication with planners of the City of Toronto. The aim is to highlight key insights and perspectives pertinent to the planning process, as well as the resulting plan of recommendations for the Eglinton Connects Study.

A New Kind of Avenue Study

Eglinton Connects is described as a new type of study - "*A new era of Avenue planning*". At a time when Toronto's planning division was searching for ways to conduct Avenue studies more efficiently, new transit infrastructure was the catalyst, offering an opportunity to carry out something transformational.

In the past, the City of Toronto had performed much shorter studies comprising segments spanning only 1-2 km of an Avenue. These previous studies have also entailed a more strategic scope of the site. For Eglinton Avenue, in light of the scale of the Light Rail Train

(LRT) line and the anticipated development pressure, it was opted to take on a new approach and study not only a greater length of an Avenue, but study it more broadly than had been done before.

Thus, EC is innovative for its study of a much larger set of aspects of planning policy and regulations simultaneously. Planners value this as an improvement, in terms of the significance of carrying out planning with a holistic and synergistic lens.

Additionally, the timing of the study is praised as it was carried out early in the LRT development phase, to get ahead of the construction, as well as the anticipated development interest, and to ensure that appropriate guidelines were in place. In contrast, some preceding studies examined avenues as a response to unsatisfactory development. Therefore, interviewees commended EC for being a proactive planning exercise toward accommodating the future growth of the City. Lastly, it is worth noting that much of this planning achievement is owed to the support of Metrolinx, without which Eglinton Connects may not have been possible. Metrolinx not only encouraged the project, but contributed a substantial portion of the funding necessary to carry out a study of this magnitude.

Transit-Oriented Planning and Best Practices

The fundamental purpose and basis of the EC Study is to ensure the coordination between land use and transportation planning, and promote a transit-oriented corridor.

The practice of corridor planning was selected to address the linear geography and generally apply TOD principles to all of the Eglinton study area, rather than a series of

individual TOD sites at isolated stations. As part of this approach, focus area nodes were identified as priority sites, including large collections of buildings or parcels of under-utilized land. The goal is to direct development to occur from the station sites outward to the rest of the corridor, and that building heights follow this prescribed order as well. Moreover, a number of locations have been recommended for further study so that a more context-specific development direction may be provided in future.

Overall, the EC plan embodies an emphasis on cultivating pedestrian and cycle friendly environments, as the planning team advocated the importance of supporting convenience in the 'before and after' portion of transit riders' travel journeys. A complete street, such as the one illustrated below, is aspired to. In terms of cycling, a progressive element will be that the entire length of the study corridor (which currently has only 50 m or less than 0.5% of bicycle lanes), will see an extension to 38 km, becoming the longest continuous cycling stretch in Toronto (City of Toronto, 2014c).

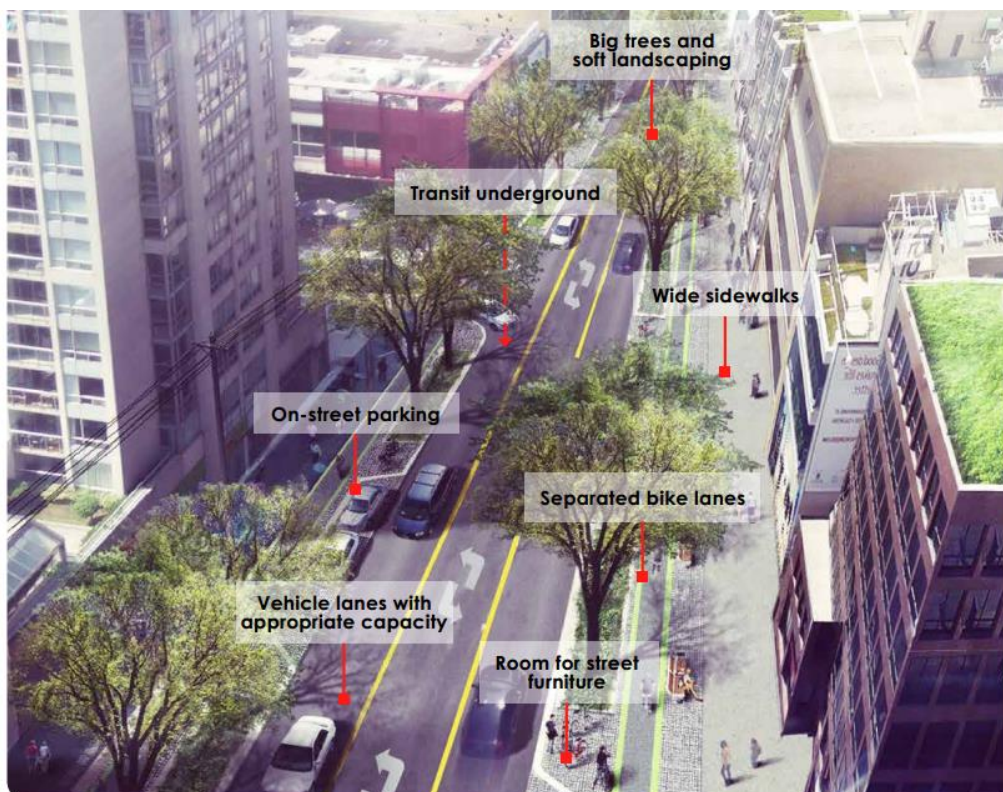


Figure 19.
Complete
Streets vision
for Eglinton
Avenue,
reproduced
from the City
of Toronto
(2014e)

The EC Study was also built upon a common theme that has emerged on desirable avenues in prior avenue studies — the positive response to public realm improvements. Learning from previous experiences, enhancements to the public realm form a significant part of the EC plan. In fact, it is perceived that it will prove as one of the top success factors for the future development of Eglinton. According to planners it also shows the City's commitment to revitalize the corridor, which resonates with developers. Interviewees explained that the development sector would be quick to agree that making investments in the public realm and community facilities stimulates development. Moreover, along with higher order transit, these are two of the biggest incentives that can be provided in order to attract development.

Challenges

The greatest types of challenges experienced during the EC Study planning process surrounded issues of agreement and support levels from the community, City decision-makers, and public partners.

Throughout the Study there were various concerns and misconceptions that emerged, leading to opposition. At times these concerns were accentuated by a lack of support from the City Council. For instance, rather than demonstrating political leadership toward the City's vision, the Mayor of Toronto at the time (Rob Ford) publicly promoted the EC streetscape objectives as "a war on the car", fueling negative and divisive sentiments (The Star, 2014). However, undertaking a highly involved public consultation process proved to be impactful and beneficial when the community itself stood up to the Mayor and responded with a letter outlining their support for the project based on civic engagement.

Although it is also worth noting that the final stages of the policy release occurred amidst a pre-election campaigning period, which certainly had the potential to increase political debate. In general, it was a unique challenge that this avenue study spanned a record 12 wards, which were represented by an array of councillors of differing opinions and visions of what they wanted for their communities. Thus, council members were briefed and consulted often prior to the public in order to obtain support before involving the neighbourhoods' residents.

Indeed, working with the community was key, especially for overcoming initial resistance. In some cases such as the proposal for separated bike lanes, the Business Interest Associations were particularly apprehensive about the negative effects that the proposal might cause to businesses. Conversely, cyclists were naturally in great favour of the proposal, resulting in public tension between these groups. Planning staff addressed this tension by holding a number of targeted working groups with only the BIAs and cycling advocates in isolation (so as to foster a more positive rapport and collectively attend to their issues). In the end, the working groups garnered an accord of the potential benefits for businesses, as well as a greater understanding among the conflicting groups.

In other cases, community distress grew to such an extent that implementation could not be achieved. When it came to the neighbourhood transition areas, it was intended for lots fronting Eglinton to combine with adjoining lots. However, in an effort to appease residents, Council was swayed to the compromise of establishing only one site as a pilot test case of the impacts on neighbourhoods. Even the implementation of zoning mid-rise development "as-of-right" is currently being challenged. Despite extensive consultation

efforts on this matter, community association members have filed to appeal the zoning amendment, which now awaits resolution before the Ontario Municipal Board.

In relation to addressing diverse interests, the creation of station designs by the City and Metrolinx for example, had its challenges in terms of coordination and agreement. Each body's responsibilities resulted in their own set of priorities in the way of design, function and costs. However, sharing the same overall vision and goals proved greatly influential to facilitating a successful negotiation process. Most recently, in late February 2015, the provincial agency officially released a Request For Proposal, in search of opportunities to pursue joint ventures at station sites. This may introduce another set of challenges to overcome once Metrolinx establishes private partners for the construction of station areas.

Greening

In general, interviewees recognized opportunities and benefits for the blending of TOD and additional green urbanism practices in Toronto's new growth. There is consensus that TOD and green urbanism tactics go hand-in-hand, and that environmentally friendly development is slowly becoming a desired commodity in today's society. As well, they noted that it appears a growing number of people are buying into the "green lifestyle", especially among those that are choosing properties near transit, and it is believed they will most likely welcome additional green features.

The EC plan is complemented by several of Toronto's existing policy and regulations. For example, in terms of greening, the corridor will largely be guided by the City-wide Toronto Green Standard and Green Roof By-Law - which apply to private development. As a one-time endeavour, it was perceived to be inappropriate that EC stipulate conditions for the

greening of private development, and rather that it could result in a disincentive by limiting the TGS in the future. However, in terms of public endeavours, the EC planning team strived to set a new precedent for the greening of avenues.

Eglinton will be characterized mainly by two major greening initiatives. Firstly, the City is making provisions to allow for the planting of 1,150 trees to beautify and maintain higher air quality. An investment of this type and scale has not previously been made for Toronto. Another notable feature that will be particularly groundbreaking for Toronto, and even across Canada, is the inclusion of a green LRT trackway for a segment of the eastern portion of the corridor. While conducting research on various model case studies, it was a Parisian consultant that immediately noted the absence of a green track in the plan, and sparked the idea of developing this feature for Eglinton. Upon further consideration of cities with similar climates, Toronto planners decided to push for a greener surface material as opposed to the conventional use of concrete. As a result, Metrolinx has agreed to install a green trackway along the at-grade portions to become a model demonstration project.



Figure 20.
Impression of
the Green
Track
Installation on
Eglinton (City
of Toronto,
2014e)

Impression of the Green Track Installation on Eglinton, 2050

However, in hindsight, several planning shortcomings remain in place. For instance, the burying of hydro lines in tandem with construction processes was insisted upon and would also have benefited the opportunity to support larger trees, is a strategy that was not endorsed by Council due to a lack of funding. Another example of missed opportunities is that considering the amount of new development anticipated, the incorporation of enhanced green building requirements or practices such as district energy were neglected. This shortcoming is acknowledged in particular for areas where higher density is nearly certain, which could have been leveraged to create a case for superior green building requirements and district energy.

The reason given for this shortcoming is that deliberate scoping decisions were made at the outset of the EC Study and there was no mandate included with regard to parameters such as green buildings and energy systems. Furthermore, it is noted that the inclusion of these parameters would have required established public and political interest, and support prior to commencing the study. Hence, it is often crucial to have champions and leadership early on, because community activists and politicians can help drive sustainability strategies. However, there are several areas of the corridor recommended for further study, and perhaps these concepts can appear through the secondary planning processes in the future.

Overall, interviewees acknowledged that while Toronto has done relatively well, there is room for improvement. The general sentiment is that there is always more that can be done. A key determining factor remains in the hands of decision-makers, their level of commitment, and the allocation of resources.

Final Takeaways from the Eglinton Connects Study

On the whole, planners expressed that based on their experience with the Eglinton Connects Study, the greatest takeaways were in relation to the importance of leadership; close collaboration; and community consultation.

The City's EC Study Team considers that recognizing the importance of their role as leaders was necessary for the pursuit of bold ambitions, and the opportunity to set new standards for Toronto. New standards were particularly strived for in the creation of the streetscape plan concept, to ensure that public investments were leveraged to the greatest extent. Although, in the end, political leadership is also stated as crucial to the ultimate realization of planning goals. Thus having political buy-in and community champions was fundamental to achieve the desired objectives.

Another important element that was vital throughout the planning process is close collaboration with partners. The project would not have been as successful without a high level of engagement and interaction to make things work.

Finally, community consultation is stated as essential to such an endeavour, particularly where TOD planning must deal with the sensitivity of neighbourhood transition areas and adjacent residents. A balance between listening to the community and providing an educational environment is most effective, all the while remaining committed to provocative and ambitious goals.

The following and final chapter will discuss and compare the Vancouver and Toronto case study findings, as well as offer recommendations and conclude the paper.

CHAPTER 5: DISCUSSION AND CONCLUSION

This chapter will discuss similarities and differences between Cambie and Eglinton, along with the strengths and shortcomings of each project. As well, a set of recommendations are presented, based on the most salient findings of the case studies.

5.1 SIMILARITIES

The two case studies analyzed demonstrate several similarities between the most recent transit corridor plans of Vancouver and Toronto. They were driven by similar goals and resulted in comparable corridor planning approaches. Moreover, both cities also experienced comparable challenges.

Firstly, the Cambie Corridor Plan and Eglinton Connects Study are examples of projects where transit was the initiating planning impetus. Once transit infrastructure was approved a corresponding land use study was the next logical step. The policy contexts within which Vancouver and Toronto operate exhibit a strong emphasis on the integration of land use and transport, supported at provincial, regional and local levels. Furthermore, intensification is key to these frameworks, particularly along transit corridors, in order to leverage such investments.

A new corridor planning approach was adopted by both cities. The preferred method appears to be a corridor-wide outlook that considers shared common elements, resulting in greater efficiency. Yet, equal importance is placed on the differences that exist between neighbourhoods, and the undertaking of strategic site planning for important individual

nodes. This is suggested as permitting in-depth guidance for areas that require narrower attention, such as station surroundings, or large tracts of land with the potential for significant redevelopment.

Another main focus is to support and encourage alternatives to driving, which is reflected in the visions of the corridor plans. Both sets of plans embody many of what are considered common best practices for land use design and mobility infrastructure. The general aims are to produce "complete communities and streets". Beyond transit mobility, planners also demonstrated to be strongly in favour of supporting the before and after portion of transit journeys that are taken by foot and by cycling. This is also considered to augment transit patronage.

In terms of challenges, the Cambie and Eglinton planning processes experienced similar difficulties, such as being met with varying interests and opposition among stakeholders as well as the general public. Each city uniquely presents the importance of consultation and diverse, targeted methods. In both cases, the common message for handling public involvement is to engage, inform, and listen, while recognizing that not everyone can be satisfied, and yet remaining committed to fundamental sustainable planning City goals.

5.2 REFLECTIONS ON VANCOUVER

Just as it has in the past, Vancouver continues to confirm its leadership in integrating land use and transportation planning. The City maintains a comprehensive strategy and commitment to its vision for building Transit-Oriented Communities.

Cambie is evidently a turning point, and an exemplary model of transit-oriented planning in Vancouver. Firstly, the Plan emphasizes mid-rise density and a corridor scale. In addition, the City displayed a particularly strong commitment to the corridor approach, by postponing the study in order to secure sufficient resources to conduct the planning exercise in this manner. Instead, the City could have chosen to pursue whichever method was achievable with the resources originally at hand. The Cambie case also displays that even though in this scenario additional land use planning happened post-transit construction, the establishment of techniques like interim zoning can maintain development control in this circumstance and still lead to a successful project.

Recently, it is also apparent that neighbourhood energy is becoming a focal point for Vancouver, even though a district energy system has existed in the downtown core for some time. Especially since the success of the innovative South East False Creek Neighbourhood Energy Utility, the City is reaping the benefits and aiming to build off its teachings. Vancouver is clearly keen to continue and advance the use of district energy, while not afraid to be bold, and has created the Neighbourhood Energy Strategy as a means of implementation. Planners have also acknowledged and promoted that TODs are excellent synergistic opportunities to pursue, and thus in this manner Cambie exemplifies a leading practice by integrating energy planning.

The experience with Cambie demonstrates that when studying the intensification of a community, transit-supportive density is not the only important consideration, it is an opportune time to assess the supportive density potential for district energy as well. By having a pre-determined threshold level of energy density, communities can be evaluated

to determine the feasibility of accommodating district energy. The tactic of identifying potential conversion sites along transit lines also presents added chances to service anticipated development.

Another lesson to draw is in regard to the likelihood of apprehensive developers, given that the application of district energy may be new to developers. Similar to the case of developing near transit, the concept of constructing district energy appears to pose difficulty in the way of the “chicken and egg” dilemma; If the neighbourhood energy utility is built first there may be insufficient density, and it may never follow, but it can also be confusing and perhaps even unnerving to develop a project for a neighbourhood energy utility that does not yet exist.

Thus, Vancouver's response to this illustrates that it is wise to apply enabling tools to assist the implementation process, and minimize financial risk by ensuring legal requirements for all buildings within designated priorities areas.

5.3 REFLECTIONS ON TORONTO

The Eglinton Connects project is a proactive example of coordinated land use and transport planning. Having been initiated and substantially funded by the provincial agency Metrolinx depicts the importance of public sector partnerships. Intergovernmental collaboration and support can help advance the realization of ambitious projects that require considerable resources.

Another promising strategy involving Metrolinx is its intent to work with developers for station area construction. This shows another beneficial opportunity of aligning land use

and transit planning in a timely manner. Land use projects that take place following the completion of the transit infrastructure, do not necessarily provide opportunities. With the station area guidelines set and approved by the City of Toronto, on February 27, 2015, Metrolinx released a Request for Proposal to jointly deliver transit-oriented developments at station sites, as suggested by the City.

Toronto has also done well in other respects, namely with the public realm study and investment in the Eglinton corridor. Building on previous Avenue studies, which frequently revealed a positive outcome stemming from a high quality public realm, the strong commitment to enhancing the streetscape of Eglinton brings promise for the future of the corridor. This will surely serve as an incentive and attract developers, as well as contribute toward realizing the main street vision of the area.

However, despite areas of strength there are a number of suggested weaknesses in the case of the Eglinton Connects process and resulting plan. In general, it appears that Toronto experiences greater political issues to overcome with planning and development, even more so with regard to sustainability. By comparison, Vancouver seems to portray greater strength in its sustainability endeavours, drawn from the leadership and unified support of decision-makers, which allows for high standards to be upheld in line with the City's ambitious goals. During the course of both projects, the Toronto Mayor and various council members campaigned against the EC initiative; meanwhile the Mayor of Vancouver and the majority of council have supported the Cambie program and endeavoured to integrate sustainable energy planning by boldly vowed to lead their City to become 100% dependent on renewable sources. It would undoubtedly be advantageous to see fewer political

roadblocks in Toronto. Yet even without political support, the Eglinton project illustrates a noteworthy instance where public consultation fostered significant community support. In this case, ultimately it was the corridor residents which stood up to the Mayor, and defended the initiative. This form of involvement reflects "the power of the people" — the role that the public can play in shaping the trajectory of planning endeavours — which can be especially instrumental in cases where political hurdles are present.

On the other hand, the same case serves as a reminder that not everyone will always be content. The Eglinton corridor planning exercise encountered varying degrees of support, which were reflected in items being compromised, or becoming cancelled altogether. Moreover, even when proposals are given the green light by Council, plans may of course be appealed. Unfortunately, this has been the fate of the approved amendment that would zone mid-rise as-of right, which planners did well to encourage. It was an excellent move to go beyond leaving it as a policy item, and to do the upfront work to ensure putting in place more concrete specifications. Having such a zoning by-law not only proposes to expedite the process for developers, but in any case of opposition that were to arise, the City will benefit by being in a better position to stand their ground with the development sector.

Moving on to the discussion of greening on Eglinton, there are glaring gaps in the conversation. Not that the arrival of Canada's first green LRT trackway is to be undermined — there are merely a handful of cities in North America that have applied this technology. The significant investment in trees is another unprecedented positive step in the direction of greening.

However, while these new ventures could be an indication that Toronto is becoming more committed to green development, the Eglinton project did not engage in a much wider spectrum of possibilities. But, within the scope of its mandate, it appears that perhaps the planning team did what it could to incorporate green measures beyond conventional TOD practices. Still, it is certainly fair to question whether these two efforts are enough. Though they are cited by interviewees as contributing to awareness about the environment, beautification, and among other benefits, enhanced air quality, they will not address the many ways in which we contaminate our environment. As mentioned throughout the Vancouver case study, green building and sustainable energy strategies are key components of the Cambie Plan, demonstrating it not only as a possibility, but that it is a very complementing opportunity to combine with transit-oriented planning.

In terms of green building development for Eglinton, Toronto opted to rely on the City-wide TGS. It is somewhat another question altogether whether the TGS is doing enough as it is now, but this warrants attention if it will dictate the build-out along the City's upcoming LRT line. Perhaps stricter design requirements for the corridor should have been explored in some capacity, even if a measure that remains tied to the TGS was employed. One suggestion is the prospect of mandating that developers pursue the Tier 2 level of the TGS program, to the extent of the City's authority. Although there is merit to the argument that Eglinton Connects was a one-off project, the idea of commanding Tier 2 standards addresses this reasoning, as it would still allow for the corridor parameters to evolve along with the TGS. Another scheme that might be considered is borrowing a concept along the lines of Vancouver's rezoning policy, whereby higher green building standards are expected in order to grant rezoning applications.

The issue that there is no district energy component to the Eglinton corridor plan seems to extend beyond this one planning project. On the whole Toronto could benefit from a city-wide district energy strategy, similar to that which Vancouver has established.

Such a strategy could have ensured that district energy be on radar when a large scale endeavour like Eglinton first came to light. It could have directed for district energy solutions to be explored earlier on, which is important for these objectives – as they are best considered from the beginning, rather than after the fact. Especially bearing in mind the technicalities of building district energy systems. For example, the system infrastructure requires a network of subterranean piping. Hence, an opportune time to lay the necessary piping for district energy presents itself during the period when streets are being excavated for transit construction.

Additionally, having district energy as part of the vision from the outset could have allowed for a feasibility study, such as that undertaken on Cambie, to help understand the potential along Eglinton. The Cambie study was similar in that it emphasized mainly mid-rise development, and it was deemed capable of accommodating neighborhood energy in the corridor. This gives reason to consider the capability of Eglinton as well. Moreover, there are some large under-developed tracts of land on the corridor, such as the Golden Mile area, that could be prime locations for a district energy system. Toronto City Planning should think about establishing partnerships for these endeavours as well. As illustrated in Vancouver, learning institutions may be approached to engage in research studies, such as a feasibility analysis for district energy. In addition, utility providers are another example of entities whom government bodies can partner with to encourage and help realize

sustainable development. The outcomes of these partnerships could range from establishing incentive programs to creating cost-sharing agreements for developing district energy projects. Overall, involving a greater assortment of parties in the conversation would help to extend knowledge and resources on this venture.

While the initial Eglinton plan had its share of lost opportunities, there are a number of sites that will require further study and planning. Future planning projects for these areas will present another embedding additional sustainability strategies in the corridor. These opportunities should not be missed a second time; we should learn from the shortcomings of Eglinton's first stage of planning and aim to improve upon them.

5.4 RECOMMENDATIONS

Based on the case studies analyzed in this paper five recommendations are offered below. These recommendations also include areas of further research for cities wishing to move forward with green urbanism practices, particularly in the way of transit-oriented planning, green buildings, and district energy.

Promote public awareness and political support for green practices

Civic awareness and education should be pursued to help promote a public that gains acceptance, and values the progression toward a greener city. Moreover, public support can prove influential to secure the political support required for green practices. As such, municipal governments and planners should encourage and be committed to high standards of sustainability and be prepared to support the investments necessary to ingrain these practices into the public and private sectors. Upper level governments must

also take an active leading role in promoting a sustainability vision and policy framework, while offering resources to assist municipal endeavours.

Usher in holistic planning and collaboration

Holistic planning must be a core value of planners and elected officials, who must realize the efficiencies and synergistic opportunities to be had, and pursue them in project design and implementation. Open communication and collaboration between city departments should be actively encouraged, in order to mobilize knowledge and capitalize on diverse expertise. Achieving external partnerships with entities such as public organizations, learning institutions, and the private sector is also recommended, as a means of drawing in an even broader range of resources. Both strong public and private partnerships can also help mitigate the complications that may arise from different requirements and goals, and facilitate mutually beneficial interests.

Treat rapid transit corridors as opportunities for reurbanization and efficient corridor planning, ideally, ahead of transit construction.

Rapid transit projects can serve as a catalyst to spur reurbanization, and that potential should be capitalized on by the public sector. Planning in advance of transit construction can help secure the goals a city aspires to, while also encouraging investment from developers by showcasing the City's intentions. Moreover, private sector beneficiaries of transit investment should be held to high development standards which help to enhance social benefits and advance environmental goals.

Public realm and public benefit plans are instrumental to help foster transit-oriented communities that are vibrant and liveable, while ensuring that the needs of a growing population are accommodated. Strategies that enhance the streetscapes and community

facilities are also great incentives to stimulate development. When planning for transit-led urban renewal, the corridor scale can offer a unified vision and planning efficiencies, while still allowing for the study of unique station area sites. Reurbanization goals should be aligned with the context and location of the corridor within the city as a whole, and utilize good urban design to ease the integration of new development. Transition areas are essential for corridors with adjacent low-rise neighborhoods, and mid-rise development should be strongly considered for sites outside of the downtown core.

Advance evolving green building standards, and establish a set of implementation mechanisms

Municipal authority over the building code is a pragmatic tool for mandating wide-ranging green building standards and it can be aligned with evolving practices, as well as technological advancements. Moreover, the evolution of the building code can be twinned with established programs such as LEED. Alternatively, green building requirements can be established within the capacity of the municipal authority, and government officials and planners should push the norm while incrementally demanding the highest level of green building. Municipalities are suggested to lead with model projects, and creative incentives to aid the development industry to construct green buildings. In addition, bylaws for rezoning and large sites are examples of implementation mechanisms that should be considered to secure superior green buildings. These types of bylaws can be especially suitable for reurbanization efforts along transit corridors in suburban contexts.

Strategic district energy planning at the municipal level

City-wide strategic plans for advancing district energy should be established to ensure that such energy systems are part of the vision for major urban planning and development projects. Transit-oriented developments can offer efficiencies from higher densities and mixed-uses, and therefore should be regarded as priority locations to establish new district energy systems and expand on the existing infrastructure. To assist the implementation of district energy, it is also advisable to establish a diverse set of enabling tools and regulations such as: technology and requirement guidelines, mandatory connections, and tactics that help establish cost competitiveness.

5.5 CONCLUSION

This paper has explored the current state of practice in planning for transit-oriented communities in Vancouver and Toronto, which present good examples of how transit can serve as an impetus for urban revitalization projects. These two cities reflect local endeavours shaped and supported by regional and provincial contexts that promote coordinated land use and transport planning, as well as a reduction in automobile travel.

As such, the Cambie Corridor Plans and the Eglinton Connects study have resulted in land use, urban design, and mobility objectives that comprise among the top conventional TOD practices, aimed at producing vibrant, mixed-use communities that support transit, cycling, and walking. Moreover, each city displayed a shift toward a corridor planning approach, which yields advantageous efficiencies, but which should be combined with individual neighborhood considerations. Throughout the planning processes analyzed, the

proponents experienced similar challenges in the way of facing and overcoming diverse interests during partnership and public engagement exercises. However, it is perceived that collaboration and public involvement also proved as key success factors for the projects.

The greatest disparity between the two plans stems from their mandates for greening the corridors. Eglinton Connects exhibits a narrow scope that resulted in limited sustainability initiatives beyond common TOD practices, as well as almost complete reliance on existing city-wide environmental policies. Overall, the City shows room for improvement in its ambitions and commitment to sustainable development.

Toronto and other cities could learn from Vancouver which is advancing on district energy with a strategic approach that acknowledges the synergistic opportunities to be had with transit-oriented development. The Cambie Plan illustrates a leading model for capitalizing on this and pursuing that the corridor be served by a renewable neighborhood energy network. Furthermore the City's rezoning policy will be employed to ensure that the corridor is built to a minimum of LEED Gold standards.

Thus, in terms of whether the corridors are geared toward producing "Green TOD", the main characteristic in line with this concept is the construction of green buildings.

However, Vancouver not only upholds a higher standard of development for green buildings, it has employed an energy framework that will further reduce the area's carbon footprint. It can therefore be considered that Cambie may develop in a way that better reflects the concept of Green TOD.

Based on the most notable findings of the Cambie and Eglinton cases, the following recommendations are offered, to help cities wishing to move forward with green urbanism practices, particularly in the way of transit-oriented planning; green buildings; and district energy:

- *Promote public awareness and political support for green practices*
- *Usher in holistic planning and collaboration*
- *Treat rapid transit corridors as opportunities for reurbanization and efficient corridor planning, ideally, ahead of transit construction*
- *Advance evolving green building standards, and establish a set of implementation mechanisms*
- *Strategic district energy planning at the municipal level*

However, it is important to note that this paper focused on the planning process up to the creation of project plans and regulation, and the corridors will need to be examined at a later point in time to assess the resulting build-out of the planning efforts. The above recommendations should also be pursued with further research in order to create a tailored planning approach that takes into account unique local contexts.

Nonetheless, a pressing lesson for cities remains in the need to foster and embrace a vision for a sustainable pathway. Moreover, holistic planning and the synergies to be garnered from transit-oriented communities and development such as Green TOD, offer promising forward-thinking actions that must be a part of the pathway to ensure the long-term prosperity of our urban habitats.

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APPENDIX A

Appendix A comprises a sample of questions utilized in interviews with City of Vancouver planners regarding the Cambie Corridor Planning Program:

- What best practices do you believe Vancouver exemplifies in the way of achieving transit oriented communities?
 - What factors have proven most influential to success?
 - What challenges have been faced, and how were they overcome?
- By comparison to conventional transit oriented development, how would you describe the presence of "green TOD"?
 - Would you say Vancouver blends TOD with green urbanism? If so, how has the City accomplished this? What strategies are used to promote/ensure green TOCs?
- What, if any, incentives are provided for greening and TOD?
- Is greening prioritized in any way for transit oriented development? Should it be? For instance would it be beneficial to impose stricter requirements of developments nearest transit stations to leverage the prime location and density?
- What is the green vision for Cambie? Are any TOD or greening strategies that are recommended for Cambie new for Vancouver?
- Why was Cambie selected as a priority area for district energy?
- How will the development of district energy be secured?
- On the whole, what do you perceive are the greatest takeaways/lessons learned from Vancouver's experience in planning for green transit-oriented communities?

APPENDIX B

Appendix B comprises a sample of questions utilized in interviews with City of Toronto planners regarding the Eglinton Connects Planning Study:

- Eglinton Connects is described as a new type of study, what are the main differences between the study and planning of Eglinton connects compared to other avenues?
- What particular elements of the planning process/study do you think will prove as success factors for the future development of Eglinton?
- What TOD best practices went into planning the Eglinton Corridor?
- What types of challenges were experienced during the planning process, how were they overcome?
- What factors were influential in the decision-making of incorporating green measures?
- Are any greening strategies that are recommended for Eglinton new for Toronto?
- In hindsight, do you think there are any shortcomings or weaknesses in terms of directing green urbanism? Is there anything that could be done differently to help produce "greener" TODs?
- Why was the integration of district and/or renewable energy not considered? Was this potentially a lost opportunity?
- In general, what do you think are the opportunities, synergies, and benefits for the blending of TOD and green urbanism practices in Toronto's new growth?
- Overall, in terms of generating green transit-oriented communities, how do you think Toronto is doing? Are we ahead or behind the curve? Are there any new types of strategies that could be considered city-wide here to achieve greater presence/levels of green TOD?
- On the whole, what do you perceive are the greatest takeaways/lessons learned from the experience in planning for the Eglinton corridor?