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The Role of Incentives in Implementing Successful Transit-Oriented Development Strategies

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ABSTRACT *The pursuit of transit-oriented development strategies (TODS) is a worldwide phenomenon but knowledge of the process of implementation remains approximate. The ingredients for changing from a non-conducive to a conducive environment for TODS and how that change occurs remain unclear. In cases of successful TODS implementation, it is hypothesised that a deliberate shift occurred in the institutional context through the introduction of incentives to overcome implementation barriers. A conceptual model proposing the relationship between formal and informal barriers in a vicious cycle as well as the lifting of those barriers through a virtuous cycle of mutually reinforcing formal and informal incentives is applied. The processes of change accompanying the identification and the role of incentives are examined in three metropolitan regions: Perth, Portland and Vancouver. The combinations of incentivising measures used are revealed.*

目前世界各国都在努力制定以公共交通为导向的发展战略 (TODS), 但对其实施过程的了解并不完善。人们对于哪些因素有利于这样的发展战略, 以及变化如何才能发生, 还不是十分清楚。我们认为 TODS 之能够成功, 在于通过刺激手段促成了体制环境的变化, 于是克服了实施障碍。我们提出了一个概念模型, 说明正规与非正规障碍的恶性循环, 并提出如何通过双向强化正规和非正规刺激, 形成良性循环, 从而克服障碍。本文考察了帕斯, 波特兰和温哥华大区三个城市发生转变的过程, 以及在此过程中如何发现激励机制, 激励机制起到了何种作用, 并揭示了不同激励措施的各种组合。

KEY WORDS: Transit-oriented development, implementation barriers, institutional incentives

1. Introduction

Metropolitan regions worldwide are increasingly interested in implementing transit-oriented development (TOD) principles through integrating land use and transport

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planning strategies. These TOD strategies (TODS), known for promoting sustainable urban development, have been used repeatedly in numerous planning contexts (Curtis *et al.*, 2009). Despite policy efforts and academic attention, only selected cases of successful TODS implementation exist. Implementation is successful when a metropolitan area moves away from a car-oriented development path towards a more TOD path. Although many substantive issues can be addressed, formal and informal barriers still constrain implementation (Banister, 2004; Rietveld & Stough, 2004; Hull, 2011). These barriers are financial, legal and socio-cultural obstacles preventing actors from implementing TODS. In cases of implementation, either no such barriers existed or they have been lifted (Cervero, 1998; Dittmar & Ohland, 2004). The lifting of barriers is accompanied by the introduction of incentives well suited to these barriers (Tan *et al.*, 2011). While TOD literature implicitly acknowledges these processes of change, there are as yet no studies explicitly focusing on them. To fill this knowledge gap, the processes various cases underwent to achieve successful implementation are reconstructed to discover what roles incentives fulfil in the abovementioned processes and the corresponding financial, legal and cultural institutions influencing group behaviour and individual choices.

Earlier research indicates a vicious cycle, in which formal and informal implementation barriers negatively influence one another producing a non-conductive context for TODS implementation (Curtis & James, 2004; Tan *et al.*, 2011). A positive relationship where formal and informal incentives reinforce each other resulting in a virtuous cycle producing a TODS-conductive context is therefore hypothesised (see Figure 1). If this is true, evidence should be found by reconstructing processes of change towards TODS implementation in successful cases. This proposition is tested using three case studies.

First, the discussion in the existing literature is framed, illustrating the relationship between formal and informal barriers and in contrast, that of formal and informal incentives as applied through and on institutions. Second, a description of methods used to identify selected cases where successful implementation has been observed is provided.

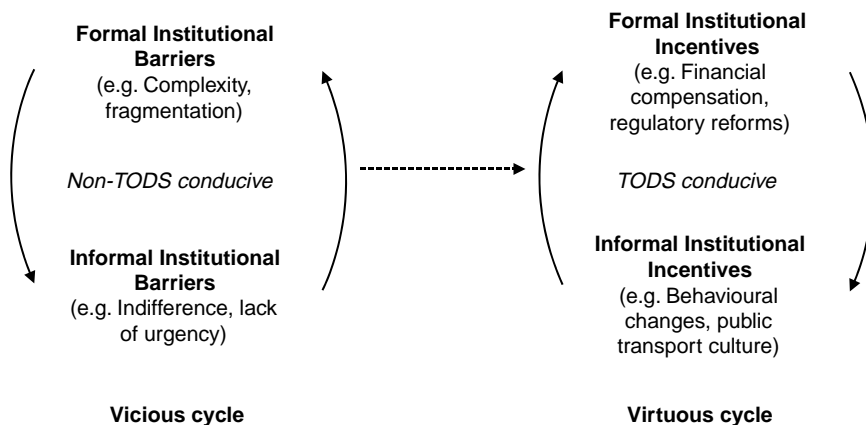


Figure 1. Preliminary conceptual model of vicious and virtuous cycle for TOD in an ideal situation (Tan *et al.*, 2011)

A reconstruction of processes in three cases, Perth Metropolitan Region (PMR), Portland Metropolitan Area (PMA) and Greater Vancouver Region (GVR), identifies barriers and incentives as observed by local practitioners. Lastly, a comparative analysis of these “theory-confirming cases” (Lijphart, 1971, p. 691) examines general patterns inferred. The article concludes by reflecting on the relationship between formal and informal incentives, and how they reinforce one another during processes of institutional change. Suggestions for further research on institutional change achieved through learning and innovation follows.

2. Barriers and Incentives

Barriers to TODS implementation are barely understood beyond the cursory, oft descriptive and context-dependent ‘best practices’ in the current literature (Cervero, 1998; Dittmar & Ohland, 2004; Dunphy *et al.*, 2005). There is a need to understand how incentives emerge to overcome barriers within institutions. Insights on how incentives consolidate as institutional change towards TODS implementation are needed. The roles of implementation barriers and incentives affecting institutions are relatively neglected in planning literature despite extensive discussion in other fields of sustainable development, organisational and management science (Clark & Wilson, 1961; Ostrom *et al.*, 1993; Lucas & Ogilvie, 2006; Woodhill, 2010).

Barriers to TODS implementation are obstacles and costs deterring realisation of plans and policies. Legal, financial, political and socio-cultural barriers are considered crucial to be resolved (Rietveld & Stough, 2004; Clifford *et al.*, 2005). Formal barriers allude to the efficiency and competency of regulatory and legislative frameworks, availability and distribution of funding as well as physical and technical blockages experienced. Informal barriers are those caused by political and cultural, and institutional and territorial deterrents. Informal barriers deal with issues of framing, perception, politics, acceptability and awareness within the planning profession. Conflicts between and within organisational and operational boundaries are also observed. They are considered informal due to the limitations of policy and instruments within formal organisations and institutions to change them as well as the predominance of social, cultural, and political beliefs and norms in shaping them. Informal barriers are thereby difficult to measure and reliant on observations of social trends and behavioural tendencies (North, 1995; Marsden *et al.*, 2009).

Incentives are “positive and negative changes in outcomes” resulting from actions within “a set of rules in a particular physical and social context” determining the cost and course of action taken by individuals within an organisation (Ostrom *et al.*, 1993, p. 8).

Incentives are perceived as positive or negative depending on the subjective view of the stakeholder. In TODS, incentives countering the negative effects of institutional barriers to implementation are viewed positively (Tan *et al.*, 2011). For example, increasing fuel tax encourages public transport usage and is experienced as a positive incentive to TODS. Yet, it is a negative incentive for car mobility.

Incentives function as levers influencing process and decision-making (Ostrom *et al.*, 1993). Incentives are legal, financial or socio-cultural measures active and embedded within the institutional field of organisations, actors and networks contributing to a larger planning context (Lin, 2002). Incentives help overcome constraints by determining an appropriate course of action or choice to organisations or individuals involved through

“tangible and intangible” rewards, material means and moral inspiration or repulsion (Clark & Wilson, 1961, p. 130).

Formal incentives are measures within formal institutions targeting barriers through enforcement or remunerations. Examples include: financial compensations, legal instruments and organisational restructuring. Informal incentives inspire stakeholders to overcome barriers with the promise of social or moral rewards. They include measures seeking to influence and change current norms, such as travel behaviour, attitudes towards public transport and general lifestyle and mobility choices (Clark & Wilson, 1961; Ostrom *et al.*, 1993).

To understand the processes of change where incentives overcome barriers in an ideal situation, a preliminary conceptual model illustrating the relationship of a vicious and virtuous cycle is proposed (see Figure 1).

The hypothesis here is that self-enforcing cycles of formal and informal implementation barriers (Figure 1, left) and formal and informal incentives (Figure 1, right) play a key role in TODS implementation (Tan *et al.*, 2011). This hypothesis contrasts with literature focused on the end state instead of the ingredients and process of institutional change (Curtis & James, 2004; Marsden & May, 2006), and will be further tested on three cases.

3. Research Methods

Three theory-confirming cases were studied and analysed for their processes of change towards TODS implementation to determine if and how incentives reinforce one another. TODS are highly context specific as their barriers and incentives are products of their institutional contexts and settings. Case studies are therefore a logical choice and approach to “capture the circumstances and conditions” by reconstructing processes leading to successful implementation of TODS (Yin, 2003, p. 41). A multiple-case design replicating the same protocol for all case studies ensures robustness and breadth of research. External validity is achieved through comparative analysis (Yin, 2003; Bryman, 2004).

3.1. Case Selection

A scan of global ‘best practices’ literature on TODS implementation resulted in three basic criteria to determine suitable cases for further study (Cervero, 1998; Dittmar & Ohland, 2004; Curtis *et al.*, 2009). Metropolitan regions with explicit TODS application towards developing regional transit corridors and corresponding developments were considered. These cases first had to be described as successful in literature ensuring optimum chance of finding a virtuous cycle. Then, each region was checked for explicit modal shift (car to public transport, relative to national average) in the last few decades as a proxy to successful TODS implementation. Lastly, each case was checked for formal and informal implementation barriers and if those had been lifted through explicit policy and cultural changes in relation to TODS. A total of 26 potential cases were observed. Certain combinations of organisational actors were present in these potential cases, with different actors taking initiative for TODS implementation. Actors presented across all cases as planning authorities, transport authorities, transit agencies and private interests active at various levels of scale. An exemplifying case for each of the three most common combinations was selected (Bryman, 2004): Perth Metropolitan Region (PMR), Portland

Metropolitan Area (PMA) and Greater Vancouver Region (GVR). PMR represents a regional planning authority leading with a strategic planning framework of formal regulations; PMA represents a transit agency leading together with a regional planning authority with formal but creative instruments with a slight variation in the presence of active lobby and citizen action groups. GVR represents an entrepreneurial transit agency leading with private developers through formal and informal regulations (Allmendinger & Haughton, 2010).

Research fieldwork was conducted for a period of four to six weeks per case beginning with an orienting study tour visiting TOD locations with local experts describing their implementation experiences. Local archives and policy documents were reviewed. An average of 15 semi-open interviews were conducted with local experts per case. These three collection methods formed the context, timeline and interview narratives, respectively. The narratives are three different facets of the reconstruction of the processes of change towards successful TODS implementation. By triangulating the three narratives, a case report is generated. Two referees¹ vetted each case report to increase research construct validity (Yin, 2003). Space for context-rich and qualitative findings is given in the context narrative where information indirectly relevant to TODS from document analysis and observations are reported describing size and scale of the regions, examples of TOD, political regimes, land use and transportation planning systems. The timeline narrative is a chronological reconstruction of TODS implementation manifested in projects, plans/programmes/policies and organisations, and trends and events of the last few decades. The timeline is then coupled with mode share data as a marker of change from a conducive to non-conducive context. This narrative, following the approach of Bertolini (2007), shows the evolution of strategies in relation to implementation within the circumstances of the period. The explanatory nature of the chronological structure establishes relation between elements over a linear sequence of time but does not presuppose causality. Local experts from the following categories of organisational scale level (national, provincial/regional, urban agglomeration or local), sector (land use, transport, both or others) and type (private, public or both) were sampled for the interview narrative. Experts selected either feature heavily in the literature as being instrumental/involved during key moments of TODS or are employed (previously/currently) in positions of power in key TOD organisations. Initial interviewees recommended others as well. Availability of the experts and the above conditions restricted sample size. The experts were guaranteed anonymity to ensure they felt free to share their experiences given their extensive involvement in practice, policy and academia. Interviews are structured around four lines of inquiry: establishing professional experiences and background, barriers experienced and overcome, incentives that have impacted their region and the perceived success of TODS implementation in their region. Transcriptions of the interviews were then made and structured accordingly.

Interviews determined the most crucial barriers and incentives as perceived by the experts. Here, an example of the reconstruction is shown with quotes representative of the sentiment of the majority interviewed on barriers and incentives. In PMR, 12 of the 14 experts² identified lack of instrumental clarity as a crucial formal barrier and all but five identified coherence in governance as the next most crucial formal barrier:

... there have been challenges in fighting against the operational aspects of the transport system against aspirations of planning outcomes. (Expert 1111)

Eleven experts identified habits and lifestyles as the most crucial informal barriers:

Retail (food and leisure) functions are locked up in 'big boxes'. Functions ... long separated ... businesses have forgotten how to work in streets. (Expert 1101)

All but four identified the differing views across sectors as third most crucial:

Transport planners still have issues with rail systems ... they cannot understand the public's demand as well as the developer's interests. (Expert 1112)

Nine of the 14 experts found financing and development models the most crucial incentive:

TOD projects are not cheap, doing something different depends on who is going to bear the cost and risks ... if the planners are willing to mortgage their house to finance my experiments, then I'm happy to do so. (Expert 1102)

The amalgamation of the ministries and its resulting plans, programmes and legislation were considered just as crucial.

Fortunate ... one portfolio with a minister that was passionate about ... All the planets were aligned. (Expert 1101)

All but five of the experts identified learning and knowledge networks as the most crucial informal incentive:

... planning profession was starting to see the light ... inspiration from people around the world. A few got inspired, then a few more, then a few more. That's how it changes ... (Expert 1103)

Incentives for behavioural change were considered next most crucial:

... inhabitants love their suburbs but came to the understanding ... the need for pockets of urbanity while offering the amenities to complement the suburb lifestyle. (Expert 1113)

These findings were compared against information collected in the context and timeline narratives. For example, the policy documents and projects following state agency amalgamation supported the sentiments expressed in the interviews (WAPC, 2005; Newman, 2011; Curtis, 2012a).

4. Reconstruction of TODS Implementation Processes in the Three Cases

TODS implementation process was reconstructed for all cases following the above methods. Attention was paid to the barriers observed and whether relationships existed between formal and informal barriers and incentives. The same observations were

Table 1. Comparison of formal and informal institutional barriers and incentives per case

	Perth Metropolitan Region	Portland Metropolitan Area	Greater Vancouver Region
Barriers	<i>Formal</i> Policy and instruments: Lack of instrumental clarity. Governance: Lack of coherence and continuity of governance.	Policy and instruments: Mismatch between planning and financing lending conventions. Governance: Lack of ability to move from plans to implementation.	Policy and instruments: Assembly of land parcels and control over under-utilised developments. Governance: Coordination between authorities.
	<i>Informal</i> Habits and lifestyle: Car-oriented community. Suburban residential patterns. Differing views across sectors: Differing opinions across land use and transport sectors.	Habits and lifestyle: Car-oriented culture and negative image of transit. Negative experiences: Justification of public funds (taxation) investment in TOD.	Negative experiences: Public backlash on spending and system/route choices. Criticism on lack of affordable housing
Incentives	<i>Formal</i> Amalgamation: Joining up of land use and transport sectors/portfolio. Improving TOD legislation. Financial/development models: Experimenting with different risk and profit sharing models.	Coherence and continuity: Metro as regional authority. TPR enacted by the state DOT. Deterrents: Limiting development with UGB.	Coherence and continuity: Commitment to SkyTrain system/technology. Regional plans: Livable Region Strategic Plan. Financial/development models: High financial returns motivate developers.
	<i>Informal</i> Learning and reflexivity: Networks for knowledge sharing and collaboration. Behavioural change: Engaging in public dialogue and programmes to encourage change in mobility patterns.	Shared belief system: Motivation and pride as leading TOD example (USA). Citizen groups monitor and police policy decisions. Behavioural change: Public opinion favouring more sustainable and compact developments.	Shared belief system: Collective commitment to being most 'liveable' region and the 'Vancouver Model'. Behavioural change: Public embrace of 'liveability' and sustainability principles.

made of incentives. When a positive relationship is observed, the incentives that played a key role were identified. Table 1 presents an overview of the findings from the reconstruction.

4.1. Perth Metropolitan Region, Western Australia, Australia (PMR)

PMR showed a rapid and conscious application of TODS (Ainsworth, 2005). A traditionally car-oriented region with a sprawling urban development pattern of relatively

low density, PMR has made a visible change within a relatively short period of 20 years (Curtis, 2012a). Here, the planning authority leads most initiatives with a strategic planning framework in a regulatory planning regime.

In PMR, TODS are mostly state-led initiatives (Curtis, 2012b). Formal barriers mentioned during the interviews were the lack of instrumental clarity, coherence and continuity of governance during the implementation process. Informal barriers were about a car-oriented community resistant to change and a practice community differing in opinions leading to a slow implementation process (Curtis & Mellor, 2011). The informal barrier of a car-oriented community has strongly influenced housing development trends and patterns since the 1950s as reflected in the retail and housing policies (WAPC, 1997). This translates into formal barriers when lending regulations are coupled to conventional parking norms not conducive to TOD. Many experts also talked about suburban residents being attached to '2 by 4' houses and how that has adversely affected market demand for TOD.

The most mentioned formal incentive is that of the amalgamation of the historically separate Departments of Planning and Infrastructure (DPI). The improvement of planning legislation (Development Control Policy 1.6) (WAPC, 2006) requiring coordination of plans and development around transit locations was another important incentive mentioned. Flexible risk and profit sharing models in the form of joint ventures (JV) between state planning agencies and private developers helped developers feel more certain when committing to previously unattempted TOD were mentioned as useful (Crawford, 2003). The risk division (state first purchasing the land for the development) and profit sharing (priority in the payment of developer's costs and/or performance bonus) make an interesting business case for commercial interests. Most experts agreed that the process of knowledge sharing, collaboration and reaching out to the wider public were important informal incentives for TODS implementation. Annual study trips organised by the Planning and Transport Research Centre (PATREC) contribute to the level of knowledge in the planning community. Many experts have been simultaneously involved as civil servants, private consultants, academics, politicians and activists. The TravelSmart programme, using innovative social marketing measures such as community outreach and educational programmes to activate community-wide travel behavioural change by encouraging transit usage and promoting walking and cycling, was deemed as crucial in shaping public acceptance of those modes as a possible and acceptable future choice (WAPC, 1999). The social pressure resulting was an important informal incentive leading to the consolidation of this programme and its policies (French *et al.*, 2011). The Dialogue with the City project (Hartz-Karp, 2005) was constantly mentioned as a turning point in shaping public understanding and urgencies for a sustainable region in the future and helped proposed strategies and policies gain legitimacy from the public (Curtis, 2006). Most local experts benchmarked PMR against well-known foreign examples such as Portland, Seattle, Zurich and London. Interestingly, many experts interviewed have practiced in Europe, a large majority practiced in the UK in particular. All experts viewed PMR as a work in progress, acknowledging improvements achieved in the last two decades as partial success. Their evaluations of success are benchmarked against previously named examples. They also expressed consciousness regarding the changes required to sustain and support further TODS. The TODS narrative has moved from just implementation to focusing on employment as well as residential and retail development in activity centres (WAPC, 2010).

4.2. Portland Metropolitan Area, Oregon, USA (PMA)

TODS in the PMA has gone from “being largely an afterthought to becoming . . . primary considerations in . . . planning” (Arrington, 2009, p. 109). Implementation has matured from fare-free zones downtown to rapid development of light rail extensions and corridors with corresponding urban development led by innovative public–private partnerships as part of regional growth planning. PMA exemplifies the ideal type where a transit agency leads with regional planning authorities in a mix of regulatory and incentive-based planning regimes with the added component of lobby and citizen action groups.

Mismatches between planning instruments and financial lending conventions, the financing of public transit and the ability of organisations to move from plans to implementation are formal institutional barriers mentioned by the experts. A dominant car culture, negative image of transit locations and justification of a huge investment of public funds on transit infrastructure are informal barriers mentioned. For instance, retail giants like Safeway or Target have their own parking norms, which are not necessarily transit friendly. Car-based lifestyle and culture are informal barriers translated into formal barriers when TODs with reduced parking norms are unable to lend funds from financial institutions with car-oriented development guidelines (Thompson, 2007).

The formal incentive most prized by the experts interviewed is the creation of the regional government, Metro. Metro’s capacity to limit development with the regional urban growth boundary (UGB) thereby creating land use scarcity was considered essential. The implementation and continued improvement of the Transportation Planning Rule (TPR) enforced by the State of Oregon was an important incentive coordination and promotion of multi-modal transportation choices in plans (Lowry & Abbot, 2010). Pride in being a shining beacon of TOD in the USA³ functions as an informal incentive motivating most interviewed (Suutari, 2007). The practice community learn and reflect on past projects, seeking to improve their next TODS. The constant monitoring of plans and policies by active and vocal citizen groups was a prominent informal incentive as well (Johnson, 2004; Thompson, 2007). Consistent public opinion favouring a more sustainable development through conservation of nature and encouraging transit use and slower modes is an informal incentive legitimising planning instruments (TPR and UGB). This institutionalisation of values and norms into policy enforcement and financial distribution are examples of the relationship between formal and informal incentives.

TODS implementation occurs at all scales; from state, metro, counties to cities; in cooperation with private interests. TriMet, the regional transit agency, leads most light rail-oriented developments with Metro coordinating. Private interests such as Hoyt Street Properties, Portland Streetcar Inc., William & Dame Development Co. and Gerding Edlen lead developments such as the Pearl District and South Waterfront (TriMet, 2011). The abundance of community activists, interest and advocacy groups, like the 1000 Friends of Oregon, Willamette Pedestrian Coalition and the Coalition for a Livable Future, is a point of interest here (Suutari, 2007). These advocacy groups have been consistently active in monitoring and pushing for sustainable development. The freeway protest in the early 1970s was a crucial motivating factor for most interviewed (Snyder, 2010). The shift in public opinion about car use and dominance is reflected in past and current policies (Lowry & Abbot, 2010; Thorne-Lyman *et al.*, 2011). Many experts interviewed revealed their simultaneous involvement as civil servants, private consultants and activists. Most experts acknowledged this phenomenon of multiple

roles and attribute easier collaboration and negotiation between parties to the fact that most people have at one point occupied similar positions and thus understand each other's motivations and capacities better. Experts benchmarked themselves against Copenhagen, Munich and Vancouver whilst considering themselves as highly, if not the most, successful in the USA. Furthermore, they exhibited pride in PMA's achievements in reducing emissions, increasing bicycle usage and transit ridership, and being early adopters of transit and land use integration. Opinions were consistent between experts from different sectors, organisations and political persuasions. There is a high degree of transparency regarding obtaining and sharing of information from relevant organisations. Experts interviewed were also extremely candid.

4.3. Greater Vancouver Region, British Columbia, Canada (GVR)

GVR is another successful example of TODS implementation where the integration of land use and transport planning manifests in densities defying North American averages. A rich history of regional planning in the GVR has contributed to a "crystallized vision of transit-oriented growth" (Cervero, 1998, p. 432). Development around the SkyTrain stations as regional centres around transit nodes along corridors have shaped urban development over the past decades (Wales, 2008). Since the freeway revolts in the early 1970s, GVR has consistently produced TODS and corresponding investments, such as the more recent Canada Line⁴ (MacKenzie, 1985; City of Vancouver, 2009). GVR's history began in the 1890s by focusing suburban developments around streetcar lines but its TODS efforts took off with the SkyTrain system introduced in the 1980s and TransLink's additional role as developer (Wales, 2008). Transit-oriented communities (TOC) have recently been introduced as the next step for TODS (TransLink, 2012). GVR is an example of an entrepreneurial transit agency leading most initiatives with private interests under a permissive and incentive-based planning regime.

Difficulties in assembling land parcels for development was a barrier mentioned. Inadequate overview and lack of implementation from planning and transit authorities and under-utilised locations were areas of concern (Walter, 2001). The lack of coordination between authorities (provincial, regional, local) and sectors (land use and transport) was a formal barrier that concerned most experts. Informal barriers included public backlash and controversies surrounding infrastructure investments such as the planning and implementation process of the Richmond Airport Vancouver (RAV) line in time for the 2010 Winter Olympic Games (Siemiatycki, 2006; Ruhland, 2010). The criticism and social concern for lack of affordable housing in Vancouver was also mentioned (Thomas, 2009).

Influential formal incentives were the consistent political commitment to the SkyTrain system despite opposition (Foth, 2010) and the continued regional planning strategies (GVRD, 1990; 1999). The high financial returns on TOD real estate and increased ridership were also incentives named (Siemiatycki, 2006; Broom, 2010). Informal incentives included the shared belief of working towards the most liveable and sustainable region, a view held by most experts interviewed. This incentive is partially connected to the general pride in Vancouver's performance in international liveability rankings (Hutton, 2011). The ambition to achieve the 'most liveable city' is an important informal incentive translated into formal plans and policies sustained by strong public support for sustainable development (Wales, 2008; Hutton, 2011).

GVR has developed its own ‘Vancouver model’, an extension of the new-urbanism-based TOD model emphasising combining high-rise and density with a human scale urban podium block with retail and community facilities at street level (Boddy, 2004). Expo ’86⁵ and the 2010 Winter Olympics were important triggers for the SkyTrain system and its extensions, respectively (Hatten, 1987; Siemiatycki, 2006; Ruhland, 2010). The influx of wealthy Asian immigrants in the 1990s also stimulated demand for high-density, high-rise housing and provided financial capital for these developments (Olds, 1998). Most experts balked at talking about TOD as a special strategy believing instead that good development behaviour should and must always be transit-oriented (Hutton, 2011). Most experts benchmarked themselves against numerous European and Asian examples. The Vancouver model and the densities achieved are comparable to TODS in Japan and Hong Kong.

GVR has a close-knit network of actors, particularly an older generation who were at the forefront pushing for TODS during the last four decades. The experts interviewed also discussed how the Vancouver model is now being exported to the Middle East and the USA. TODS has evolved from a planning concept to a commodity (Lowry & McCann, 2011).

5. Comparative Analysis

Self-enforcing cycles of formal and informal institutional barriers (Figure 1, left) or incentives (Figure 1, right) were hypothesised to play a key role in TODS implementation. A vicious cycle of negative influence could be lifted by the positive relationship from a virtuous cycle of formal and informal incentives. The change from a vicious to a virtuous cycle is evaluated based upon the reconstruction of TODS implementation processes in the three cases.

5.1. Formal and Informal Institutional Barriers and Incentives

The analysis shows many similarities between the perceived formal and informal institutional barriers (see Table 1). Formal barriers in all cases were about inadequate policies and instruments as well as incoherent governance. There is comparable frustration amongst the experts interviewed in all cases on these inefficiencies, recalled during the interviews with great clarity and emotion, even if they were experienced decades ago. The most crucial informal barriers were related to the societal landscape of persistent habits and lifestyle tendencies, public opposition formed by negative experiences or differing views and norms across sectors. Both barriers function as a constant reminder for experts to sustain efforts in TODS implementation. Most experts are critical about their region’s perceived success in TODS implementation. Common remarks from experts on their respective region’s success were that the regions were “work in progress”, “on its way to success” or “successful in certain aspects with room for improvement”.

Slight differences between the cases result from the different legal, financial and political contexts. All cases experienced barriers of authorities favouring road infrastructure in lieu of transit. In PMR, this was related to the removal of an existing piece of rail infrastructure and service. Whereas in PMA and GVR, it was the introduction of freeways into existing urban areas (MacKenzie, 1985; Snyder, 2010).

Similarities and differences were found with formal and informal incentives (see Table 1). According to the experts interviewed, formal incentives with the most impact were those institutionalising TOD principles in planning law and/or financial arrangements. These incentives provide continuity and coherence to TODS implementation through either governance restructuring or establishment of regional authorities and plans. Political ambitions enabling these shifts are also experienced across all cases. The most prominent informal incentives were shared belief systems and those contributing to behavioural change. Behavioural change incentives encourage transit usage or influence a more positive public opinion on TODS. Cultivating a sustainable development inclined culture within public opinion, practice arenas and political discourse are also important informal incentives.

In each case, experts from opposing sectors, differing levels of scale and organisation types could identify and agree on the same crucial incentives, even though they differ in opinion about their effectiveness. Academics, developers as well as civil servants in PMR all agreed that the amalgamation of the portfolios of transport and land use in the DPI has been of crucial importance. However, evaluation of the success of the amalgamation differs between experts. For example, transport sector civil servants felt amalgamation diminished their role and authority in TODS. The academics were disappointed that the amalgamation did not have a lasting impact but agreed that it gave an impulse to TODS in planning policies. The developers benefitted from the amalgamation with the financing of their projects but remained sceptical on the impact that the TOD projects will have on housing market demands.

In all cases, public stakeholders' were more positive about policy incentives than private stakeholders. This bias can be attributed to the public stakeholders level of involvement in shaping policy incentives. In PMR, PMA and GVR, stakeholders also agreed that the shift of public opinion and behavioural change towards TODS were crucial for eventual implementation. These informal incentives contributed to a more conducive environment for TODS as triggers or as legitimisation for introducing formal incentives. Experts from all cases acknowledge past successes but are certain that much more can be done to achieve their ideal of TODS implementation.

5.2. *Vicious to Virtuous Cycle*

All three metropolitan regions shifted from a vicious cycle of a non-conductive environment for TODS towards a virtuous cycle. In all cases, a long period of time was required to make that switch. For example, PMA commenced TODS in the early 1970s. GVR promoted TOD together with the SkyTrain in the 1980s and is recently considering redeveloping corridors along its streetcar lines from the 1890s (Wales, 2008). PMR started slightly later in the late 1980s. The timeline of all cases indicate consistent introduction of incentives leading towards new TODS, policies and corresponding projects. Throughout all cases, continuous efforts sustained a cyclical process towards a more conducive TODS environment. The introduction of incentives to overcome barriers proved crucial for moving away from a vicious cycle. The findings did not reveal a clear hierarchy between formal and informal incentives as both positively influence the political and socio-cultural landscapes. Both were deemed crucial and interdependent for a virtuous cycle as expected in the hypothesis.

During the interviews, many experts indicated a desire for further improvement in their regions towards an even more virtuous cycle. In PMA and GVR, TOC are considered the next target to be achieved. In PMR, activity centres are the next step. Experts in each case

benchmarked themselves against other regions perceived as ‘better practices’ from which they wish to emulate. The experts interviewed displayed awareness and knowledge of current TODS innovations in regions they aspire to. All experts enquired with great interest about practices and innovations in TODS that the researchers were familiar with. The ambition to improve and curiosity indicate a continuous learning process and openness to innovations from other contexts.

The above not only proves the shift from a vicious to virtuous cycle in all cases but also presence of a cyclical and iterative process. There are feedback loops active in the movement towards a virtuous cycle. Positive encouragement comes from increased profits in developments as evidenced in PMR and GVR and peer recognition from other regions pursuing TODS as in GVR and PMA. This however suggests that negative feedback could also influence a virtuous cycle adversely.

TODS are highly context specific and are as much a result of the political and socio-cultural landscape of a region as its geography (Curtis *et al.*, 2009; Hull, 2011). The barriers and incentives to TODS implementation are imprinted on these same characteristics (Tan *et al.*, 2011). Findings also show that there is active learning by experts and translation of innovations originating elsewhere towards their own context. These adaptations take the form of concepts, such as new urbanism and TOD for the PMR or as transportation systems and development densities in PMA and GVR. PMR adopted financial arrangements with developers inspired by ‘better practices’ in the USA, notably from the PMA. Experts expressed evident interest for usable and potential incentives from elsewhere. Likewise, those seeking change towards a virtuous cycle for TODS could benefit from learning about incentives used in PMR, PMA and GVR for their own regions.

5.3. Four Combinations of Types of Incentives

Incentives are used to reward or deter individuals and organisations towards a particular goal. In the planning institutional field, incentives can be categorised into three different types of measures affecting the legal, financial and socio-cultural arenas. All types have been observed to play a role in the successful TODS implementation of all cases. In the metropolitan regions researched, these measures are always used in combination with one another. Eliminating repetition in pairings leaves four possible combinations:

- (1) **Legal–financial:** Regulations and rules coupled to financial rewards or deterrents and vice versa (e.g. taxation on parking by public transport authorities or grants linked to fulfilment of planning requirements).

In PMA, local and regional authorities have the right to increase local taxes periodically to finance transit infrastructure and developments.

- (2) **Legal–socio-cultural:** Regulations and rules that form or change social–cultural practices or vice versa (e.g. institutionalisation of public opinions in plans and policies and/or travel behavioural change through policy instruments).

In GVR, the “Most livable city” concept became an important narrative in design and evaluation of regional plans (Hutton, 2011). “Dialogue with the City” in PMR is also an example (Hartz-Karp, 2005).

- (3) **Financial–socio-cultural:** Financial rewards or deterrents that form or change social cultural practices (e.g. attracting market players through reducing

financial risk or stimulating acceptance for TOD in neighbourhoods and/or using social interests to determine funding).

Community Amenities Contributions (CACs) in GVR allow developers to achieve their desired densities as long as a fee is paid (CAD\$3/square foot) or community facilities (i.e. parks and crèches) are provided in return (Punter, 2002). The PMA Metro TOD programme leverages its limited budget as starting capital for private developers to lower initial financial risks (Thorne-Lyman *et al.*, 2011).

- (4) **Legal–financial–socio-cultural:** Regulations and rules with financial reward or deterrence aspect inspired by or resulting in changes in social–cultural practices (e.g. flexible and market-oriented authorities and/or financial redistributive programmes).

The Infrastructure Australia funds promote sustainable development and are evaluated by a panel of experts. Successfully co-financed plans tend to promote economic vitality and transit use (Infrastructure Australia, 2010).

In all cases, the shift towards a virtuous cycle has been achieved through introducing combinations of incentives as mentioned above. In each combination, the relation between formal and informal incentives is reciprocal. Most combinations are activated as formal incentives but affect informal institutions. Likewise, most formal incentives would never exist without informal incentives. For example, implementing taxation to encourage TODS would never be possible without sufficient public support.

Social norms and values also play a crucial role in determining actions towards TODS-conducive policy environments that eventually result in institutional change. In all regions, introduction of these combinations either coincide with or effect changes in both formal and informal institutions. For example, changes to formal institutions such as introduction of new organisations and policies—such as the DPI and the DCP in PMR; the TPR and Metro in PMA; or Metro Vancouver and TransLink in the GVR—could not occur without changes in the informal institutions of norms and values. These above combinations, their roles and processes in successful TODS implementation form important lessons for regions seeking similar outcomes.

6. Conclusions and Further Research

The article hypothesised that a positive relationship between mutually reinforcing formal and informal incentives lifting barriers results in a virtuous cycle conducive to TODS as indicated in the conceptual model (see [Figure 1](#)). Evidence in all cases confirmed this, implying that formal and informal institutional barriers and incentives play key roles in TODS implementation from an institutional perspective. These findings furthermore confirmed a self-enforcing cycle connecting both types of barriers and incentives. The cases show that shifting from a vicious cycle to a TODS-conducive environment with the use of incentives is possible. Findings also indicate that stakeholders of metropolitan regions experiencing a virtuous cycle still actively pursue further improvements through reflecting on their past achievements while seeking innovations from ‘better practices’ elsewhere. This indicates a supplementary feedback loop of learning and reflection in planning practice as evidenced in all cases (see [Figure 2](#)).

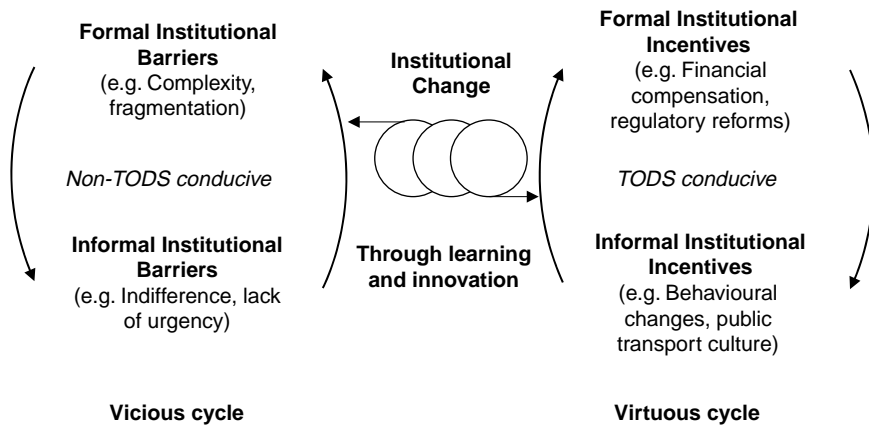


Figure 2. Improved conceptual model featuring feedback loop of learning and innovation leading to institutional change

This feedback loop is an addition to our initial conceptual model (see [Figure 1](#)). Logically, a negative loop would then disrupt the learning process resulting in institutional changes for the worse and/or reinforce the vicious cycle. The planning community thus needs to focus on the process of institutional change through learning and innovation.

Comparative analyses of the three theory-confirming cases show incentives being present in four combinations. These combinations are (i) legal financial, (ii) legal socio-cultural, (iii) financial socio-cultural, (iv) legal financial socio-cultural measures. These combinations provide the following lessons for other metropolitan regions seeking to shift towards a virtuous cycle for TODS implementation. Incentives must be well matched to the barriers they seek to lift and operate as levers in both formal and informal institutions (Ostrom *et al.*, 1993). Policy measures and instruments seeking to incentivise TODS implementation should utilise both formal and informal institutions. Incentives operating within informal institutions should not be underestimated (Rauf, 2009).

To achieve TODS implementation as in these cases, regions also need similar cycles of inspiration, learning and eventual transplantation or translation of incentives adapted to context-specific circumstances (Janssen-Jansen *et al.*, 2008). This leads to important questions for further research. The first being what are the necessary conditions and the dynamics of institutional change needed to shift from a vicious to virtuous cycle for TODS implementation. This question will be tackled in further research by comparing these cases using a theoretical framework for institutional change. The second question concerns the process of learning and innovation within these cases. This will be examined in a next step discussing learning and policy transfer theories to analyse findings from these cases (Marsden & Stead, 2011). How other metropolitan regions could learn from these subsequent findings would be the final question tackled through an “experiential case study” (Straatemeier *et al.*, 2010) exploring application of findings in metropolitan regions with a non-conductive context for TODS implementation.

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Notes

1. Referees are local experts in practice or academia in the respective regions. Referees checked the validity of our conclusions and were asked to give any suggestions or report any irregularities in the collected information. No irregularities have been reported. Suggestions given have been used to improve the case reports.
2. The experts will be identified by code number and the scale, type and sector are shown below:
 - Expert 1101: Provincial/Regional scale, Private stakeholder in Land Use sector.
 - Expert 1102: Urban Agglomeration scale, Private stakeholder in Land Use sector.
 - Expert 1103: Provincial/Regional scale, Public stakeholder in Land Use and Transport sector.
 - Expert 1111: Provincial/Regional scale, Semi-private stakeholder in Land Use sector.
 - Expert 1112: National scale, Semi-private stakeholder in other sector.
 - Expert 1113: Provincial/Regional scale, Semi-private stakeholder in other sector.
3. Portland is known for many firsts in funding and implementing TOD (regional UGB and funnelling freeway funds for transit), has the highest number of green buildings as well as high transit ridership numbers.
4. Formerly the Richmond Airport Vancouver (RAV) line.
5. 1986 World Exposition on Transportation and Communication.

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