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# Is transit-oriented development (TOD) an internationally transferable policy concept?

Ren Thomas<sup>a</sup> , Dorina Pojani<sup>b</sup> , Sander Lenferink<sup>c</sup> , Luca Bertolini<sup>d</sup> ,  
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## ABSTRACT

Many cities and regions have embraced the concept of transit-oriented development (TOD). This paper explores how transfer of TOD as a policy concept impacts its implementation in the Netherlands. The study determined international policy ideas and tools that have contributed to implementation and tested them with Dutch experts using workshops, serious gaming and design charrettes. The findings suggest a number of factors complicating policy transfer, and that 'softer' transferable lessons (e.g., good actor relationships, information sharing) are much more difficult to transfer than 'harder' technical tools. Using policy lessons and tools in learning exercises helps to develop contextually appropriate policy solutions.

## KEYWORDS

transit-oriented development (TOD); implementation; policy transfer; financing tools

**JEL** C71, D78, E61, L98, O18, R42, R52

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## INTRODUCTION

Transit-oriented development (TOD) is often defined in terms of mixed-use development near and/or oriented to mass-transit facilities. Common characteristics of TOD include urban compactness, pedestrian and bicycle-friendliness, public spaces near stations, and stations designed to be community hubs (Transit Cooperative Research Program (TCRP), 2002). TODs can be classified as: (1) new TODs, developed around new public transportation services; (2) high-density TODs, where new public transportation services are provided in existing, compact, mixed-use areas; and (3) low-density TODs, in which the density and diversity of existing, suburban-style neighbourhoods adjacent to public transportation services are increased (De


Vos, Van Acker, & Witlox, 2014). In parts of Asia, North America and Europe, the TOD approach reaches beyond stations toward a network approach to realign entire urban regions around rail transport (Knowles, 2012; TransLink, 2012).

TOD strategies are usually based on the idea that there will be both social and economic benefits of implementation, e.g., reduction of CO<sub>2</sub> emissions, prevention of urban sprawl, higher property (real estate) prices (Cervero & Kockelman, 1997; Renne & Wells, 2002). Research suggests that even in car-oriented contexts such as North America, car ownership and use is lower among households living in housing near rail stations. However, the difference is not explained by rail access alone: other TOD aspects such as on- and off-street parking, housing type and tenure, density,


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and bus service are as important (Chatman, 2013; Renne & Wells, 2002; van Lierop, Maat, & El-Geneidy, 2017).

Although many cities and regions have conceptually embraced TOD, most still need to move from concept to implementation (Curtis, Renne, & Bertolini, 2009). This situation has led governments and municipal planners to search for international flagship examples and transfer successful policies to their home context (Tan, Janssen-Jansen, & Bertolini, 2014). Policy transfer can be described as:

the process by which knowledge about policies, administrative arrangements, institutions and ideas in one political system (past or present) is used in the development of policies, administrative arrangements, institutions, and ideas in another political system.

(Dolowitz & Marsh, 2000, p. 5)

This transferable knowledge includes policy goals, content, instruments and programmes; institutions, ideologies and attitudes; and even negative lessons.

Several observers have noted an upsurge in knowledge and policy transfer in recent decades (Dolowitz & Marsh, 2000; Evans, 2009a, 2009b; Healey, 2010). Current efforts to identify, disseminate and promote international examples are guided by the belief that best-practice catalogues will contribute to intra- and international learning, lead to improvements in policy and practice, and help avoid the mistakes of others (Stead, 2012). However, uninformed, incomplete or inappropriate transfer may occur, where the borrowing country has insufficient information about the policy/institution and how it works, crucial elements are not transferred, or insufficient attention is paid to the differences between economic, social, political and ideological contexts in the transferring and borrowing countries (Dolowitz & Marsh, 2000).

TOD as a policy concept has spread around the world through international conferences, study tours of public-sector experts, and policy-makers' attempts to transfer it to their own cities, states and countries. Since TOD is a complex policy concept whose implementation involves multiple stakeholders and levels of government over extensive time periods, we question whether TOD theory and practice is transferable. This paper explores how transfer of TOD as a policy concept impacts its implementation in the Netherlands, a country that has accepted TOD as a policy concept but has a mixed history of its implementation (Tan et al., 2014). It illustrates how the TOD concept can be adapted to a country, the difficulties observed when a complex policy idea is transferred and how transfer of a policy idea influences its implementation. The findings stress the importance of openness to knowledge and learning, and offer practical guidance for anyone who would like to move past barriers to TOD implementation.

## STUDY CONTEXT

One might say that TOD was adopted in the Netherlands a long time ago: Dutch cities are compact, with dense bicycle and public transport networks, and the country is served by

an extensive rail system. Nevertheless, the development of urban regions along TOD principles, which have become popular in Asia, Western Europe and North America over the past few decades, still meets with substantial difficulties. Although TOD has become fashionable in the Netherlands as a transportation policy concept, translation of the concept into implementation has been fraught with difficulties. Few projects have actually been implemented in recent years; where TOD projects have been implemented, they have often met with limited success in liveability and market viability (Geurs, Maat, Rietveld, & de Visser, 2012; Tan et al., 2014).

Barriers to successful implementation of TOD in the Dutch context are most evident in newer residential areas and redevelopment areas. These barriers include the prolonged economic crisis, the absence of an academic and political consensus on TOD, weak regional governance institutions, an office space surplus, and a mismatch between the supply and demand of areas for residential development (Lenferink & Van der Stoep, 2013; Pojani & Stead, 2014b; Tan et al., 2014; Thomas & Bertolini, 2014). Fragmented ownership of land and properties may also act as a barrier to the (re)development of station areas; station areas may have contaminated soils as a result of industrial uses throughout the 20th century (e.g., Nijmegen and Zwolle station areas). The design quality of TOD areas is also a factor: several TOD nodes outside historic centres are generally considered unattractive, indicated by high office vacancy rates (e.g., Amsterdam Sloterdijk or Bijlmer Arena station areas). They include little or no housing, shopping or entertainment establishments, and when they do, it is in the form of 'big box' development rather than the fine-grained residential and commercial mix advocated in TOD. Their aesthetic quality, with modernist, high-rise buildings, is unattractive to many. While they offer relatively convenient access for office workers, buildings and public spaces are empty in the evenings and on weekends (Pojani & Stead, 2015). This outcome likely reflects broader issues related to the application of modernist planning culture in the Netherlands (e.g., Needham, 2007; Van der Cammen, de Klerk, Dekker, & Witsen, 2012), including land-use segregation (Ibelings, 1999). It may also reflect social segregation and spatial mismatch issues: the populations living in these TOD hubs often do not work locally.

Because the Netherlands provides a mix of barriers and drivers for implementing TOD, the authors propose that the Dutch case offers valuable lessons to planners and policy-makers who would like to advance TOD as a policy concept in their own cities or regions. This paper presents the findings of a two-year study (2012–14) that sought to understand how to force a breakthrough in the implementation of TOD in the Netherlands. The study had three parts, which were conducted simultaneously by three research teams. Part 1 examined actors, policies and governance arrangements that have contributed to TOD implementation in international cases. Part 2 identified and tested public and/or private financial arrangements and tools to encourage TOD implementation. Part 3 explored the design characteristics of successful TOD projects.

Each of the three study parts, including methodological approaches, has been discussed in detail elsewhere (Thomas & Bertolini, 2014, 2015a, 2015b; Pojani & Stead, 2014a, 2014b, 2014c, 2015; Lenferink & Van der Stoep, 2013; Lenferink, Samsura, & Van der Krabben, 2014; Lenferink et al., 2016). In the interest of treating a complex subject in depth, but with sufficient brevity in a single paper, an overview and synthesis of the research, literature and study results is provided. The study methodology incorporated a range of qualitative and quantitative methods, and for each part of the study, a two-step structure was adopted in which a determination of international lessons was followed by the development of a local model with stakeholders. For part 1, a meta-analysis of completed case studies on TOD implementation was used to find cross-case similarities from cities around the world; rough-set analysis was conducted with these policy ideas; and policy-transfer workshops determined whether policy ideas could be transferred to the Netherlands. Part 2 included abstract gaming simulations for four finance and governance instruments commonly used in TOD in other countries; and two serious gaming workshops with local practitioners from the municipal, regional and provincial levels of government to determine how the instruments would be used. Part 3 included interviews with policy officials at various government levels, academics, and planning and transportation consultants in the Netherlands and 16 other countries; and two design charrettes with local TOD experts.

## FINDINGS

### Policy transfer in TOD: two-way learning

Before presenting the findings from the three parts of the study, it is useful to discuss how the two-way process of policy learning on TOD works in the Netherlands. The interviews (part 3 of the study) and workshops (part 1) show that policy ideas from other countries have not resulted in implementation in the Netherlands, and that there is only a partial understanding of the processes of planning for TOD (e.g., emphasis on technical rather than 'soft' planning skills). Cultural and institutional barriers have played a role in the policy-transfer process.

Interviews with national, regional, and local policy officials and key stakeholders explored the processes of transferring TOD-related knowledge and information between the Netherlands (42 participants) and other countries (22 participants across 16 countries). The transfer and representation of TOD policy concepts and tools was analyzed from two perspectives: examining policy tools sought by policy-makers and key stakeholders in the development of TOD policies in the Amsterdam metropolitan region, and examining the extent to which policy-makers and stakeholders from elsewhere look to the Netherlands for transport and land-use policy inspiration. Finally, the policy-transfer workshops and meta-analysis determined whether the TOD policy ideas that had worked in international cases could be transferred to Dutch planning practice.

The interviews revealed that, despite best intentions, efforts to transfer policies to and from the Netherlands have rarely resulted in concrete actions or hard outcomes. Contextual differences in culture, social set-up, language, physical patterns, planning legislation and financial resources, as well as the failure to involve political elites in transfer processes, are obstacles to embedding planning policies elsewhere. Knowledge transfers are often highly dependent on the actions of individuals, and the process of knowledge exchange is frequently uncoordinated and fragmented. While planning ideas from international contexts often provide inspiration for policy-makers, these do not often lead to changes in the formulation of policy or practice (Pojani & Stead, 2014a, 2014c).

The workshops found that Dutch land-use and transportation planners are familiar with TOD concepts and ideas, but less familiar with 'softer' transferable lessons that consistently play a role in successful TOD implementation, such as good actor relationships, the support of the national government, the need for a multidisciplinary, experimental approach, and active public engagement. Participants felt that Dutch planners showed a low willingness to experiment with policy and project implementation, and that coordination of local policies and agendas with those of the national government was difficult.

Workshop participants considered the ability of other city-regions to engage the public, and to communicate the goals of TOD to those outside of the planning profession, as ideas they wanted to incorporate in some way into the Dutch planning process. The use of policy ideas from other contexts helped them understand possible solutions to TOD barriers and reach a shared vision on the possible solutions. Most agreed that their planning organization has the ability to use solutions from international contexts, but many noted that the culture of their organization does not favour the implementation of these solutions.

Thus, a number of institutional and cultural barriers to using international policy lessons in TOD remain in the Netherlands. These findings corroborate the findings of prior studies on policy transfer processes and best-practice exchange in urban and transportation planning. For example, Stead (2012) and Stead, De Jong, and Reinholde (2012) concluded that the scope of policy transfer within Europe is limited due to substantial differences in the economic, political and social situation of member states. Marsden and Stead (2011) found that the motivation for learning from others is strongly bounded to funding opportunities and that policy transfer is sometimes introduced for political reasons to legitimate decisions already made by an organization. In a study of 30 transportation policy innovations in a dozen large metropolitan areas in North Europe and North America, Marsden, Frick, May, and Deakin (2011) found that human interaction through trusted networks of colleagues was the most important source of learning and a condition for successful policy transfer.

We now turn to the findings from each of the three study parts.

## Actors, institutions and policies

This section discusses the actors involved in the planning process, the institutions and governance arrangements involved in land use-transportation integration, and the policies that encourage and enable TOD (i.e., part 1 of the study). Part 1 focused in particular on understanding how cities and regions have overcome barriers to TOD implementation. While several scholars have evaluated international TOD cases (e.g., Curtis et al., 2009; Tan et al., 2014), a systematic comparison of successful and unsuccessful cases focused on key policies, practices and governance models had not been attempted before this study.

Two methods were used: a meta-analysis comparing case studies from international city-regions (using meta-matrices and rough-set analysis) and two workshops with local planners exploring the applicability of these policy lessons to the Netherlands. Meta-analysis is one of many cross-case techniques (Miles & Huberman, 1994) that can be used to enhance the generalizability of case studies and deepen understanding and explanation. This approach aims to identify patterns and derive common elements from a set of case studies. Cases can then be compared and evaluated, and factors that are responsible for differing results across similar studies identified. Within meta-analysis, a number of techniques can be used to identify cross-case patterns, e.g., meta-matrices, qualitative meta-synthesis (Schofield, 2002).

In this case, 11 city-regions were selected from a long list of potential cases: city-regions with at least a 20-year history of attempting TOD, available extensive case study reports for analysis, and the availability of three local experts in each city-region to provide information for the research. The selected city-regions (e.g., Naples, Vancouver and Copenhagen) had varying degrees of success implementing TOD, following the notion that there is as much to learn from 'failure' as there is from 'success'. Three Dutch city-regions (Amsterdam-Utrecht, Rotterdam-The Hague, and Arnhem-Nijmegen) were also included. Using a meta-matrix, case reports were developed and the data were compared systematically.

### *International theories and policy lessons: critical success factors*

Sixteen critical success factors (e.g., Nijkamp, van der Burch, & Vindigni, 2002) were identified, which were crucial in the ability of international city-regions to implement TOD. Rough-set analysis was used to determine whether some factors were more important than others in achieving successful implementation, or if key combinations of factors had been useful. The critical success factors are summarized in Table 1 (based on Thomas & Bertolini, 2014). Strengths among these factors influenced successful implementation, e.g., a very high willingness to experiment with new policies/pilot projects. Conversely, weaknesses acted as barriers to implementation, e.g., little or no collaboration between the actors involved in TOD.

The rough-set analysis indicated that the more important factors affecting TOD outcomes were: national

political stability, relationships between actors in the region, regional land use-transportation body, interdisciplinary implementation teams and public participation. By contrast, policy consistency, intermunicipal competition, key visionaries and site-specific planning tools may be less important (Thomas & Bertolini, 2015a).

There is evidently much to be learned from 'imperfect' success, or even failure, in TOD implementation at the regional scale. Land-use and transportation authorities in other regions could use the list of critical success factors to identify and overcome some of the barriers they face in TOD implementation, e.g., they could focus on developing better informal and formal relationships between municipal actors (e.g., a TOD committee) with the aim of improving coordination, or they could introduce a pilot project to implement key site-specific tools such as floor area ratio (FAR) bonuses to stimulate TOD implementation.

### *Development of a local model: better relationships, policy consistency*

To understand the local value and relevance of the international critical success factors, they were applied in the Dutch planning context using two workshops with land-use and transportation planners (a total of 20 expert participants). The participants used the list of 16 critical success factors to identify strengths and weaknesses in the two largest Dutch city-regions: Amsterdam-Utrecht and Rotterdam-The Hague.

The weaknesses identified by the workshop participants were: weak actor relationships (especially between local planners and the national government, and between local planners and professionals outside of the planning discipline); an unwillingness to experiment; and lack of engagement with the public contributing to a low level of knowledge about planning concepts. Strengths included a recent shift toward actor collaboration in the region, particularly in Rotterdam-The Hague, and the ongoing financial support of the national government in transportation planning.

The participants' proposed solutions to move past the identified barriers included: (1) the development of a common, cross-stakeholder 'story' that incorporates TOD as a means to realize multiple goals; (2) marketing and communications efforts to aid understanding among the public and other actors outside the discipline; (3) the development of a regional land use-transportation authority, or at least more formal relationships between the actors; and (4) more consistency in growth management policy (transportation and land-use coordination).

### *Governance and financial tools stimulating TOD implementation*

This section discusses the finance, legal and governance models that can be applied to stimulate TOD implementation (part 2 of the study). The discussion is based on the results of a series of game (simulation) experiments in which 361 local practitioners acted as municipalities, private developers or owners seeking to maximize their profit from a development project. The aim was to assess which

**Table 1.** Critical success factors in the implementation of transit-oriented development (TOD).

<b>Critical success factor</b>	<b>Increases success</b>	<b>Decreases success</b>
<b>Plans and policies</b>		
1 Policy consistency	Very consistent over time in planning policy supporting TOD, e.g., specific station areas, transit corridors, and other transit-supportive and non-motorized-supportive land-use planning	Very inconsistent planning policy supporting TOD, major changes over time
2 Vision stability	Very stable vision, e.g., city-regional vision for land use-transportation planning or urban sustainability	Very unstable vision, major changes over time
3 Government support	Very good support of higher levels of government, e.g., provincial tax on petrol/gasoline to support public transit, national station location or regeneration policy, provincial funding for cycling infrastructure	No support of higher levels of government, no policies or funding
4 Political stability (national)	Very stable national political agenda supporting TOD	Very unstable national political agenda supporting TOD, major changes over time
5 Political stability (local)	Very stable local (municipal or regional) political agenda supporting TOD	Very unstable local (municipal or regional) political agenda supporting TOD, major changes over time
<b>Actors</b>		
6 Actor relationships	Very good relationships between municipal actors at a regional scale, e.g., communication, overlap in goals and vision, roles	Poor or no relationships between municipal actors at a regional scale
7 Regional land use-transportation body	Presence of a regulatory regional land use-transportation planning body	No regional land use-transportation-planning body (advisory or regulatory)
8 Intermunicipal competition	No competition among municipalities for new developments/funding	Very intense competition among municipalities for new developments/funding
9 Multidisciplinary implementation teams	Widespread presence of multidisciplinary teams implementing TOD	Sector-specific teams (e.g., solely planners or engineers) implementing TOD
10 Public participation	Very high public participation in land use-transportation planning processes	No public participation, public not engaged or interested
11 Public acceptance	Very high public acceptance of high densities and public transit	No public acceptance of high densities and public transit
12 Key visionaries	Many influential key visionaries over time, e.g., elected, citizen or business leaders	No key visionaries over time
<b>Implementation</b>		
13 Site-specific planning tools	Widespread use of site-specific planning tools, e.g., floor area ratio (FAR) bonuses, leasing of air rights, density targets	No use of site-specific tools
14 Regional-level TOD planning	Corridor-level planning, e.g., coordination of land use and transport in widespread transit corridors	No corridor-level or station-area planning
15 Certainty for developers	High degree of certainty for developers, e.g., plans and policies supporting higher densities, tools to enable mixed uses at station areas, and designation of areas for development/transit corridors	Uncertainty; developers are unaware of policies, tools and sites encouraging TOD
16 Willingness to experiment	Actors are very willing to experiment with new policies, practices and tools	Actors are unwilling to experiment with new policies, practices, and tools

preconditions are necessary for the successful application of finance and governance instruments and how these instruments could lead to a renegotiation of the public and private roles in TOD.

This role of renegotiation is crucial in the current adverse economic climate. Until recently, Dutch municipalities played a dominant role in development. They assembled land, which they purchased from private parties, and later resold or leased as serviced building plots to private developers. This allowed for efficient large-scale development and generated an important source of revenue for Dutch local authorities. Moreover, it enabled them to ‘capture’ the real estate value increment in station areas that were the result of public investments in public transport and increased accessibility of these locations (since they sold these building plots against full market value). The economic crisis caused some authorities to have substantial land assets worth less than the purchase price (Van der Krabben & Jacobs, 2013). Furthermore, much of the municipal land stock is located in greenfield areas on urban fringes, as a result of national spatial planning policies dating from the 1990s, to meet expected high demand for new housing. Municipalities need to develop and sell this land before moving to other areas, such as railway station areas. As a result, municipalities have become reluctant to continue with their proactive role as public land developers, while private developers are not prepared to step in. Though many municipalities stimulate developments in the vicinity of railway stations, they have moved from a development-led planning perspective to what is now sometimes called ‘planning by invitation’: individual land and property owners are invited to a cooperative and ‘organic’ development process. However, effective governance and finance strategies that support this new strategy seem to be missing.

The changing financial circumstances have transformed the perception of TOD in Dutch planning. Although financing urban development has, in general, become more difficult, greenfield urban expansions have suffered most. Therefore, TOD is increasingly seen as a business opportunity or alternative strategy for local governments. Cities now believe that growth should be accommodated within the existing urban fabric in order to render new real estate development sustainable, and along existing infrastructure lines (train and tram), in order to use the investments in infrastructure more efficiently. TOD fits within this strategy, as it serves as a link between infrastructure and land development. However, new development instruments are needed in order to force a breakthrough in the present situation.

#### *International theories and policy lessons: communication and information exchange*

A multitude of financial, legal and governance instruments are available, which can lead to an alternative urban development model that facilitates and stimulates TOD. Table 2, which is based on Van der Krabben, Lenferink, Martens, Portier, and Van der Stoep (2013), summarizes these instruments. The tools are applied internationally, albeit

to various degrees and with different outcomes. Their diversity and sheer number testifies to the complexity of contemporary urban developments (De Roo, van Weeze-mael, & Hillier, 2012), which often require a context-specific approach that effectively combines short-term actions and longer-term strategic planning efforts (Lenferink & Van der Stoep, 2013).

While instruments differ in character and level of dissemination within countries, they all involve some form and amount of negotiation among stakeholders in a development project. Two essential aspects of negotiation include information and communication. Both are deeply rooted in applied game theory (Ostrom, Gardner, & Walker, 1994; Samsura, 2013). In game theory, information most commonly refers to the cost structures, rewards, strategies or payoffs available to the players (Samsura, Van Deemen, Van der Krabben, & Van der Heijden, 2015). Communication refers to the possibilities for interaction among the players. As mentioned, the present study included a number of gaming experiments, which examined these two aspects.

#### *Development of a local model: sharing information in negotiations*

Four instruments, often used elsewhere but not in the Netherlands (Van der Krabben & Heurkens, 2014), were selected for gaming simulations. The first instrument, business-improvement districts (BIDs), is commonly applied in the United States and United Kingdom, and involves businesses paying an extra tax or levy in a certain area to finance improvements within that area, which go beyond the regular services provided by the municipality. The second instrument is urban land readjustment (ULR), which is applied in Asia, Spain and Germany. It involves owners sharing adjacent properties, developing the whole and redistributing land and (financial) results afterwards. Third is tax increment financing (TIF). This instrument is applied, amongst others in the United States and Canada, to pre-finance investments by earmarking future tax revenues as a result of that investment. The fourth and final instrument investigated is transferable development rights (TDRs). They involve the introduction of a market for rights to certain developments, e.g., additional building floors in the case of air rights (common in the United States).

The four selected instruments (described in detail in Table 2) were considered the most promising for application in the Netherlands because: (1) they offer a fundamental and yet simple financial alternative for the active land policy of municipalities explained above (BID and TIF); (2) they can potentially deal with inefficient land positions around stations (ULR); or (3) they involve a strong incentive for local and regional cooperation of government on land and transportation policies (TDRs). In addition, the Dutch national government is currently making efforts to incorporate two of the instruments (BID and ULR) into Dutch law. The four selected instruments involve all three main types of negotiations: private–private, public–private and public–public. A total of 361 experts participated in the gaming simulations: for BID, 48



**Table 2.** Financial, legal and governance instruments that can apply in the implementation of transit-oriented development (TOD), with four investigated instruments highlighted.

Governance instruments	Financial instruments	Legal instruments
Design competitions	Assessment districts	Unbundled parking
Area concessions	<b>Tax increment financing (TIF)<sup>b</sup></b>	Long land lease
Organic development	Owner shareholder constructions	Temporary lease/functions
<b>Urban land readjustment (ULR)<sup>a</sup></b>	Owners association on location level	Vacancy legislation
Building claim model	Transportation utility fees	Guarantee requirements
Private maintenance of public space	Co-financing	Open zoning plan
Collective actions for housing development	Development fees/impact fees	<b>Transferable development rights (TDRs)<sup>d</sup></b>
Public developer	Funding constructions	Transferable CO <sub>2</sub> -emission rights
Regional development company	<b>Business-improvement district (BID)<sup>c</sup></b>	Design–build–finance–maintain(–operate) contracts (DBFM(O))
Alliance/coalition model		Building envelopes
Area development company		Exploitation permit
Supply chain arrangements		

Notes: <sup>a</sup>ULR is a tool commonly applied around the world to deal with inefficient ownership and land positions, but its application in the Netherlands is limited (Van der Krabben & Needham, 2008; Louw, 2008). It involves owners of land to exchange and readjust parcels in order to come to more efficient plots. The instrument can be considered for stimulating TOD because existing station areas often have to deal with inefficient ownership positions as, over the years, they have been transformed from a mainly industrial character to stations that provide services and residential functions.

<sup>b</sup>TIF considers financing an investment by projected income from taxes generated in future, and has been widely applied in Anglo-Saxon countries from the 1950s onwards (Weber, 2003; Klemanski, 1990). The instrument is interesting to consider for stimulating TOD because it can help to make large pre-investments possible. Such pre-investments are often required in (re-)developing station areas where road and railway infrastructure are to be fitted properly in the urban tissue to enable property (real estate) development.

<sup>c</sup>BIDs are a local financing arrangement that can be introduced by business and property owners to small investments (Houstoun, 1997; Hoyt, 2004). These can be, but are not limited to, investments in security, public space, park management and advertising. A BID can be interesting to consider for improving TOD because it completely revolves around businesses: they initiate and finance the investment taking over the role of local government. Because BIDs can finance local improvements, they can be easily applied to increase the attractiveness of a station area as a destination for customers and as a place to locate businesses.

<sup>d</sup>TDRs involve the introduction of a market system with sending and receiving areas to enable the trading of development rights (Levinson, 1997; Machermer & Kaplowitz, 2002). Such development rights can take various forms, from the rights to build additional stories on buildings (so-called air rights) to mineral rights and access rights. The introduction of TDRs could be interesting for TOD because it could stimulate governments to focus on station areas as focal points for future developments. In order for TDRs to work, a scarcity in rights needs to be created, limiting the possibilities in non-TOD areas. In addition, a functioning TDR system can introduce market forces to choose between TOD locations, and thereby prioritize the developments.

Source: Adapted from Van der Krabben et al. (2013).

participants; for ULR, 150 participants; for TIF, 66 participants; and for TDRs, 97 participants. In the gaming simulations, local practitioners were asked to use the instruments while role-playing as municipalities or private developers/owners negotiating outcomes of a development project.

Gaming simulations employing two *private–private* negotiation instruments, BID and ULR, show that increasing information available to other stakeholders in a development project can help cities reach fairer agreements: distributing the added value of developments more equally among stakeholders involved. Introducing a regulatory framework, which supports private–private negotiation instruments, could further strengthen this outcome. However, additional information about other parties in the negotiations also makes it harder to reach an agreement. As the understanding of other players' position improves, the discussions on profit margins intensify and individual profit-maximizing behaviour emerges.

Gaming simulations employing a *public–private* negotiation instrument, TIF, demonstrate that information availability determines the outcome of this type of negotiation. Again, chances to reach an agreement are lower when more information is available. However, revealing

information about other players speeds up the negotiation processes and can cut transaction costs. While applying TIF, municipalities must be aware that stating both economic and societal goals can provide private developers with an opportunity to reap benefits from public investments in a TIF.

Gaming simulations employing a *public–public* negotiation instrument, TDRs, show that through interaction, players reveal information and can approach a regional optimum in supplying locations for development, if sufficient coordination is provided by a regional authority. Interestingly, in terms of reaching common regional goals, revealing information appears to be more important than open communication. In other words, a regional TOD strategy can be more easily adopted when cities reveal their cost structure, land position, profit margins and so forth to each other, than when regions facilitate extensive but unfocused communication sessions.

To summarize, this part of the study suggests that Dutch experiences in financial, legal and governance instruments for TOD are limited, that outcomes are context specific and therefore possibilities for policy transfer are limited. Although negotiation experiments clearly help to identify preconditions for applying instruments in

practice, gaming simulations remain valid only at an abstract level. Outcomes of negotiations can differ when real (TOD) plans, real people and real stakes are involved. In such cases, other factors and considerations play a role, which can make site-specific negotiation outcomes differ from the assumed financial-rational simulation outcome. Nevertheless, a number of lessons for policy transfer can be suggested for the broader application of the proposed instruments at the local, regional and national levels.

At the local level, sharing information on cost structures, land positions and profit margins can help municipalities reach better agreements and help reduce transaction costs. Communication is not a solution in itself. Rather, outcomes depend on the type of information shared during interactions. The long-term strategic choices for TOD are made at the regional level. As stressed in the previous section, TOD implementation requires regional coordination. Regional coordination can be achieved through stronger links between policy and financial instruments. For example, regional or provincial governments can financially reward or punish local governments, based on the degree to which local developments comply with regional TOD policy. National rules and regulations can stimulate certain instruments to reach fair agreements during negotiations and to build successful cooperation at the local and regional/provincial levels. The national government can clarify instruments to be applied locally and provide a definition of 'desirable developments'. These measures would help subnational governments in the Netherlands, and elsewhere, pursue TOD more vigorously.

### TOD design concepts

This section discusses design issues in TOD specific to the Dutch context, based on data from 18 interviews and two design charrettes with 24 local specialists (part 3 of the study). The design quality of TOD areas is particularly important because the goals and ideas of TOD need to be fitted to real-world constraints of space, time and money at the urban design stage of a project (Jacobson & Forsyth, 2008).

New TOD projects in the Netherlands are seen as dependent on good urban design to coordinate transportation modes, mix land uses and create an appealing public space within a limited area. This accent on design reflects early TOD tenets (Cervero & Kockelman, 1997) but also a contemporary European and North American trend to use urban aesthetics consciously as an economic development tool in the new competitive, globalized milieu (Gospodini, 2002; van Lierop et al., 2017). Superior, distinctive urban design pays high dividends in the Netherlands. Here, research has revealed a significant relationship between district visual quality and the location behaviour of 'footloose' creative entrepreneurs, a highly coveted labour pool in the new, service-based economy (Smit, 2011).

Scholarly attention to detailed, site-level urban design issues inherent in TOD has been limited. The key works in this area provide adequate information to help form a vision of an 'ideal' TOD model mainly informed by American preferences, as most research on TOD design has been

produced in the United States (e.g., Calthorpe, 1993; Dunphy, Myerson, & Pawlukiewicz, 2003). While American scholarship and practice provides a solid starting point for TOD planning and implementation, it is unlikely that 'made in the USA' TOD design guidelines can be applied in their entirety to other contexts due to cultural differences in the responsiveness to urban environments. Cross-cultural studies have demonstrated that cityscapes must accommodate local values, conditions and expectations (Bull, 2007). Hence, the American TOD model, at least in terms of design, needs to be revised to fit Dutch circumstances and perceptions.

### *International theories and policy lessons: neo-traditional prototype*

The main aesthetic principles and best practices set forth in the international literature on TOD are summarized in Table 3. The principles are grouped into 12 dimensions clustered in three key topics: place-making, facilities/logistics and process; a similar model has been used by Jacobson and Forsyth (2008) and Kong and Pojani (2017). For the most part, these principles embody many of the same design elements found in neo-traditional and new urbanist movements, such as moderately high densities, interconnected street patterns, mixed land uses, convenient and safe walkways, varied housing products, civic squares, and priority for non-motorized transport. Also, in many ways, the American TOD prototype borrows from an old-fashioned, idealized 'European' town planning style (TCRP, 2002).

### *Development of a local model: mid-rise, context-sensitive design*

When comparing the data from the interviews and design charrettes with the international body of theory, a vision of an 'ideal' Dutch TOD model begins to emerge – which, however, is not universal. The model might look very different in other countries. It is mostly applicable to small and medium-sized cities, which also need integrated transport and land-use investment the most, as – with a few exceptions – they presently are the most car dependent. The model involves a visually appealing, mid-rise, medium-density, mixed-use, intricate, landscaped and interconnected neighbourhood, centred on a multi-modal station. The area contains water features, trees and cosy squares with small cafés and restaurants. Existing historic buildings are preserved and combined with new, high-quality architecture, which incorporates some traditional materials such as brick. While having a higher density than the surroundings, especially in the areas surrounding the station, the TOD area blends seamlessly with the rest of the city, and does not necessarily have a strong identity of its own. Context sensitivity is crucial.

In addition to creating a new TOD, existing development near transit nodes is retrofitted and redesigned in a less uniform fashion to counter the homogenizing effect of large-scale planning schemes. These TOD areas are gradually filled in by businesses and homeowners as demand arises.

**Table 3.** Urban design characteristics of transit-oriented development (TOD) areas.

Dimension	Recommended guideline or approach
<b>Place-making</b>	
Scale and density	<p>Ensure comfortable walking distances between points (i.e., TOD encompassing a 0.5 km or a five-minute walk radius, doubled for major stops, with placement of homes near transit at sufficient density)</p> <p>Place commercial uses, jobs, parks and civic uses within walking distance of transit stops to allow for trip linking or consolidation</p> <p>Taper densities with distance from a station (i.e., a 'wedding cake' density)</p> <p>Provide sufficient densities to sustain transit investments (i.e., set minimum floor-area ratios, and do not exclude tall buildings and intensive development)</p>
Public spaces for human use	<p>Design individual parts of the overall plan with human activity in mind</p> <p>Make public spaces the focus of building orientation and pedestrian activity (i.e., cluster benches and sitting ledges, provide special public art, allow for flexible use, accommodate outdoor dining, encourage water features and discourage large setbacks, i.e., more than 6 m from the street edge)</p> <p>Add human-scale details, such as architectural features and textures on buildings, street furniture, colourful vegetation, public seating, a mix of building colours and plantings</p> <p>Design public spaces for a sense of 'an outdoor room'; a recommended minimum height-to-width ratio is 1:3</p> <p>Ensure that main entrances and windows face the street</p> <p>Provide large shade trees that form continuous canopies over the street</p> <p>Create attractive landmarks and gateways to the development</p>
Safety	<p>Provide physical measures such as good lighting at night</p> <p>Control access in non-public spaces through fencing, lighting and landscape</p> <p>Avoid blank facades (provide transparent facades with non-reflective glass)</p> <p>Ensure adequate sight lines</p> <p>Avoid tunnels, narrow paths and other entrapment spots or isolated areas</p> <p>Encourage a variety of uses to ensure round-the-clock activity</p>
Variety and complexity	<p>Break up long streets with parks and other diverse, colourful and interesting public spaces</p> <p>Avoid monotony, in terms of either appearance or use</p> <p>Avoid uniform planning regulations</p> <p>Create a sense of identity (i.e., have a common vocabulary for buildings and public spaces)</p> <p>Encourage every price point to live around transit, i.e., provide affordable housing options</p>
Connections	<p>Design relatively small blocks (i.e., a proposed average block perimeter limits is 400–450 m)</p> <p>Provide pedestrian-friendly street networks that directly connect local destinations (i.e., pedestrian cut-through paths)</p> <p>Avoid cul-de-sacs</p> <p>Avoid barriers such as highways or large parking lots</p> <p>Prefer grid street networks</p>
<b>Facilities/logistics</b>	
Pedestrian/cyclist orientation	<p>Apply traffic-calming devices such as signal timing, speed bumps/tables, medians, undulating roads (chicanes), small curb radii, lower speeds and narrow roadways. Provide buffers that separate moving traffic from pedestrians (i.e., through landscaping elements such as trees, flower boxes or grass strips, or special features such as different materials or curb bulb-outs)</p> <p>Provide a continuous network of pavements/sidewalks</p> <p>Set maximum and minimum pavement/sidewalk widths (to accommodate pedestrian traffic but not appear empty); a recommended range is 1.5–7 m</p> <p>Provide bicycle stations at major stops</p> <p>Provide secure bicycle parking at more minor stops</p> <p>Allow two- or four-lane streets maximum (with rare exceptions)</p>

(Continued)

**Table 3.** Continued.

Dimension	Recommended guideline or approach
Transit in the urban pattern	<p>Locate transit stops in the centre of the community rather than on the periphery</p> <p>Ensure high-quality design of the main transit stop</p> <p>Provide attractive, comfortable, informative and sheltered transit stops</p> <p>For underground stations: open up stairs and escalator area for easy and pleasant access</p> <p>Ensure modal integration, i.e., connections between buses and trains</p>
Car movement and parking	<p>Eliminate minimum parking requirements and require maximum parking requirements (up to 9% of the surface area)</p> <p>Apply flexible parking standards</p> <p>Move parking away from the platform to open prime real estate for development</p> <p>Provide shared/pooled parking facilities</p> <p>Prefer enclosed parking over surface parking lots</p> <p>Wrap parking structures with service and entertainment establishments</p> <p>Place surface parking in the back of buildings and wrap with walls or hedges</p> <p>Allow on-street parking</p> <p>Allow park-and-ride lots to be used for other activities past business hours</p>
<b>Process</b>	
Timeframe	<p>Design with short- and long-term timeframes in mind</p> <p>Take an 'evolutionary' approach to development, with layering and infill over time</p> <p>Factor in the possibility of future growth</p> <p>Allow uses (functions) to change easily over time</p>
Public engagement	<p>Include various stakeholders in the design stage</p> <p>Use visioning and communication processes to elicit design ideas and create the design plan</p>
Programming	<p>Plan events and activities in public spaces (i.e., concerts, flea markets, farmers' markets, art shows, outdoor theatre etc. occurring at different times of the day, week and year)</p>
Maintenance	<p>Budget for maintenance requirements, especially landscaping and greenery</p>

Notes: Dimensions (left column) are adapted from Jacobson and Forsyth (2008). Guidelines or approaches (right column) are adapted from Calthorpe (1993); Ewing (1996); Transit Cooperative Research Program (TCRP) (1997, 2002); Dunphy et al. (2003); Siegman (2003); Ditmarr and Ohland (2004); and Ewing and Bartholomew (2013).

The station itself is easily reachable on foot, but especially by bicycle, and contains ample bicycle parking facilities. The cultural preference for cycling over walking implies a larger TOD radius than elsewhere, up to 2–3 km as opposed to the standard 0.5–1 km. Because of this, relative to other contexts, there is less need to concentrate homes around stations and to build at high residential densities to ensure transit ridership. The station building, which contains shops, food vendors and service establishments, as well as travel information points, constitutes a recognizable element and an orientation point in the urban fabric. It features an open square in front from which vistas and lines of sight direct exiting passengers toward the city centre. Ideally, the infrastructure (e.g., train tracks and platforms) is placed underground to avoid noise pollution and visual intrusion. Traffic calming and parking restraint devices apply in the TOD area as in the rest of the city. Surface parking lots are avoided, especially at stations in highly desirable locations.

These recommendations reflect basic human needs in relation to urban space (e.g., walkability), as well as contemporary taste requirements. They are also partly

informed by the international exposure and learning of the study informants. Therefore, the Dutch 'ideal' TOD mirrors in many ways its 'universal' counterpart found in the literature. However, context- and culture-specific priorities are also present in this vision. While some differences are more subtle and allow for more flexibility (e.g., the inclination toward cycling at the expense of other modes, which leads to a larger TOD radius than elsewhere), other requirements (e.g., undergrounding rail infrastructure in high-demand areas) are rather striking and require a substantial amount of funding to be accommodated. In view of these findings, it becomes clear that many of the design aspects of TODs can be transferred, but there are differences that require planners to examine and take account of the local context.

## CONCLUSIONS

This study on the use of international policy lessons to help overcome barriers to TOD implementation in the Netherlands reached several conclusions, reflecting the complexity of transnational policy transfer and implementation.

Successful TOD implementation involves the translation of policy ideas, tools, relationships and processes into practice. In general, these require:

- cooperative/collaborative relationships between actors, consistent policy and plans, a long-term vision for transportation/land use, and a multidisciplinary and experimental approach to implementation;
- site-specific tools and instruments that enable financial gains among actors using private–private, public–private or public–public partnerships, and whose efficiency is increased through negotiation and communication; and
- attention to detailed, small-scale design, the ability to access transit stations from cycling and walking infrastructure, and the ability of TOD to blend into the existing architectural framework and historical street networks.

In each of these three broad categories, local planners and TOD experts adapted the policy ideas to the Dutch context in order to develop their own policy solutions (i.e., the need for a common ‘story’ to align stakeholder goals, using TOD as an organizing concept, sharing specific types of information to facilitate area development negotiations, or a TOD design concept that allows for cycling as a main station-access mode). Thus, the study demonstrated that merely copying or emulating policy ideas from other contexts does not work; rather, policy learning and adaptation is the preferred route for policy transfer among local policy-makers and other stakeholders. Therefore, policy ideas or planning, financial and design instruments should not be viewed as rigid and isolated routes toward a fixed goal. They must be adapted to the circumstances and combined with each other as needed. A deliberate effort to sustain this adaptation process – seen in the different types of workshops – is needed.

The adoption of policy concepts, particularly such complex ideas as TOD, has not necessarily led to successful implementation in the Netherlands, in part because the ‘softer’ aspects of policy, such as communication and negotiation strategies or developing common goals, have not been transferred. These structures, practices and relationships are much more difficult to transfer (if indeed they can be transferred at all), so implementation does not necessarily follow, even when TOD has been successfully integrated as a transportation policy concept. Also, the poor design quality and context insensitiveness of a few TOD attempts in the Netherlands has vested the policy concept with a negative image.

### Implications for other cities, regions or countries interested in implementing TOD

Planners, policy-makers and other stakeholders need to understand fully all aspects of policy ideas, tools and practices before attempting to transfer them to their own cities/regions. Policy ideas from other geographical, cultural and planning contexts indicate not only the successes that can occur but also the difficulties that international cities/regions have encountered in implementation. While there

are some generalizable policy ideas, tools, relationships and processes characterizing successful TOD implementation in international contexts, it is unlikely that the exact model of implementation that worked in one context will work in another. It is absolutely necessary for local planners and experts to develop their own context-specific TOD solutions on policy, financial tools and design using international examples only as inspiration: TOD must be specific to their urban forms, political and planning contexts, and cultural preferences in order for implementation to be successful.


The ‘softer’ aspects of policy design and implementation, e.g., actor relationships and information sharing to achieve common goals, are often rooted in culture, language and history; therefore, they seem to be difficult to transfer. The adoption of financial tools requires understanding and experience within organizations and institutions, stronger coordination between policy and financial instruments, and incentives to reach fair agreements during negotiations. Design concepts need to take into consideration local patterns and behaviours (e.g., cycling in the Netherlands, which results in a larger radius for TOD than typically used in other countries).

Finally, good communication and collaboration among actors in TOD planning is essential. Long-term collaboration within a region can lead to new relationships between organizations and more consistent policy and tools. Even in the application of specific financial tools, negotiation, communication and information exchange are critical in successful implementation. Local planners, transportation authorities, transportation providers, the public and actors outside of the planning profession must be able to understand the broader concepts of TOD (i.e., contributing to sustainability and enhancing liveability) in order to develop a shared vision for TOD at a regional level.

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