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Talking TOD

learning about transit-oriented development in the United States, Canada, and the Netherlands

van Lierop, D.; Maat, Kees; El-Geneidy, A.

DOI

[10.1080/17549175.2016.1192558](https://doi.org/10.1080/17549175.2016.1192558)

Publication date

2017

Document Version

Final published version

Published in

Journal of Urbanism

Citation (APA)

van Lierop, D., Maat, K., & El-Geneidy, A. (2017). Talking TOD: learning about transit-oriented development in the United States, Canada, and the Netherlands. *Journal of Urbanism*, 10(1), 49-62.
<https://doi.org/10.1080/17549175.2016.1192558>

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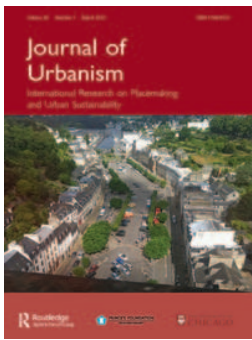
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Journal of Urbanism: International Research on Placemaking and Urban Sustainability

ISSN: 1754-9175 (Print) 1754-9183 (Online) Journal homepage: <https://www.tandfonline.com/loi/rjou20>

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To cite this article: Dea van Lierop, Kees Maat & Ahmed El-Geneidy (2017) Talking TOD: learning about transit-oriented development in the United States, Canada, and the Netherlands, *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 10:1, 49-62, DOI: [10.1080/17549175.2016.1192558](https://doi.org/10.1080/17549175.2016.1192558)

To link to this article: <https://doi.org/10.1080/17549175.2016.1192558>



Published online: 07 Jun 2016.



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Talking TOD: learning about transit-oriented development in the United States, Canada, and the Netherlands

Dea van Lierop^a , Kees Maat^b  and Ahmed El-Geneidy^a 

^aSchool of Urban Planning, McGill University, Montréal, Canada; ^bDepartment of Urban and Regional Development, Delft Technical University, the Netherlands

ABSTRACT

City and regional governments in North America and the Netherlands are implementing transit-oriented development (TOD) policies to provide residents with accessible and compact communities that are socially, environmentally, and economically sustainable. Through 13 in-depth semi-structured interviews with planners and transportation professionals in the United States, Canada, and the Netherlands, this study attempts to identify the factors that practitioners in these regions determine to be essential for the post-development success of TOD. Our analysis reveals that seven key elements contribute to the success of TOD which are approached differently by planners in the three regions. The study concludes by suggesting ways in which professionals could integrate land use and transportation projects based on planning for flexibility, accessibility, and collaboration.

KEYWORDS

Transit-oriented development; land use; transportation; urban planning; semi-structured interviews

Introduction

In North America and Europe, both city and regional governments are implementing transit-oriented development (TOD) policies to provide more socially, environmentally, and economically sustainable communities. This form of development is largely a reaction to the economically inefficient as well as environmentally and socially unsustainable automobile-dependent suburban communities that characterized postwar planning. After the Second World War, the popularity and affordability of the automobile facilitated sprawling residential development and decentralization of employment locations. Infrastructure was developed to accommodate car-dependent lifestyles, and public transit became increasingly limited and uneconomical in low-density areas. Residents relied heavily on their cars, resulting in increased congestion on regional highways (Badoe and Miller 2000; Dunphy 2005; Easley 1992). One way to reduce the negative effects of urban sprawl is to build denser, mixed-use developments with the aim of reducing reliance on the automobile, by making other modes more accessible and available (Cervero 2004; Chatman 2013; Samuelson 2009). Densifying urban areas around existing and new rail stations, and discouraging automobile use, are expected to yield significant benefits for cities, such as increases in the use of sustainable travel modes for certain trips (Hofstad, 2012; Langlois et al. 2015; Renne and Wells 2004). Also, such policy is expected to improve the social and economic prosperity of communities. However, with much of the city already built, the challenge is for planners to carefully develop these new urban environments while capitalizing on existing transportation infrastructure.

This study sets out to develop a better understanding of the process of TOD planning in the United States, Canada, and the Netherlands. It investigates what, in the opinion and experience of TOD-related professionals, are the most important factors influencing post-development TOD in their representative regions. The focus is on the opinions and experiences of practitioners because of their first-hand experience in planning TOD. Studies attempting to determine the factors contributing to effective TOD are useful to situate the context of this research. For example, Jacobson and Forsyth (2008) discuss good TOD practices based on analyses of seven TOD projects, and Thomas and Bertolini (2014) use a meta-matrix of 11 case studies to determine critical success factors with regard to the TOD implementation process; they focus specifically on the planning process and relationships with institutions, as well as policy. Although these studies provide useful suggestions, they do not directly include the experiences of planners and transport professionals – the individuals with hands-on experience. Therefore, the present study takes a different approach and determines the key elements influencing TOD in the abovementioned regions based on an analysis of 13 in-depth semi-structured interviews. First, we discuss the context of TOD in each geographic region. Next, we discuss how we prepared for the interviews and provide information about the themes presented in the interviews. We then discuss the results of the interviews and incorporate a discussion of the relevant literature to better frame the content of the interviews. Finally, we present the advice that TOD professionals have to offer for planners involved in planning future TOD.

Context

TOD planning involves integrating transport and land use planning in a way that promotes the use of public and active transportation over the use of the private car (Curtis, Renne, and Bertolini 2009). In the US and Canada, TOD planning stems from the concept of New Urbanism¹ (Burchell, Listokin, and Galley 2000) and focuses on increasing residential and commercial density, mixed land uses, and pedestrian-friendly designs. Although variety in the form and content of New Urbanist communities exists (Trudeau 2013), a consistent goal of New Urbanism and TOD planning is to discourage auto use, and thereby focus on increasing transit ridership as well as walking and cycling trips (Boarnet and Compin 1999, Belzer and Autler 2002; Cervero and Kockelman 1997; Krizek 2003; Renne and Wells 2002).

In the Netherlands, TOD planning has its roots in the concept of Compact City² (Alpkokin 2012). Yet, unlike the North American policies directly addressing auto use, Compact Cities are driven by policies encouraging economic development and urban containment that focus on densification both within cities and around rail stations. Moreover, even though the Compact City approach includes social, economic, and environmental components, the focus of policies has been predominantly to strengthen the regional economy and foster economic growth (Hofstad, 2012; Nabielek 2012; Naess et al. 2011).

In the US, the concept of TOD often performs as a node which, although it has been developed to be mixed-use, tends to be primarily mono-functional in practice (Boarnet and Compin 1999, Chatman 2013; Podobnik 2002). In the Netherlands TOD is often more effective in integrating multiple land uses and also frequently includes multimodal transit hubs that provide frequent and reliable access to other TOD locations within the network (Geurs et al. 2012). The Canadian concept of TOD lies between that of the US and the Netherlands. For example, even though planners in Vancouver, Canada, have developed several individual TOD projects, they have ensured that the different developments are directly connected to the city's public transit network (Translink 2010). TOD planning in Vancouver tends to be similar to the Dutch approach in the way that each TOD is well integrated into the wider transit system.

Methods

In this study we set out to learn what, in the opinion of practitioners, are the key elements influencing the implementation of TOD in the US, Canada, and the Netherlands. The findings of this paper are derived from 13 semi-structured telephone and in-person interviews with transport planners, urban planners, and TOD managers in these regions (Table 1). Initially we had set out to learn from TOD practitioners

Table 1. List of interviewees (interviews were carried out in June 2013).

Name	Title	City/state/region	Transit-oriented development projects
Baker, Vivian	Assistant Director of New Jersey Transit	New Jersey, United States	Morristown, South Orange, Rahway
Baldwin, Susan	Senior Regional Planner, San Diego Association of Governments	San Diego, California, United States	Rio Vista West, Uptown District, America Plaza
Bragado, Nancy	Program Manager in Development Services, Planning Division, City of San Diego	San Diego, California, United States	Rio Vista West, Uptown District, America Plaza
de Visser, Gert	Project Leader of Land Use Development, StedenbaanPlus	South Holland (Zuid-Holland), Netherlands	StedenbaanPlus
Gelissen, Herman	Program Director, StedenbaanPlus	South Holland (Zuid-Holland), Netherlands	StedenbaanPlus
Gordon, Michael	Senior Central Area Planner, City of Vancouver	Vancouver, British Columbia, Canada	Collingwood Village
Jansen, Barend	Policy Advisor, Metropolitan District of Haaglanden	The Hague and Rotterdam, South Holland (Zuid-Holland), Netherlands	StedenbaanPlus, Haaglanden region
Johnson, Doug	Senior Transportation Planner, Metropolitan Transportation Commission	San Francisco, California, United States	Fremont, Hayward, Berkeley
Schrijnen, Joost	Spatial Management Consultant, Rotterdam Area	Rotterdam, South Holland (Zuid-Holland), Netherlands	StedenbaanPlus, Rotterdam region
Termorshuizen, Jan	Transportation and Mobility Expert, the Hague Region	South Holland (Zuid-Holland), Netherlands	StedenbaanPlus, The Hague region
van Staalduine, Klaas	Project Leader in Network Development and Rail, StedenbaanPlus	South Holland (Zuid-Holland), Netherlands	StedenbaanPlus
Walker, Lyle	Senior Planner, Transportation and Land Use, Translink	Vancouver, British Columbia, Canada	Collingwood Village
Wierzenski, Jack	Director of Economic Development, Dallas Area Rapid Transit	Dallas, Texas, United States	Mockingbird Station

in several European countries, but because the overwhelming majority of the European TOD literature originated in the Netherlands, we narrowed the study to include only Dutch examples.

With this in mind, the first step we took to prepare for the interviews was to review previous studies focusing on TOD in the three geographic regions. To identify what TOD scholars had determined to be important aspects influencing post-development TOD success, we searched for English-language, peer-reviewed articles published between 2000 and 2013 on the topic of land use and transportation integration that specifically analyse, discuss, or consider TOD (or related terms, including “rail-oriented development” and “traditional communities”) and Compact City concepts. Literature was gathered through an extensive search utilizing Google Scholar, Science Direct, Taylor and Francis Online, Sage Publications, Web of Science and the Transportation Research Board archive. The terms searched included “transit-oriented development,” “new urbanism,” “smart growth,” “land-use and transportation,” “transit villages,” “transit communities,” and “compact city.” Additional relevant literature was selected by searching the references cited in each paper. The majority of papers that surfaced through the search were from North America, and almost all were from the US, with the exception of a literature review by the regional transportation authority for Vancouver, Canada, and several studies from Asia, Australia, Scandinavia, and Western Europe. However, because we decided to focus on learning about TOD in the US, Canada, and the Netherlands, studies conducted outside these regions were not included. The search process led to the review of approximately 40 papers that analysed various aspects of TOD. The most commonly discussed dimensions of TOD were selected and classified into seven categories: physical design, transportation, environment, social/community, economy, collaboration, and accessibility. These themes were used to frame participant interviews, and a discussion of the scholarly discourse on these topics is presented later in the paper to contextualize the interview findings.

In addition to setting the framework for the content of the interviews, the review of the literature also helped us select the geographic locations where the interviews would take place. The overwhelming

majority of the TOD literature focuses on the US, with particular developments in New Jersey, California, Texas, Oregon, and Virginia often being recognized for their success (Bae 2002; Cervero 2004; Dunphy and Porter 2006; Niles and Nelson 1999; Renne 2008, 2009). Invitations to participate in the study were sent to TOD managers, urban planners, and transportation professionals in these regions, and TOD professionals in New Jersey, San Diego, San Francisco, and Dallas responded positively and were later included in the study. Our requests in Arlington and Portland were not returned and therefore could not be included in the study. Although interviews with TOD professionals in Portland and Arlington would enrich this study further, the geographic and contextual variation in the other locations provides insight into TOD across the US. In Canada, interviewees were chosen in Vancouver because of the city's current focus on TOD (Translink 2010) and because the Joyce/Collingwood TOD has become internationally renowned (Davison 2011). Interviews were also requested in Toronto, but were denied. As previously mentioned, the Netherlands was included in this study as the overwhelming majority of the European TOD literature stems from this country; many researchers in this area are working on analyses of a comprehensive program for spatial development and public transport in the Dutch province of South Holland (Balz and Schrijnen 2009).

Individuals representing TODs in a variety of settings were chosen to be interviewed. In the US and Canada, interviewees represented specific TODs, while in the Netherlands interviewees were chosen based on their involvement with an important TOD and rail development project in the country's most populated region (Geurs et al. 2012). In the case of San Diego, Vancouver, and the Dutch province of South Holland, more than one person was contacted per region, as the first person interviewed recommended that we also speak to another person in the region. Interviewees were contacted by telephone and email to schedule interview times. In total, eight formal, semi-structured telephone interviews were conducted at times specified by the participants. They were not recorded, but handwritten notes were taken during the interview. All of the American and Canadian interviews were conducted over the phone, as well as one Dutch one. In addition to phone interviews, six in-person semi-structured interviews were conducted at several planning offices throughout the Netherlands. A total of 13 semi-structured interviews are included in this study: 7 were with participants in North America and 6 with planning and transport professionals in the Netherlands. Table 1 includes a list of professionals interviewed for the study. Although the interviewees' official titles differ, these individuals were included as they were responsible for similar aspects of the TOD planning process.

Results

Interviewees were asked a series of questions about the TOD planning process in the context of the geographic region of the TOD they represented. More specifically, they were asked to discuss their goals and approaches, with regard to each of the themes identified in the literature. In addition, the interviewees were asked what, in their opinion, are the key elements of a successful TOD. Finally, they were asked whether they had any advice for TOD professionals involved in the development of future TODs. To ensure consistency, each interviewee was presented with the following definitions:

- *Physical design* refers to elements of the built environment that planners and transportation professionals consider being essential for the success of TOD.
- *Transportation* not only refers to the rail network, but also recognizes the importance of planning for access and egress modes.
- *Environment* refers to policies and design elements that improve quality of life by protecting and improving environmental standards.
- *Social* encompasses the need and awareness to plan a community and transportation network that is accessible for people of different ages, abilities, social backgrounds, and lifestyles.
- *Economy* recognizes that the success of TOD depends partially on its financial successes.
- *Collaborations* refers to the need for collaboration between stakeholders, and big-picture, network-focused planning.

- *Accessibility* refers to generating a system of residential, commercial, and transportation services that allows commuters to access facilities they wish to reach.

These themes were used to shape the interviews, and are discussed within the context of the relevant literature in the next section. Although specific aspects of the themes are interconnected, each one is discussed in a different subsection below.

Physical design

The first questions we asked the interviewees had to do with the physical design of the TOD they represented. We chose to start by discussing the physical design as it is a major determinant of TOD success in the literature. For example, density, mixed use, and a quality pedestrian-friendly environment are consistently identified as key elements of the physical design necessary for the success of TOD (Belzer and Autler 2002; Calthorpe 1993; Cervero, Ferrell, and Murphy 2002; Cervero and Kockelman 1997; Chatman 2013; Handy 2001; Krizek 2003; Ohland 2001; Renne 2009; Samuelson 2009).

In the literature there is a strong emphasis on the importance of providing quality pedestrian and cycling environments at TOD locations (Belzer and Autler 2002; Calthorpe 1993; Cervero, Ferrell, and Murphy 2002; Cervero and Kockelman 1997; Chatman 2013; Handy 2001; Krizek 2003; Ohland 2001; Renne 2009; Samuelson 2009; Wayne 2007). In the Netherlands TOD catchment areas tend to be larger than in other regions due to the fact that a high number of access and egress trips to the main transit hub are made by bicycle (Balz and Schrijnen 2009). The physical design of TODs should be developed to accommodate non-motorized access and egress modes and be assessed by using indicators that include street width, grid pattern, block size, connections, and amount and location of parking (Cervero and Kockelman 1997; Renne 2009). TOD scholars have made clear that physical designs should promote vibrant environments, have diverse functions, and include architectural and urban design features that emphasize both vertical and horizontal development (Belzer and Autler 2002; Cervero and Kockelman 1997; Renne 2009).

Similar to the results presented in the literature, interviewees assessed the success of the physical design of TODs by using indicators that include street width, grid pattern, block size, connections, and amount and location of parking. Three American and one Canadian TOD professional (Baker, Gordon, Johnson, Wierzenski – see Table for details on interviewees) emphasized that future TOD developers should be willing to invest in urban design to create safe and vibrant active transport networks for people of all ages, socio-economic statuses, and abilities.

With regard to facilities at stations, two American planners (Baker, Baldwin) suggested including temporary office spaces (short-term rental spaces) as a means of improving station attractiveness. In the Netherlands, this is already a reality, calling the spaces *Seats2meet* (seats2meet.com), where high-tech meeting spaces are available for rental by different firms to conduct business at the transit station (Schrijnen).

Nancy Bragado, program manager in development services with the city of San Diego, expressed the need for universally accessible urban design by stating, "At the end of the day, TOD should take into account the needs of many different people and respect all the elements of good basic planning." Susan Baldwin, senior regional planner with the San Diego Association of Governments, similarly expressed that accommodating all ages and socio-economic statuses translates to a mix of housing types with respect to physical design. Baldwin, as well as another American (Bragado) and a Canadian planner (Gordon), made clear that it is necessary to have a good mix in terms of commercial and residential developments in a TOD that are designed to resemble the buildings in the surrounding neighbourhoods.

One important idea that is not emphasized in the literature but was stressed by Michael Gordon, senior central area planner for the City of Vancouver, Canada, is the need to resist erasing or attempting to rewrite the history of the land where new TODs are built. Other planners also made clear that providing TODs with an identity that is relevant to its geographic location is important for the success of a development. On brownfield sites, as is commonly the case in Vancouver, this could be reached by

giving tribute to an area's history (Gordon), whereas on greenfield sites, a new identity could be created through innovative urban design with an emphasis on place making (Bragado).

To measure the success of the physical design of a TOD, all of the North American interviewees (Bragado, Johnson, Walker) reported using both land use density and the number of people who walk to the rail station. Included in their definitions of density were the number of square metres of office space, variety of development, and number of housing units. Similar ideas are found in the literature, where it is claimed that medium- and high-density³ developments are more likely to contribute to the success of TODs as they can encourage people to walk, cycle, or use transit (Bernick and Cervero 1997; Chatman 2008; Ewing, Pendall, and Chen 2002; Frank and Pivo 1994; Krizek 2003; Kuzmyak and Pratt 2003; Moudon et al. 1997; Newman and Kenworthy 1999, 2006).

In the Netherlands, the physical design discourse takes on a more general tone and refers to the quality of life that the urban design of a TOD can provide. Planners are concerned with developing stations that are both origins and destinations and making them attractive places to live and work. For example, Barend Jansen, policy adviser with the Metropolitan District of Haaglanden, emphasized the need to make attractive, dense, and urban prewar-style neighbourhoods. Similarly to TOD development in North America, there is a focus on creating a design that encourages active transportation.

With regard to parking, the approach varies between the Netherlands and North America. In the Netherlands, a major goal of TOD is to provide attractive, well-integrated, and safe parking facilities for bicycles, automobiles, and taxis. For example, Joost Schrijnen, spatial management consultant for the Rotterdam area, supported the development of well-integrated park-and-ride facilities in TOD hubs, stating that "the Netherlands is a car-oriented region, and you have to accept that." The point is that if you want people who cannot live close to a rail station to take a train, you must provide drivers with parking that is close to and well-integrated into the physical environment of the TOD. The literature from the Netherlands supports the idea of developing ample space for parking by emphasizing the regional context of TOD and how the availability of parking around transit nodes is positive because it encourages hinterland residents to use transit (Nabielek 2012; van Wee and Maat 2003).

Transportation

In the literature, increasing transit ridership and the use of active modes of transportation are cited as the primary measures of TOD success in terms of transportation (Belzer and Autler 2002; Cervero and Kockelman 1997; Cervero 2004; Chatman 2013; 2008; Renne 2009; Handy 2001; Renne and Wells 2004). All of the interviewees also revealed that the most important TOD success indicator in their region was an increased number of non-auto trips. This was especially prominent for the interviews taking place in North America, where the mode share of active transportation is lower than that of the Netherlands. Because of the lower percentages of pedestrians and cyclists in the US and Canada, interviewees in these regions (Baker, Baldwin, Gordon) said that they were specifically focusing on ways to increase the number of pedestrians and cyclists (Translink 2010). All of the interviewees agreed that increases in active transportation for single-mode trips, as well as an access mode for transit, are indications of post-development TOD success. In addition, three American and one Canadian planner (Baker, Baldwin, Gordon, Johnson) determined the well-being of a TOD not only by the total number of transit riders but also by the number of choice riders, as opposed to captive riders, using the transit service.

Similarly to the approach of the North American interviewees included in the study, Dutch planners continuously worked to improve pedestrian and cyclist access to train stations in TOD areas. However, all of the TOD professionals in the Netherlands stated that the primary goal when developing TOD was to reduce commuters' overall travel time. One way that this goal is being reached is StedenbaanPlus's⁴ plan to increase ridership by intensifying the frequencies of trains from four to six per hour (de Visser, Gelissen, Schrijnen, van Staaldoune). However, although the literature states that increases in ridership are commonly used to calculate the success of a TOD (Geurs et al. 2012, Hofstad, 2012; Maat 2001; Scheurer and Kroen 2005), when Dutch planners were asked whether TOD success should be determined by its achievements using the quantity of boardings and alightings, two (Termorshuizen, van

Staalduine) stated that they prefer to base overall success on the quality of life that TOD inhabitants and users experience. The StedenbaanPlus project demonstrates that unlike the North American emphasis on creating an urban-village feeling where proximity dictates development, Dutch TODs focus on providing access to high-frequency trains at multimodal transit hubs. Schrijnen stressed this notion by stating, "Public transit is the backbone of the network."

Environment

The success indicators assessing physical design and transportation dominate both the literature and the interviews. The literature draws inconsistent conclusions on the topic of the environment, and it is worth noting that the idea of conserving green space differs between North America and the Netherlands (Hofstad, 2012; Nabielek 2012; Naess et al. 2011; van Wee and Maat 2003). In North America, the concept refers to safeguarding and protecting a particular piece of land, while in the Netherlands the focus is often on conserving a particular *amount* of land, regardless of location. The literature discusses the "balancing principle," which involves a compensation for loss of green space that varies in practice for each municipality (Hofstad 2012).

When the TOD representatives were asked to outline any specific environmental goals, two Dutch planners warned that framing land use and transportation development through an environmentally focused agenda is not helpful for development. In the US, Jack Wierzenski, director of economic development with Dallas Area Rapid Transit, had a more positive response and emphasized the importance of ensuring that environmental sustainability is a prominent aspect featured in every TOD plan. Other American TOD professionals (Bragado, Baldwin) emphasized the importance of providing enough public space, such as parks.

In California, the Clean Air Act is driving the environmental focus of development. The literature supports these goals, particularly the provision of parks and recreational space (Belzer and Autler 2002; Podobnik 2002; Renne and Wells 2002; Renne et al. 2005). In addition, Renne et al. (2005) included the amount of air pollution, measured through Air Pollution Index reports, and consumer gasoline consumption, measured in gallons. However, although several environmental issues were discussed in the interviews, the lack of consistency and detail demonstrates, to our surprise, that the environment is not a major issue for TOD planning in any of the three regions.

Social

The literature predominantly addresses the social aspects of TOD by discussing the importance of social housing. In the North American literature, there is a greater focus on affordable housing, diversity of housing types, and a sense of community, which are all cited as important components of a neighbourhood (Calthorpe 1993; Lund 2006; Podobnik 2002; Renne and Wells 2002). Affordable housing is particularly important in a TOD because lower-income passengers often represent the majority of transit users (Dunphy, Myserson, and Pawlukiewicz 2003; Lund 2006; Podobnik 2002; Tumlin and Millard-Ball 2003).

All of the interviewees stated that the inclusion of affordable housing should be a key component in the planning of any TOD, and two (Gordon, Johnson) emphasized the importance of planning for different people with varying socio-demographic backgrounds. Planners in the US cited community involvement as a priority and a necessary component of TOD to warrant successful implementation. For example, Vivian Baker, assistant director of New Jersey Transit, stated that a goal of the New Jersey Transit Villages Initiative is to "inform, educate, and communicate" with TOD residents in the effort to ensure that people know the importance of living in TOD and that they feel they are a part of a community. However, while fostering a sense of community is not explicitly on the agenda for Dutch planners, it is also not ignored. More specifically, Schrijnen revealed that the Dutch approach does not place social goals at the forefront of planning but rather expects social benefits to be a product of good planning.

Economy

The economic goals of planners from North America and the Netherlands differ due to their spatial contexts. In North America, the approach is primarily local and centred on the neighbourhood level; the literature focuses on how proximity to transit increases the consumer base and the labour supply, resulting in higher property values (Belzer and Autler 2002; Cervero 2004; Samuelson 2009). In the Netherlands, planners have a more regional perspective with respect to their economic goals. Their primary concern is to ensure that major cities do not compete when it comes to job opportunities, but rather benefit economically from each other through reducing travel times between hubs (Balz and Schrijnen 2009). Additionally, jobs should be located near transit stations, and focus should be placed on the economic goals behind the decision of developing job opportunities around nodes (Geurs et al. 2012; Headicar 2003; Keller et al. 2011; Meurs and Haaijer 2001; Nabielek 2012; Naess 2003; Naess et al. 2011; van Wee and Maat 2003). Similar claims are made in the North American literature, which often suggests that commerce be located within a quarter-mile of transit stations (Guerra and Cervero 2013).

The findings from the literature are reflected in the interviews with planners. For example, in Vancouver, one way that the economic success of TODs is determined is by creating revenue opportunities, primarily through retail, and ensuring a good mix of local and big businesses (Gordon). Additionally, in New Jersey, Baker stated that the growth of grant money can also be used as an indicator of the success of TOD, since the more TOD-specific funding is available, the more emphasis is placed on TOD, signifying its growing popularity and importance. Furthermore, other TOD professionals in the US, Canada, and the Netherlands (Bragado, Termorshuizen, Walker) stated that a measure of economic success should include the number of jobs produced and the number of housing units.

Collaborations

The discourse on collaboration includes the process of policy implementation, as well as managing expectations. The literature on this topic discusses the need for partnerships and collaborations between stakeholders, emphasizes the need to align goals with interventions, and warns against developing goals that are the result of arbitrary policies (Boarnet and Compin 1999, Belzer and Autler 2002; Cervero 2004; Ohland 2001; Renne and Wells 2002; Samuelson 2009). For example, Curtis, Renne, and Bertolini (2009) discuss the roles of various stakeholders, emphasizing the complexity of coordinating land use and transport planning with various developers, investors, and users.

Similarly to the literature, interviewees discussed the need for TOD policies to be made with specific goals in mind. According to Lyle Walker, senior planner with Translink, in Vancouver, TOD will function only when the municipal development plan meets the goals of the region. Another concern for planners and transportation professionals in North America is the need to manage expectations, realizing that successful TOD takes time, and therefore it is important to be patient with the development process (Bragado, Wierzenski). Consequently, there is the need to make sure that TOD is successful in both the short term and the long term. In other words, planners must be flexible and willing to make compromises to accommodate the changes in demographics, technology, and land use over time.

Accessibility

As with the majority of the themes listed, North American and Dutch approaches to accessibility vary in terms of scale and the goals of development. Accessibility is defined as a measure of potential opportunities for interaction (Hansen 1959) and is understood in terms of providing people with access to as many opportunities as possible by different modes (El-Geneidy and Levinson 2006). Interviewees defined accessibility to the interviewees as the generation of a system of residential, commercial, and transportation services that allows commuters to access the facilities they wish to reach. When interviewees were asked to define their accessibility-related goals specific to the TOD they represented, two Dutch planners (Gelissen, Schrijnen) responded by stating that the success of a TOD should be

determined by the level of accessibility it provides to transit users. Schrijnen emphasized the goal of developing polycentric and metropolitan regions that include housing and commercial uses at different TOD locations that serve as both origins and destinations. However, he made clear that this goal could not be achieved in the short term, but should be a priority for long-term planning. In addition, all of the Dutch planners said that TOD should focus on network accessibility in terms of multimodality. In other words, TOD planning in the Netherlands works towards ensuring that all modes, including cars, have access to the rail network.

In contrast, all of the North American planners discussed accessibility within individual TODs, and only planners in Vancouver mentioned the importance of the network. In addition, two North American TOD professionals (Baldwin, Johnson) also referred to what they called “financial accessibility,” which they defined as ensuring that no resident will be priced out of the market.

The 13 semi-structured interviews with TOD professionals and the discussion of the literature reveal that while some “good practices” are already well established in previous TOD literature, others are not. In addition, the interviews made clear that the planning process continues to be forward-thinking, with many planners concentrating on how to improve existing and future TODs. However, TOD professionals in San Francisco and San Diego (Bragado, Johnson) expressed their concerns about plans that are developed based on arbitrary goals rather than on an assessment of the failures and successes of past projects, and therefore suggested that planners take the time to reflect and assess the communities that they have planned before continuing to generate future TODs. Table 2 provides a summary of practitioners’ advice for successful post-development TOD planning, based on their hands-on experience.

Discussion

The final interview question asked the TOD professionals about the advice they would give their colleagues to develop successful future TODs. Although responses varied and included specific elements from each of the seven themes discussed above, the overarching advice was that planners should plan for flexibility, accessibility, and collaboration.

Plan for flexibility

The theme of planning for flexibility arose due to the need for planners to be able to adjust land use development and transportation systems to changes in the financial and political economy. Planners

Table 2. Practitioners’ advice.

Physical design	<ul style="list-style-type: none"> • Build dense, mixed-use transit-oriented development (TOD) with safe and attractive public realms • Develop a multifunctional and attractive transit station • Integrate the TOD into the surrounding neighbourhoods
Transportation	<ul style="list-style-type: none"> • Develop well-integrated parking for cars and bicycles • Achieve a high mode share of active transportation users • Ensure high frequency of transit service • Design high-quality facilities and vehicles
Environment	<ul style="list-style-type: none"> • Measure success based on increases on overall quality of life • Conserve existing green space • Develop quality, attractive, and safe public spaces • Measure air quality and consumer gas consumption to assess TOD
Economy	<ul style="list-style-type: none"> • Gain revenue from businesses • Determine TOD success by increases in TOD grant money • Base success on the number of jobs produced and the number of residential units inhabited
Collaborations	<ul style="list-style-type: none"> • Create collaborations between stakeholders • Develop policies with specific goals in mind
Accessibility	<ul style="list-style-type: none"> • Allow flexibility to accommodate changes in demographics, technology, and land use over time • Ensure that every TOD is both an origin and a destination • Focus on multimodality • Plan for populations with different needs

in the US and the Netherlands emphasized the need to adjust the physical design and transportation options at TODs in accordance with changes in demand and explained that these variations were not always the result of demographic changes, but also of unstable financial systems that caused the 2008 financial crises and resulted in unexpected financial losses for many developers. As a result of these unanticipated changes, nearly all of the interviewees said that the most important advice they would give their colleagues would be to plan for economic flexibility as well as technological and land use flexibility.

Economic flexibility allows planners to adjust land use and transportation planning according to changes in available finances. For example, Baldwin stressed the importance of planning and executing TOD in phases, allowing flexibility dependent on market demand. She also suggested allowing flexible short- and long-term budgeting to ensure that plans remain financially feasible in the long term, and stated that developments must be compatible with the current market to avoid the risk of becoming obsolete. Wierzenski also emphasized this point, stating the futility of forcing development on a market that does not exist.

Technological and land use flexibility allows planners to change the physical design of some areas in a TOD, based on developments in technology and changes in the needs of the population. According to four different American planners (Baker, Baldwin, Bragado, Johnson), this form of flexibility strengthens both the short-term and the long-term viability of TOD. The idea of planning for unpredictable change was particularly stressed by Doug Johnson, who stated, "Things are happening now that planners could never have anticipated." It is therefore necessary to be clear from the beginning what the TOD will look like and how it will function, using a system that preserves good design and is not too rigid, allowing flexibility. Walker and Baldwin elaborated on this notion, explaining that planners and transportation professionals must recognize that each TOD is location-dependent and there is no one-size-fits-all, cookie-cutter approach. In other words, each TOD has its own specific needs that may change over time. Flexibility in terms of expectations is also integral to the discussion; planners must manage their expectations and realize that creating a successful TOD takes time. It is therefore necessary to be patient with the development process (Bragado, Walker).

Transportation professionals had advice specifically relating to bus transit. For example, Walker cautioned against focusing only on rail-based development, encouraging planners to consider bus corridors. Baker advocated for bus transit, specifically development around bus rapid transit stations or creating bus rapid transit connections to rail. Walker also identified flexibility with respect to service, such as increasing or decreasing the number of busses or shuttles. TOD professionals also had advice about flexibility in terms of land use and infrastructure. For example, four planners in the US and Canada (Baldwin, Bragado, Johnson, Walker) identified the need to be flexible in the transit plan, both in form and in use, such as allowing the conversion of car parking to a bicycle lane or being flexible about the location of a bus route. For example, Bragado identified shared office spaces as potential station facilities that would increase the station's attractiveness. Others (Bragado, Gordon, Johnson) spoke about the need for community spaces, such as public parks and libraries. Only Gordon was not completely convinced of prioritizing flexibility in planning; he cautioned against it, stating that the ambiguity of what a business location could be (e.g. nightclub vs. flower shop) could negatively influence property values and negatively affect the residents.

Plan for accessibility

In the Netherlands all of the interviewees mentioned the importance of ensuring multimodal regional connectivity and explained that these concepts had been included in the current TOD plans. Similarly, in the US and Canada, the majority of planners also stressed the importance of integrated regional TOD planning. However, in North America, there is a stronger history of isolated pockets of development, such as the suburban neighbourhood that can only be reached by car, and consequently the notion of regional connectivity is still somewhat illusory, although planners agree that it is paramount. Johnson

emphasized that TOD should only be done in existing neighbourhoods or cities and that isolation simply does not work. Planners in Canada also explained their integrated approach and made clear that TOD must be planned as part of a regional network. An important difference between how North America and the Netherlands approached accessible planning is that in the US and Canada the interviewees generally considered accessible planning to be synonymous with inclusionary planning. However, in the Netherlands, the concept of accessible planning focused more generally on reducing travel times, with the goal of increasing employer activities and positively influencing the overall economy (Schrijnen, van Staalduine). While these interpretations of accessibility have resulted in the development of different goals in North American and European TOD planning, it is clear that in both cases planners are dedicated to increasing overall access to residential, commercial, and transit facilities services.

Plan for collaboration

All of the interviewees strongly encouraged collaborative planning, with the goal of sharing of data and transferring knowledge. To make this possible, they identified the need to develop a common language among planners, designers, and transportation professionals. The notion of integration and collaboration also transfers to the broader community. Three American TOD professionals (Baker, Bragado, Johnson) emphasized that without the involvement of the residents, TOD has less chance of success. These interviewees also emphasized that collaborative planning is essential for developing socially equitable TODs, and their advice focused on creating inclusionary policies such as affordable housing, community projects, building public spaces (including facilities available to share), and ensuring that the original residents do not get priced out of the market. In addition, collaboration also refers to developing supportive planning tools that make the development plans more financially predictable for those involved (Venner and Ecola 2007).

Limitations and conclusion

Findings from interviews with 13 TOD professionals and a discussion of the relevant literature suggest that the approaches to TOD planning in the US, Canada, and the Netherlands have many similarities but are also geographically specific given the cultural context of each development. Limitations of this study include the number of interviews, and the fact that not all of the TOD professionals we contacted accepted to be part of the study. This is especially true in Canada, where only one city was included in the study. Future research should allocate more time to recruitment.

Differences between the American, Canadian, and Dutch approaches to TOD planning include the fact that with regard to physical design, North American planners focus on urban design features, whereas in the Netherlands it is on improving the overall quality of life by enhancing the urban environment. Although the results may be similar, planners in the regions approach physical design from different angles. To improve mobility in and to TOD, North American planners focus heavily on improving active transport networks, whereas in the Netherlands they focus on developing multimodal hubs and short travel times between rail communities. Another major difference between the regions was that while the American TOD professionals stated the importance of developing a community, Dutch planners stated that a TOD's social benefits should come as a result of good physical, transportation, and economic planning. However, with regard to the environment, planners in each region agreed that it was not a primary goal, but rather that environmental benefits were expected to result from TOD initiatives.

The final interview question provided invaluable advice from TOD professionals to future TOD planners. Advice about planning for flexibility, accessibility, and collaboration is useful for planners to develop future TODs. And, although the advice from planners was given in the context of TOD, these concepts are not unique to this type of development and generally define good planning practice. Johnson reiterated this idea by stating that TOD "can just be good planning."

Notes

1. New Urbanism is a set of development practices to create more attractive, efficient, and livable communities. Features include a transit stop, retail businesses, public spaces, and amenities at its center such as gardens and public buildings (Burchell et al. 2000).
2. The European concept of the Compact City combats urban sprawl by indirectly targeting the negative consequences of auto-dependent neighbourhoods (Hofstad, 2012; Nabielek 2012; Naess 2003; Naess et al. 2011; Raman 2010).
3. There are a number of measures of density, with the consensus being a minimum of 10 to 30 dwelling units per acre (Boarnet and Compin 1999, Calthorpe 1993; Cervero 2004).
4. StedenbaanPlus is a comprehensive program for spatial development and public transport the Dutch province of South Holland.

Acknowledgments

The authors would like to thank the 13 urban planners, transportation professionals, and TOD managers who provided their time and input on which this paper has been based. We would also like to thank Angela Brinklow for providing us with the inspiration, framework, and contact information which allowed the execution of this project, and Ana Tepavac for her assistance with the North American interviews.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding information

This work was supported by the Natural Sciences and Engineering Research Council of Canada (NSERC), Social Sciences and Humanities Research Council of Canada (SSHRC) and the Netherlands Organization for Scientific Research (NWO).

Notes on contributors

Dea van Lierop is a PhD Candidate at the McGill School of Urban Planning. Dea's current research interests include public transit satisfaction and loyalty, land use and transportation planning, pedestrian and cyclist safety, and innovations in Transit Oriented Development.

Kees Maat is associate professor and head of the section Urban and Regional Development at the OTB Research Institute for the Built Environment, Delft University of Technology. He is also connected to the section Transport and Logistics of the Faculty of Technology, Policy and Management (TPM). His research is concerned with transit-oriented development, car ownership and use, electric vehicles, and bicycling.

Ahmed El-Geneidy is an Associate Professor at McGill University's School of Urban Planning and is an editor of the Journal of Transport and Land Use. Ahmed's research interests include land use and transportation planning, transit operations and planning, travel behaviour analysis including both motorized (Auto and Transit) and non-motorized (Bicycle and pedestrian) modes of transportation, travel behaviour of disadvantaged populations (seniors and people with disabilities) and measurements of accessibility and mobility in urban contexts.

ORCID

Dea van Lierop  <http://orcid.org/0000-0002-0669-6403>

Kees Maat  <http://orcid.org/0000-0002-7832-7017>

Ahmed El-Geneidy  <http://orcid.org/0000-0002-0942-4016>

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