

Knowledge Product 2

# LAND VALUE CAPTURE FOR TRANSIT ORIENTED DEVELOPMENT

*A Demonstration*

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*A Demonstration*

## ACKNOWLEDGEMENTS

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Commissionerate, Meerut Division  
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Meerut Development Authority  
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NIUA would also like to acknowledge and appreciate the inputs provided by Mr Deepak Nayyar (Independent Real Estate Consultant), Mr Srinivas Rao (TCPO, Government of India), Ms Prerna Mehta (WRI India), Mr Adarsha Kapoor and Ms Somi Chatterjee (Creative Footprints), Ms Shreya Gadepalli (ITDP India) and Ms Paromita Roy (IRSDC) in refining this publication further.

# Preface

Transit Oriented Development (TOD) is a globally recognised approach for achieving sustainability through land-use-transportation integration. It can be used effectively to create high density, compact neighbourhoods supported by public transit, to reduce the dependence on private vehicles and the pollution and congestion resulting from it. The Ministry of Housing & Urban Affairs' (MoHUA) National Smart City Mission presents a timely opportunity and support for many Indian cities to adopt TOD as an approach to address some pressing issues of housing, mobility and infrastructure that they are struggling with currently. As these cities are in the process of implementing their Smart City Plans, they face the great challenge of operationalising their proposed TOD projects and sustaining them to deliver long term improvements (beyond the immediate framework of the Smart Cities Mission) in the quality of life for its citizens.

In 2017, NIUA completed a study on TOD in Indian Smart Cities for the Prosperity Programme of the FCO-UK. The study aimed to and achieved providing technical support to the Indian Smart Cities planning to implement TOD/land-use-transportation integration through immersion visits, domestic and international workshops for about 15 Indian city commissioners and technical documents regarding complex TOD issues. All the generated knowledge products are available at [www.tod.niua.org](http://www.tod.niua.org). During and after the completion of the project, NIUA supported the development of policy briefs for MoHUA regarding National Value Capture Policy and National Transit Oriented Development Policy drawing upon its findings from the study and numerous interactions with the municipal commissioners, TOD experts and the private sector.

Findings from international examples indicated that successful global implementations of TOD have managed incorporating technical & program management with due course corrections, however, Indian cities, over the last decade have begun to solely implement the technical components of TOD without necessarily integrating the program management component. Thus, the pressing rationale for this particular study is to help these cities develop a formal approach to raising resources, developing business case, planning for O&M costs through value capture, engaging various private and public stakeholder buy-in and support and develop the TOD proposal to project ready for ground breaking.

The main aim of this project was to assist any one Indian city towards implementation of its proposed TOD in its Smart City Plan or otherwise. However, after preliminary consultations with the cities of Pune & Ranchi that had identified TOD projects in their Smart City Plans and the National Capital Region Transport Corporation (NCRTC) that is in the process of implementing the Regional Rapid Transit System (RRTS), NIUA signed a Memorandum of Understanding with the National Capital Region Transport Corporation for providing technical assistance for implementing TOD & related Value Capture mechanisms along the proposed Delhi-Ghaziabad-Meerut RRTS corridor. The entire process is documented in the form of knowledge products that can be used by other interested Indian cities for demarcating TOD zones and exploring options for value capture financing in the context of Transit Oriented Development.

The Course of Implemenation for TOD that NIUA has devised, based on its extensive research on the subject and experience from the implementation project is depicted in the knowledge products with steps and components thereof for easy understanding.

# Course of Implementation of TOD

Knowledge Product 1:

## Value Capture Finance in Transit Oriented Development

*A Guide to Implementation*

*This document is the first knowledge product developed as a part of the technical assistance. It emphasizes the importance of Value Capture Financing and the role it plays in implementation of Transit Oriented Development.*

*Further its also covers the process of identification, demarcation and area estimation of Influence Zones around transit stations and Special Development Areas identified in the vicinity (step 0-1) and talks about different instruments that can be used for VCF, their enforcement and regulatory mechanisms by detailing out the strategy followed for Delhi-Ghaziabad-Meerut RRTS (Step 2).*

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### Baselining

- Background study; understand existing Regional Plans, Master Plans, Zonal Plans and the respective Development Control Regulations
- Formulate a vision for the corridor including each individual TOD nodes after extensive consultation with city government officials
- Arrive at appropriate land use mix for each IZ & SDA

1

### Identification & Delineation of Transit Oriented Development zones

- Delineation of TOD zone after consultation with city government officials.
- Define the criteria for calculation of the amount of land that will undergo development/ redevelopment through the project lifecycle.
- Develop appropriate scenarios to derive the total amount of developable land (conservative, realistic and optimistic scenarios)

3

### Planning of a TOD node

- Undertake Demand studies to identify key economic drivers and activities
  - Prepare a Zonal plan for each Influence zones & Special Development Areas including:
    - Land use plan and zoning
    - Development Control Regulations
    - Form based codes, design and sustainability guidelines
    - Traffic integration strategies
- Follow a consultative process with participation from:
  - City Government officials
  - Private developers, potential occupiers and tenants
  - Citizens

4

### Local Governance

- Facilitate inter agency coordination and shared ownership of the TOD project
- Amendments to Acts, Policies, Regulations, etc
- Institutional framework & governance mechanism

2

### Resource Mobilisation Plan

- Identify & shortlist potential revenue instruments
- Generate VCF scenarios (Conservative, Realistic, Optimistic)
- Fund management mechanism
- Evaluate Land Value Capture opportunities through real estate development

Knowledge Product 2:

## Land Value Capture for Transit Oriented Development

*A Demonstration*

*The second document focuses on the concept of Land Value Capture and different aspects of the same (step 2-d). Essentially, it presents the case of Sahibabad where the project team demonstrated Land Value Capture by leveraging publicly owned lands as a trigger for development.*

# Message from Ministry of Housing & Urban Affairs

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As cities around the world strive to achieve goals of sustainability and liveability, challenges around land, housing, mobility and informal economy remain unaddressed to a large extent. Amongst the above, mobility overlaps to a great extent with the goals of sustainability, climate change adaptation, and mitigation. Transport lines are the lifelines of a city, and need large investments to provide for ever-growing needs.

Government of India's Smart Cities Mission has supported investments for upgrading infrastructure for mobility corridors in several cities, as they cope with the challenges of land use and transport integration. Transit-Oriented Development (TOD), which is an ancient concept has emerged to be one of the most effective choices. Few cities in the west such as Curitiba, Bogota and London have adopted the concept in a renewed manner with some excellent results to showcase. Several cities in the Asia have also attempted the same to overcome their respective challenges. TOD not only helps in reducing carbon footprint through minimised private vehicle usage, but it also encourages walkability and other modes of non-motorised transport with compactly designed neighbourhoods. It is very encouraging to see that cities want to implement such sustainable solutions for a more sustainable and liveable future. I am also glad that the topic of TOD along with ways of implementation is being deliberated upon among experts and planning professionals today.

Value Capture Finance (VCF) is yet another concept that is gaining importance as an execution mechanism for funding of large scale infrastructure projects. Few cities in India such as Pune & Nagpur have been experimenting with several instruments of VCF, however, there is a pertinent need of bottom-up & data-driven approach, and citizen participation to be designed into this entire process. Further, the methodology, along with challenges and lessons needs to be captured and documented as knowledge for further dissemination.

I commend NIUA's efforts of working with NCRTC on their RRTS project and simultaneously documenting the process, challenges and lessons in the form of these knowledge products. They shall certainly be of lot of help to other cities chasing similar goals for a sustainable and climate-responsive future. Lastly, a special mention of the Shakti Sustainable Energy Foundation for making this study happen with generous financial support.

My congratulations to the team and best wishes to the cities benefiting from the products to take it forward.

*Kunal Kumar (IAS)*  
*Joint Secretary-MoHUA & Mission Director-Smart Cities*

# Foreword

Transit Oriented Development (TOD) is a globally recognized approach to maximise the amount of housing, work and leisure that is within walking distance from high quality public transport infrastructure. It is characterised by high density, compact and diverse land-use neighbourhoods supported by a continuous and direct street network, with high quality public transport, walking and cycling infrastructure. Such developments reduce the need for motorised trips and enable a shift toward public transport, thereby reducing the energy and emission intensity of the transport system. With many Indian cities investing in mass transit systems such as metro rail and Bus Rapid Transit (BRT) systems, adopting a TOD approach can help maximise patronage to these public transport systems.

In 2017, the Ministry of Housing and Urban Affairs (MoHUA) released the National TOD Policy acknowledging the importance for cities to adopt TOD within their development plans. Many states have adopted and released their own TOD policies. However, despite policy action, two critical barriers to implement TOD remained unaddressed. The first was the lack of adequate urban planning tools that enabled area level interventions necessary for TOD; the second was the challenge of sustainably funding high quality transit and urban infrastructure required to build TOD in our cities.

Recognising this challenge, Shakti Sustainable Energy Foundation supported National Institute of Urban Affairs (NIUA) to provide technical assistance to the National Capital Region Transport Corporation (NCRTC), on overcoming these barriers while implementing TOD along the proposed Delhi – Meerut Regional Rapid Transit System (RRTS). Over a period of two years, NIUA provided targeted inputs to NCRTC on implementing this project, incorporating the means to sustainably finance TOD through Value Capture Finance (VCF) mechanisms.

In our endeavour to ensure that best practices may be adopted at scale, this project presented a unique opportunity to ensure that relatively niche subject area such as VCF for TOD, could be made more accessible to a range of expert working in the field of sustainable transport and urban development. With this objective, NIUA developed a process document, which captures the various steps and considerations for effective implementation of VCF while executing TOD along a mass transit project.

These Knowledge Products provide perspectives on the value the VCF approach brings to sustaining large-scale public transport and urban development investments, while discussing a bouquet of tools that can be used to deploy VCF, comparing their enforcement and regulatory mechanisms and lastly demonstrating Land Value Capture at one of the nodes along the RRTS corridor.

I trust these Knowledge Products will provide meaningful guidance to other Indian cities and transport entities to realize their TOD projects. I take this opportunity to thank our grantee partner, the National Institute of Urban Affairs, for their efforts in supporting NCRTC and developing these Knowledge Products.

Chinmaya Acharya  
CEO (Interim)  
Shakti Sustainable Energy Foundation

# Foreword

NIUA, with its research base in several urban themes ranging from urbanisation & economic growth, urban governance & finance, urban infrastructure & built environment amongst others, has over the years emerged as a thought leader and a knowledge hub for urban development in India through its competencies in research, knowledge management, policy advocacy and capacity building to address urban challenges and has continuously strived to develop sustainable, inclusive, and productive urban ecosystems in the country.

In 2017, NIUA was engaged in a research project on Transit Oriented Development in Indian Smart Cities that was financially supported by the Foreign & Commonwealth Office of Government of United Kingdom. The project produced outputs that established constructs of Urban Density, Urban Diversity, Urban Design, Housing and Mobility – as core themes in a Transit Oriented Development, followed by a series of publications that outline tools for financial sustainability of TOD and assessment of Smart City plans that featured TOD projects with respect to the identified TOD constructs.

Subsequent to the above, NIUA received a generous grant from Shakti Sustainable Energy Foundation (SSEF) to take forward the implementation of TOD in an Indian city. After screening across the country, NIUA partnered with the National Capital Region Transport Corporation (NCRTC), as their RRTS project had TOD as a stated intention and work was on a fast pace. NIUA deployed a team for technically assisting NCRTC for TOD implementation and related value capture mechanisms along the proposed Delhi-Ghaziabad-Meerut RRTS corridor.

As the engagement with SSEF on this project comes to an end, NIUA is now pleased to publish knowledge products that capture the process that was followed for the project, documenting the challenges faced and key lessons learnt and thereby providing a guide for other cities and transport entities to follow; to realise their TOD-based projects and proposals through several financial mechanisms and tools. The products primarily focus on providing an understanding into the course of implementation of TOD & VCF related instruments and tools with supporting references drawn from Delhi-Ghaziabad-Meerut RRTS corridor. Further, based on evidence and decision-making methods, the team has formulated a step wise methodology for assessment and revenue estimation for various VCF instruments.

NIUA is thankful to Shakti Foundation for its gracious support and commitment to the cause of a cleaner tomorrow. I appreciate the encouragement of Mr. Chinmaya Acharya (interim CEO), Mr Vivek Chandran & Ms Avni Mehta throughout our engagement of more than two years. We also appreciate the inputs provided by group of experts who shared their wisdom and experience with the team at NIUA and helped in refining these knowledge products. Finally, I would like to acknowledge the hard work and dedication put in by our project team in developing these products. We hope that these knowledge products prove to be a useful tool for other cities in implementation & decision making for Value Capture Financing in Transit Oriented Development.

Hitesh Vaidya  
Director  
National Institute of Urban Affairs (NIUA)

ABBREVIATIONS

ABD: Area Based Development  
CBD: Central Business District  
CDA: Comprehensive Development area  
CIDCO: City and Industrial Development Corporation  
CWG: Canary Wharf Group  
DCR: Development Control Regulation  
DOT: Development Oriented Transit  
DMRC: Delhi Metro Rail Corporation  
DPR: Detailed Project Report  
FCO-UK: Foreign & Commonwealth Office- United Kingdom  
GDA: Ghaziabad Development Authority  
IZ: Influence Zone  
JNR: Japanese National Railway  
LARR: Land Acquisition, Rehabilitation and Resettlement  
MoHUA: Ministry of Housing & Urban Affairs  
MMRDA: Mumbai Metropolitan Region Development Authority

MRTS: Mass Rapid Transit System  
MTR: Mass Transit Railway (Hong Kong SAR,China)  
NCR: National Capital Region  
NCRPB: National Capital Region Planning Board  
NCRTC: National Capital Region Transport Corporation  
NIUA: National Institute of Urban Affairs  
NMT: Non-Motorized Transport  
PD: Property Development  
RRTS: Regional Rapid Transit System  
SDA: Special Development Area  
TPS: Town Planning Scheme  
TOD: Transit Oriented Development  
UPAVN: Uttar Pradesh Awas Vikas Nigam  
UPSIDC: Uttar Pradesh State Industrial Development Corporation  
UPSRTC: Uttar Pradesh State Road Transport Corporation

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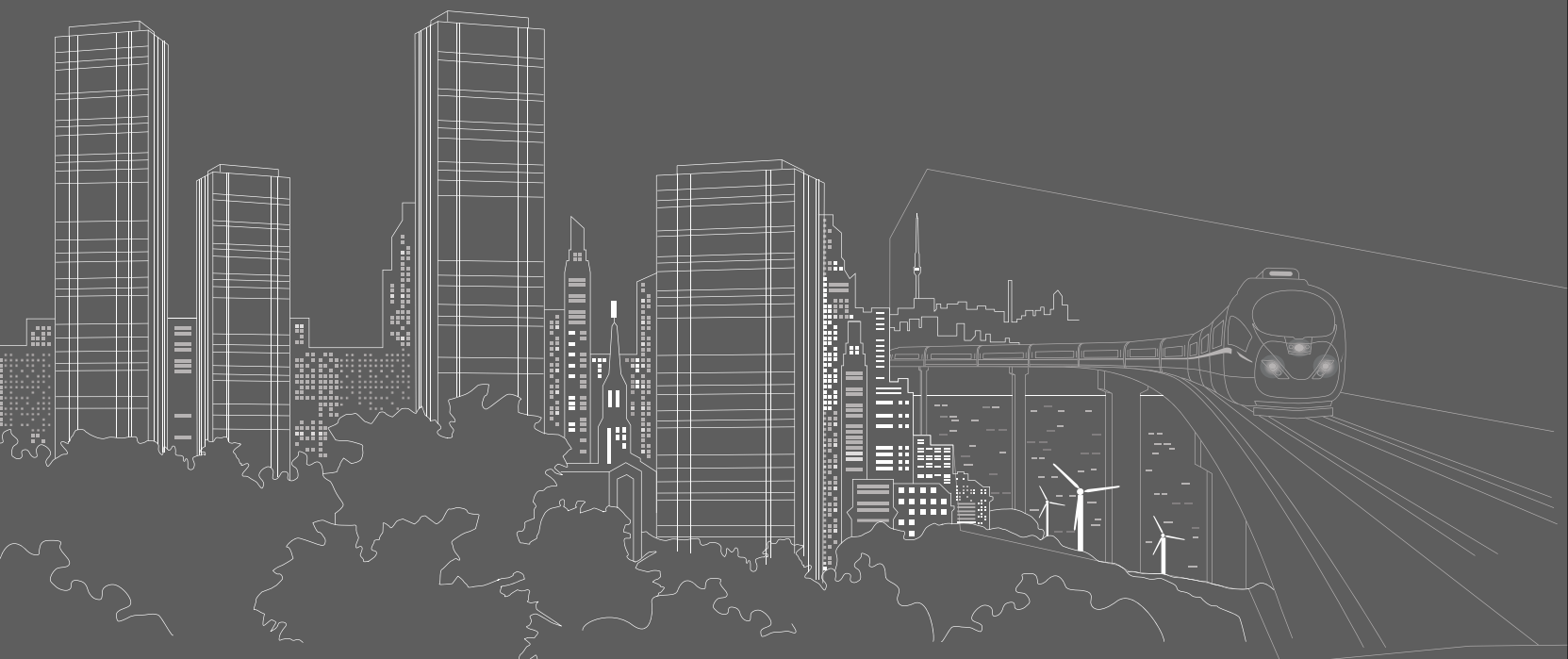
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# Introduction

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01

Land is considered to be the longest-living asset and mostly has an essentially everlasting appreciation value. It gains even more importance when a large-scale infrastructure project such as a transit corridor is proposed. Thus, while catering to the subsequent real estate and supporting infrastructure demand, optimum utilisation of the available land is crucial in any development scenario. Land assembly is one of the fundamental components for any large-scale development and the close second is the monetisation of the land asset. One of the ways that can trigger further development in any development scenario is leveraging of the presence of lands owned by any public agency. The public agency can self-develop or opt for joint development/PPP model, which can facilitate attracting more investments in the area and expediting the overall development. In contrary in case of privately-owned land parcels, the challenge is to assemble the land together to propose any large-scale project or infrastructure.

Globally, there are several mechanisms been adopted for the same. In India, urban land management is been done using following two primary land management techniques: Land Acquisition and Land Pooling/Readjustment. Compulsory acquisition of land through Land Acquisition Act is the conventional approach, whereas the concept of land readjustment assembles small land parcels into a large one, providing it with infrastructure in a planned manner and returning the reconstituted land to the owners, after deducting the cost of the provision of infrastructure and public spaces by the sale of some of serviced land.

Land Acquisition can enable rapid availability of adequate amount of land for development, provided most of the owners agree for sale. It provides almost a clean slate for the new master plan for the assembled land and as the value of the land appreciates, it provides opportunity for the development authority to accrue the benefits(Ballaney, 2008). One of the acts governing the process of land acquisition is the LARR Act of 2013. However, the process of land acquisition involves a lot of demerits namely, lack of benefit to the original land owners,

time consuming process, land monopoly and adverse effects on the socio-economic structure. This is the reason Land Pooling or Land Readjustment is preferred by the Development Authorities or public planning agencies when it comes to large scale land development.

The mechanism of Land Pooling brings together a group of land owners under the aegis of the state-level Town Planning Act. Since this mechanism does not involve any acquisition, there is no case of monetary compensation. With preparation of a Master Plan for the said area, the resultant land parcel is reconstituted into plots to original owners. It was extensively followed in Maharashtra & Gujarat under the aegis of erstwhile Bombay Town Planning Act 1915 to expedite the process of land development. Development of Magarpatta city in Pune is an excellent example of land pooling. The city of Ahmedabad has been developed using the Town Planning Scheme (TPS) mechanism. A recent example of TPS implementation in Maharashtra is the land pooling carried out for Navi Mumbai Airport Influence Notified Area (NAINA) by CIDCO under the amended Maharashtra Regional & Town Planning Act 1966.

A more unconventional model of development to monetise the available land asset, is infrastructure guided development that uses the provisions of infrastructure as a facilitator to guide urban development in the region. This is at times done in partnership with landowners who pay for the cost of serving their land through donation of land for public infrastructure and payment of a betterment levy. This mechanism is a form of capturing the value created by the infrastructure and is termed as Land Value Capture. The development of any transit corridor project results in an increase in the real estate values along the corridor because of the improved connectivity benefits. This is more around the station areas. The leveraging of the real estate potential of lands /airspace in and around stations is by the means of land value capture. The transit authority has the opportunity to undertake real estate development in and around the station premises to encash on the prospect of a prime property.

‘Land value capture enables communities to recover and reinvest land value increases resulting from public investment and other government actions.’

*Lincoln Institute of Land Policy; Policy Brief on Land Value Capture*

Figure 1 : The settlement at Magarpatta in Pune was developed in early 2000s where 120 farmer families came together to develop the agricultural land into a residential and commercial township.





Figure 2: Bandra Kurla Complex, Mumbai



Source: [https://www.reddit.com/r/india/comments/3p4jq6/bandra\\_kurla\\_complex\\_mumbai](https://www.reddit.com/r/india/comments/3p4jq6/bandra_kurla_complex_mumbai)

There are different development models that are followed in Land Value Capture. In an area where a new transit corridor is proposed to be built, the government transfers land development rights to a transit authority at the before-transit development price. The authority then has an option of developing the land on its own or it can partner with private developers to further develop the properties near the new transit route, share the profits, and use the funds to reinvest in the transit system and other public improvements.

Government of Maharashtra granted Maha Metro the status of Special Planning Authority for development along the metro corridor. The transit authority then planned property development along the metro corridor by leasing out sites to real estate developers or end users and following the PPP model of development. The lease was for long term (50 years) and the revenue is proposed to be received by Maha Metro upfront or on annual basis. The real estate developer can avail the benefits of additional FAR as prescribed in the TOD policy notification of 2017. Following a successful run in Nagpur, Maha Metro also requested the Government of Maharashtra for status of a Special Planning Authority in Pune.

The Hong Kong Mass Transit Railway (MTR) Corporation used the Rail + Property (R+P) model for three decades to build vibrant neighbourhoods, conserve open space, and construct a railway system that covers 221 km and serves more than five million people.

The Corporation has at times raised US\$1.5 billion annually via the self-sustaining R+P model (Lincoln Leong, 2016). A similar model is followed in Haryana where Joint Development is used to allow private developers to assemble parcels that exceed the limits set by the Urban Land Ceiling Act. Haryana State, with the enactment of the Haryana Development and Regulation of Urban Areas Act (HDRUAA) in 1975, became the only State in India to formally involve the corporate private sector in the acquisition, development, and disposal of urban land.

In a different licensing case of development, the Mumbai Metropolitan Region Development Authority (MMRDA) was successful in developing the entire area of Bandra-Kurla Complex (BKC) located in the western suburbs of Mumbai by leasing out parcels of land on a long-term basis (99 years) and accruing the revenue for further infrastructure development in the area. In 1977, the MMRDA was appointed as the Special Planning Authority for planning and development of BKC. It covers 370 ha. area of once low-lying land on either side of the Mithi River, Vakola Nalla and Mahim Creek. The complex now provides more than 2 lakh jobs and was a successful solution to absorb the growth of offices and commercial activities in the city. The Authority developed 19 hectares of land with an office space as large as 1,17,000 sq. m. Today, BKC hosts corporate headquarters of several Multi-National Companies in addition to staff quarters, club, 5-star hotels, convention complex, Diamond Bourse, hospitals, public open spaces and a 30 km long cycle track.



Property Development as a form of Land Value Capture

The MRTS/RRTS stations offer an excellent opportunity to take advantage of the real estate opportunities targeting huge number of commuters as well as the people in the immediate neighborhood and in the catchment area. These properties command a hefty premium to the market due to their proximity to the station. For a transit authority these are additional revenue streams which can be utilised for enhancing the non-fare box revenue. There are two ways to leverage the real estate revenues – one is through property development on

the land adjacent to the station area and the other through leasing out space within the station box. The station box itself can have small retail outlets such as ATM, Telecom business, Kiosk, Water vending machine, Shop, Health Monitor, Smart Box and Semi-Naming Rights for the station and Optical Fibre Cable network leasing. The mix can be decided based on the design of the station, projected footfall and profile of the neighborhood.

Approach & Methodology of revenue projections of Property Development within & outside stations  
Case of Delhi-Ghaziabad-Meerut RRTS

The Delhi-Ghaziabad-Meerut RRTS is proposed to run for a length of 82 km with 22 stations. At each station, NCRTC proposed to dedicate a certain amount of area for commercial establishments. A projection of rentals across the recommended typology -mix can help define the quantum of rental revenue possible.

For the purpose of deriving the feasible retail establishments at the 22 RRTS stations, 143 DMRC stations are studied for the operational retail typologies and subsequently 6 representative stations are shortlisted based on the average daily footfall, projected neighborhood character and development potential of the surrounding area. An equivalent year<sup>1</sup> is arrived at after comparing the 22 RRTS stations to the representative 6 DMRC stations for revenue estimation from each of the retail typologies identified in this study.

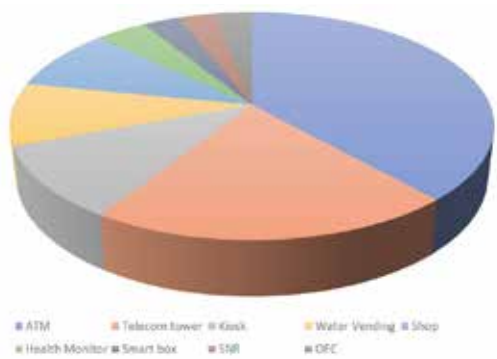
The six representative stations taken were – Kashmere Gate, Nehru Place, Vaishali, Welcome, Shahdara and Mundka. For each of the 22 stations the most appropriate benchmark station it would match to and in which year was determined. Thus, for each retail typology, the base rental and year was equalized and rental value projections for the entire 35-year project lifecycle was done with the year of operationalization of RRTS being 2024.

Based on the station designs, the locations and the actual number of retail typologies were quantified and area was allotted. The area and rent value projections help in arriving at the total rental revenue projections. Further, 2 scenarios were generated for rental

projections, where in for scenario 1 a 20% increase in rentals was assumed every fourth year, while in scenario 2, a 5% annual increase in rentals was assumed. These quantify the rental revenues by Property Development for the entire project lifecycle.

For such projection in case of Delhi-Ghaziabad-Meerut RRTS corridor that is proposed to be operational by 2024, only 50% of occupancy was assumed in the first year of operations at all the 22 stations. Further, 80% occupancy was assumed for every year for next 35 years. Figure 3 shows the share of the rental projections for all above retail typologies.

Figure 3 : Retail Typologies within the stations



<sup>1</sup>One can define 'equivalent year' as the projected year when the subject station would become comparable in real estate rentals to the benchmarked station. It is a subjective decision (based on experience) and would depend on the future profile of the neighborhood at the subject station and the respective footfall.

Apart from the small retail outlets mentioned above, there is also a possibility of utilizing additional floor space area available at stations. In case of Delhi-Ghaziabad-Meerut RRTS corridor, out of the 22 stations, there are 5 stations that are elevated and there is a potential for additional floors below the platform level. Additionally, there are 3 stations that are underground and at an enormous depth, where concourses are possible above the platform level. Such levels, whether overhead or underground are full concourses that can be used for property development, i.e. leased out commercially for a long duration. Out of the total area for property development, the effective area for such commercial establishments may not be more than 50% of the available area within the station after excluding the circulation space and utilities.

As regard to the occupancy of these areas with property development along Delhi-Ghaziabad-Meerut RRTS corridor, it is assumed that there will be 30% occupancy in the first operational year of RRTS; 60% occupancy in the second year; 70% in the third year and 80% occupancy further every year for the next 35 years

Another assumption has been made with regard to rentals achieved in these large areas at the stations. It has been assumed that the rentals from a large floor space leased out for a long duration would be 75% of the rental rates for small retail typologies at the same station. Since the areas are much larger than the area occupied by the retail typologies, the achievable rentals for them would be at a discount to the retail area rentals..

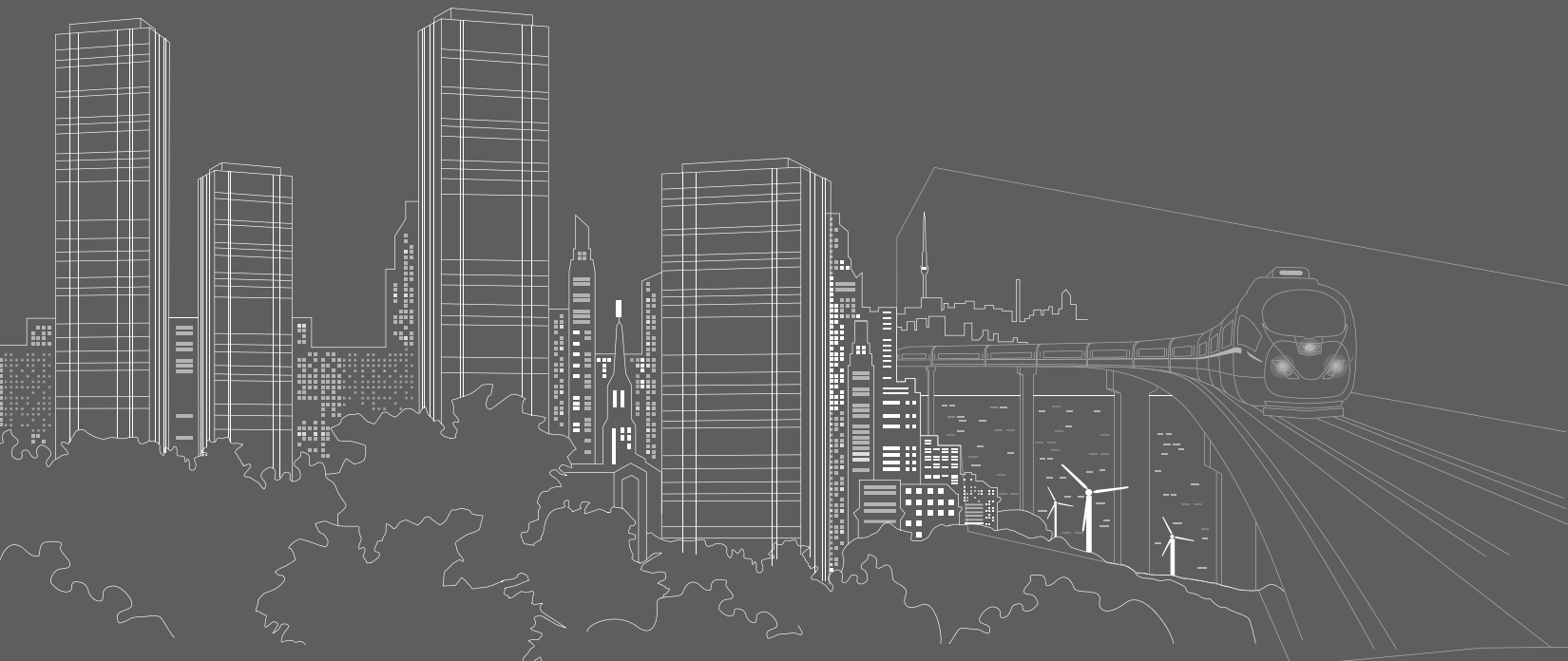


Source: <https://www.dfordelhi.in/4-malls-cum-metro-stations-in-delhi-every-newbie-must-know-of/>

# Case Studies: Transit Oriented Development & Land Value Capture

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# 02





# King's Cross, London

The mixed-use redevelopment of the King's Cross site has involved a long process of spatial coordination with three local authorities: Camden Council, adjoining Islington Council, and the Greater London Authority. There has also been close consultation with related statutory bodies (such as English Heritage over buildings to be preserved) and with local community groups through the King's Cross Development Forum (Gossop 2007). In 2006 the Camden Borough Development Control Committee gave planning permission for redeveloping the King's Cross brownfield site via a Section 106 agreement, reflecting the consultation process of spatial coordination with local stakeholders (Camden Council 2006). The agreement contains the broad principles of the redevelopment scheme with "floor space maxima" to guarantee diverse site use.

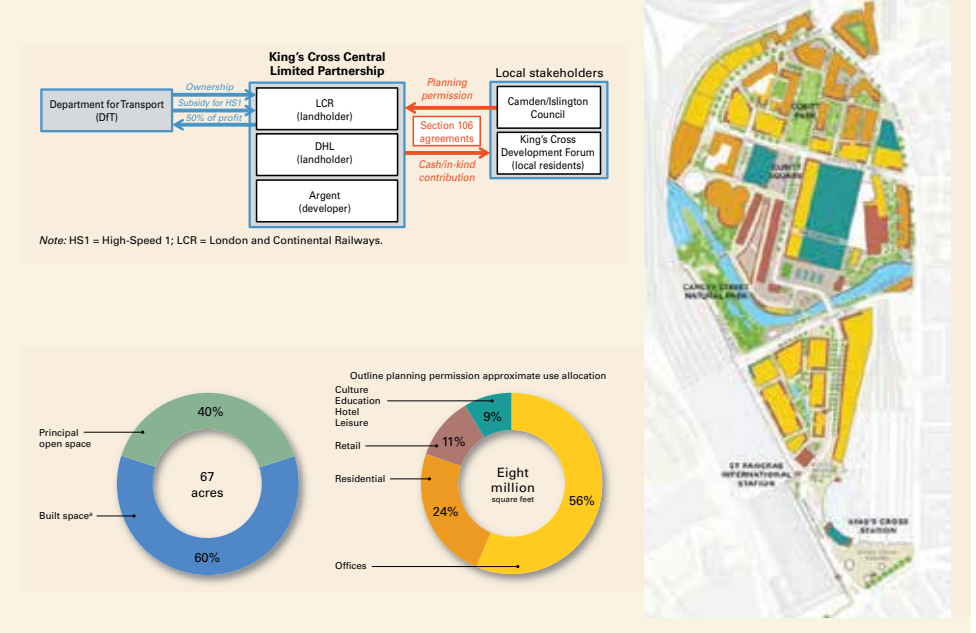
This section provides a means for local authorities to negotiate agreements or planning obligations with a landowner or developer in association with the granting of planning permissions. Section 106 agreements can be financial in that landowners or developers are required to make some sort of financial commitment (lump sum or recurring) in exchange for development permission; or can be in kind

that assure local interest, such as affordable housing or community facilities.

The Section 106 agreement package around King's Cross includes cash and in-kind contributions to the provision of local infrastructure and community services by the joint developer for the Camden council including £2.1 million to create 24,000-27,000 local jobs through a Construction Training Centre and Skills and Recruitment Centre; 1,900 homes, more than 40 percent of which will be affordable housing; cash and in-kind contributions for community, sports, and leisure facilities; new green public spaces, plus new landscaped squares and well-designed and accessible streets, accounting for about 40 percent of the entire site; a new visitor center, education facilities, and a bridge across the canal to link streets; and cash contributions to improve adjacent streets, transit stops, and bus services (Camden Council 2006).

Source: Hiroaki Suzuki, Jin Murakami, Yu-Hung Hong, and Beth Tamayose.2015. Financing transit Oriented Development with land Values, Adapting Land Value Capture in Developing Countries.

Figure 4: Stakeholders in the land value capture scheme and Section 106 agreements around King's Cross



Source: 2014 Argent (property Development) Services LLP. Used with permission; further permission required for reuse

Figure 5: Station area-King Cross



Source: Construction at King's Cross



Source: <https://tod.nyu.org/todisc/book.php?book=1&section=4>





Source: <https://tod.niua.org/todfisc/book.php?book=1&section=4>

## Canary Wharf, London

Canary Wharf site benefits from very good public transportation connectivity, being served by the Docklands Light Railway, the Jubilee underground line through Canary Wharf tube station, several bus and cycle tracks. Canary Wharf Pier is also served by two commuter-oriented river ferry services. As a result, more than 90% of Canary Wharf commuters now travel by means other than private car. This excellent connectivity is a major benefit to the neighborhood which stimulates economic growth. The developers played a pro-active role in improving transport links, which they recognized as essential to the success of the project.

Canary Wharf Group plc is a British property company headquartered in London, England. It is the owner and developer of Canary Wharf business district in London, under a Public-Private Partnership (PPP). The revenue of the group comes from the office space rental. The development of traditional high-rise structures was coupled with intense facility management technology and a pronounced desire to create a sustainable urban space. CWG worked with engineers, architects, facility managers, and consultants from around the globe to create the perfect blend of green, high tech, and economically vibrant development project.

Source: [www.tod.niua.org](http://www.tod.niua.org)

Figure 6: Canary Wharf Development Plan - 2025



Source: SOM 2025

Figure 7: Station area - Canary Wharf



Source: Google Map, 2016



# Shingawa, Japan

Through the 1987 privatization, about 10 hectares of the Shinagawa rail yard was transferred to the JNR Settlement Corporation not only to pay off the huge debt but also to increase asset values by promoting more comprehensive area planning and development around. The initial yard's function was gradually relocated to another site in Tokyo, costing about ¥42 billion (\$382 million) over 18 years.

The JNR Settlement Corporation, bringing in JR East, private developers, new property owners, and local governments, designated the land readjustment district over the 13.7 hectares that encompassed the 10-hectare yard site, as well as surrounding public-private blocks. This extensive approach generated greater road access to the station and a better-connected pedestrian network in and around the project district without much public assistance. This urban regeneration package was comprehensively adapted to convert both the land readjustment and private property redevelopment districts (totalling 16.2 hectares) into six hyper-blocks that incorporated “human-scale” circulation systems within the six large parcels.

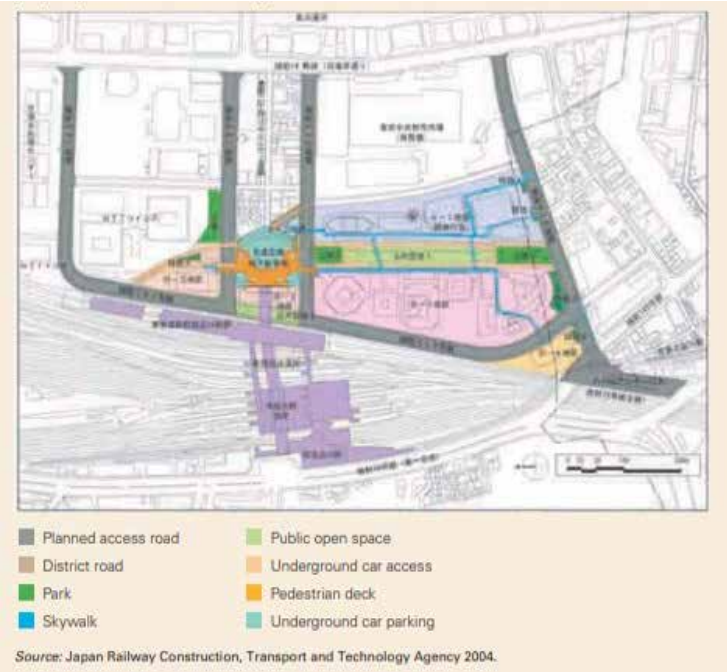
Figure 8: Before and after images of Shingawa station, Japan



Source: ©Japan Railway Construction, Transport and Technology Agency, 1981 and 2008.

To incentivize the provision of residential, pedestrian, and public amenity spaces within the private commercial redevelopments, substantial FAR bonuses were given to the new property owners. For instance, the B-1 commercial district (base FAR 7.0) achieved the maximum FAR of 9.5 by including 35,433 square meters of collective housing floor area for a bonus FAR of 0.6 and by creating public open and green spaces as well as a pedestrian skyway network for a bonus FAR of 1.9. This attracted amenity-conscious business entities and increased property prices. Land values of the station area soared by over 73.6 percent, but such a jump was also likely due to intercity accessibility benefits produced by JR Central's new Shinkansen stop, which opened in 2003. The construction costs of the wide bridge with the new Shinkansen terminus were paid for from the developer building owner side through a petition process, largely because JR Central had taken a passive position since the early stages of the regeneration plan (Suzuki, 2015).

Figure 9: Access roads, pedestrian facilities, and green spaces provided by private property owners within the superblocks for floor area ratio bonuses



Source: Japan Railway Construction, Transport and Technology Agency 2004.



Source: <https://study.galjinpot.com/lesson/yamanote/shinagawa-station/>





Source: [https://ja.m.wikipedia.org/wiki/%E3%83%95%E3%82%A1%E3%82%A4%E3%83%AB:Hong\\_Kong\\_West\\_Kowloon\\_Station\\_view\\_201810.jpg](https://ja.m.wikipedia.org/wiki/%E3%83%95%E3%82%A1%E3%82%A4%E3%83%AB:Hong_Kong_West_Kowloon_Station_view_201810.jpg)

## Kowloon, Hong Kong

Opened as a key intermediate terminus of the Airport Express in 1998, the Kowloon Station case shows that R+P with the principles of transit-oriented development need not be limited to greenfield projects.

On reclaimed land in West Kowloon, the distinctive R+P packages that integrate the 118-story International Commerce Centre with residential and retail complexes on the Kowloon Station net out at a moderate FAR of 8.1 within a 13.5-hectare CDA zone. Built as part of a city-led waterfront redevelopment initiative, the station area plan contains a generous amount of public open space and cultural and entertainment facilities, coordinated with the government and private developers. The intermodal vehicle facilities and pedestrian circulation systems are well integrated within the podium development, offering seamless travel services.

However, this podium design has disengaged station area activities from the surrounding context with a high blank-wall ratio (about 89 percent) and has limited ground-level integration and interaction with neighbouring districts in West Kowloon. Due to its vertical multiplicity, engineering complexity, and market conditions, this R+P project was divided into seven components and completed with 13 developers' phase by phase from 1998 to 2010 (Suzuki, 2015)

Figure 10: Rail plus property development layers atop Kowloon station

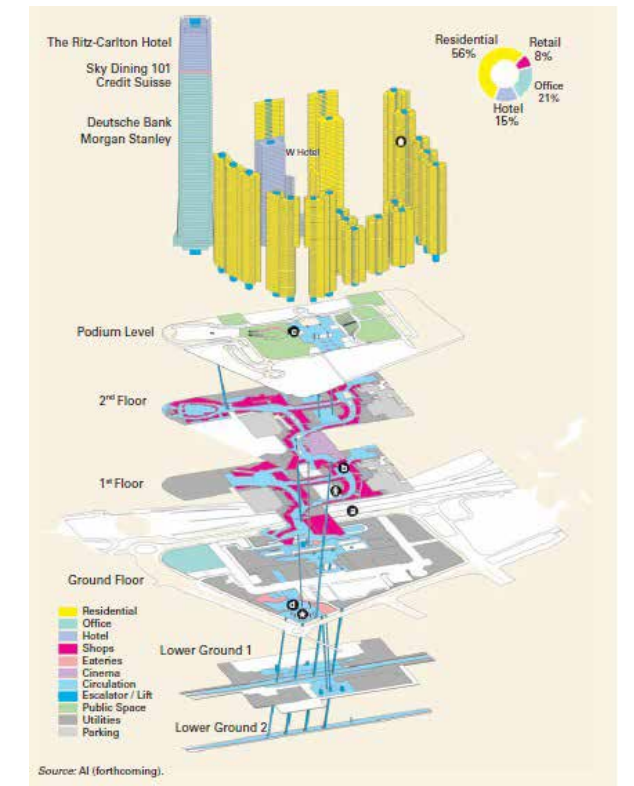


Figure 11: Location of Kowloon station on Tung Chung line and the Airport Express of Hong Kong's MTR



Source: [https://www.researchgate.net/figure/Targeted-stations-along-the-Tung-Chung-Line\\_fig2\\_326413298](https://www.researchgate.net/figure/Targeted-stations-along-the-Tung-Chung-Line_fig2_326413298)





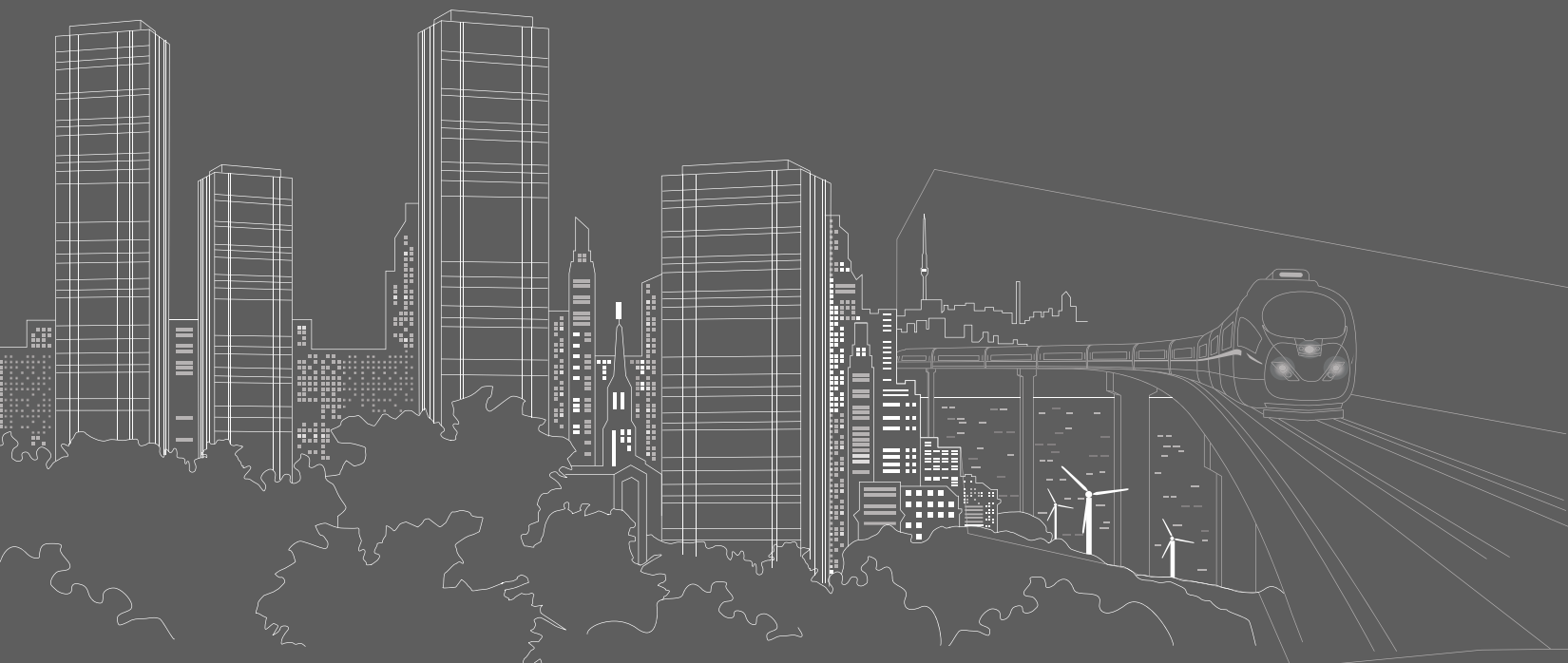
## Key take-aways from the Case Studies

- Any envisaged transit-oriented development is an organic process where spatial coordination and close consultation with local authorities and community groups is essential. Following the example of Kings' Cross, London, the process can be formalised by the higher (State-level) Authorities through statutory notifications.
- Public-private partnership plays an important role in TOD. The model followed by Canary Wharf Group PLC is an excellent example where an entity is set up for the implementation of the envisaged development, which also undertakes the land assembly process.
- Multi-stakeholder engagement in Shinagawa for the land readjustment provided greater road access and better-connected pedestrian network, thus emphasising yet again on its significance. This is accentuated again in the case of Kowloon, Hong Kong where mixed use brownfield development was possible with a multi-stakeholder approach.
- It can be seen from the case of Shinagawa that any model of Transit Oriented Development can be triggered by awarding additional Floor Area Ratio to accommodate the planned residential, pedestrian and public amenities.
- Increased land and property value can be captured for further augmentation of infrastructure. Case of Canary Wharf exhibits the same where in the initial stages, the revenue of the group came from the office space rental.

# Demonstration: Sahibabad, Uttar Pradesh

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03





A demonstration pilot study was undertaken to showcase how land value capture can be leveraged along a transit corridor. There are 3 land parcels next to the Sahibabad RRTS station -one (Parcel A) belongs to UPSRTC and the other two (Parcel B&C) belong to UPAVN. (Refer figure 18)All the 3 totals to over 90 acres in the heart of Sahibabad. This also forms an intermodal exchange with the RRTS

Sahibabad is a suburb located in the district of Ghaziabad on north-east of the city of Delhi. It is strategically located close to the borders of cities of Delhi, Noida, and Ghaziabad and constitutes a part of the Delhi National Capital Region.

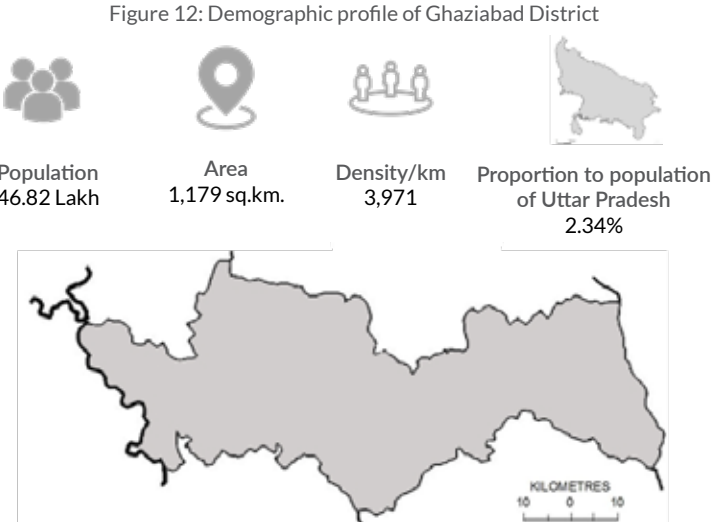
Traditionally the city & region of Ghaziabad was planned as an industrial settlement. Over the years improved social and civic infrastructure and augmentation in connectivity with New Delhi and Noida has brought in an influx of commercial avenues to the city and has enriched the persona of the city. The region is administratively monitored and controlled by the Ghaziabad Development Authority (GDA). All the enhancements and upgradations are aiding Ghaziabad steadily to shed its earlier image of an industrial destination.

The alignment of Delhi-Meerut RRTS passes through the settlement of Sahibabad. In addition to RRTS, the region is also well connected by Hindon Elevated Road, Delhi-Meerut Expressway & Ghantaghar-Bhatia More Elevated Road and the proposed leg of Ghaziabad Metro.

Figure 13: Location of Sahibabad on Delhi-Ghaziabad-Meerut RRTS



station, MRTS station (proposed) and an existing bus terminal next to each other. These 3 land parcels belonging to various government agencies and situated on a large intermodal exchange offers an excellent opportunity to undertake a sub-regional level mixed use development which can act as a driver for economic growth.



Source : District census handbook: Ghaziabad ,2011

Figure 14:Proposed Sahibabad RRTS station



Figure 15: Travel time on RRTS from Sahibabad

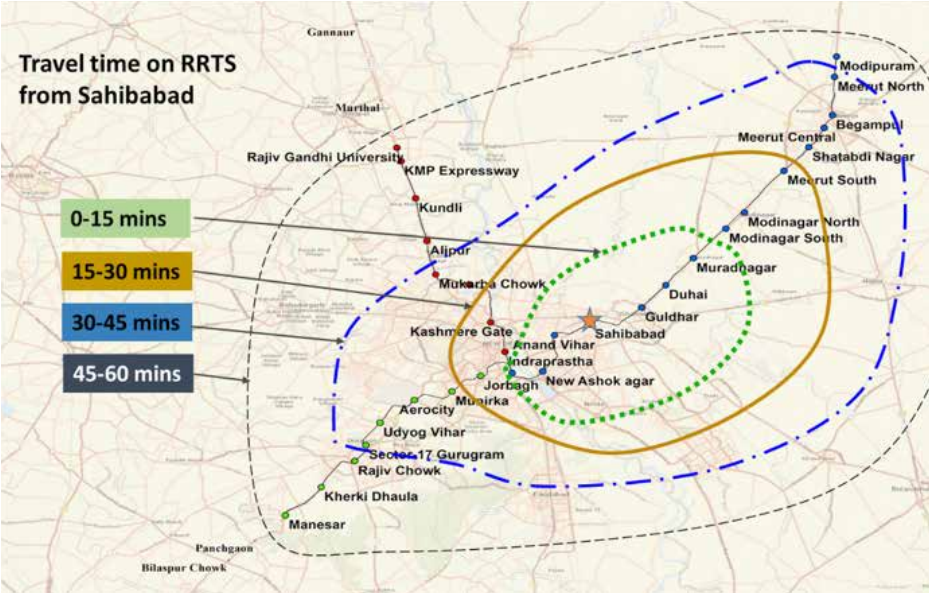
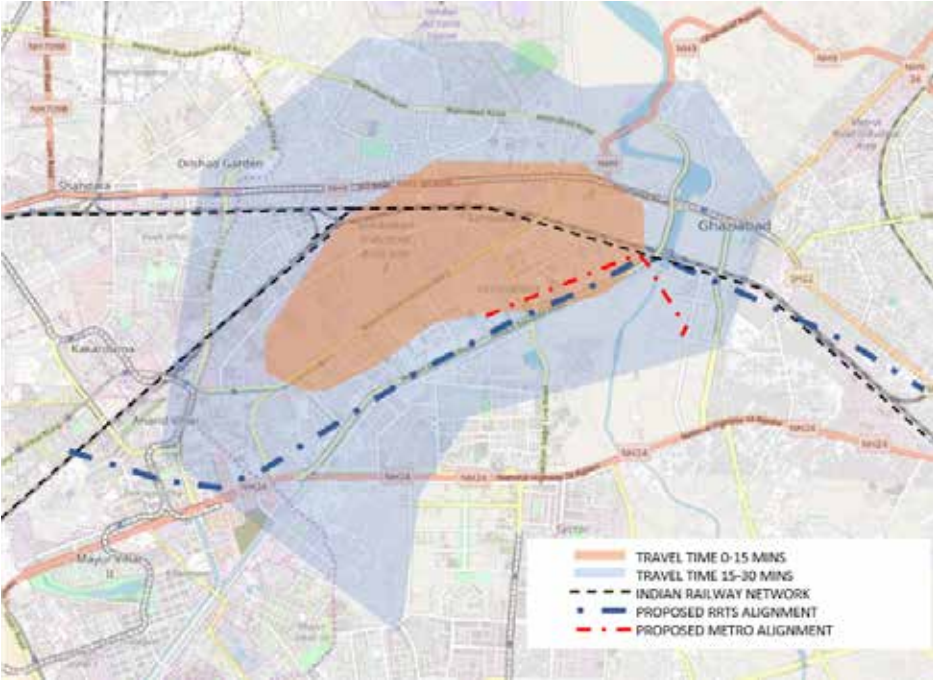


Figure 16: Travel time on RRTS from Ghaziabad



## Vision

The opportunity at Sahibabad needs to be seen in a regional context because RRTS offers a much bigger catchment in terms of travel time. Travel time or the length of time for a door to door commute for residents as well as for movements of goods plays a very important role in the decision-making process for selecting a place of stay or location of a business. The RRTS will disrupt precisely this and alter the behavioural and investment parameters along its alignment. The adjacent map explains this in better detail. The areas that would be serviced by the RRTS network in 60 minutes of travel time from Sahibabad RRTS station are demarcated.

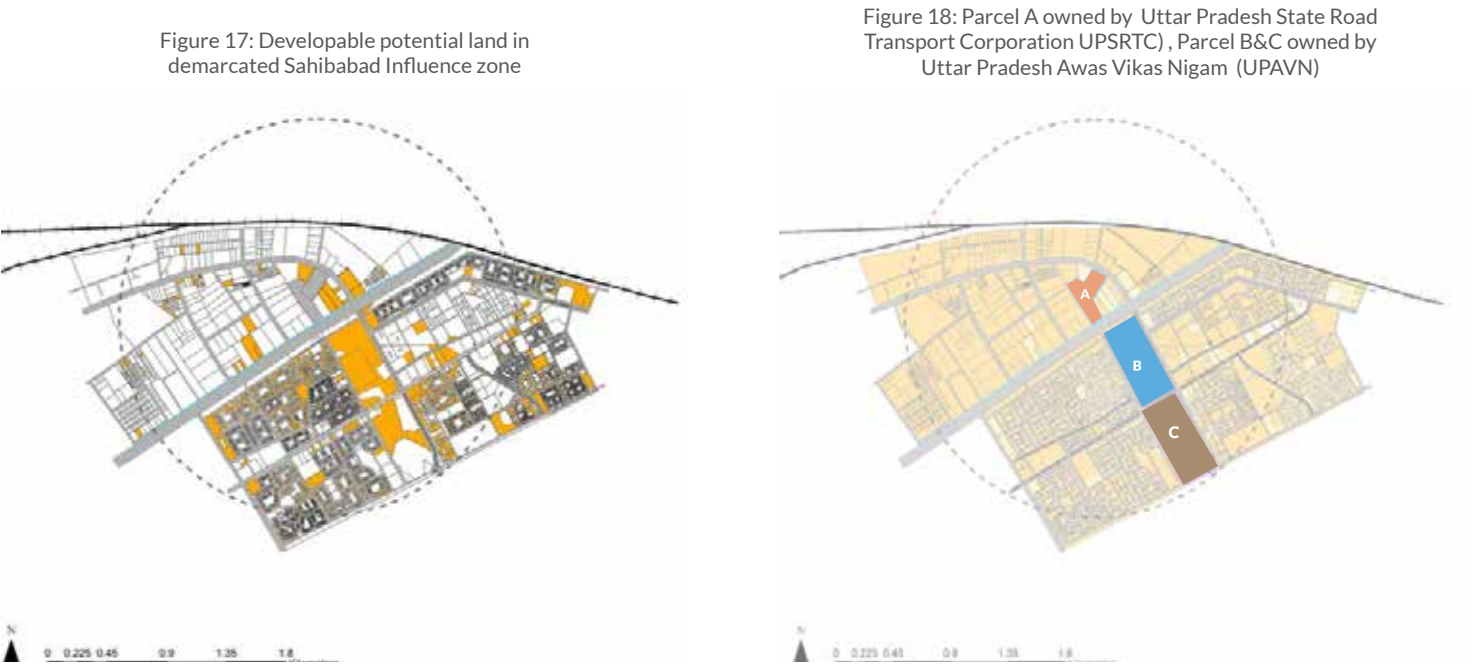
The subject site being located at an intersection of transit network (RRTS and Delhi Metro), presents a massive commercial opportunity. Sizable economic gains can be unlocked accompanied with a prospect of elevating the profile and positioning of the subject catchment and Ghaziabad as a city. The availability of the transit system would ensure comfortable, reliable and speedy commute to a magnified demographics and expose an avenue of opportunities to them by integrating the subject catchment to the core of NCR in addition to extending the reach to the outskirts. With the development of proposed transit systems in Ghaziabad, there is an opportunity to unlock the latent potential of the city and position it as a commercial hub. Such visioning exercise is proposed to be done at the beginning of any development project.(Refer Knowledge Product 1:Value Capture Financing in Transit Oriented Development,page 53)

Since Sahibabad is a brownfield node, the land available for potential development is very less (Refer figure 17) The only land parcels that are vacant and available are the ones that are publicly owned, namely by Uttar Pradesh State Road Transport Corporation (UPSRTC)



& Uttar Pradesh Awas Vikas Nigam (UPAVN) (Refer figure 18). In such scenario, it is advised to leverage the presence of such publicly owned vacant land parcels as a catalyst for further development in the region. Additionally, it is also a good opportunity to demonstrate Land Value Capture. Thus, in this exercise, an attempt was made to optimally plan for identified vacant land parcels making it a mixed use multimodal hub.

Elaborated here henceforth is the process followed for the same. The primary step for any planning exercise is to conduct a baseline study and assessment of the area, study the real estate dynamics to arrive at an appropriate product mix and recommend a development strategy. An International Property Consultant was appointed to conduct the same for Sahibabad. Terms of Reference for the appointment of an IPC are detailed below.



Terms of Reference for engagement of an International Property Consultant (IPC)

- 1. Study of the real estate trends in the subject region with regard to various uses like office, retail, leisure & entertainment, hospitality, healthcare, institutional and other uses, covering the demand supply dynamics across the sectors.
- 2. Detailed study of the prevailing pricing for rentals and capital values and what is it likely to be in future based on reasonable assumptions on development of the transit corridor.
- 3. Comparative study of different assumptions for rentals, lease and any other relevant modes for capturing maximum value of it before and after the transit corridor.
- 4. Benchmarking of competing projects across sectors.
- 5. Derive the most appropriate product-mix with phasing following a consultative process.
- 6. Develop financial viability, risk and sensitivity scenarios with a consultative process.
- 7. Develop a conceptual design

- Steps followed by the International Property Consultant for conducting the exercise:
- Step 1:** Critically analyse the site and uncover the key facets such as shape, size, frontage, access and encumbrances. Assess the potential impact of the attributes of site on envisioned development.

**Step 2:** Assign a primary and secondary catchment to the subject site that would impact the dynamics of envisioned development.

**Step 3:** Deep and wide analysis of performance of various asset (residential, office space, retail, hospitality, health and wellness) classes in the identified catchment, with an aim to ascertain benchmarks, and as a base to delineate and formulate the product mix.
- Step 4:** Critically examine the Development Control Regulations (DCRs) applicable for subject site to understanding the permutation and combination of development mix that can be developed on the subject site,

**Step 5:** Basis the market research and analysis of DCRs devise a product mix and critically scrutinize each mix under various parameters and identify the best suited product mix.

**Step 6:** Develop the financials of the recommended product mix to uncover the potential returns that could be attained.

As an initial step, a detailed exercise to determine the real estate potential in respect of one Influence Zone containing 3 land parcels (parcel A owned by UPSRTC and parcel B & C owned by UPAVN) at the Sahibabad RRTS station was undertaken. It was envisaged that the outcome of such exercise shall help in devising the development strategy including, defining of the product mix and phasing of development for the IZ, thereby leading to an optimum, balanced & coordinated growth in the region. Similar detailed exercise for other influence zones along the corridor is advised to be undertaken.

The assessment of the 3 available land parcels mentioned above is presented below:

Table 1 : Ownership, Area and Current use of Parcel A,B&C

S.No	Name	Ownership	Area (in acre)	Current use
1	Parcel A	Uttar Pradesh State Road Transport Corporation (UPSRTC)	14.4	This falls in Industrial use land as per current master plan and is given on lease by UPSIDC to UPSRTC for 90 years ,Used for <ul style="list-style-type: none"><li>• Bus depot</li><li>• Workshop</li><li>• Tyre re-treading</li><li>• Bus parking.</li></ul>
3	Parcel B	Uttar Pradesh Awas Vikas Nigam (UPAVN)	75.7	Sector 8, Vasundhra which is currently zoned as commercial in the Ghaziabad Masterplan 2012. Currently part of it is being used as a casting yard of DMRC.
3	Parcel C			Sector 7, Vasundhra which is currently zoned as Institutional and Residential in the current Sectoral plan.
	Total area of 3 parcels (A+B+C)		90.1	

The research captures the nature, size, trends, demand & supply of market/ sub market/ IZ. Based on this and considering the opportunities that the RRTS shall bring in future, possible development alternatives are evolved and their realizations are evaluated to arrive at an optimal real estate development plan. For this, 2 scenarios are considered as below:

- i. An option with lower risk & emphasis on residential development.
- ii. An alternative option with balanced growth & emphasis on key economy drivers which would trigger economic growth in the region while repositioning the city of Ghaziabad as a commercial/ business destination along with a healthcare hub and thereby augmenting commerce and employment.

The second scenario was selected and detailed out in terms of financials, phasing and possible development strategy as this would optimize the benefits of RRTS. A product mix and phasing were developed considering the same. This product mix (Refer Table 4) was generated by the IPC based on the market assessment and can eventually form the outline for the planning of the identified land parcels.

However, a more detailed analysis was conducted for one of the parcels, parcel A owned by UPSRTC. Parcel A was selected to demonstrate Land Value Capture and to present the conceptual design of a multi-modal bus terminal integrated with retail & commercial spaces, hospitality and a medical centre.

The present UPSRTC Sahibabad Bus terminal is located in the Sahibabad industrial area. The site has access from the 60 m wide Madan Mohan Malviya Marg towards its south and the 45m wide Saur Urja Marg along its east. The Sahibabad RRTS station is proposed to come directly in front of the site and would be elevated. The entry and exit of the RRTS station would be from Madan Mohan Malviya Marg. The DMRC Metro station is also proposed to come on the opposite side of the RRTS station across the road on Madan Mohan Malviya Marg itself. There is a skywalk proposed between the 2 stations so that passengers can avail unhindered passage in the intermodal exchange.



The parcel, admeasuring 70,847 sq. m(14.4 acre), belonging to UPSTRC is currently being used as the Sahibabad bus stand and the back side of it houses their workshops and depot. There is also a unit of tyre retreading and a functional petrol pump for their exclusive use. Around 6,064 sq. m of land adjoining the Madan Mohan Malviya Marg is proposed to be given to the NCRTC to construct the RRTS station. The balance remaining 64,783 sq. m would be available for private development after incorporating the needs of the UPSRTC for the refurbished bus terminal.

Several consultations were conducted with UPSRTC for validating the product mix developed by the IPC. The brief from UPSRTC included the following:

The brief from UPSRTC included the following:

- Covered bus bays for Scania (size) buses totaling 80 bays.
- Night parking for 40 buses in basement.
- Open parking for 40 to 50 buses.
- 5 workshops, 3 for AC and 2 for non-AC buses for 2 buses each with supporting stores/offices.
- 2 petrol pumps and 1 CNG station.
- Adequate space for stores in basement.
- Adequate space offices, dormitories for drivers, passenger waiting areas/lounge and food-court on Mezzanine floor.
- Supporting retail kiosks.
- Electric Charging points at some Bus Bays
- Based on this, the product mix and required areas was revised subsequently (refer Table 4).

Table 2 : Product mix and area statement of Parcel A

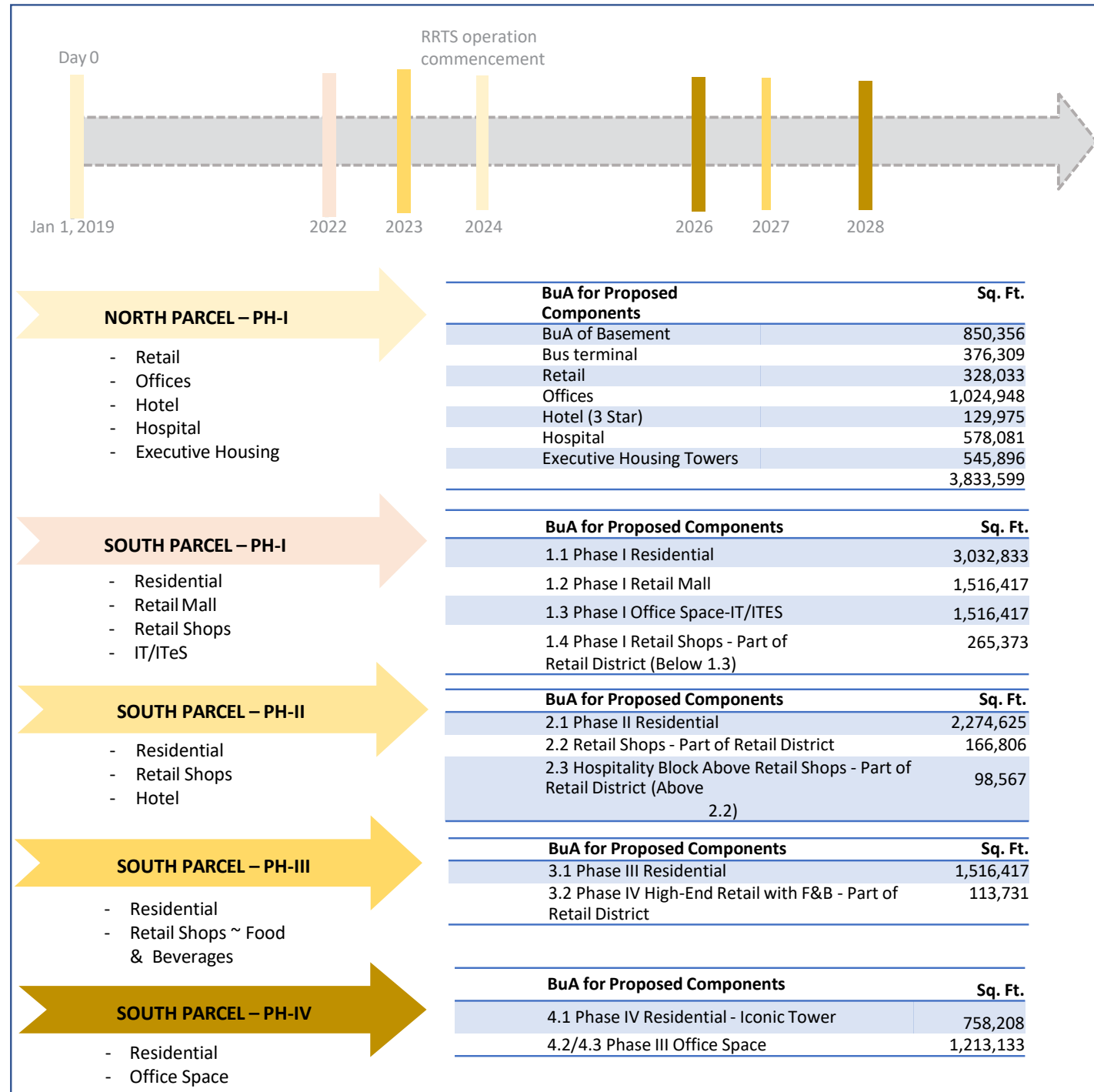
Typology	Area (in sq. m)	Area (in sq. ft)	Area breakup (in %)
Retail	60,200	6,47,993	22.2%
Hospital	32,600	3,50,906	12.0%
Hotel	10,800	1,16,251	4.0%
Offices	98,800	10,63,483	36.4%
Executive Housing	37,200	4,00,421	13.7%
Bus Terminal	25,700	276,635	11.7%
<b>TOTAL</b>	<b>271,500</b>	<b>2,922,426</b>	<b>100%</b>

Table 3 : Product mix and area statementof Parcel B&C

Product-Mix	Percent	FAR Area (sft)	FAR Area (sft)	BUA(sft)	Floors
Retail-Mall	10.00%	1,22,503	13,18,623	15,16,417	6
Retail district	4.25%	52,064	5,60,415	6,44,477	6
Office	16.00%	1,96,005	21,09,797	24,26,264	20
IT/ITES	10.00%	1,22,503	13,16,623	15,16,471	27
Residential	45.00%	5,51,264	59,33,805	68,23,875	25
Residential Iconic	5.00%	61,252	6,59,312	7,58,208	30
Healthcare and Wellness District	8.00%	98,002	10,54,899	12,13,133	11
Educational District	1.75%	21,438	2,30,759	2,65,373	10
<b>TOTAL</b>	<b>100%</b>	<b>12,25,031</b>	<b>1,31,86,232</b>	<b>1,51,66,167</b>	

Table 4 : Revised Product mix of Parcel A developed for UPSRTC

Activity Components	Area (In sq. m)
Gr. Floor Ticketing, Offices etc (5x100m)	500
Bus Terminal basement ramp (6x10x10)	600
80 No. Bus parking's (40x10x20m)	8,000
Workshops Block (10 buses) (5x20x10) + stores + office Ground plus Mezz	1,200
Workshops Block - Mezz Offices/stores	200
Bus terminal passenger circulation	6,400
Bus Terminal cores	2,000
Mezz-Offices + Dormitories	2,000
Mezz-Waiting lounge + Food court	4,800
Petrol & CNG pumps (3 nos)	540
Total Bus Terminal	25,700

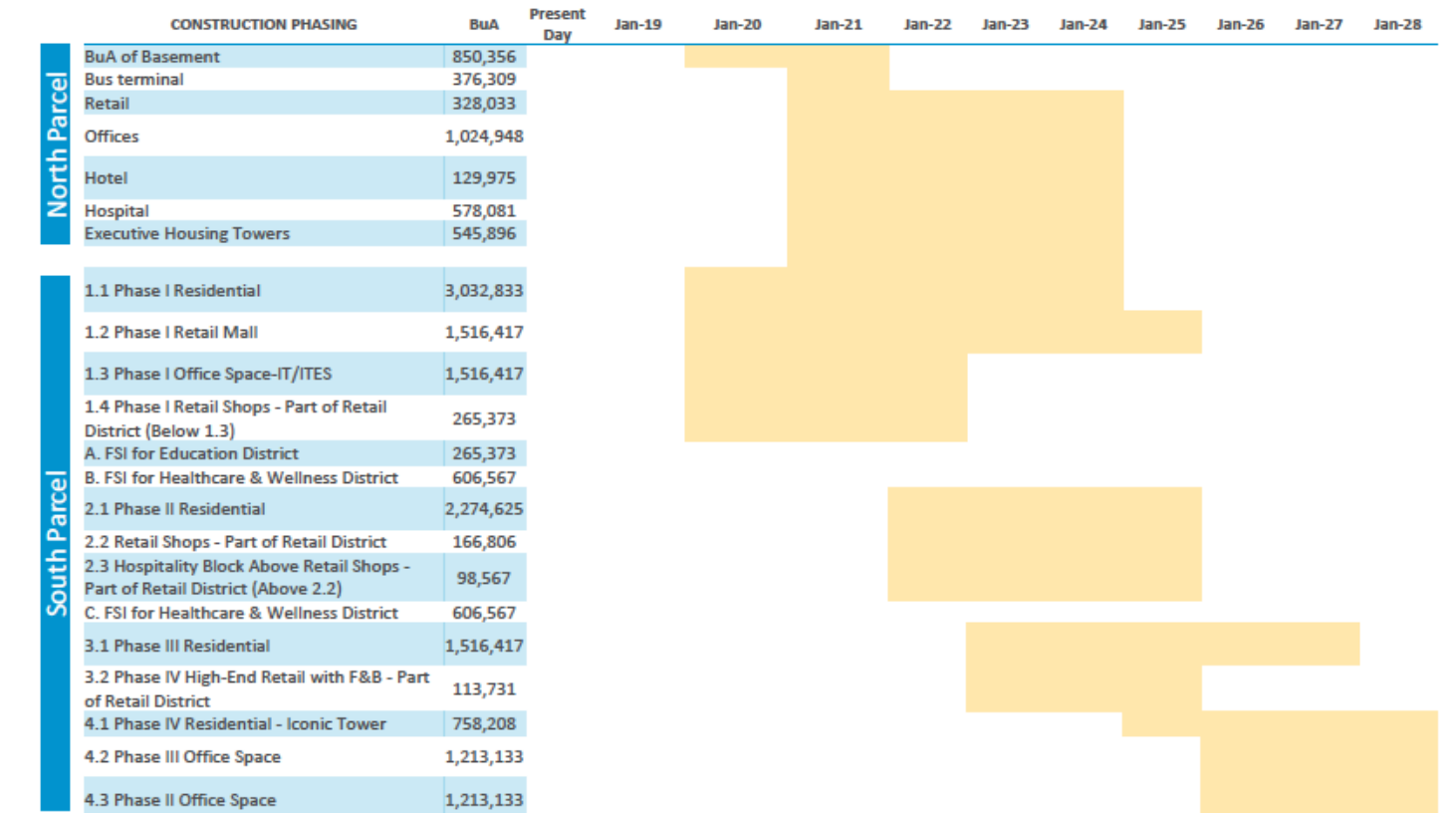


## Development Recommendations & Phasing

The development strategy best suited to incorporate such diversified asset class, where project execution would be as long as 20 years, is to assign a Master Developer, an entity that would be manage the execution of the envisioned development. The entity would be

responsible for allotting smaller land parcels with development potential to various sub-developers, who in turn would be solely responsible for development and operations of a particular asset class on the allotted plot with confined development rights.

Figure 20: Construction Scheduling/Development phasing







# Learnings

As evident from the case studies, other examples referred to and experience from Delhi-Ghaziabad-Meerut RRTS corridor, triggering development in the TOD zone (Influence zones & Special Development Areas), whether brownfield or greenfield is one of the challenging tasks for implementation. Preparation of a Zonal Plan of each demarcated Influence Zone and Special Development Area is essential, based on which, the Government agencies can estimate the expenditure for development/upgradation of major roads and supporting infrastructure.

Moreover, the Development Authority needs to acquire land for laying of such infrastructure, developing of public & semi-public spaces and building of necessary amenities such as schools, hospitals, community centres, etc. Such acquisition may materialise through land acquisition or land pooling based on the context. It has been observed that land pooling is a better option as the concerned developing authority does not pay for the resultant land, instead they only return the parcel of land back to the original land owner post development of infrastructure.

A nodal agency at the zonal level for land pooling and program management shall benefit from the entire planning & development process as it can play the role of a mediator/ coordinator with the relevant agencies and landowners.

Development in the identified TOD zones (Influence zones & Special Development Areas) can also be triggered if the Development Authorities prepare an inventory of public land holdings and leveraging these to trigger further development. The authorities can thus rationalize their land assets and put them to optimal use, resulting in more recyclable land into the market. These land assets can be monetized utilizing higher FAR as applicable in TOD zones and earn revenue to fund supporting infrastructure. The node of Sahibabad envisioned to be a mixed-use Central Business District with a multi-modal interchange with RRTS, Ghaziabad metro & Sahibabad bus terminal, demonstrates this model.

Further, development models, such as joint development, development with public-private participation or self-development can be formulated based on the context and priorities of the concerned authority.



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Notes:

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Shakti Sustainable Energy Foundation seeks to facilitate India's transition to a sustainable energy future by aiding the design and implementation of policies in the following areas: clean power, energy efficiency, sustainable urban transport, climate change mitigation and clean energy finance. For more information, visit ([www.shaktifoundation.in](http://www.shaktifoundation.in))



National Institute of Urban Affairs (NIUA) is a premier institute for research, capacity building and dissemination of knowledge for the urban sector in India. It conducts research on urbanization, urban policy and planning, municipal finance and governance, land economics, Transit Oriented Development, urban livelihoods, environment & climate change and smart cities.



National Capital Region Transport Corporation (NCRTC) – a Joint Sector company of Govt of India and States of Delhi, Haryana, Rajasthan and U.P, under the administrative control of Ministry of Housing and Urban Affairs, is mandated for implementing the Regional Rapid Transit System (RRTS) project across the NCR of India, ensuring a balanced and sustainable urban development through better connectivity and access.



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