

Transit Oriented Development In Delhi

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Abstract - Inspite of Delhi's recent investments in Public Transport Systems including a world class Metro and a pilot BRT system, current lack of Connectivity to Stations, abundant subsidized parking space as well as a general lack of safety for walkers and cyclists in the city, has compromised the use of public transportation as the preferred mode of travel in Delhi. In addition, the past auto-centric planning of the city with segregated landuses, large unwalkable block sizes, large R/Ws with encroached footpaths, rampant construction of flyovers and cloverleaves within city limits, and auto-oriented urban design has led to the city becoming increasingly private-vehicle dependent, making life even more difficult for public transport users. This has led to Delhi having more cars today than the total cars in the states of Maharashtra, Tamil Nadu, Gujarat and West Bengal. Delhi is already at the second highest level of air pollution in the world (by particulate matter). 70% of this air pollution in the city comes from Vehicles. In this alarming situation, it is imperative that a rapid paradigm shift is undertaken in order to move people from private vehicles towards the use of public transportation. The aim of this paradigm shift is therefore - to make it easier, safer, faster and more convenient for people to use public transportation so that maximum number of people are incentivized to leave their cars at home and shift to the use of public transport. Only then can the desirable modal split of 80-20 (public-private) be achieved as envisioned in the Masterplan of Delhi 2021.

Keywords - Transit, Delhi, Development, Capital, Transport.

I. INTRODUCTION

The **Delhi Metro** is a rapid transit system serving Delhi, Gurgaon, Noida and Ghaziabad in the National Capital Region of India. The concept of a mass rapid transit for New Delhi first emerged from a traffic and travel characteristics study which was carried out in the city in 1969. Over the next several years, many official committees by a variety of government departments were commissioned to examine issues related to technology, route alignment and governmental jurisdiction. In 1984, the Delhi Development Authority and the Urban Arts Commission came up with a proposal for developing a multi-modal transport system, which would consist of constructing three underground mass rapid transit corridors as well as augmenting the city's existing suburban railway and road transport networks.

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II. TRANSIT ORIENTED DEVELOPMENT

A **transit-oriented development (TOD)** is a mixed-use residential or commercial area designed to maximize access to public transport, and often incorporates features to encourage transit ridership.



Figure 1 circles showing transit oriented development

A TOD neighborhood typically has a center with a transit station or stop (train station, metro station, tram stop, or bus stop), surrounded by relatively high-density development with progressively lower-density development spreading outward from the center. TODs generally are located within a radius of one-quarter to one-half mile (400 to 800 m) from a transit stop, as this is considered to be an appropriate scale for pedestrians.



Figure 3 Three-dimensional view of the nature of development along transit

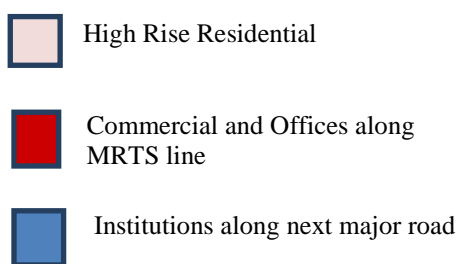


Figure 2 transit oriented development

In TOD a vibrant mix of uses including:

- Residential
- Retail
- Office
- Commercial
- Institutional
- Thoughtfully designed community spaces

- Exciting, pedestrian friendly areas for live, work and play.



Figure 4 Five and ten minutes walking radius from the transit point

The major goal of TOD is to provide concentration of living, shopping, entertainment, and employment opportunities within walking distance of transit stations, so that people can easily use transit in place of cars. TODs include pedestrian amenities and bicycle facilities to promote alternative travel options, and encourage shared parking opportunities.

III. CASESTUDY OF TOD

1.1 NEW YORK

1.1.1 CITY SPATIAL STRUCTURE

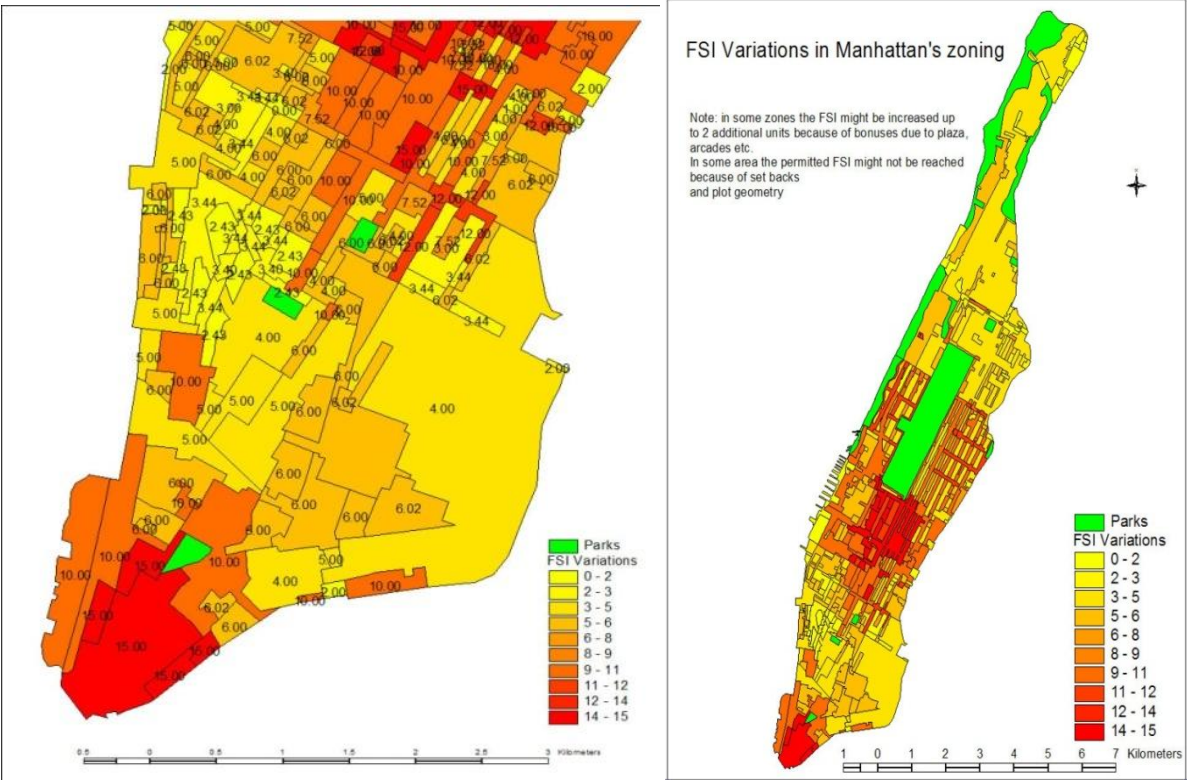
- One of the few mono-centric city in the US,
- specialized CBDs in Manhattan

1.1.2 TRANSPORT

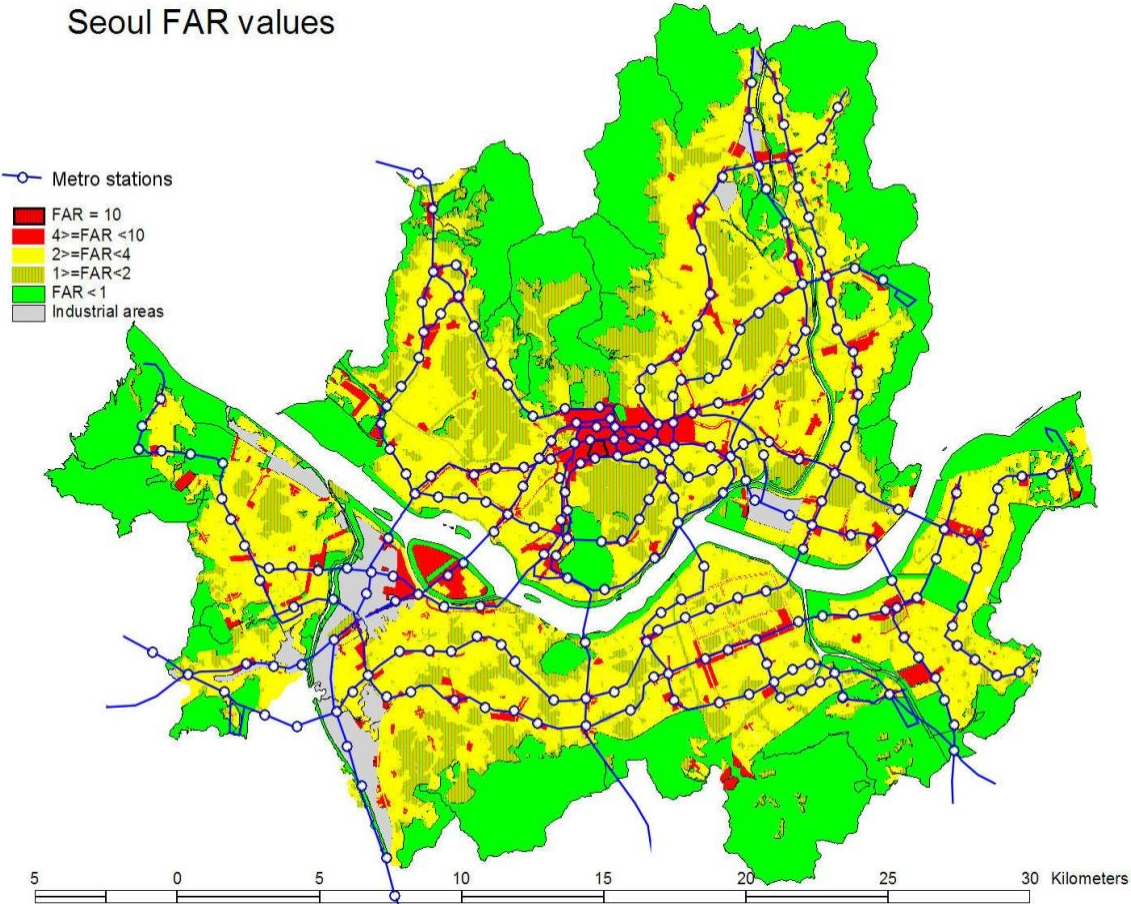
- 30% of trips by transit (60% in Manhattan)
- The longest metro network in the world
- Mostly radio-concentric metro network

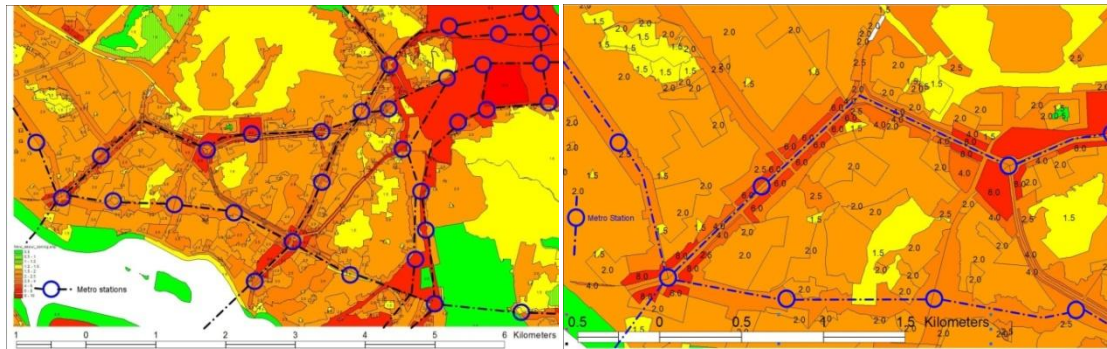
1.1.3 FAR

- 15 in CBD, 10 along main avenues



Seoul FAR values





Residential FSI from 0.6 in the suburbs to 10 in Manhattan next to CBDs.

1.2 SEOUL CITY

1.2.1 CITY SPATIAL STRUCTURE:

- compact, expansion restricted by hills and northern border
- Polycentric, with a large CBD but many important sub-centers
- Built up population density in the built-up area similar to Mumbai

1.2.2 TRANSPORT

- Grid like metro system, linking the various sub-centers and the CBD. Seoul metro is the 3rd longest in the world

1.2.3 FSI STRATEGY:

- 10 in part of the CBD, 8 in the rest of the CBD and in sub-centers
- 0.5 to 4 in residential areas
- Higher FSI in areas around main metro nodes

IV. CONTEXT FOR TOD IN DELHI

The Masterplan of Delhi 2021 clearly outlines its goals for redensification and redevelopment of areas within 500m catchments of MRTS Stations, in order to accommodate the city's future housing and employment demands within the catchments of MRTS corridors.

The following MPD Goals may be achieved through Transit Oriented Development:

- Population & Employment Targets
- Affordable Housing Needs
- Optimum Utilization of Land
- Efficient & prioritized Public Transportation
- Reduce air & noise Pollution
- Meeting the Housing Deficit & Demand in a time bound manner
- Provide adequate and Equitable access to Infrastructure
- Better safety & security, & Quality of Life.
- Public Participation and time bound implementation.

1.3 DEFINITION OF THE "MRTS INFLUENCE ZONE"

- "Station Area" is the plot on which the Station stands. This is generally fully owned by the Transit Agency.
- "MRTS Walking Influence Zone" in the zone which lies within actual 500m (6- minute) walking distance from MRTS Station. Properties whose entrances lie within the actual 500 m Pedshed measured along street centre-line will be considered to be part of the MRTS "Walking Influence Zone".
- "MRTS NMT Influence Zone" in the zone which lies within actual 1500m (6- minute) Cycling/ Cycle- rickshaw distance from MRTS Station.

1.4 DEVELOPMENTAL TRANSFORMATIONS IN AND AROUND METRO STATIONS

Metro station	Type of structures		Activity	
	Before	After	Before	After
Dwarka	Low residential area	Residential apartments coming up approved by DDA	Residential area	Increased residential use.
Dwarka Mod	Unapproved area covered by slums	Single storied buildings, unapproved colony.	Low residential area	Dominant land use is residential, Development of informal commercial activities. Small size shops all along the metro line
Nawada				
Uttamnagar West	Single storied buildings occupied by lower middle class	Lower middle class residences predominantly two storied buildings	Residential area with very few shops.	Dominant land use is residential but small size shops all along the metro line
Uttamnagar east				
Tilaknagar	Upper middle class residential area	High and upper middle class residences predominantly two storied Multistoried commercial buildings.	Residential area with few commercial centers located within the residential zone	Dominant land use is residential. New categories of higher order commercial activities coming up.
Rajouri garden				
Kirti nagar				
Patel nagar				
Rajendra place				

Metro station	Type of structures		Activity	
	Before	After	Before	After
Shahdara	Prior to metro slums were there	Single storied lower middle class residences	Labour class residential area	More residential character, commercial complexes coming up
Pitamoura	Scarcely populated single storied structures	Newly developed residential areas, predominantly two storied structures.	Predominantly residential character	Increase in commercial activities
Rohini				
New Delhi station	Combination of old and new structures	Combination of old and new structures	Mixed land use	commercial use is dominant
Karol bagh	High income group residences	Apartments coming up	Residential area	Dominant residential character
Connaught place	Multistoried commercial buildings.	Multistoried commercial buildings	Commercial hub	Commercial hub of the city

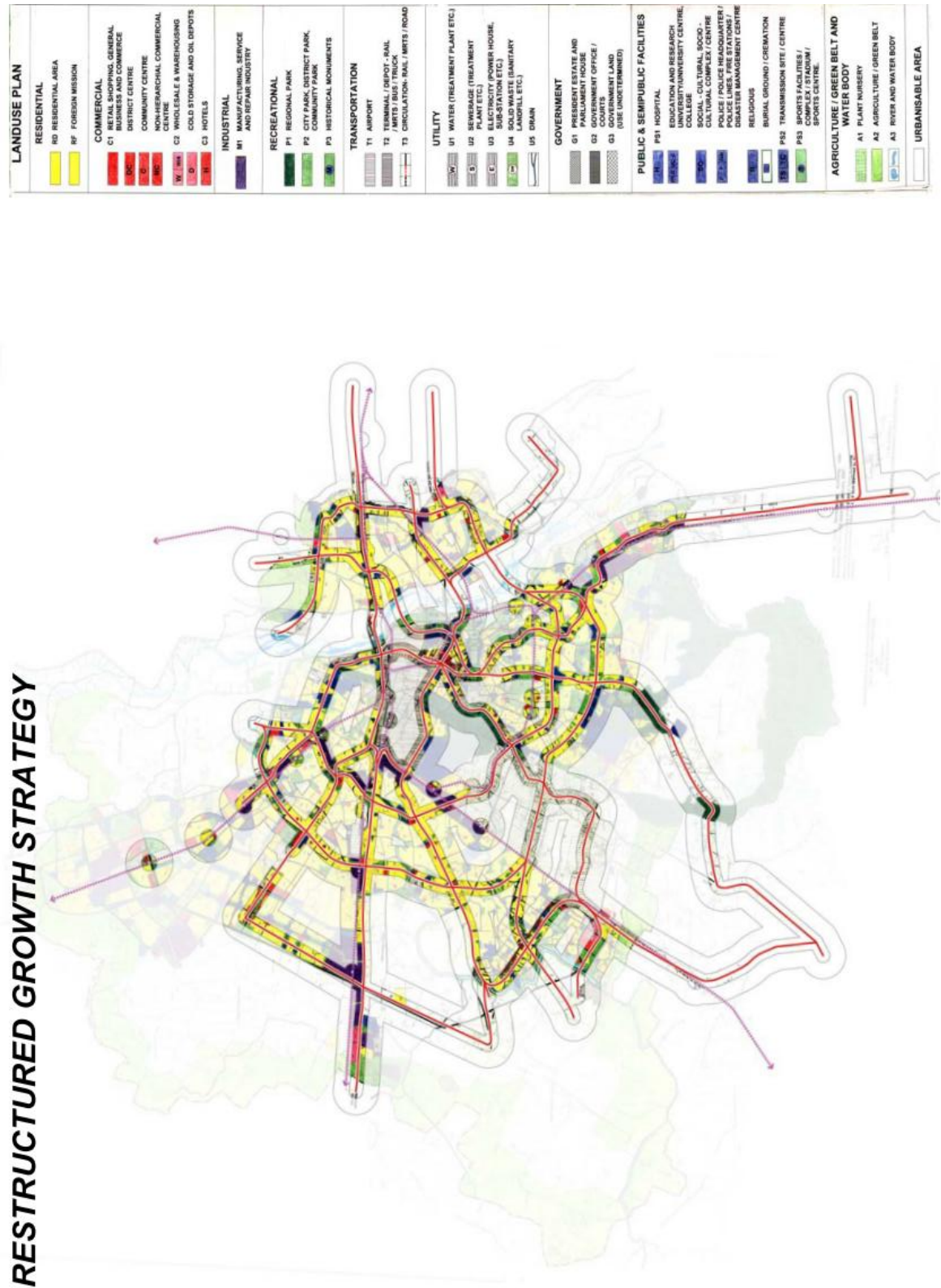


Figure 10 Restructured Growth Strategy as per TOD