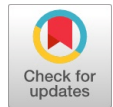


Land Value Capture and Transit Oriented Development (TOD): A Comparative Review of Indian TOD Policies Measures

Sahil Singh Kapoor, Tejwant Singh Brar



Abstract: Several Indian metropolitan cities are willing to adopt and explore various methods to implement transit-oriented development (TOD) around their transit stations to reverse the ongoing trend of automobile-oriented urbanization. Implementation of development-based Land value capture (LVC) schemes in emerging middle-income countries asks to understand and adapt to locally-specific favorable macro conditions such as rising real-estate incomes, increasing automobile dependency, and traffic congestion which all together endow to appreciate land values near transit stations or corridors. This paper identifies enabling TOD linked factors and indicators to measure them besides transit investment that may influence Development-based LVC mechanism and TOD based investment in transit station areas or corridors. To achieve the desired study goal, this study identified 13 indicators directly related with six TOD dimensions to evaluate Indian TOD policies formulated at various levels. By doing so, it will determine new innovative funding opportunities available to implement and integrate lacking land-use and transit planning mechanisms and proposing a land-value capture strategy with lacking a clear framework for Indian cities. The study revealed that population densities, particularly employment densities, length of blocks and intersection intensities, electric charging stations, multimodal integration and smart apps provision are largely lacking in the most Indian TOD policies framed. The current ongoing TOD policy formulation is only limited to increase densification by permitting higher than permissible Floor Area Ratio (FAR), providing parking facility and its management, and allowing land-use mix.

Keywords: Indian cities, Land Value capture, Transit-oriented development, TOD Policies.

I. INTRODUCTION

Several Indian metropolitan cities are willing to adopt and explore various methods to implement transit-oriented development (TOD) around their transit stations to reverse the ongoing trend of automobile-oriented urbanization. However, lack of adequate links between land-use and public transportation planning has widened the transit funding gap and severe fiscal constraints in most Indian cities to finance

highly capital-intensive Mass Rapid Transit System (MRTS) (McIntosh, et al., 2015). Many Indian cities have underutilized public lands that would offer more valuable price if opted for urban regeneration or infrastructure development such as transit system (Peterson, 2009) [21]. Moreover, Indian metropolitan cities are experiencing together fast economic growth, urban sprawl, and an unprecedented growing urban population owing to which they are facing complex urban challenges of overcrowding, environmental problems like air pollution and mobility-related challenges (Jain & Singh, 2019) [10]. As the 'World Urbanization Prospects 2018' mentions, India as a Lower-middle-income country in Southern Asia would be almost doubling its urban dwellers' population by 2050 from 2018 [15]. Here, the rural population will decline and urban population increment will be the most of more than 416 million urban inhabitants by 2050. Like many cities across the globe, Indian cities have made large investments to develop transport corridors as the lifelines of a city (NIUA, 2020) [18]. According to the World Cities Report 2020 by UN-Habitat, more than ninety-five percent of anticipated urban growth between 2018 to 2050 will happen in India along with China and Nigeria. Enhancing mobility embraces city to achieve long-term sustainability, livability and deal with typical confronted challenges such as housing, shortage of sewerage network, and cheap public transportation through the land use and transit integration.

Several metropolitan cities including Hong Kong SAR, London, Tokyo, Washington, and New York through development-based Land Value Capture (LVC) have successfully been able to generate not only funds to sustain transit investment and supporting operation and maintenance cost but also taken opportunity to utilize their transit system to guide sustainable urban development (Suzuki, et al., 2015) [12]. Implementation of development-based LVC schemes in emerging middle-income countries asks to understand and adapt to locally-specific favorable macro conditions such as rising real-estate incomes, increasing automobile dependency, and traffic congestion which all together endow to appreciate land values near transit stations or corridors. Moreover, urgent need to have a strong integrated regulatory legal and institutional framework with consistent vision and strategy to adapt to local context-based LVC scheme as a strategic planning tool for urban management and financing.

The 21st century is witnessing an incredible rise of the cities to play an important socio-economic and political role around the world with the typical smallest municipal government structure dependent

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on another order of state and national government for revenue and economic growth (Suzuki et al., 2015) [23]. However, automobile dependency has led travel to grow inconsistently in rapidly growing cities of middle-income countries with typical urban transportation system problems – traffic congestion, lengthy trips, greenhouse gas emissions, and social inequality. Unlike other problems owing to urbanization such as traffic congestion, air pollution, and social inequality, transport differs most as it gets worse rather than perform better by the persistence of economic growth (Suzuki et al., 2015). Recognizing such problems owing to car-oriented urbanization, several Indian metropolitan cities such as Delhi, Mumbai, Bengaluru, and Jaipur have already started to invest in the metro-rail system to meet their continuously growing traffic demand (Ellis & Roberts, 2016) [6]. Indeed, rapid urbanization is closely associated with economic growth and modifies the demographic structures and social issues in both cities and rural areas to uplift economic development (United Nations, Department of Economic and Social Affairs, Population Division, 2019) [26]. During the 2001-2010 decade, the majority of developing Asian cities have introduced new quality MRTS to reduce road congestion and increase economic performance (Abiad, et al., 2019) [1]. But this MRTS system is extremely cost-intensive and requires high operation and maintenance costs. Delhi metro and Shenzhen in China started their metro operation nearly in the same period with almost similar track-lengths however, during the period 2017-18, Shenzhen metro carried nearly 10,000 more passengers per kilometer compared with Delhi metro. Delhi's transport, planning, and other allied agencies need to look for suitable development-based LVC schemes to integrate transit with urban development for transit financing and promote transit-oriented development as indeed done in Hong Kong SAR, China; Osaka and Tokyo, Japan and Singapore. FAR of the central business districts (CBD) and District center/Sub-Central Business District in the national capital – Delhi is much less only 1.5 compared against other global cities (15.00 in New York City, 20 in Tokyo, Japan and 12 in Hong Kong SAR, China) (Suzuki et al., 2015). Unlike property tax or fee-based instruments, development based LVC can trigger an increase in land value near the transit station through regulatory tools such as higher floor area ratio (FAR) to increase densification, selling development rights, making land readjustments (Land pool), redeveloping land around station areas based on TOD concept to ensure higher transit ridership and sustainable long-term revenue profits from retail shops, parking, residential buildings, recreational and leisure facilities. TOD is an ancient concept and globally recognized approach which is emerging in several Asian cities to embrace walkability and other non-motorized transport modes around high-quality MRTS (NIUA, 2020) [11]. It minimizes carbon footprint by reducing private vehicle usage and designing compact neighborhoods with housing, employment centers, and recreational activities. TOD not only helps in reducing carbon footprint through minimized private vehicle usage, but it also encourages walkability and other modes of non-motorized transport with compactly designed neighborhoods. It does so by achieving high density with mixed-use activities and compact development supported with walking and cyclable

infrastructure, direct street network connectivity to the transit station, and maximizing ridership to use public transport system. LVC is only a partial contribution to the transit finance and its funding solution and thereby, cannot cover all the cost of transit construction (Olajide & Arcé, 2017). For urban transit systems, different studies show that land value gains are highly concentrated within a 500-meter distance radius surrounding transit stations and are much weaker or even negative effects on land value along the transit corridor with distant accessibility points (Peterson, 2009).

II. OBJECTIVES OF THE STUDY

This paper aims to review various recently formulated TOD policies at National, State and city level to guide and catalyze the development of urban rail transit systems in several Indian states and help them formulate there in process transit-oriented development based respective state-level policies. To achieve the desired study goal, TOD dimensions along with their criteria and indicators to measure them have been identified from the vast literature review. By doing so, it will determine new innovative funding opportunities available to implement and integrate lacking land-use and transit planning mechanisms and proposing a land-value capture strategy with lacking a clear framework for Indian cities. During the last decades, numerous Indian cities have solely begun to work upon the implementation of TOD technical components without necessarily developing policy advocacy which to raise funding sources, engage various private and public stakeholder, use value capture to recover O&M costs and develop a business case-based TOD proposal ready for implementation (NIUA, 2020).

III. MOTIVATION AND NEED OF STUDY

Many cities of the US have even rarely developed a complete framework to facilitate the integration of land-use planning with transportation policies to raise transit funding and thereby, need to develop a new LVC strategy and assessment framework (McIntosh et al., 2015). It is anticipated that once the entire MRTS network in Delhi is developed by 2021 [5], nearly 60 percent of the urbanized area of Delhi city will be reachable within 15 minutes walking from the metro stations (Suzuki et al., 2015). Moreover, the recently introduced Smart Cities Mission in the year 2015 has drawn attention towards an integrated and holistic approach to ameliorate the quality of life in India cities by establishing potential interrelationships among urban planning, finance, and governance (NIUA, 2017) [17]. Many Indian cities are already in the process to implement their Smart City Plans and look forward to adopting the TOD projects approach to address some typical challenges related to mobility, infrastructure, and housing (NIUA, 2020) [13]. However, operationalizing and sustaining TOD projects requires long-term borrowings and government grants to augment revenue generation above operating cost which is beyond the policy framework of the national Smart City mission. Many smart city projects implemented across India's 100 Smart Cities had lot of pitfalls and failed to provide desired promises to its citizens as urban scheme was predominantly dependent

on cutting-edge technology, which ultimately exacerbated social inequality in cities (UN-Habitat, 2020) [25].

As Jain et al. (2020) states, since 2004 there has been a keen interest of academicians and urban practitioners worldwide, especially in the United States on the contemporary theme TOD which justifies the purpose of the study especially in the Indian context where there has been a terrible decrease in engaging Indian urban researchers since 2006 to work on the TOD topic [20].

Restoring the lost relationship between land-use and transit integration due to rampant unplanned urbanization and proliferation of automobiles in the 20th century is one of the fundamental aims of the National TOD policy 2017, published by the 'Ministry of Housing and Urban Affairs (MoHUA)' [8]. However, despite having the National TOD policy and its various state TOD policies, TOD implementation faces two critical barriers [14]. The first remains the preparation of local area-level TOD influence zone plan using numerous urban planning interventions and the second challenge is related to sustainable funding sources necessary for capital-intensive transit corridor development (NIUA, 2020). As Ellis & Roberts (2016) states, consecutive master plans prepared of many Indian cities have failed to integrated urban development with Transportation planning which not only underestimates future population growth, but also fails to assign adequate urban land for future urban expansion and mobilize enough funding to build roads and transit networks [9]. Across many Indian cities, master plans and transit projects are dealt by different agencies and there is absence of a dedicated nodal body to enable smooth coordination and decision making among various public agencies (Dhindaw, et al., 2021) [3].

Contemporary planning focuses on TOD as an effective development strategy to overcome ill effects of urban sprawl, traffic congestion, air pollution, and inefficient use of available resources mainly land and fuel. Many Indian states such as Maharashtra, Madhya Pradesh, and Haryana have come up with exclusive TOD policies to successfully implement TOD and its replication in Indian cities [4]. However, transit-oriented urbanism is much more than just encouraging urban development near the transit station/corridor. Successful TOD implementation requires a 'Form-based approach' as a paradigm shift away from conventional zoning where building codes not only create building envelopes but also emphasize its relation with adjacent land-uses and streetscape (NIUA, 2017). As Patnala et al. (2020) states, there is a strong need to have a local context-sensitive TOD definition to devise proper and well-defined TOD policy with quantified norms and guidelines to successfully implement TOD projects across Indian metropolitan cities [24].

IV. LAND VALUE CAPTURE

Land Value Capture (LVC) was an idea advocated by David Ricardo (1821) and later accorded with Henry George (1879) to internalize and capture positive externalities related with land value such as investment in public transport and infrastructure development, changes in land-use regulations, landowner's investment and population growth (Suzuki et al., 2015). LVC can be area-based value capture that attempts to delineate the area of influence of land appreciation as an

outcome of infrastructure development while project-based LVC aims to capture both, land value appreciation, as well as proposed building, projects value and resource utilized (MoUD, February 2017) [16]. LVC is a public financing method that aims to boost land prices surrounding metro stations through desired alterations in land-use regulations such as higher FAR than permissible, mixed land-use, or the introduction of a dominant public transit system. However, its feasibility depends on external prevailing market conditions and transit-supportive land-use policies, which makes it difficult to quantify the impact of transport investment alone on surrounding land value under different urban conditions. Today's LVC uses a balanced view approach to create a strong relationship between transportation assets, transit funding, and users (Olajide & Arcé, 2017) [19]. TOD works on a policy-based concept which needs to be flexible and renewed as per the area requirements and its importance to the city or metropolitan region (Jain & Singh, 2019). Theoretically, accessibility and economic agglomeration increases as the external economic benefits of public transport investment are capitalized to capture land value increases near transit areas. Accessibility benefits can be reaped through contemporary urban planning which attempts to coordinate and locate economic and social activities near nodes of transit and regional metro networks with higher accessibility. Economic agglomeration benefits are theoretically indirect and more complex than accessibility benefits as they increase economic productivity at the city level by taking locational advantages of allowing TOD-based infrastructure development near transit nodes such as higher population densities of economic and social activities, sharing local amenities and infrastructure, and bringing matching people to jobs (Suzuki et al., 2015). Value capture finance (VCF) mechanism aims to capture indirect benefits created by public investment to the property owners to in turn capitalize property value increment and finance public investments, which are usually limited to direct identified beneficiaries (NIUA, 2017). As Ellis & Roberts (2016) states, in numerous Indian cities, policies and long-term vision zoning plans limit themselves to respond to changing market demands and are deficit of up-to-date land and real-estate information of housing. They need to be aligned with abrupt market realities to meet long-term goals and facilitate effective land-value capture design strategies necessary to fund massive infrastructure development like MRTS and facilitate the timely supply of land or land assembly, which else will lead to comparatively higher land value prices.

A. Value Capture Finance

VCF essentially works on the standard of 'beneficiary pays', suggesting that the immediate and backhanded users of any high-quality public infrastructure investments including private land and buildings will add to the capital expense of the infrastructure development or the operating costs through different mechanisms (NIUA, 2020). It is an innovative system to streamline or upgrade the local Government body's asset management. Some portion of the augmentation in the estimation of land and building ought to be caught to fund projects being set up for



general society by the Central and State government along with the ULBs (MoHUA, 2017b).

V. IDENTIFIED STUDY FACTORS

This paper identifies enabling factors besides transit investment that may influence Development-based LVC mechanism and TOD based investment in transit station areas or corridors. These area favorable macro and micro-design conditions, encouraging regulatory and institutional framework, considerable transit technologies expertise and adaptive local market conditions (Suzuki et al., 2015).

A. Macro Factors

Strong economic and rapid urban population growth as macro factors have always remain fundamental for creating demand for land development and its subsequent management with improved accessibility and economic agglomeration benefits. In the context of Indian metropolitan cities, these macro conditions are favorable leading to relatively high land demand at prime locations with good accessibility and amenities. Further, existence of real estate with differing types of sub-markets (such as neighborhood markets, retail shops, offices, residential apartments, and so on) enhance land value with support of reliable transit services. Micro design elements are supportive to macro conditions such as TOD based station area plan including pedestrian and bicycle access routes, mixed land-use and high-intensity development provision, parking facilities near transit stations, and environmentally friendly sustainable technologies such as electric vehicles. Community support warrants TOD success and thereby, area has to be attractive to its users along with a wide mix of activities within a neighborhood. Urban design plays a major role to attract users to live and work in TOD areas by designing built environment form comprising group of buildings and neighborhood in accordance with the community goals (NIUA, 2017). Formulating zoning around and building design guidelines to successfully capture long-term vision prospects of land value surrounding transit stations requires flexibility to respond effectively to diverse and ever-changing local markets conditions and involvement of multiple stakeholders such as private developers, local people, transit authorities and local development authorities (Suzuki et al., 2015). Incentive zoning supported with measures like additional FAR and density bonus attracts private developers to create recreational areas like parks and dissuade auto-oriented landscapes by providing pedestrian and cycling infrastructure near transit stations (Shakti Sustainable Energy Foundation, 2017) [22].

B. Regulatory and Institutional Factors

Changing existing government planning land-use regulations (for example land readjustment, higher FAR, public parking supply and allowing mixed land-use) allows to create high articulated density areas near transit stations with diverse land-use mix to increase LVC revenues. Framework of most local municipalities is not supportive for TOD based development as current land-based codes and bye-laws are designed for single purpose land-use and building which encourages automobile-oriented and sub-urban development. Thereby, to balance development mix, it becomes imperative to understand metro station's dual role as a node in transit system and its role as a residential

neighborhood (Shakti Sustainable Energy Foundation, 2017). Competent institutions such as local government and transit agencies are required to have adequate knowledge of real estate and TOD-related investments to allow private participation in transit development and LVC implementations. Moreover, gentrification is another concern related with TOD as it aims to create economically resource efficient and environmentally sound urban spaces in and around transit areas, leading to higher land prices and displacement of low-income households. Thereby, city authorities should allow higher FAR for building affordable housing close to transit stations as an incentive of LVC-based development (Gihring, 2009) [7]. Institutional support at the local level and their businesses is required to delineate TOD station precinct zone for pedestrian-oriented development (Jain & Singh, 2019).

C. Regulatory and Institutional Factors

Urban rail system such as MRTS have a wider impact of surrounding property prices than other transit systems such as Light rail or Buss Rapid Transit system (BRTS) owing to its higher ridership, higher speeds, and connectivity with other transport systems such as railways, roads, and so on (Suzuki et al., 2015). MRTS serves as an active independent public transport system with equal and safe access for all to reach out to wider services and job opportunities (UN-Habitat, 2020).

D. Local Market Demand and Socio-economic conditions

In developing Asian cities, social segregation of employment niches and spatial labor division encourages local market and socioeconomic segregation to be path dependent, which would impact TOD based investments and LVC at some point of time. TOD often displaces local low-value business with high value retail stores which encourages homogenization of local economic opportunities (Suzuki et al., 2015). To avert this homogenization effect, local urban bodies should develop strategic community-engagement consultations to create diverse job opportunities, retain existing local businesses, and strategically negotiate key office locations (Shakti Sustainable Energy Foundation, 2017).

VI. FRAMEWORK METHODOLOGY

The key objective of investment in transit in metropolitan cities is to ease road traffic congestion to possible extent in the most economical and financially effective ways to serve as many people as possible. This paper proposes a conceptual assessment framework with value capture strategy through integration of strategic land-use development, public transportation and transit funding. To achieve this objective, the proposed steps in the integrated framework assessment are:

- **Step 1.** Systematic Literature review of identified urban planning regulatory documents and transit-oriented planning policies
- **Step 2.** Identifying enabling factors for LVC Development-based mechanism



- **Step 3.** Comparative analysis of identified TOD policies at the national, state and city level

Step 1: Systematic Literature review of the relevant urban and transportation policies

The first step of the proposed integrated assessment framework methodology comprises of is to undertake in-depth literature review of urban planning regulatory documents and transit-oriented planning policies of the Delhi city, including:

National TOD Policies

- Master Plan of Delhi (MPD) 2041 Report
- National TOD Policy 2016
- National Urban Policy Framework 2018

State TOD Policies

- Jharkhand TOD Policy 2016
- Madhya Pradesh TOD Policy 2018
- Maharashtra State Urban Transport Policy 2017
- Haryana TOD Policy 2016
- Uttar Pradesh (UP) TOD and Mixed-use Policy 2014

City TOD Policies

- Bengaluru TOD Policy 2019

This first step of the methodology establish what existing urban land development and transportation policies are available to form regulatory basis for capturing land value gains from Delhi metro and identifying alternative transit funding mechanisms [2]. If there is some regulatory implementation drawback that would limit the introduction the introduction of land value capture assessment framework, certain new or modifications in the existing local bye-laws would be proposed to encourage TOD based mixed land-use development near transit stations [27].

Step2. Identifying enabling factors for LVC Development-based mechanism

Based on the literature review, few enabling factors and their supporting indicators have been selected to undertake comparative analysis of various national and urban level TOD policies. These have been discussed in detail in Table 1.

Table- I: Enabling Factors and Indicators for Comparative review of TOD Policies

| Factors | TOD | |
|--------------------------------------|---|--|
| | TOD Dimension | Indicators |
| MACRO FACTORS | <ul style="list-style-type: none"> • Density • Urban Design • Travel Demand Management | <ul style="list-style-type: none"> • Population Density (1) • Length of blocks (2) • Intersection Intensity (3) • Parking Facilities (4) • Parking Area (5) |
| REGULATORY AND INSTITUTIONAL FACTORS | <ul style="list-style-type: none"> • Land-use diversity • Demographics | <ul style="list-style-type: none"> • Affordable Housing Density (6) • Mixed Land-use (7) • Vertical Mixed-use (8) • Higher Densification through FAR (9) |
| TRANSIT TECHNOLOGY ADVANCEMENTS | <ul style="list-style-type: none"> • Demographics • Destination Accessibility | <ul style="list-style-type: none"> • Electric vehicles/charging stations (10) • Multimodal transport Connectivity at metro stations (11) • Smart City Applications and Intelligent Transport Systems (ITS) (12) |
| LOCAL MARKET DEMAND AND SOCIO-EC | <ul style="list-style-type: none"> • Density | <ul style="list-style-type: none"> • Employment/Commercial Density (13) |

| Factors | TOD | |
|-------------------|---------------|------------|
| | TOD Dimension | Indicators |
| ONOMIC CONDITIONS | | |

Above mentioned factors are used as a tool to understand different TOD policies formulated at national, state and city level and their potential in operationalizing TOD based Land value appreciation.

VII. COMPARATIVE ANALYSIS OF TOD POLICIES

On the basis of vast literature review, TOD policies are designed to encourage TOD implementation at three levels: city or regional level, neighborhood/local area level and station area level (Jain & Singh, 2019). The understanding of different TOD policies is done through identified study factors and indicators has been mentioned in the Table 2 below. Further, the discussion of amendments required in policies to make TOD application successful and thereby, enhance land value surrounding transit station.

Table- II: Comparative Analysis of TOD Policies

| Description | Table Column Head | |
|---|--------------------------------|------------------------------------|
| | TOD Indicators Achieved | TOD Indicators Ignored |
| National | | |
| National Urban Policy Framework 2018 | 6, 7, 9, 10, 11, 12 | 1, 2, 3, 4, 5, 8, 13 |
| Master Plan of Delhi 2041 | 4, 5, 6, 7, 8, 9, 10, 11 | 1, 2, 3, 12, 13 |
| National TOD Policy 2016 | 4, 5, 6, 7, 9, | 1, 2, 3, 8, 10, 11, 12, 13 |
| State Level | | |
| Jharkhand TOD Policy 2016 | 2, 4, 5, 13 | 1, 3, 6, 7, 8, 9, 10, 11, 12 |
| Madhya Pradesh TOD Policy 2018 | 4, 5, | 1, 2, 3, 6, 7, 8, 9, 10, 11, 12 13 |
| Maharashtra State Urban Transport Policy 2017 | 1, 2, 4, 5, 6, | 3, 7, 8, 9, 10, 11, 12, 13 |
| Haryana TOD Policy 2016 | 1, 4, 5, 7, 9, 11, | 2, 3, 6, 8, 10, 12, 13 |
| UP TOD and Mixed-use Policy 2014 | 4, 5, 6, 7, 8, 9 | 1, 2, 3, 10, 11, 12, 13 |
| City Specific | | |
| Bengaluru TOD Policy 2019 | 1, 2, 4, 5, 6, 7, 8, 9, 12, 13 | 3, 10, 11 |

VIII. CONCLUSION AND SUGGESTIONS

All of the above compared TOD policies on common identified TOD parameters encourages efficient blend of diverse compatible land-use including residential, retail, office and public space near transit stations along with achieving higher densification by providing more than permissible FAR. However, most of the policies fail to consider vertical mixing within buildings falling in intense TOD zone in a quantified way as done for horizontal Land-use mix with defined percentage of various land-uses in combination. Few state level policies are failing to consider affordable housing provision for Economically Weaker sections (EWS). There is a need to quantify percentage of total built-up area dedicated for EWS housing. Similarly, most of the policies have even though realized need for higher densities particularly population,



job and commercial densities however, have limited themselves to quantify such densities, especially employment densities.

Few policies have considered gross population densities and have prescribed persons per hectare (PPH) while no such defined criteria are there for job or commercial densities. Only few policies have realized the need to have smaller walkable blocks and have defined block sizes to be kept less than 150 meters. Intersection densities are completely ignored as they can further reduce short to medium daily trips lengths within a TOD zone. Most policies have provided provisions for providing parking facility, especially for bicycles and its management. Similarly, policies have ignored provision of providing dedicated electric vehicles charging stations as an alternate to non-motorized travel with no carbon emissions. Multimodal integration of transit system with other travel modes like bus, e-rickshaws, paratransit to resolve issues related with last mile connectivity have been ignored to a large extent. Lastly, very few policies consider to have innovative smart mobile based applications to provide real-time information to the nearby residing inhabitants. Like Bengaluru and Delhi city, which have been able to better capture LVC mechanism by particularly framing its own-context specific TOD policy, other metropolitan cities should do the same instead of only relying of National and State-level TOD policies.

Transit-supportively land-use requires effective coordination among local municipalities and transit companies to allow physical integration of transit station facilities with surrounding private properties and neighborhoods. For example, in case of Delhi, responsibility of TOD policies and projects implementation, matters are more complicate as three key bodies namely Delhi Metro Rail Corporation Limited (DMRC), DDA, & National Capital Region Board functions extensively overlap and all are under Ministry of Housing and Urban Affairs (MoHUA). Moreover, it is seen that DMRC's transit local station plans are often interfered by MoHUA (Suzuki et al., 2015).

TOD policies should provide a flexible layer of Form-based building codes (FBCs) to allow TOD based development to occur in consensus with community vision. FBCs are a place-based new urban design tools which can be adopted into municipal and building bye-laws to address form of development and physical character related issues such as pedestrian-friendly design key streets, relationship among building facades and defining public spaces. It proactively regulates these physical character related issues into blueprint for future development growth of an area which are desirable to community vision. In this manner, it not only results in high-quality and predictable public realm design by regulating and controlling overall physical character but also guides individual building component in shaping public spaces. In the Indian cities context, coordinated urban planning policies with TOD strategies will act as a major factor to optimize valuable land surrounding transit corridor through walkable urban development allowing amalgamation of different land-uses such as housing, retail shops, offices and other public amenities. It is imperative that state governments provide more power to city governments to link transit planning with other public services including housing, land-use planning and building bye-laws.

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