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Transit-Oriented Development: Lessons from International Experiences



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About Centre for Urban Equity (CUE)

CUE was established at CEPT University in 2009, evolving from the Urban Poverty Alleviation (UPA) Cell established in 2008. CUE advocates a human-centered and equitable urban development paradigm. CUE undertakes research and advocacy; conducts training and capacity-building; imparts education; and networks with stakeholders on various aspects of human settlements with a focus on urban equity.

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Abstract

Transit-Oriented Development (TOD) presents unique opportunities for Indian cities to meet the challenges of rapid motorization, rising inequity, deteriorating quality of the urban realm and climate change. This paper explores the case of TODs – planned or underway – in three Indian cities and examines if the international experiences of TOD have enriched our understanding of TOD. It critiques these attempts and presents suggestions for Indian cities to achieve a development that is more oriented to transit than being adjacent to it.

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1. Introduction

This paper is an output of the research conducted under the ‘Towards Inclusive and Low-Carbon Transit-Oriented Development (TOD) for Indian Cities’ project. The project argues for policy, design and governance based interventions that could help the TOD projects being undertaken in various Indian cities in becoming more inclusive, thereby contributing towards the achievement of the goals of TOD. While an earlier paper (Joshi et al. 2017) presents a Figure of progress achieved in Indian cities, there is a need to look at the historical moorings of the concept of TOD to understand the reasons behind its adoption, successes and failures in cities where TOD has been around for long. Despite the initial optimism surrounding the concept, progress has been tardy. Carlton (Carlton 2007) says that only a portion of the anticipated TOD projects have been developed and even they do not fully incorporate the philosophies outlined by Calthorpe (Calthorpe 1993) in the American context. In defining TOD, Calthorpe saw it as “a mixed-use community that encourages people to live near transit services and decrease their dependence on driving (Calthorpe 1993).” However, as several researchers have observed, in the absence of strong government intervention in provision of affordable housing near the transit stations and lack of public participation, several TODs have not been able to host the kind of people that could be expected to move from personal private transport to public transit. This paper examines secondary literature on international cities which have had a history of TOD and identifies best practices that could help make our TODs more sustainable, affordable and inclusive.

2. Historical moorings of TOD

TOD evolved as a response to the need to provide urban residents with an improved quality of life and reduced household transportation expenditure. It was to be marked by stable mixed-income neighbourhoods with reduced environmental impacts and real alternatives to traffic congestion (Dittmar and Ohland 2003). However, as Carlton (Calthorpe 1993) puts it, TOD soon began to serve real estate development and not the other way around. One of TOD’s foremost precedents was the garden city of Ebenezer Howard where the communities were intended to be planned, self-contained and surrounded by green belts with carefully balanced areas of residences, industry and agriculture (Howard 1965). Master plans were made in the 1880s for workers housing in the United Kingdom with regulations related to the provision of urban amenities like parks which were to closely mimic the rural hinterland. These regulations also restricted the number of factory units that could come up near residential units. Carlton argues that just as these regulations were possible in part due to their being under single ownership, TOD relies heavily on design guidelines that municipalities can incorporate into zoning codes.

2.1. Early origins

Howard’s garden cities were followed by the industrial town of Letchworth which had open spaces, tree-lined streets, commercial corridor and a greenbelt surrounding the town. Rules were put into place that encouraged the integration of income groups. Carlton (Calthorpe 1993) writes that when the railway station was opened in 1913, the similarities with Calthorpe’s ideas of TOD became evident. Calthorpe’s ideas of TOD were also influenced by Raymond Unwin who had once said:

“Streets are not a virtue in themselves. In fact, the less area given over to streets, the more chance one has of planning a nice town. To be obsessed with the idea of planning for traffic is a mistake (Unwin, R.; “Columbia University Lectures” found in Carlton, 1993).”

Unwin had a pro-pedestrian, anti-automobile philosophy combined with great regard for natural features which he retained and enhanced in the Letchworth development. The Letchworth experiment was followed by several other examples like Welwyn, Wythenshaw and Vallingby which laid emphasis on their pro-pedestrian and pro-rail biases. Radburn near New Jersey was also an example of natural romanticism. However, after the Second World War, the garden city concept was quickly adapted to the automobile in several cases which may have caused the environment a lot of harm (Carlton 2007).

The Robert Moses versus Jane Jacobs debate on automobile-centric planning in New York is well documented. Jacobs (Jacobs 1961) argued that Howards’ paternalistic design program was responsible in part for shortcomings of modern planning. However, till the environmental sustainability movement picked up in the late 70s, America continued to invest in auto-centric cities. Transit agencies which were flush with research funds as a result of the passage of the Intermodal Surface Transportation Efficiency Act, 1991 had determined that high-density development near stations encouraged the use of transit. Environmental groups were promoting high-density, pedestrian-friendly neighbourhood design as a means to prevent urban sprawl and reduce automobile dependence (Carlton 2007).

2.2. Pedestrian pockets as precursor to TOD

Calthorpe - along with Robert Cervero -, is widely regarded as someone who pushed the concept of TOD. He prescribed a road to achieving environmental sustainability through a compact, pedestrian-friendly urbanism. The attempt was to focus on a) shortening trips, b) reducing through traffic, and c) strengthening street hierarchies without necessarily accounting for transit. Later efforts indicated a swing towards acknowledging the important role played by commuter rail in the success of the early garden cities by Howard. Subsequently, his practice began to talk about affordable housing and mixed uses marked by a walkable environment. Further, pedestrian pockets¹ that accommodated both cars as well as transit and walking were conceived. These could not address the issue of urban sprawl effectively but were considered as the precursor to TOD. The pedestrian pockets were different from the New Towns owing to their smaller sizes. The concept was realised as an experiment in Oregon around 1987. Bernick (Bernick and Cervero 1997) described pedestrian parks as “mini-cities” of five thousand residents surrounded by open lands and characterised by a mixture of four storeyed commercial buildings, two-storeyed detached houses, apartments and single-family dwelling units. He saw the pedestrian pocket as an attempt centred on maintaining walkability in the settlement that need not have any effect on transit nearby, if at all. Carlton (Carlton 2007) opines that the pedestrian pocket concept, with its attempts at reintegrating the car with the pedestrian across age and social groups too idealistic and deterministic in parts. Calthorpe’s design for Laguna West was one of the precursors to TOD with homes built to line with the street with short vehicular accessways. Streets were narrow so as to slow down the cars.

¹ A pedestrian pocket was described as a simple cluster of housing, retail space and offices within a quarter-mile walking radius of a transit stop (Calthorpe 1993; Carlton 2007).

2.3. Birth of TOD and New Urbanism

The TOD agenda first came to the fore with Bay Area rapid Transit (BART)² commissioning a study in 1989 to examine the case for promoting high-rise housing near transit stations. On discussion were issues like “jobs-housing balance” which are today considered elementary when talking of transit. Research revealed that those living close to transit were more likely than others to use BART. The result was that high-rise housing with densities of 70-90 units per acre and ground floor retail were encouraged in a manner as seen today. Calthorpe’s association with Robert Cervero who was a professor at Berkeley helped the former in suggesting land use densities that would help transit ridership. It was Cervero who suggested the name “TOD” with a need to help build a brand. It was clearly an extension of the pedestrian pockets concept described earlier. They would collaborate with others and define what has come to be known as New Urbanism.

“We advocate the restructuring of public policy and development practices to support the following principles: neighbourhoods should be diverse in use and population; communities should be designed for the pedestrian and transit as well as the car; cities and towns should be shaped by physically defined and universally accessible public spaces and community institutions; urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice (Carlton 2007).”

New Urbanism strived to learn from past mistakes in order to revitalise metropolitan cities and stressed on the need for replicable guidelines based on narrow streets, on-street parking, and shops near residences with a view to blunt the damage done by automobile-centred planning. The book titled “The Next American Metropolis” (Calthorpe 1993) outlined the key components of TOD as:

- Organize growth on a regional level to be compact and transit-supportive,
- Place commercial, housing, jobs parks, and civic uses within walking distance of transit stops,
- Create pedestrian-friendly street networks that directly connect local destinations,
- Provide a mix of housing types, densities, and costs,
- Preserve sensitive habitat, riparian zones, and high-quality open space,
- Make public spaces the focus of building orientation and neighbourhood activity.

These components were based on planning principles that were rooted in the ecological movement while advocating aesthetic, pedestrian-friendly and compact built-form.

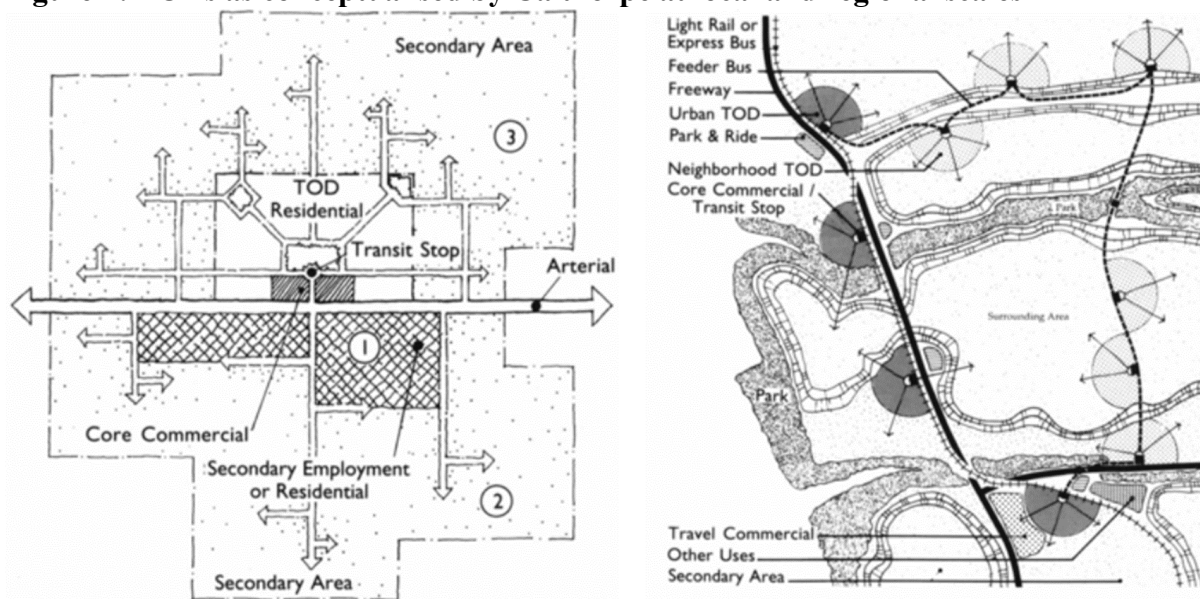
2.4. Progression of TOD and criticism

Today, TODs have evolved in a way that they show characteristics that could fit under any of the following geographic contexts: a) Single-use corridors where residential and commercial (offices or retail) uses dominate certain areas and people use transit to reach there from the residential areas, b) Mixed-use corridors where single or groups of land parcels feature multiple uses, c) Neo-traditional development as described earlier, where traditional countryside settings are reproduced with reduced setbacks, narrow streets, small plots and detached parking, d)

² The BART is an elevated and subway system that serves the San Francisco Bay Area. It was conceived in the 1940s and constructed in the 1960s with services being started in 1972 (BART-Not a Moment Too Soon, *Los Angeles Times*. September 13, 1972).

Compact, mixed-use development concentrated near transit stops, e) Village concept characterised by single-family homes around a central green commons, and f) Purlieu, a development of 150 acres and 7,000 residents with regulations on design (and not land use) regulations (White and McDaniel 1999). Contrary to expectations, TODs have not really taken-off in a manner that was expected. This can be attributed to either the lack of resources or absence of favourable densities in the West. Calthorpe (1993) advocated that governments spend huge amounts of money in getting rapid transit constructed and bringing high-density development around the transit stations. The American milieu was not accustomed to the notion of high densities, used as they were to sprawling cities that could be traversed by car. Factors such as a) freely available parking in

Figure 1: TODs as conceptualised by Calthorpe at local and regional scales



Source: Calthorpe (1993)

abundance, b) lack of walkable environment around transit, c) low levels of service, d) inadequate mixing of land use, e) missing housing-jobs linkages, and f) inability of development codes to cope with the TOD concept have long impeded the growth of TOD in America. The ones that exist are not in accordance with what Calthorpe and Cervero had advocated (2007). Dittmar and Ohland outline the failure of TOD,

“Somewhere between the conceptualization and opening day, many projects end up becoming fairly traditional suburban developments that are simply transit-adjacent (Dittmar and Ohland 2003)”

TOD versus “eyes on the street”: It is interesting to read the progression of TOD in the light of Jane Jacobs’s opposition to the idea of master planning, which she felt killed the sense of community. While Jacobs’ argued for improving the public realm through interventions that encouraged people and eyes on the street, the “neo-traditional” approach that TOD took was based on a command-and-control style that was more inspired by Howard. Others have pointed out the disconnect between Calthorpe’s pro-pedestrian rhetoric while accommodating and sometimes encouraging the use of motorcars as seen in the light of the pedestrian pocket phase that TOD evolved from. Even as regional planning agencies promoted TOD, nothing was done

to discourage the use of motorcars. This fundamental disconnect between the theory and practice of TOD is disconcerting and has led to a lot of disillusionment (Carlton 2007).

TOD and the role of the planner: Another important aspect that needs to be discussed is the inability of regional planning agencies to make the area around transit attractive for the real estate market. If the coming of transit were to make peripheral areas of a city more attractive than the surrounding hinterland, developers would have naturally constructed more floor space around transit stations. This combined with effective development codes could have promoted higher densities in such areas. However, such evidence is rare. TODs are being conceived as infill development and more in an incremental approach.

The complexities and risks of TOD: The presence of multiple stakeholders with varied interests and the collective indifference of the real estate market towards TOD makes TOD a proposition with great risks and more chances of failure than success. The probabilities of getting several things like mix of land use and jobs-housing are very low but important for the success of TOD. This is very different from the utopian garden cities of Howard. Owing to these challenges, we have seen only partially successful TODs and that too in isolation as against unison. Some of these are presented as case studies below.

3. Positive lessons from different milieu

Per-capita vehicle travel tends to decline when the following are achieved, a) population and jobs density is high and concentrated in compact activity centres, b) a mix of land use, c) connected street networks that support pedestrian and cyclist movement, d) safe and attractive streets that accommodate pedestrians and cyclists where buildings are connected to footpaths and not setback from the parking lots, e) traffic speeds are reduced using traffic calming measures, f) competitive transit system that is well integrated with high-density development within 500 m (walkable distance) of transit stations (VTPI 2008). Since private vehicles contribute in a major way to emissions of air pollutants like particulates, ozone and other organic compounds. Therefore, TOD can help restrict the ill-effects of rapid motorization. Additionally, TOD can help a) encourage efficient use of public transport and urban infrastructure, b) reduce costs related to urban congestion, c) revitalise local economies of urban districts, d) increase property values, e) increase physical activity of residents as a result of increased proximity to commercial centres, greens paces and schools.³

3.1. Diverse communities and TOD

TOD literature talks about achieving community diversity as a means to achieving successful TOD. The State of Queensland (2010b) defines a diverse TOD community as one where people with diverse demographic, socio-economic, cultural and employment characteristics live in a harmonious manner. There is no consensus on the ideal mix as has been discussed earlier. It depends on the area and the changing dynamics of the area. Earlier research has proved that diverse TOD communities can help achieve social and economic benefits. Social disadvantage

³ Heath et al. (2006) state that physical activity increases by: a) 161 per cent as a result of community-scale land-use planning that supports physical activity, such as proximity to commercial centres, green spaces and schools, and connectivity of streets, b) 48 per cent due to access to suitable places (e.g. trails, facilities and parks) and by reducing barriers such as safety concerns and lack of affordability, and c) 35 per cent because of urban design that supports physical activity at a street level, such as improved lighting, ease of street crossings, pathway continuity, traffic-calming structures and aesthetic enhancements.

when concentrated in small pockets can be problematic. This is especially true when redevelopment and infill occur in a neighbourhood owing to the coming of transit. Therefore, planning agencies need to ensure a combination of land use, investment and community development strategies. Diverse TOD communities can be achieved through a) urban form, b) housing mix and design, c) economic development, d) provision of community facilities, e) community development, and f) community engagement. It is seen that revitalisation of historic core cities leads to a decline of diversity owing to gentrification. Long-term investments in social housing, improving infrastructure, incentivising local businesses and efforts towards facilitating integration of incoming communities into existing ones needs to be taken to counter these. In order to promote community diversity, the following factors are said to be most influential: a) urban form and land use, b) housing, c) access to diverse jobs and retail diversity, d) social infrastructure, e) improved access and movement, f) open spaces, recreation and improved public realm, g) community engagement, and h) community development.

3.1.1. Urban form and land use

Community diversity can be supported through developing transit stations as hubs for the local community. These can be in the form of common facilities or opens spaces. Strong physical linkages need to be established between the existing neighbourhoods and the hubs. Clusters of residential areas with shared access to community facilities and visual relief need to be developed. Design can help in ensuring that the access to such shared facilities remains open for all and their legitimacy is ensured. Land uses that are compatible with each other must be put in close proximity with each other.

3.1.2. Housing

Research suggests that by providing a range of dwelling unit sizes, different types of housing and tenure and by ensuring flexibility of design, it may be possible to attract and retain a wide variety of residents in the TOD. This helps keep the diversity of the local economy as service-providers like plumbers would be able to live within the close proximity of those that would need their services. TOD regulations could make it a requirement for developers that a certain proportion of the new units must be two-bedroom or lesser. The government could provide funding mechanisms to help developers provide affordable housing in TOD. Also, regulations could ensure that a certain proportion of new units in TOD area are suitable for differently-abled or aged. Design could be used to ensure easy access to open spaces and forced interactions between people belonging to different socio-economic groups. Streets must be humanised with a multi-use character fit for use by people belonging to different backgrounds and abilities.

3.1.3. Access to diverse jobs

Research shows that TOD is often accompanied by the replacement of local low-value businesses by high-value retail chains. This leads to homogenization of economic opportunities which does not augur well for the success of TOD. The local body will need to engage with the existing community to develop local strategies, stimulate investments, negotiate strategic office locations and retain local businesses. Additionally, land use measures can be used to generate building footprints of varying character that can support businesses of different scales. Housing that encourages home-based businesses will also be ideal to stimulate local economy and provide more opportunities for those from the neighbourhood and beyond.

3.1.4. Social infrastructure

Social infrastructure like schools, hospitals and gardens encourages people to take part in community life, builds belonging, reduces social isolation and meets basic needs. TOD places a premium on private space. Social infrastructure could potentially help communities in adding value to their lives by use of shared facilities for community purposes. These need to be provided in a manner that they are convenient, multi-use, flexible, easily accessible and economically viable.

3.1.5. Improved access and movement

By providing an easily accessible TOD precincts, the community will find it comfortable to negotiate the public realm. Direct, attractive, safe pedestrian and cycling linkages with great signage need to be provided. This would incentivise even the low-income groups in living close to transit. Inter-modal transfers should be made convenient by design. Those that have special needs must be able to move around in a convenient manner.

3.1.6. Open spaces, recreation and improved public realm

The quality of the public realm is determined by its availability, diversity, utility and meaning to users. Such spaces help people come in contact with not only nature but also people from groups that they would not normally identify themselves with. Safe, convenient and equitable access to places of vitality are essential to ensure the welfare of the community. The public realm must be designed in a manner that prioritises pedestrian and cyclist over the automobile. Flexible and versatile spaces that could host a variety of uses are needed. There must a physical and visual access to nature. Open spaces must be easy to access and completely safe for various user groups.

3.1.7. Community engagement and development

Only a high degree of engagement with the community can ensure a sense of ownership and belongingness among the community. TOD plans and outcomes must be shared with the diverse stakeholders and feedback sought and acted upon. A collaborative approach that harnesses the wide range of skills available in the local community can help the TOD. Long-term commitment to the idea of engagement must be shown and accompanied by a flexible planning framework. The process must be open and accountable and should help develop the capacities of the local community members. TOD plans must foster local community cultural values and their expression through the creation of accessible public spaces. A fine-grained street network would add a lot to the complexities of the area thereby making it diverse and interesting. Involve local communities in seeking solutions to local problems and regulating anti-social behaviour.

3.2. Equitable and inclusive TOD?

There appears to be a great syntactical variety in how literature refers to equity aspects of TOD. Some like Soursourian (Soursourian 2010) have referred to the this development as equitable TOD (eTOD) while some others have referred to affordable TOD (aTOD). Greg LeRoy writes that “the benchmark for proximate affordable housing is median monthly rent or median monthly mortgage debt service that does not exceed 35 percent of the median workplace wage or salary, which is computed exclusive of the highest 10 percent of salaries. Housing costs are derived from either the municipality in which the workplace is located”(Soursourian 2010). An altogether different set of people have referred to what is called as inclusive TODs.

In order to achieve an equitable and inclusive TOD, literature points towards achieving a) revitalization and intensification, b) neighbourhood preservation, and c) access and connectivity. Table 1 below shows approaches that can contribute towards making a TOD more inclusive. These are essentially a combination of the neo-traditional approach advocated by Calthorpe (Calthorpe 1993) - in postulating the pedestrian pockets and later TOD - and the more humane approach advocated by Jane Jacobs (Jacobs 1961) in imagining a liveable neighbourhood that displays a strong sense of community.

Table 1: Factors that contribute towards an inclusive TOD

Theme	Approaches
Revitalization and intensification	Increase density/development
	Revitalize commercial corridors
	Develop affordable housing
	Assist existing residents economically
	Enhance economic (jobs) growth
Neighbourhood preservation	Prevent displacement of vulnerable HHs
	Preserve historic buildings
	Enhance community activities (parks)
	Maintain/enhance local identity
Access and connectivity	Increase transit ridership
	Overcome barriers to using NMT
	Improve safety
	Improve urban design

Source: based on (Soursourian 2010)

TOD is in a position where it can help the low-income and middle-income groups in accessing employment, recreation and health services. TOD can also help bring investment and renew inner city areas that have borne the ill-effects of economic and planning neglect. However, it is seen that TODs help high-income communities, many of whom are interested in moving back into the city centres from the suburbs. The commercial success of TOD depends to a large extent on the spike in land price that follows its announcement and later implementation. This spike in land prices allows the implementing authority to fund infrastructure provision in the receiving area by charging higher land development fee/tax. The improvement in the area subsequent to the coming of TOD attracts richer communities who then price out lower and middle income communities already living in the city centre. As a result, the lower and middle income communities are forced to move to the peripheries, far away from jobs and transit. The TOD therefore may disrupt instead of helping these communities who are more likely to use transit in the first place.

3.3. Lessons from North America

3.3.1. Setting up a TOD fund

Denver demonstrated a tool for encouraging equitable development around new investments in transportation. A \$15million capital fund in 2010 was devised by the city of Denver, enterprise community partners and a national non-profit with major top loss investment coming from the city of Denver (Urban land conservancy 2013). Within three years it increased to a \$24million loan capital fund. Through this funding, 8 properties were acquired and 626 affordable homes were built with 120,000 sq. ft. of commercial space with other social amenities like a public library, a child care program, Theatre Company and an affordable space for non-profits. The Denver fund is a revolving loan fund which makes capital available to purchase and hold sites for up to five years along current and future rails and high frequency bus corridors across the Denver metro region.

Figure 2: Denver affordable housing site near TOD

Source: Confluence Denver

3.3.2. Non-profit led TOD

Fruitvale in Oakland is an example of how local non-profits can promote community development around transit stations and integrate affordable housing, commercial space, and social services with public transportation in a way that benefits local residents. In 1995, the Unity Council (a local nonprofit) spearheaded local residents' movement against BART's proposal for a multi-level car parking near the transit station. Subsequently, the Unit Council, BART and the City Council were able to work together and evolve a proposal for what was to be done around the transit station. This included affordable housing, senior citizen friendly housing and for-sale at market rates housing and commercial space to fund the affordable housing units. About 47 apartments were constructed out of which 10 were affordable units, other 68 affordable units were constructed specially for seniors. The community space within Fruitvale which includes a health clinic, library, Head start program and senior centre is almost three times the retail space in the area.

There were challenges that were overcome. Part of this was to find tenants for the commercial space which took a long time. There was not enough foot traffic to attract commercial use. The buildings of the shops had high construction standards, which increased the rents, a lack of balance ensued when high income shops didn't correspond with the residents. Secondly, the latter part of the project coincided with the housing bubble bust in 2008. This delayed the profitability of this venture. One interesting observation was that Fruitvale was an origin point rather than a destination, and people generally shop on destination stops which hindered the sales of the shops.

The funding of this \$100 million project came from 20 different mechanisms. "The Federal Transit Administration contributed over \$5.7 million to fund various aspects of the project. The

City of Oakland used prepaid leases, tax increment financing, and Community Development Block Grant funds to help finance the Transit Village. Several foundations provided grants for the project as well” (Grady and LeRoy 2006). The lesson for other cities is to recognise the interrelated forces at play. It was also of great help that the Unity Council had a long history of having worked in Fruitvale and could therefore easily organise charrettes with the residents easily. A balance of mixed income housing would also ensure profitability of enterprises falling in the area while also considering the origin destination passengers.

Figure 3: Mixed use Development in Frutivale, Oakland

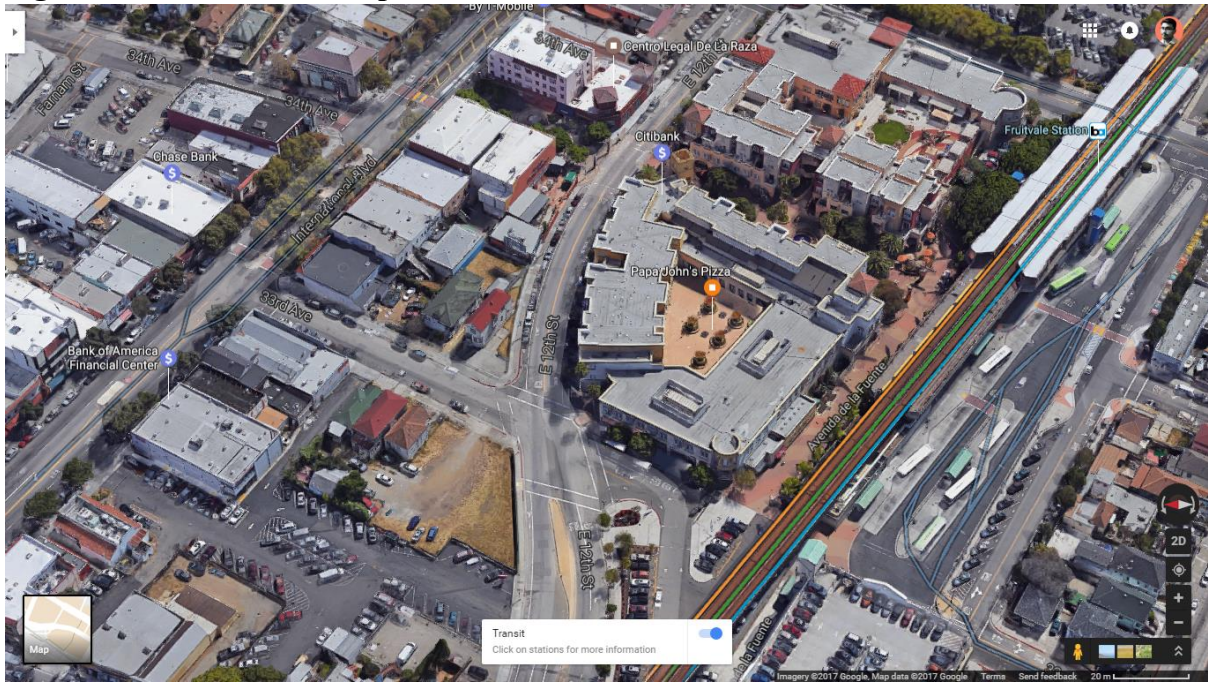
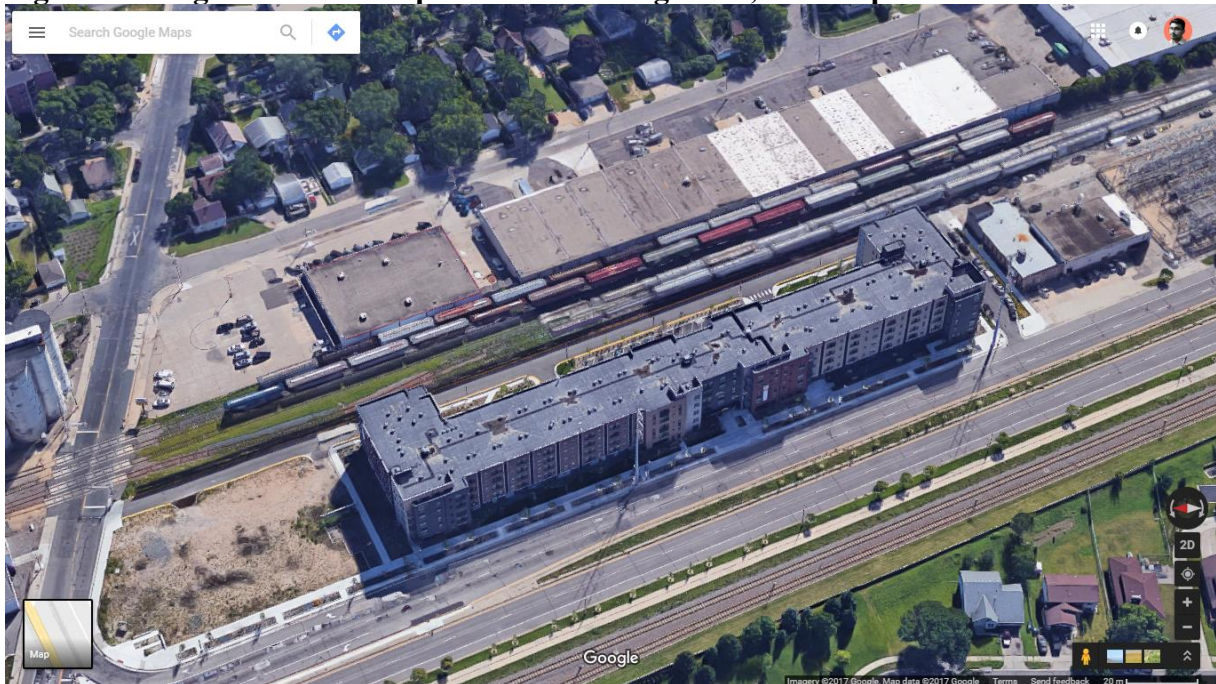


Figure 4: Longfellow station apartments in Longfellow, Minneapolis



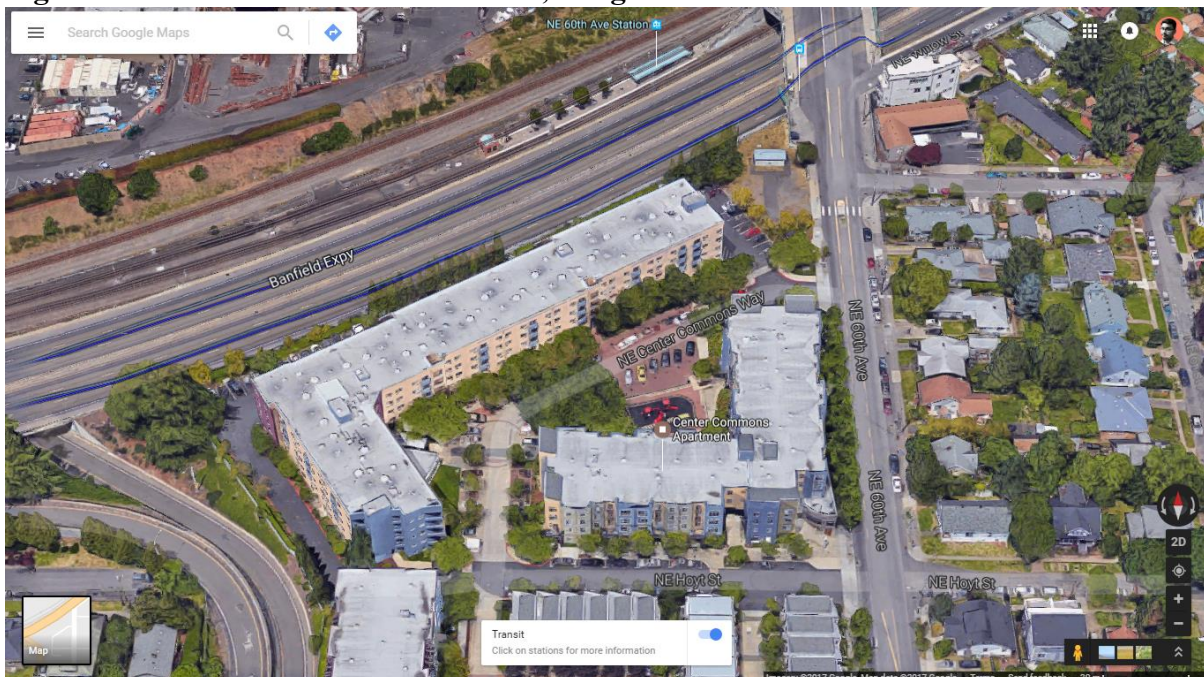
Source: Google Maps

3.3.3. Community benefits agreements: Minneapolis & Oregon

Longfellow saw a smaller non-profit (Longfellow Community Council) working with the community and developer(s) to incorporate a legally binding contract that codifies commitments made by the developer with regards to the benefits that TOD projects would bring to the area around them. CBAs typically contain provisions related to affordable housing, living wages, local hiring, environmental justice, and resources for community services. Since the community was concerned about how the development would hurt the local character, they made it binding that in the newly developed commercial space, national chains would not be allowed to consume more than 70 per cent of the total built-up area. Local businesses were to occupy at least 30 per cent. Similarly, the developer was contract-bound to provide space for public art and exhibitions.

Diving into the specifics, the developer owned all the land, so land acquisition or rehabilitation did not take place. It was a mixed use project which had about “185-300 housing units, 35,000 to 50,000 square feet of neighborhood commercial space, and approximately 400 structured and below grade parking spaces” (Development Finance Division 2007). At least 20% of the units will be affordable households (36-60 affordable units) with 50% of Metro Median Income. The process was long and it requires a greater amount of effort to see if all commitments made were going to be met. The key was to moderate the expectations of the community.

Figure 5: Center Commons in Portland, Oregon



Source: Google Maps

Center Commons in Portland, Oregon: The Center Commons demonstrates inclusivity at multiple levels of income and age. Thereby, it ensures that people from all stages of life are able to benefit from the TOD. The 4.9 acre residential and retail development has senior housing, affordable family housing, day-care facility and pedestrian accessibility to the nearby transit station. The Portland Development Commission which bought the land engaged a master developer that made affordable housing the priority and constructed more affordable units

than required. Portland provided developers and residents with property tax abatement, loans, tax credits, revenue bonds and 10 year transit-oriented property tax abatement. The neighbours to the property were also involved in decision making and as a result, a range of housing types, income levels, rental/owner ratio reflecting the neighbourhood and creation of commercial space was achieved in addition to the preservation of several large oak trees. However, a criticism of the project has been that it was not able to do much about social barriers as a result of which despite the mix of income levels, there is segregation among the residents. People belonging to one income group, age or tenure are generally placed in one building. If a greater mixing had been thought of, things could have been different.

Figure 6 The Village at Overlake Station Apartments, Redmond, Washington



Source: Google Maps

3.3.4. Improved stakeholder powers

All these case studies suggest high-levels of participation from the local community and a transit agency willing to pay heed and act upon the concerns of the community. The community benefits agreement cases in particular require median income data and interventions based on such data for families living close to the transit stop. There is also reservation in the new development for people earning less than the median income of the area.

3.4. The Singapore experience: Adaptive city

As one of the successful models of development, Singapore has an efficient public transport with some pragmatic policies on the TOD implementation. The city has a ring radial structure with circumferential MRT rail networks and LRT feeder networks with a densely built urban centre. It has major and minor sub centre nodes with high densities at the intersection of MRT lines. Singapore realised its need for a public transport oriented plan when it could no longer expand its road infrastructure to accommodate more cars and being an island it could not sprawl, moreover the Land Transport Authority (LTA) could not tackle problems of congestion. Hence, the new transport plans address the policies regarding parking, integrating jobs and work places through public transit, and co dependence of housing and the expansion of LRT

and MRT networks. Singapore complements its public transit with high parking charges and replaced its existing scheme of Area Licensing Scheme (ALS) by Electronic Road Pricing (ERP) in 1998. It ‘deducts charges from a stored-value in-vehicle debit card according to time of day and vehicle class’ (Barter and Dotson 2013). In addition to this, Singapore also has a Vehicle Quota Scheme (VQS) that limits annual vehicle registrations through an electronic open bidding system with additional supplemental charges for vehicle registration.

Figure 7: MRT and LRT network in Singapore

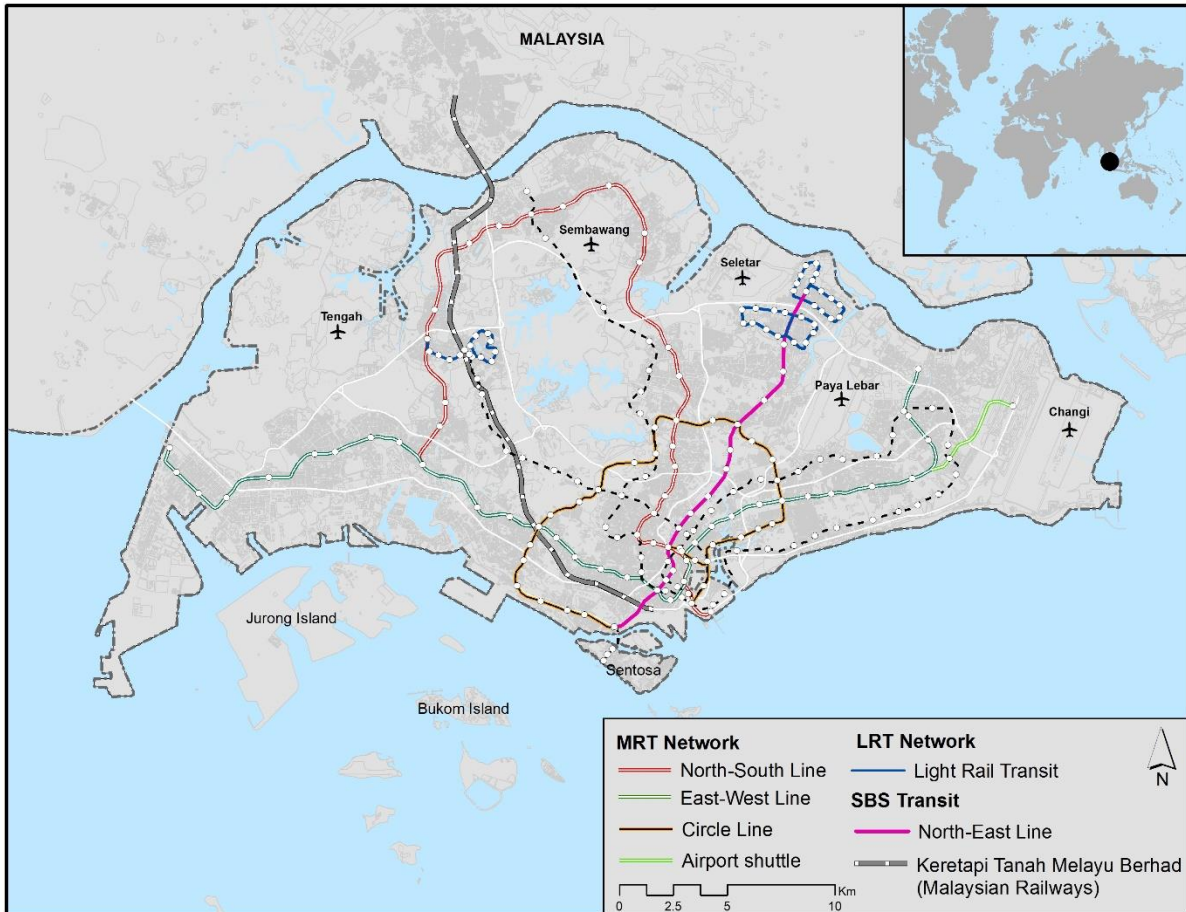


Figure 8: ERP system in Singapore to regulate parking of private vehicles



Source: (Lina n.d.)

The city-state is also reducing its parking requirements per square metre in new developments after 1990s. All the revenue coming from motor vehicle tax goes to a consolidated fund used

in various sectors including housing and public transport rather than going directly to highway projects as is the case of United States and many other industrialized parts of the world. The urban structure of Singapore focused on 'new towns' integrated and located around MRT stops with diverse activities of local shopping, other commercial and community services with residential populations envisaged to be about 60,000 to 120,000 people in these new towns. About 7 residential neighbourhoods are grouped around the centre with schools, community and recreation facilities and NMT routes linked to the neighbourhood. These locations are safeguarded for development which would enhance accessibility and transport capacity by the MRT. This approach enhanced flexibility but has left many of these new town centres unfinished for a long time (Cervero and Murakami 2007).

One critique of the new towns was the balance between employment centres and housing where 80% of the employed residents in new towns travelled to the industrial estates located on the western part of the island near the port or in other new towns (Barter and Dotson 2013). The integration between transport and land use is essential but a balance in employment and housing would reduce the necessity to commute. In the new plans, more residential units were to be built near employment centres such as industrial estates, business parks and commercial centres. Despite the changes which allowed flexibility in still to be identified land uses, it left many plots around the MRT stations in new towns vacant.

Figure 9: Pedestrian crossing in Singapore



Source: (Yong 2013)

Figure 10: High density development around transit in Singapore

Source: Google Maps

The integration of local area planning and transport has been enhanced sporadically but in the process of that integration a human scale built environment lagged behind. Although, pedestrian networks and cycling tracks have been provided on all major roads accessing the MRT stations, it is adequate but basic. More user friendly access to public transport supporting the local area movement networks was expected in the strategies but a basic infrastructure was provided with most focus on other aspects of the TOD. Singapore is an interesting case because of its geography where it could no longer expand its road networks for private vehicles and hence focused on an integrated approach to public transport and focused on the various aspects adequately and has been improving and mutable in its plans while identifying its issues and focusing on the strategies accordingly.

3.5. The Curitiba experience: Hybrid city, adaptive cities and adaptive transit

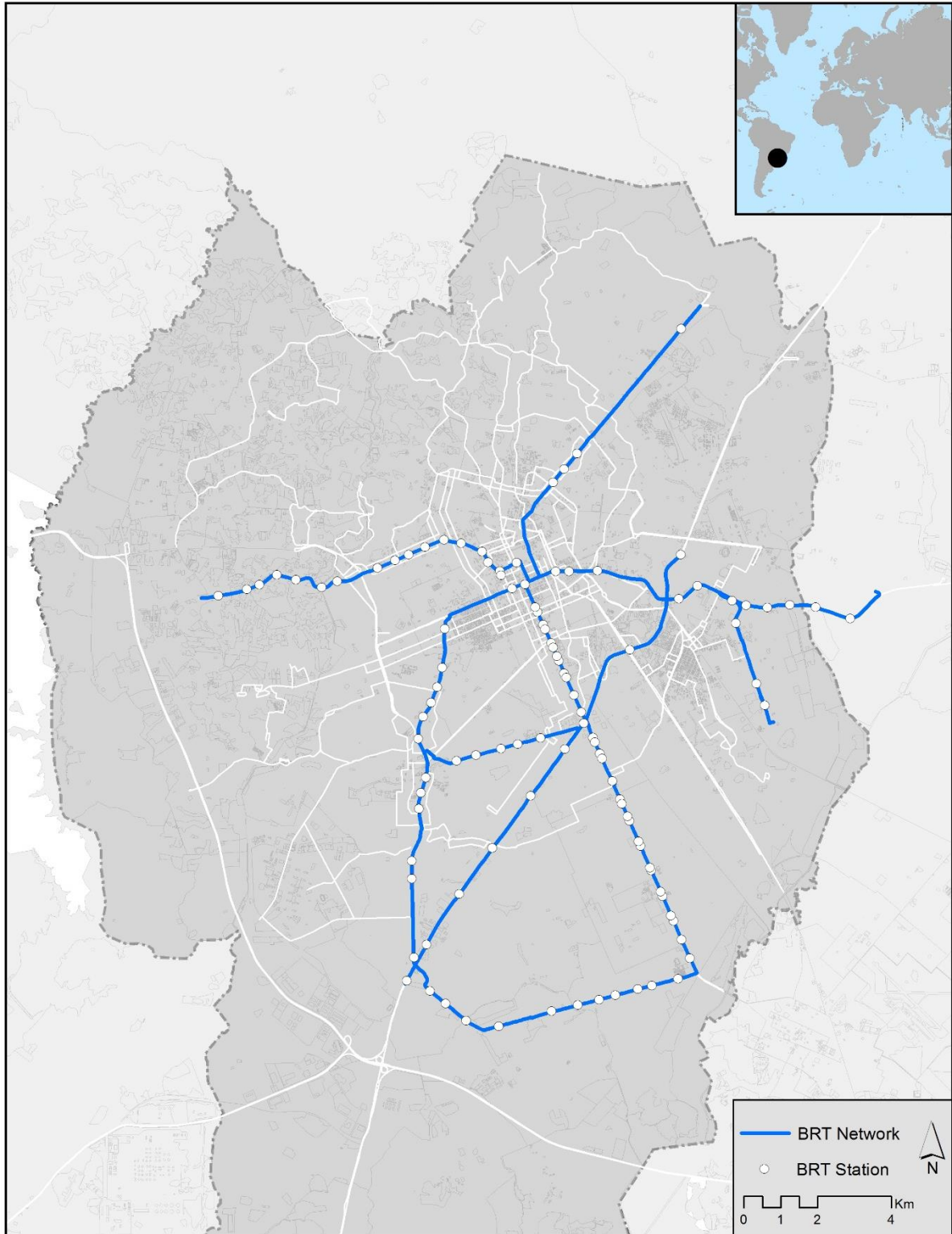
Curitiba, city in Parana state of Brazil realized its need for a transport plan quite early on compared to other Latin American cities. In the 1960s, Curitiba already had a transport master plan in place and laid its first BRT line in 1974. As of now more than 75% percent people commute through its public transport. It is a comprehensive plan which also focuses on the conjunction of transit oriented housing policies and NMT within its plan itself. With a view to our study, the plan of Curitiba is progressive and tries to not just have a transit for the purpose of commute but integrate the land use around it to gain more ridership by all social groups in the city.

The current BRT system caters to more than 1.6million people and accounts for about 70% of trips every day. The BRT system helped the city in reducing its air pollution tremendously; lowered traffic jams and lowered per capita cost on transport. The NMT network currently consists of 150km of bikeways with bicycle parking and with most major roads having walkways. It is an essential part of implementation of BRT as unsafe walkways and bicycle tracks would discourage the citizens to access the BRT. Curitiba has a trinary system where BRT routes run in one roadway in the center with private vehicles on either side and 2 roads on either side of the main corridor cater to private vehicles. It has 5 major “structural axes” which has

the trinary system and caters to high density land use along the roads with feeder lines connecting the main corridors. The buildings facing the transit corridors need to be high rise with mixed building use which means they need to have at least half the ground floor and second floors to be of commercial use. Beyond the private vehicle roadway, residential areas are zoned and taper down in density as the distance increases from the main transit corridor. Curitiba controls the use of private vehicles by expensive off street parking around the main corridors and limited on-street parking in location and duration; some of the central areas are also closed off for private vehicles to a degree. The idea of a minimum density in buildings is easily implementable in Ahmedabad as it is already accommodating high FSIs along the BRT corridor. Some of the transit supportive housing policies include a ‘buy up’ for developers who can build two extra floors of residential buildings by contributing to a low income housing fund which are granted to residential parcels in the ZR4, ZR3 and ZR2 zones which lie within walking distance of the transit way. These “buy ups” are offered at 75% of the market value of the extra building area provided. Through this fund the city has housed 20,000 low income families within walking distance of the transit corridor over a period of 25 years. The high density housing being built within the transit corridor is not affordable for low income housing because of increasing land prices, the city bought one of the last largest plot within its limits and gave land to the people to build their own houses. These people were provided a deed, a pair of trees and an hour with the downtown architect. This plot also had a BRT station within it ensuring connectivity for the citizens residing there. It is an interesting response to the market which can work in Ahmedabad because of similar scenarios. The housing board in Ahmedabad has land parcels around the transit corridors or parcels within its city limits to ensure housing for low income families within walking distance of these corridors.

These land parcels could be dedicated to such low income housing which will essentially increase the ridership of BRT in Ahmedabad. Special property rights were provided in the city center for heritage buildings to sell their property rights to other parts of the city and developers would receive inducements if they built it on the transit corridor. This is similar to the concept of TDR in the Indian context to sell unutilized FSI to other parts of the city which can further ameliorate if it could be sold within the transit corridor. Other land use integration involves ‘zoning reforms, pro-development tax policies, assistance with land assemblage, and supportive infrastructure investments’ (Cervero and Dai 2014). The land use planning is done in a way that higher density is concentrated near the corridors with more commercials and decreasing density along the feeder. The system has a stimulating mix of controls and incentives integrated with the trinary road system catering to the transit corridors. In context to the Indian scenario, the finances of Latin American city have a very similar condition to Indian cities’ local governments and with minimal loans and funding coming from cross subsidizing and fuel surcharges within the city, Curitiba managed to make the BRT system with 1.5 million dollars per kilometre. One major consideration within project implementation is participation from developers as well as citizens from lower income families. People have a sense of pride for their transit systems in Curitiba and this to achieve in India seems to us as a challenge but can be achieved if considerable amount of valuable participation takes place.

Figure 11: The BRT network in Curitiba



Source: Centre for Urban Equity

integrate community, state and regional interests, and e) include a local government infrastructure plan (LGIP). These planning schemes are reviewed every ten years (Queensland Government 2017).

TOD in Brisbane is guided by a set of principles drawn from its regional plans. The regional plans encourage local government planning to allow for a mix of land uses that generates high demand for public transport within 400 to 800 metres of stops or stations in high-frequency transit corridors. They also advocate that cities adopt the principles listed in Table 2 to facilitate TOD especially in the state of Queensland. The Queensland Government has focused on TODs as a means to influence travel behaviour to shift from car-based travel to more sustainable modes of transport. To quantify the extent of needed shifts in travel, in 2006 a ‘typical’ individual in SEQ made 2.5 walk/bicycle trips, 1.5 trips using public transport (e.g. bus, train, ferry), and 21 trips using the car in an average week. In contrast, the targets in SEQ for 2031 are to: (a) double the share of active transport trips (such as walking and cycling) from 10 per cent to 20 per cent of all trips; (b) double the share of public transport from 7 per cent to 14 per cent of all trips, and (c) reduce the trips by private motor vehicles from 83 per cent to 66 per cent (Kamruzzaman et al. 2014).

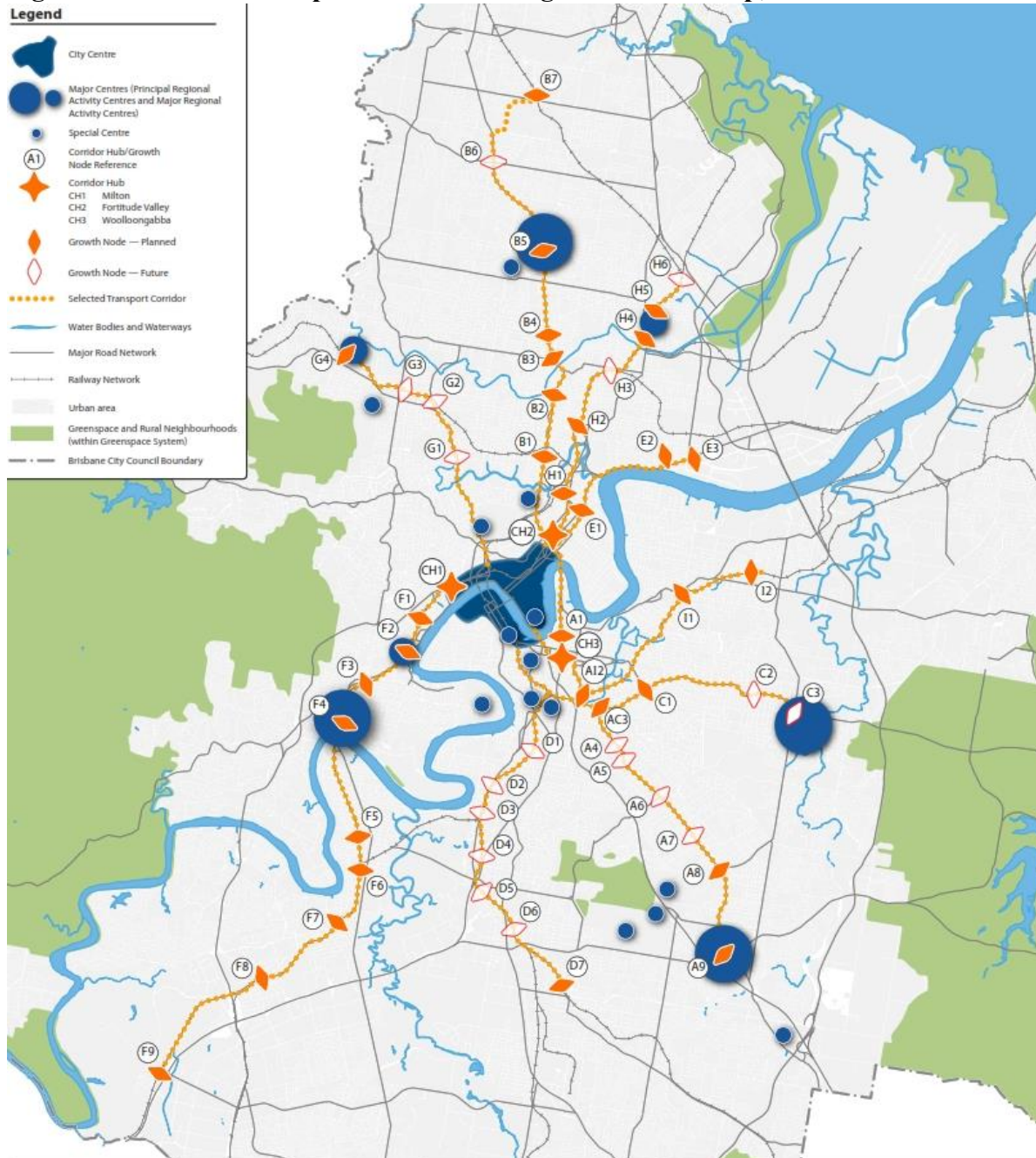
Table 2: TOD principles as recommended for practitioners in Queensland

Location	
Infrastructure and service levels	Locate development around nodes where infrastructure capacity exists, or can be created. Prioritise locations with high levels of transit service.
Development levels	Ensure TOD occurs at a scale that is appropriate for the location.
New development	Apply TOD principles in new communities where transit nodes exist, or are proposed.
Land use	
Type	TOD precincts must be dominated by land uses that support transit.
Extent	Focus on area within 5 to 10 minutes’ walk of the transit node.
Density	Incorporate high-density residential use in TOD precincts: activity centres: 40-120 DU/Ha; suburban locations: 30-80 DU/Ha
Intensity	Incorporate high employment intensities and a mix of employment opportunities.
Mix	Integrate a mix of uses that creates a variety of services catering to diverse needs of a community. Ensure the contextual correctness of the mix being recommended for communities.
Continuity	Encourage continuous activity in TOD precincts to provide sense of vitality and safety.
Design	
Adaptability	Development must be robust and flexible to respond to future changes in densities of people, jobs.
Built-form	Development must ensure high-quality subtropical design that maximises amenity and activity.
Public realm	High quality public realm including open space, pedestrian areas and transit access. Design must promote social interaction, inclusion, activity and a sense of place and identity.
Integration	Design must seamlessly integrate transit nodes and the community.
Safety and accessibility	Development must promote a high sense of personal and community safety and equitable access to the public realm.
Parking	Manage car parking in a way that walking, cycling and public transport accessibility are supported.
Transport	
Mode share	Increase mode share for walking, cycling and public transport with priority to pedestrians.
Transport efficiency	Facilitate intermodal connections.
Social	
Diversity and inclusion	Ensure development that supports social inclusion and diversity (age, culture, jobs and income). Ensure mix of housing types, tenure and affordability. Promote physical and social connections between new and existing communities. Ensure community development initiatives integral with community building.
Process	
Coordination	Ensure coordination between the multiplicities of stakeholders.
Community engagement	Engage early and throughout planning and development with the community to encourage a sense of ownership.
Timeframes	TOD takes time. Set reasonable timeframes.

Source: Department of Infrastructure and Planning (2010a)

The Queensland Government is aiming to develop six types of TODs in Brisbane namely, city centre, activity centre, specialist activity centre, urban, suburban and neighbourhood. TOD around the Brisbane BRT network can be classified in three categories. First, the busways are serving existing areas that had many TOD characteristics, but lacked a dedicated transit connection. Second, the busways are serving as a catalyst for new, green field development near

Figure 14: Brisbane transport corridors and growth nodes map, 2014



Source: (“Brisbane City Planning” 2014)

stations. Finally, the busways are catalysing urban infill, including significant air rights development. Most of this TOD activity has been market-driven, with little encouragement by the government. Recently, however, the government has begun actively promoting TOD in the

busway station areas (Breakthrough Technologies Institute 2008). Key factors determining the ability of bus-based transit to spur development were permanence; rider demographics; parking availability and parking restraints; transit agency TOD capabilities; urban density; noise and pollution; frequency and speed; and bus stigmatization (Currie 2005, 2006).

Kamruzzaman et al. (Kamruzzaman et al. 2014) conducted a study on developing typologies of neighbourhoods with respect to TODs and their effectiveness. Unlike other international studies which are often not developed on the basis of quantitative findings and rely on generalised geographical approaches with little scientific support, this study based on built environmental indicators arrived at some interesting conclusions. Residential type of TODs are more homogeneous neighbourhoods, whereas activity centre type of TODs are more socially and commercially diverse communities. Neighbourhoods with more educated residents are less likely to be supportive for activity centre types of TODs. Neighbourhoods with disproportionately younger aged residents are more likely to be supportive of activity centre types of TODs. Neighbourhoods with larger sized households are good candidates for potential TODs. Neighbourhoods with fewer private dwellings are good candidates for activity centre types of TODs. Residential areas where more than 15 per cent of residents do not own private vehicles are suitable for both residential TODs (15-18%) and activity centre TODs (>18%). Evidence indicates that residential TODs and their residents will engage in travel somewhat differently than residents in an activity centre type of TOD. The study also argues that long term strategic planning needs to account for policy indicators like public housing in order to inform TOD design indicators like density and diversity.

Figure 15: Yeerongpilly TOD site in Queensland, Australia



Source: Google Maps

Figure 16: TOD plan for Yeerongpilly in Queensland, Australia

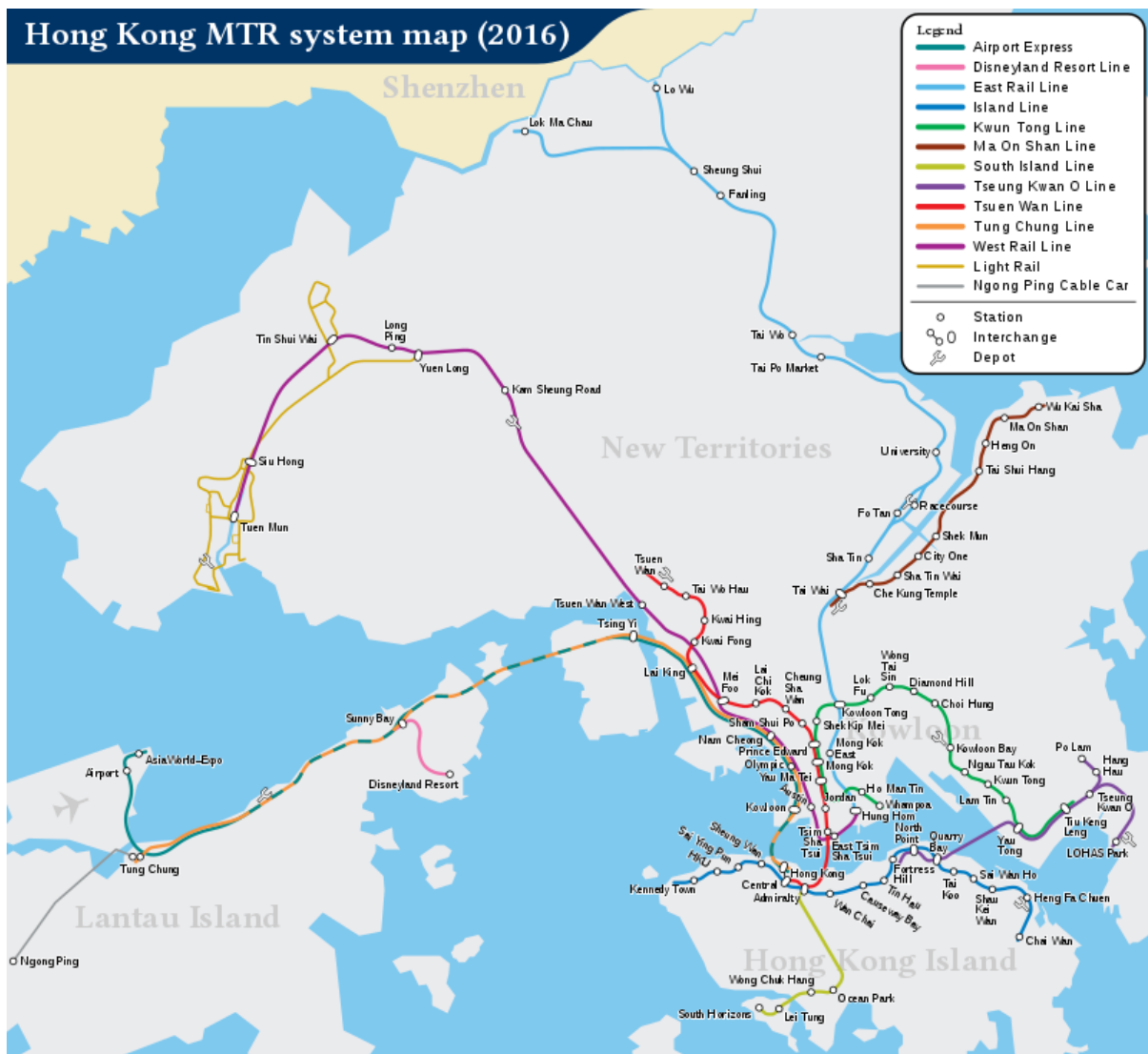


Source: (Queensland Government 2016)

3.7. The Hong Kong experience

Hong Kong is known for its rail and property integrated development model also referred as R+P model. It is an interesting concept with a public and private partnership using the TOD concept. The land value capture is done by the government who hands out properties to the railway company who develops the land and gains profit from the rising land values. The whole process of developing TOD begins before the inception of the rail line itself. “The government hands out development rights around the station to the railway company, who in turn develops the land and can gain profit from the rising property values” (Tang et al. 2004). Opportunities for development around the new station are discussed and followed by government granting developmental rights around the station to the MTRC (Mass Transit Railway Corporation), MTRC “draws up master plans and conceptual proposals for the area, making sure to give attention to public interests and especially planning for a built environment that promotes transit use”(Tang et al. 2004). All the services are provided by the MTRC which ensures end to end services and later MTRC and property developers share the profits gained from selling and leasing the properties. This is a profitable model for the public and the private and some of its advantages also list the surety of quality services within the transit corridor and with the involvement of the private players, services are maintained as well. Other important features of the Hong Kong TOD worthy of inspiration is its focus on density, diversity and design. The 3Ds are applicable in context of hong kong in terms of its built environment around transit stations

Figure 17 Hong Kong MTR system map



Source: Wikimedia Commons

4. Discussion: From Transit Adjacent Development (TAD) to Transit Oriented Development (TOD)

TOD is quite a stir among the various stakeholders including real estate developers and the city governments. It is essentially seen as more development around the transit corridors by the real estate developers and to capture the land value around TOD. One of the threats associated with TOD is the market experiencing a lull and not building the kind of floor space that was being expected by the development authority. For example, one of the earliest prototypes of TOD namely Laguna West in Sacramento, California failed to materialise owing to lack of interest from the real estate developers. In North America, developers were not very upbeat about the prospects of development around light-rail stops in St. Louis, Pittsburgh and Buffalo. This led to delays in realising TOD built-form (Cervero et al. 2002). Cervero et al. opine that for TOD to work, a proactive public sector is a prerequisite. TOD plans require the participation and eventual buy-in from the community. The State enjoys the kind of legitimacy that could help in this kind of processes. The large plots required for TOD can be easily assembled or made ready for assembly by the State. The State could also write down the value of land under its

control for a share in project revenue. Provision of infrastructure through investments and creating incentives for (re)development such as tax-holidays are the State's forte. Subsidies at the initial stage in order to interest developers can go a long way in the success of the TOD. Case studies highlight the important role played by the collaboration between the State and developers in the success of TOD.

4.1. Regulatory and governance policies

Grants: In the case of North American cities we saw that grants and local foundations working towards the TOD concept helped a lot financially in the development of the areas around transit stations. It also helped in generating interest locally for the people to participate and retain their local character.

Tax reliefs: In a few case studies, tax exemption on building near TOD or in the Singapore case study tax exemption and other incentives for transferring developmental rights within the TOD zone were incentives for developers to build within the TOD zone. Concepts like Transferrable Development Rights (TDR) in India should further take initiative and exempt taxes on buildings or rights sold within the TOD zones.

Equity Participation: TOD is a concept which is connecting and revitalizing the people and the economy and it is essential to understand the various sectors that the concept is dealing with at a time. It is vital for private and public partnerships to build a thriving economy around TOD corridors and it can happen with the equity participation from the people, planners and real estate developers. Hong Kong is a great example for studying the integration between public and private partnership and the provision of services by involving different sectors financially.

Loans: In a lot of TOD case studies, finance mostly comes from loans and grants and loans from central or state government in Indian cities could go a long way for the city to produce a successful TOD. With the current situation of Indian cities suffering from shortage of funds it is essential for a certain capital fund to be created through loans. In cases like Denver, a revolving loan fund ensured properties to be built and developed by the fund.

Interest-cuts: One of the successful incentives for TOD is interest cuts. A specific rate of interest for TOD would ensure development in the sector and also help ease the shortage of funds. Private players would want to invest in lower interests and this would ensure development around transit nodes. In Indian cases, it is an essential element in the success of TOD as higher funds would eventually reflect higher development with more private players.

4.2. Land-based initiatives

Land assembly: Land assembly like it is done in Hong Kong and a lot of North American cities ensures that the services are provided by one big player and a standard quality remains. Redevelopment of land becomes much easier, such tools help tremendously in assisting the government to develop faster without arising a stagnant period.

Land swaps: Land swaps is an essential tool for the local governments to benefit by increasing partnership and vesting co-ownership in developing properties around the TOD. A mismatch between permissions and approvals between the private player and the local government, sometimes renders the private player to be discouraged as the project might not reap as much benefits as they would have predicted.

Land banks: Having enough foresight and money to spend, city governments speculate the land prices around station areas and purchase land prior to the development of the station or the corridor and after appreciable development around these areas happen, public agencies can sell these parcels of land or partner with private players to develop them, eventually earning profits out of such land banks. A downside to this initiative is that is solely dependent on the willingness of the current land holder.

Saleable development rights: In a few TOD areas of Singapore, heritage value preceded and most of the development rights in those areas could be sold anywhere within the TOD zones. Such initiatives of saleable development rights works within the TOD where devilment can accelerated with more FSI.

Siting of government facilities: To promote TOD, local governments can provide facility siting and parking programs. Removing parking subsidies (through cash out initiatives), the local government can boost transit ridership and “create a base of workers that attract private investors”(Transportation Research Board 2002). In California, a state law requires all the state office buildings to be located “within quarter mile of average or above average transit service”. Such state laws in India, could help in constructing buildings which increase transit ridership.

4.3. Zoning and regulation

Planned development: In the Indian scenario, development plans in Ahmedabad for TOD called Local Area Plans and in Bangalore called Station Area Plans aim to plan development around transit stations and try and avoid haphazard development with smaller plots and eventually underutilise the amount of FSI available. A planned development would ensure optimum utilisation of the available FSI and also avoids complete capture of private players constructing high end commercials or high income residentials only. These plans and bye laws would help in suggesting amalgamation of plots and create parks around transit stations among other elements to ensure maximum transit ridership. A lot of urban design features work in respect to planning for such development as higher NMT infrastructure would encourage more people to cycle or walk to transit stations.

Transfer of Development Rights (TDR): Under TDR, unused development rights are traded to other parcels where densities can be stacked up and more FSI can be created resulting n higher densities around transit stations. Such initiatives ensure twin objectives of achieving higher densities around transit corridors and also preserve historical properties which might be under threat to be demolished under the pretext of achieving higher densities. For the owner, TDR is a fair compensation for rights which are relinquished through zoning laws(Transportation Research Board 2002).

Transportation Demand Management (TDM): Promoting policies for TDM can be great complements to TOD initiatives. TOD initiatives alone seemed to have little impact on travel behaviour, but TDM and TOD initiatives together would have a huge impact. In Portland, “violation of carbon monoxide standards prompted the leader to employ TDM parking strategies wherein minimum parking standards were replaced with maximum parking limits. Building frontages were zoned for lowest ratios (0.7 spaces per 1000 sq. Ft. of floor space) and higher ratios as it goes further. The problem of exceeding carbon monoxide was dealt with TDM strategies coupled with TOD which was a success as no records were found of any exceedence of carbon monoxide thereafter (Transportation Research Board 2002).

Table 3: Comparison of case cities on approaches to inclusive TOD

Approaches	North America	Singapore	Curitiba	Queensland
Revitalization and intensification				
Increase density/development	The North American TOD relies on provision of high rises along transit. An example is BART.	Making 'new towns' around MRT stations with higher density and diverse uses.	High density around main BRT corridor and tapering down densities as distance increases.	The government promotes integrated transport and land use planning, in close proximity to high-capacity public transport nodes and corridors
Revitalize commercial corridors	The Longfellow experience places limits on how much space could be consumed by big retail (70 %).	-	Increasing mixed use around main corridors to have diverse activities.	Mixed-use typology combines large and small retail uses at ground level with residential apartments above.
Develop affordable housing	The community benefits agreement as seen in Fruitvale, Oakland between the developers and the community helps retain and create affordable housing. Denver experimented with a TOD fund for affordable housing.	'New towns' around MRT stations aim to accommodate 60,000 to 120,000 people from the low income group.	To add more floors, developers contribute to a housing fund used to make low income housing within walking distance of public transit.	The Yeerongpilly TOD plan seeks to encourage community diversity through development of affordable housing on a vast site near the station.
Assist existing residents economically	The community benefits agreement as seen in Longfellow helps ensure local hiring and living wages for communities in TOD.	-	-	-
Enhance economic (jobs) growth	All the examples cited as case studies contributed towards adding value to the local economy using measures discussed earlier.	Creating job opportunities near residential areas in new towns to reduce the necessity to commute and adding residential to commercial areas.	More jobs and activities around the transit corridor.	Commercial and retail development is located close to the railway station and provides activity around the public plaza.
Neighbourhood preservation				
Prevent displacement of vulnerable HHs	Through community benefits agreement and through state intervention in the form of buying plots of land for housing Portland demonstrated how displacement of vulnerable HHs can be prevented.	Yes, new towns have specific land uses dedicated to low income housing.	Yes, Accommodating HH within walking distance or building stations in low income neighbourhoods.	

Approaches	North America	Singapore	Curitiba	Queensland
Preserve historic buildings	-	-	Special property rights to sell to other parts, inducements to sell within zones near transit corridor.	Existing heritage buildings are retained and the associated curtilages are incorporated into the public realm and open space network.
Enhance community activities (parks)	The Longfellow Community Council managed to get the developers to develop public art spaces and exhibition spaces as part of the contract.	Yes, more community centres and recreational facilities around the new towns.	-	
Maintain/enhance local identity	The Longfellow example demonstrates how the local community council worked closely with developers to maintain local identity.	-	-	Adaptive reuse of heritage buildings for commercial purposes and not community facilities.
Access and connectivity				
Increase transit ridership	No conclusive evidence available. Many transit systems have reported stalling ridership numbers.	By increasing activities around transit nodes and increasing densities, will lead to increased ridership	Yes, by encouraging mixed use buildings with mixed commercials and residential including low income housing	No conclusive evidence available.
Overcome barriers to using NMT	No conclusive evidence available. Interventions towards improving the public realm in terms of walkability and cycling have been minimal. Some investments have been made in improving the quality of public spaces for purposes such as art exhibitions.	Not many strategies have been focused on NMT, basic but adequate facilities provided	Pedestrian and bikeways with bicycle parking. 150km of bikeways already exist	The Yeerongpilly TOD plan seeks to provide direct, safe and clear pedestrian pathways connecting the neighbourhood to the station. A pedestrian and cyclist pathway connects the open space with the Brisbane River. A community garden is provided allowing public access for residents.
Improve safety		Not much has been done to improve safety for pedestrians but because of good integration between commercials, recreational and residential, it would be safe around new towns.	Strategies focused on providing for pedestrians and other NMT, otherwise mixed use buildings equate to different timings for activities making it naturally safe	
Improve urban design		-	-	

5. Conclusion

This paper was an attempt to identify best practices in TODs attempted in diverse contexts. It presents a brief account of the historical moorings of TOD. This was important to understand the origins of the concept and the influences various actors and contextual references that have reflected in the evolution of TOD. The discussions centred on the give and take between neo-traditionalists who evolved their understanding of cities from Howard's garden cities and the humane conception of cities as places for people and communities led by those that adhered to Jane Jacobs is an interesting debate. This discussion had a major effect on Calthorpe's conception of TOD as reflected in his publication "The Next American Metropolis: Ecology, Community, and the American Dream." Cervero provided the empirical basis for much of what Calthorpe advocated and their collaboration played a major part in the branding and propagation of the concept of TOD.

This paper also presents a comprehensive review of existing literature on contemporary TOD practices. The objective was to identify what other researchers and planning authorities consider as vital to make TOD work. The North American experiences demonstrate the important role played by citizen engagement in ensuring that TOD remains local. Singapore and Curitiba are examples of what land use planning can help achieve with regards to making TOD work. Finally, the Queensland experience presents best practices with regards to how diverse communities can be achieved in TOD areas. Further, this paper outlines the characteristics of the Inclusive/Affordable TOD scenario being developed for Indian cities as part of this project. This scenario is modelled in a different research paper on the city of Ahmedabad to demonstrate the positive effects that ATOD can have when compared to the business-as-usual and TOD scenarios.

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