

GETTING TRANSIT ORIENTED DEVELOPMENT RIGHT

ABSTRACT

Transit Oriented Development (TOD) is really just a new name for an old idea, as much of Aotearoa's early urban fabric was built around urban tram and rail networks. This model was disrupted after the Second World War by the emergence of suburbanisation and auto-mobility. The (re-)emergence of TOD fits a paradigm of re-urbanisation with the rediscovery of the inherent liveability of urban cores and the desire to retrofit suburbia more sustainably.

This paper summarises elements of recent Stantec Urban Places research on what works and doesn't work with TOD and looks at Auckland's experience with TOD in New Lynn and Hobsonville Point. These achieved some success, but past attempts at TOD have typically been driven by the assumption that high quality public transport alone will be enough to spark land use change. Frequent and preferably rapid public transport (whether bus or rail) is a necessary but insufficient condition for TOD, and Auckland's efforts have lacked an understanding of fundamental market drivers and how to harness the market to help achieve public good outcomes.

The Stantec Urban Places work draws lessons for New Zealand cities wanting to better integrate transport and land use from case studies in Canada, the United States and Australia. Key to this is leveraging the tools the public sector has at its disposal to achieve public good outcomes; clearly understanding of where TOD has (and more importantly does not have) potential, and tools to fund and actually get TODs implemented on the ground.

INTRODUCTION

The development of commuter rail networks in the late 19th century gave middle-class urbanites the opportunity to work in but reside outside the industrial city, with new settlements clustered around suburban rail stations. In Auckland, the historic architecture and pedestrian-oriented character of many villages reflect transit-oriented principles: in the early 20th century, new tram stops encouraged residential expansion and attracted concentrations of retail and services. The increasing adoption of the automobile as a mode of travel in the latter half of the 20th century saw this approach abandoned in favour of dispersed and increasingly disconnected urban form.

The concept of TOD emerged in the 1980s aiming to reposition public transport as a community-building tool. The idea was that the design of the public transport station, and the transport networks and land uses that connect with it, as an integrated whole can create sustainable urban change. It has gained increasing traction in transport and land use planning in cities across the world. It differs from the original suburbanising tendencies of early rail suburbs in its shift towards a reurbanising concept: densifying, diversifying, and redesigning the urban fabric to create a pedestrian-supportive neighbourhood character, anchored by high quality public transport service.

Absolutely crucial to TOD is the integration of transport planning and land-use planning. Conventional transport planning focuses on mobility as an end in itself, whilst TOD combines land use and transport planning focussing on accessibility – increasing the number of trips that can be accessed by foot, bike or public transport. This increases both accessibility and mobility without the requirement to invest in expensive and often impactful roading infrastructure.

WHAT IS TOD?

A useful definition of Transit Oriented Development comes from G B Arrington, one of North America's best-known TOD practitioners: Transit Oriented Development is....

“A compact development, with moderate to higher densities, located within an easy walk of a transit station, generally with a mix of residential, employment, and shopping opportunities designed for pedestrians [and cyclists] without excluding the auto.¹”

¹ Arrington, G.B (2002) Transit Oriented Development: Understanding the Fundamentals of TOD.

KEY FACTORS IN TOD

There are certain key factors creating TODs. Translink's Transit-Oriented Communities Design Guidelines² posits 6 D's of designing what they term transit-oriented communities:

Density	Diversity	Design
Destination	Distance	Demand Management

The core characteristics of TOD are often referred to as “density, diversity and design³”.

DENSITY

In TOD, the optimal location for high-density development is within 400 metres of a public transport stop or station, corresponding to an approximately 5-minute walk. Beyond this distance, modal shift to public transport begins to drop off, reducing overall ridership benefits.

One false assumption often made in TODs is that upzoning to allow for increased density and compatible mixed use will result in a market response to deliver the increased density and mix of uses. This only occurs when the TOD area is already market-attractive. Where market conditions are not conducive, additional public action is necessary to attract market activity. In these cases, the quality of the transit station itself is crucial as it acts as an anchor and beacon. Surrounding public realm and social infrastructure investments from local government can act as a catalyst.

Density and zoning controls need to be understood as a lever and a tool to help deliver public good outcomes, not something to be given away for free. This was a key learning in Edmonton, Canada which acknowledged that original zoning efforts to encourage redevelopment around stations had met with little success. Edmonton developed a more nuanced and market-driven approach, resulting in the 2012 Transit Oriented Development Guidelines⁴. These guidelines established clear expectations for a series of station area typologies around the existing and future LRT network. The signals the guidelines sent to both internal Council staff, public agencies and private developers were comprehensive and integrated, describing expected planning processes, targeted densities, desired land use mix which varied based on station area context, and urban design standards. Instead of a focus on precinct planning and Council-led rezoning processes, which had been common up to the turn of the century, Edmonton began to shift towards developer-led site-specific zoning for redevelopment proposals which were then negotiated to ensure positive public outcomes, using the guidelines as a common reference point for evaluation⁵.

Similarly, the City of Vancouver uses Community Amenity Contributions (CACs)⁶. These are in-kind or cash contributions provided by property developers when the city grants development rights through rezoning, such as an increase in the allowed density. The CACs enables the city to build or expand city facilities such as parks, libraries, childcare facilities and community centres. This means that there is a direct link between increased density and benefits provided to that community by the density increase.

DIVERSITY

Land use diversity within TOD areas – mixing some or all of institutional, employment, retail and service, and residential uses – offers significant advantages of transport efficiency and contributes to a sense of place. Mixed uses make TOD areas destinations for multiple users, creating convenient public transport access to work, home, and services. Access becomes even easier for some users, who can take advantage of different uses with little to no travel at all.

² Translink (2012) Transit Oriented Community Design Guidelines, Vancouver.

³ Cervero, R and, Kockelman, K (1997) Travel demand and the 3Ds: Density, diversity and design.

⁴ City of Edmonton (2012) Transit Oriented Development Guidelines.

⁵ Stantec Urban Places (2018) Transit Oriented Development, Auckland.

⁶ <https://vancouver.ca/home-property-development/community-amenity-contributions.aspx>

Some locations such as Central Business Districts (CBDs) are already very transit oriented, reflecting significant density and land use diversity, as well as a high likelihood for residents to use alternatives to private vehicles. This can also sometimes be the case in regional town centres, where employment and higher density residential land uses are clustered, and public transport service is already at a relatively high standard. In these areas, introducing new rail or bus transport infrastructure may only reinforce these patterns, rather than resulting in dramatic land use transformation. Providing higher quality public transport service to such locations may support further shifts away from private vehicle use, reducing the demand for parking and offering opportunities for more incremental shifts of land use.

TOD in low density residential or single land use areas may take a relatively long time to gain momentum, as it will take time to develop a sufficient number of attractor services for residents.

DESIGN

Another key characteristic of successful TODs is design: of buildings, public space, streets and public transport infrastructure itself. On one level, design concerns the functionality of space, but it also plays a central role in placemaking – creating an attractive space to establish station areas as destinations for activity and not just flow-through points for public transport.

For buildings, TOD-supportive design includes direct relationships to footpaths and pedestrianised spaces, including windows and doors that connect the inside with the outside, both functionally and visually. Ideally, ground-floor uses also generate and take advantage of adjacent public spaces, such as cafes or restaurants with outdoor patios. Buildings that provide parking do best to locate it underground or on lanes or service streets away from pedestrian activity.

Streets should be multi-modal, supporting convenient and comfortable access to the public transport station by foot, bicycle or connecting public transport. Cars can and should be accommodated, at a lower priority but their movements should be managed carefully to support a pedestrian-focused environment in the vicinity of the station.

Though not essential, public spaces such as plazas and parks can greatly enhance TOD areas. They add the most benefit when carefully integrated with public transport infrastructure and the surrounding urban fabric, creating convivial gathering spaces that can be programmed for events and activities, whilst also functioning as approach spaces to the station.

The public transport infrastructure itself can either boost or detract from the overall placemaking impact of a TOD area, depending on its design. Cordoning off rapid transit corridors enhances reliability and speed of service but can also sever neighbourhoods by creating a barrier for movement. Smaller, more permeable station designs integrate more easily into the surrounding urban fabric than large stations with pedestrian over-bridges and lengthy routes, which may also hinder the attractiveness of adjacent land for redevelopment.

DISTANCE

Understanding the disposition to walk to public transport is key to understand where to locate key TOD land uses. There are a number of rules of thumb for median walk distance, such as this⁷:

Conventional transit (less than 15-minute frequency)	400 metres
Frequent transit (15-minute or better frequency)	600 metres
Rapid and frequent transit (15-minute or better frequency)	800-1,000 metres

However, this masks an increased sensitivity to walk distance at destinations. Auckland Council research⁸ looking at Auckland rail and busway stations, showed that whilst people are prepared to

⁷ Human Transit: (2011) Basics: Walking Distance to Transit, viewed 10 November 2018
<https://humantransit.org/2011/04/basics-walking-distance-to-transit.html>

⁸ Auckland Council (2013) Walkable catchments analysis at Auckland train and Northern Busway stations,

walk for 1km or more from home to a rapid transit station, the walk distance propensity at destination stations was substantially less at around 400 metres.

This reflects international experience as per the graphic below of walk distance decay for rapid transit in North America. Of particular note in the table is that the sharpest destination decay effect is the downtown example.

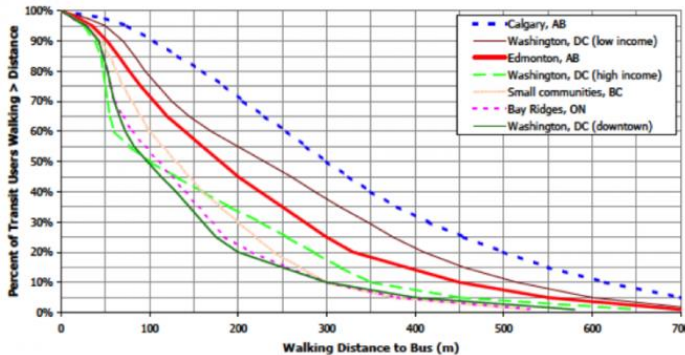


Figure 1: Walking Distance to Public Transport

The learning here is that destination land uses which generate the highest public transport trips, commercial, retail and office uses, should be located closest to the station to minimise the distance decay effect and to account for walk distance sensitivity. Residential uses can locate further away which has the double benefit of avoiding localised noise at transit stations – such as light rail vehicle wheel squeal – and accounts for the reduced distance decay effect.

Roadway networks vary from location to location, influenced by transport design theory at the time of original construction. Pre-World War II neighbourhoods in North America typically reflect grid layouts, whereas areas developed during the second half of the 20th century tend toward more hierarchical and disconnected roadway patterns which create walkability challenges and limit access to public transportation. Their tendency to concentrate traffic on larger streets can also hinder densification on lower-capacity streets, which become more circuitous to access by any mode.

A compact urban development pattern with a consistent grid layout facilitates greater pedestrian access and increased walkability and supports transit-oriented development by providing predictable, complete and direct pedestrian and cycling routes between the public transport station and various destinations. To maximise the benefits of these compact patterns requires pedestrian priority such as zebra crossing and the avoidance of undue delay to pedestrians at signalled intersections.

Station areas which already have a highly connected grid of streets offer more pedestrian-friendly environments that functionally increase the station’s pedestrian catchment, increasing the area reachable within a 5- to 10-minute walk. More disconnected street patterns may significantly limit land near a station that can be reached in 5 to 10 minutes on foot. Such sites merit an analysis to determine whether targeted investments can remove pedestrian barriers and/or insert new street or footpath connections to expand the pedestrian catchment and improve station accessibility.

DESTINATION

When land use and transportation are well coordinated, public transport can provide fast, direct, and cost-effective access to more destinations for more people. TOD coordinates land use and transportation in two important ways:

1. At the neighbourhood scale they locate most new development along reasonably direct corridors so that most destinations are ‘on the way’ to other destinations.

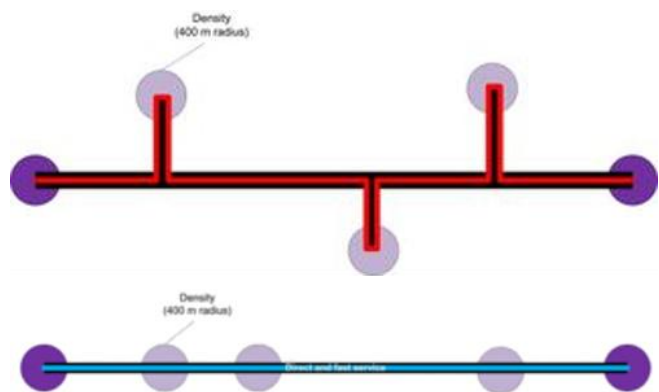


Figure 2: Effective public transport connects destinations directly

2. At the regional scale they locate the highest densities of development and the most important destinations at the intersection of several frequent transit corridors. *Figure 3: Be on the Way, Jarrett Walker, Human Transit*

It is crucial that TODs be “on the way,” not requiring the rapid transit service to deviate off the most logical and direct route between two points; to link a series of destinations on the way – the so-called “pearls on a necklace” – and to preferably have strong anchor destinations at both ends of the rapid transit service to the TOD.

DEMAND MANAGEMENT

TODs use Travel Demand Management (TDM) strategies to discourage unnecessary driving and to promote walking, cycling, and public transport use.

A crucial element of this is parking management, including pricing as a demand management tool and whether it is appropriate to include park and ride at all in a TOD. TOD area parking can compete with the goal of a pedestrian-oriented station area. As TOD strategies begin to bear fruit, parking should give way to other, higher-value land uses.

It's important to remember that active uses generate dollars, vitality and public transport users. Parking supports those uses but, except in park-and-rides, generates little public transport use whereas public transport increases the value of adjacent land and attracts more intensive forms of development. Parking revenue simply cannot compete with this.

A key tension for TOD areas is always park and ride. Park and ride is space consumptive, which is counterproductive to the compact character required to make TOD successful. Numerous cities have hamstrung TOD efforts by locating park and rides in TOD station areas. While park and ride has a role to play in public transport, this requires careful consideration in conjunction with the character of the corridor. Park and ride should be avoided in any station with a strong pedestrian orientation, or high potential to become so through a combination of public and private improvements.

The role of park and ride is often overestimated in generating new public transport trips and the cost per parking space is often very high, especially if structured parking solutions are required. For example, only around one-eighth of Auckland's peak rail trips have park and ride as an access mode with the majority of customers walking on to the station.

AUCKLAND EXPERIENCE

Auckland has had mixed experience with TOD, often through a failure to appreciate fundamental market economic drivers and the failure to fully integrate transport and land use planning. Uniquely for New Zealand, Auckland Council is not a road controlling authority with this function being delivered by Auckland Transport, a council-controlled organisation with its own board. This means that transport and land use are delivered by different organisations, with one focused on movement and the other focused on place (together with other organisations such as Panuku Development Auckland and Homes Land Community). While planning in silos is not uniquely an Auckland issue, it is important to understand that there is no point having movement with no place to go, nor place with no way of getting there, and the segregation of these planning and design functions tends to mitigate against coordinated approaches.

The New Lynn TOD project, spearheaded by the legacy Waitakere City Council prior to amalgamation in 2010, was postulated on achieving integrated transport and land use outcomes. From a transport point of view, it has been very successful with substantial growth in both bus and rail patronage, despite the project eliminating free park and ride. The council partnered with developers to implement ground floor retail, a health centre and apartments immediately adjacent to the bus-rail interchange. But wider transit-oriented development was stymied by the Global Financial Crisis and lengthy delays in getting TOD-supportive planning controls in place, principally due to resistance from large retailers to the reductions in minimum parking requirements.

Overall, the task of regenerating tired main street retail strips competing with regional malls and bulk retail developments was underestimated. The investment in rail with the trenching of the western rail line through New Lynn, together with a high-quality bus and rail interchange was a pre-requisite and enabler for TOD but not a guarantee of success in its own right.

In contrast, Hobsonville Point, developed by the Hobsonville Land Company (now Homes Land Community), a subsidiary of Housing New Zealand, on the former Royal New Zealand Air Force Hobsonville base, has been much more successful in delivering on key TOD elements, such as density, with an average net density of over 50 dwellings per hectare; a diversity of housing typologies, scale and architecture; and the early delivery of social infrastructure, including a primary and secondary school, local retail and parks and open spaces. A tight, fine-grained pedestrian-friendly street network combined with cycle lanes on Hobsonville Point Road has led to two-thirds of school students walking or cycling to school, which is extraordinarily high by Auckland standards, especially considering the neighbourhood's urban fringe location. Bus and ferry services were instituted when the first residents moved in but whilst bus services have been further improved, the ferry service only operates in weekday peak periods and weekend ferry services were only introduced in late January 2019, partly funded by Hobsonville Point residents.

To some extent, it could be argued that New Lynn has the transit orientation of TOD with public transport infrastructure and services without the hoped-for development, whilst Hobsonville Point has the development components in terms of design and density but lacks the foundational high quality public transport service. TOD requires both in combination to be successful.

CONCLUSIONS AND RECOMMENDATIONS

The recent research by Stantec Urban Places, a small fraction of which has been able to be covered in this paper, has provided insights on what is needed to make TOD work in New Zealand. Key to this is understanding that whilst public transport, in the form of a rapid transit station and service, is an indispensable pre-requisite for TOD, its provision is only the end of the beginning of TOD with considerably more work required to either direct or stimulate market forces to deliver public good outcomes by fully leveraging the tools the public sector has at its disposal. Retaining leverage over the rezoning process is very important to this.

As with any development, context matters and one size does not fit all. Where an area is already market-attractive, it is important to guide development, using the leverage tools available, to achieve public good outcomes. Where TOD areas are not yet market-ready, some incentives and/or investments may be required to move them towards market-attractiveness. Lead infrastructure investment, such as in social infrastructure or public realm, can be part of this but will only help effect change if they are tools to get an area closer to market-readiness.

A critical point is that the public transport infrastructure associated with the TOD is there to serve the TOD, not to sever it. The design of the infrastructure is important and stop spacing should be driven by land-use considerations, not rigid adherence to rules of thumb about stop or station spacing. The fundamental purpose of mobility is to serve and provide access to places, a fact sometimes forgotten when mobility is seen as an end itself. To conclude, a quote from Brent Toderian, former Chief Planner for the City of Vancouver: "The best transportation plan is a great land use plan."

REFERENCES

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Figure 1: Transportation Research Board: Walk distance decay to bus service in selected Canadian and US cities.

Figure 2: Walker, J: Be on the Way, Human Transit, viewed 10 November 2018

<https://humantransit.org/2009/04/be-on-the-way.html>