9th Urban Mobility India Conference & Expo 2016
Planning Mobility for City's Sustainability

Leaders-5 Mid Term Review

LUTP

A PROJECT ON

ZONING AND DEVELOPMENT REGULATIONS FOR TRANSIT ORIENTED DEVELOPMENT (TOD) AROUND METRO STATIONS/ALONG SPR METRO CORRIDOR IN GURGAON

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NEED FOR TRANSIT ORIENTED STRATEGIES FOR INDIAN CITIES

1. Transit Oriented Development (TOD) is smart growth strategy to move people away from private vehicles towards public transportation by offering more attractive alternatives to the use of personal modes like:

   a) low cost, comfortable, non-motorized transport
   b) pleasurable walking experiences
   c) easily accessible and comfortable mass transportation with easy, convenient and comfortable intermodal transfers for last mile connectivity

2. The National Urban Transport Policy (NUTP) document of 2006 has also advocated promotion of TOD concept for Indian cities
3. All cities where metro system are being planned are restructuring their cities based on TOD

STUDY AREA CONTEXT

1. Gurgaon falls in the Southern most region of the state of Haryana. It is situated in vicinity of Delhi and falls within the National Capital Region (NCR).

2. Gurgaon has become a major centre for I.T. Industry, electronics, ready-made garments, pharmaceuticals, apart from automobile manufacturing hub in the country.

3. On account of Gurgaon's proximity to the capital city of Delhi, the commuter traffic between the two cities has experienced an exponential growth in the last few years.

4. The traffic circulation pattern within Gurgaon has become heavily overburdened due to explosive population growth and rising traffic demand.

NEED OF THE STUDY

1. Gurgaon has witnessed a rapid growth in population in recent decades. Its population is expected to increase from 22 lakhs presently to 41.65 lakhs by the year 2031 as per the Development Plan of Gurgaon-Manesar Urban Complex (GMUC).
2. Keeping in view the expected increase in travel demand as a consequent of population growth, the existing yellow line of Delhi Metro has been extended upto HUDA City Centre, Gurgaon and further extension of Metro along Northern Periphery Road (NPR) and Southern Periphery Road (SPR) has been planned by the State.
3. As the construction of Metro system entails huge capital investment for its construction, operation and maintenance, TOD becomes imperative to ensure smart growth and financial sustainability.
4. In the absence of appropriate policy guidelines on NMT in the TOD or DOT (Development Oriented Transit) policy in Gurgaon it is necessary to evolve land use zoning regulations for TOD/DOT around metro stations in Gurgaon and proposed corridors .

AIM

To evolve Land Use Zoning Regulations for TOD/DOT around Metro Stations/alongwith Metro Corridors in Gurgaon

OBJECTIVES

1. To appreciate the concept of TOD/DOT.

2. To review best practices of TOD around the globe and its related land uses and zoning regulations.

3. To assess the existing land use zoning regulation at the existing metro station at Sector 29 Gurgaon and prepare a strategy for safe walkways / bicycle tracks i.e non motorized traffic in the proposed TOD/DOT corridor on Southern periphery Road.

Research Methodology

Problem Identification- based on background study and finalisation of study objectives

Literature Review (Phase -1)

Data Collection (Phase-2)

Primary

1. **Real Estate Survey**
2. **Metro User Survey**
3. **Reconnaissance Study**

Secondary

1. **Review of Existing Development Plan and zoning regulation and TOD policy .**
2. **Detail about metro corridor alignment and area under development /developed**
3. **Ridership details.**
4. **Station area land use.**

Research Methodology

Data Analysis

1.Land Use Pattern/Built up space around existing metro stations and SPR corridor .

2 .Metro User Characterises and other stakeholders.

3. Land value around Metro Station and along with SPR corridor.

4.Public Transport & NMT Road Network Supply in catchment area of existing metro stations sector -29 Gurgaon

Travel Demand assessment for TOD along the proposed corridor

- Potential Demand for various land uses

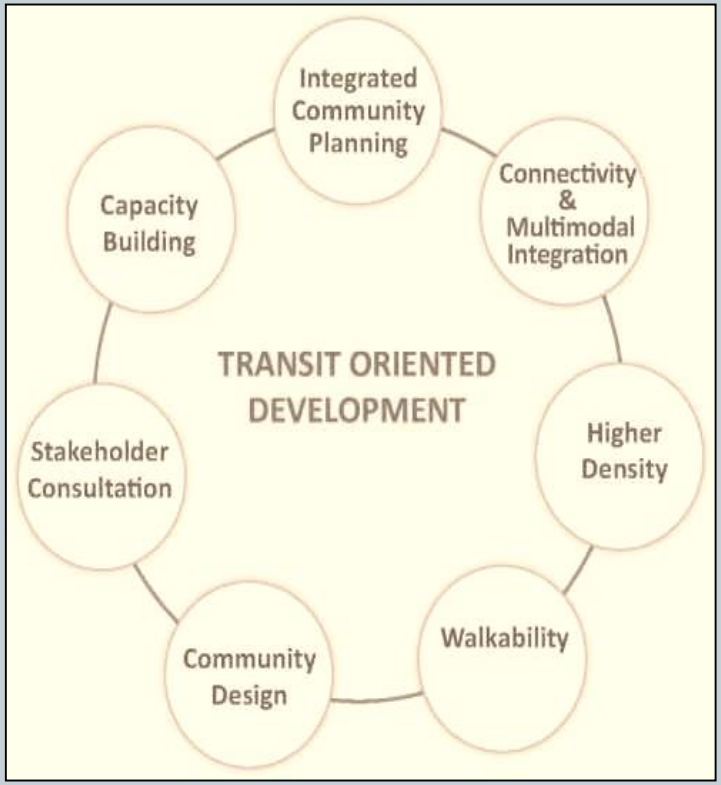
Proposed NMT Strategy for TOD for Southern periphery Road (SPR)

SCOPE & LIMITATIONS

1. The study will be based on secondary data supplemented by limited primary surveys.

2. Potential Guidelines for TOD in Gurgaon shall be recommended for influence zone of metro stations proposed along Southern Periphery Road.

HOLISTIC CONCEPT OF TOD



TOD is not only about densification and redevelopment, it is also the Integration of various components of Sustainable Community Planning into a holistic framework

T = **Transit frequency and** Usefulness

O = **Orienting infrastructure for** making pedestrian connections between transit and development

D = **Development featuring a mix** of uses and densities

KEY COMPONENTS OF TOD

•**Improved densities-** Increased population and employment densities place more potential riders within walking distance of transit station /stops.

• **Mixed uses-** Retail, office , residential and public space promote concentration of public activity around transit station/stops, increasing the physical and cultural prominence of transit in the community, as well as facilitating trip changing linked to transit

- **Pedestrian Orientation-** Placing daily goods and services, as well as recreational destinations, within walking distance of residents reduce incentives for car ownership and use ,supporting transit use for commuting and other regional travel; orienting building entrances towards transit stops

- **Urban design** – The urban design aspects play an important role in making the TOD communities pedestrian friendly and ensuring more active lifestyle in the community

Transit Oriented Strategies

1. Intensification of development along transit corridors.
2. Adequate accessibility for safe and sustainable transportation systems;
3. Traffic and pedestrian safety management;
4. Parking policy;
5. Policies for retrofitting, redevelopment/infill and green field developments;
6. TOD influence zones for areas within a certain radius of transit stations or stops;
7. Detailed influence zone plans for creating pedestrian friendly environment, multimodal connectivity, modal shifts and high density development

GLOBAL BEST PRACTICES IN TOD

1. SINGHAPORE

- Planning and investing in infrastructure ahead of demand, **to create high quality urban spaces and infrastructure that can support a range of population trajectories,** with a total population of about 5.8 to 6.0 million in 2020, and 6.5 to 6.9 million in 2030.
- Transportation planning will include 800 new buses to the public bus fleet over 5 years, increasing capacity by 20%, extending the rail network by about 100 km to 280 km by 2021 so **that 8 in 10 homes will be within a 10-minute walk from a rail station in 2030.**
- The original FAR is 1.2 in initial years and raised to 3 .5 to 4.0

- Exploring new technology and innovative solutions, to expand and optimize land use, create new land capacity, and make use of space more efficiently and effectively to enhance livability and support longer-term
- The proximity to MRTS Stations creates demand of space addressed by block wise F.S.I zoning. In down town area F.S.I is upto 2.0.
- The F.S.I Regulation tries to capitalize on existing infrastructure facilities in down town area and accessibility to MRTS and enables compactness in the development.

Case study –Hong Kong

1. Hong Kong's transportation network is highly developed. Over **90% of daily travels** (11 million) are on **public transport**. Urban development generally follows a "Public Transport-Oriented Development" approach. Its unique characters in terms of dense population and limited size of land have shaped Hong Kong to be capable of adopting the concept of TOD.

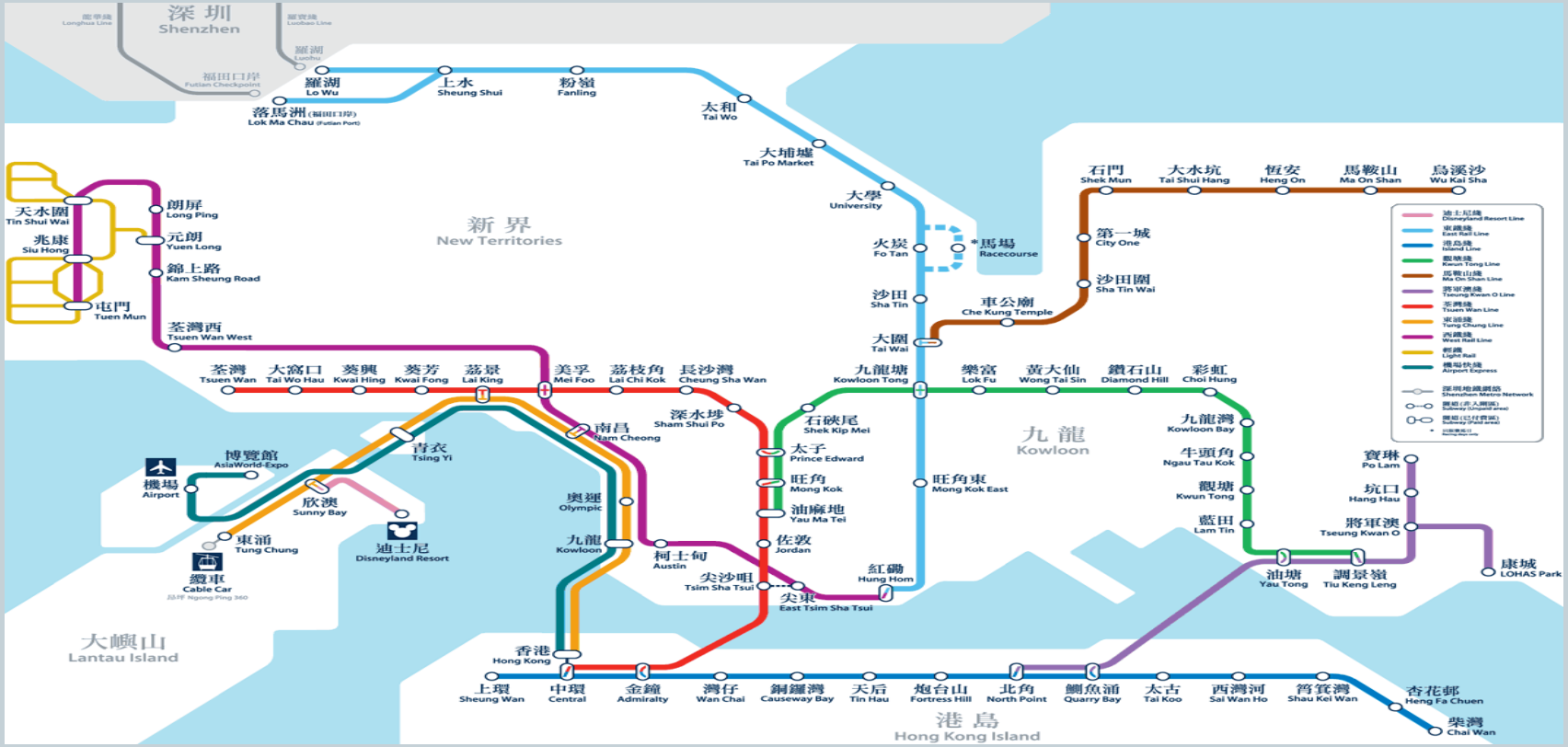
2. The Hong Kong 2030 Planning Vision and Strategy, an integrated approach to land-use, transport and environmental protection, was adopted, leading to a "**Preferred Development Option**" which highlighted the planning concepts of setting development axes along railways and allowing more intensive development around railway stations.

- Approximately 42% of the housing and employment population and 75% of the commercial and office floor areas are located within a radius of 500 meters of railway stations which demonstrates the integration of land use and transport planning and a compact and efficient urban development approach.

- The compact development have various residential housing choices within walking distance of a transit facility ranging from 0.4 to 0.8 km radius, or up to a 15 minute walk

Sustainable transportation Strategy

1. Better integration of transport and land use planning
2. Better use of railways as the back-bone of transport system
3. Better public transport services and facilities
4. Better use of advanced technologies in transport management
5. Better environmental protection



Delhi

Application of TOD Influence Zone

Zone 1: Intense TOD Zone	Zone 2: Standard TOD Zone	Zone 3: TOD Transition Zone
• **300 M** influence zone of all MRTS Stations • **800m* (10-min walking)** influence zone of Regional Interchange Station (i.e. Rail -MRTS, or two MRTS lines.)	**800m* (10-min walking)** influence zone of all MRTS Stations.	• **2000m** (10-minute cycling distance)** influence zone of all MRTS Stations.

*Walking speed is considered approx. 5 km/hour.

**Cycling speed is considered approx. 12 km/hour.

Delhi

Norms:

At least 30% residential and 20% Commercial & Institutional use (min. 5% commercial and min. 5% institutional use) of FAR is mandatory in every new/ redevelopment project within the Influence Zone.

i. New/ Redevelopment projects with more than 1.5 FAR of Commercial use shall be permitted/ located only within the 300 m walking distance from the MRTS station (Intense TOD zone).

ii. At least 50% of total street frontage length of any TOD project should have an active frontage, i.e. a mix of at least two types of uses with different peak hours of activity stacked vertically, to provide round-the-clock 'eyes on the street'.

Cont…

Delhi

Permissible FAR and Density*

Gross FAR (site)	Minimum permissible density (with ±10% variation)	
	Residential dominated project (Residential FAR ≥ 50%)	**Predominantly non-residential** (Residential FAR ≤ 30%)
Below 1.0	Under-utilization of FAR (not permitted)	Under-utilization of FAR (not permitted)
1.1 - 2.0	200- 400 du/ha	100 - 200 du/ha
upto 3.0	400 - 600 du/ha	250 - 400 du/ha
3.1 - 4.0	600 - 800 du/ha	400 - 600 du/ha

*** Site level FAR shall be based on Approved TOD Influence Zone Plan.**

Minimum Ground Coverage.

The minimum Ground Coverage requirement for all plots, blocks and projects within TOD influence zones is 50%. In developed areas, this norm would apply to redevelopment or infill development projects only.

Delhi

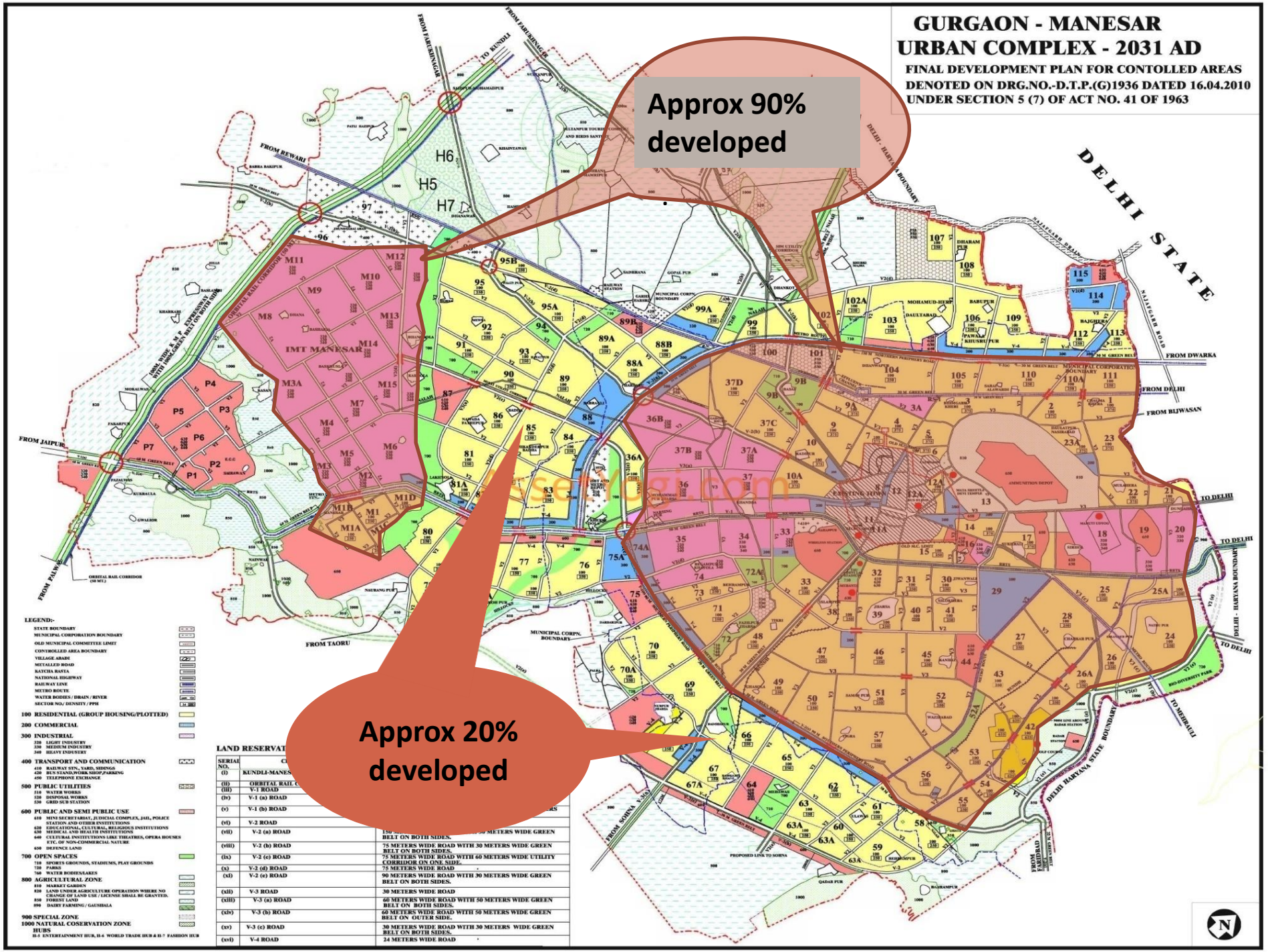
Non-Permissible Uses for all new projects within TOD Intense Zone

1. Car-sales showrooms
2. Banquet halls
3. Automobile-repair/ services/ vehicular servicing shops
4. LPG Godowns
5. Electric Substation 220 KV (Check Buffer requirement/ restriction)
6. Bus Depot (permitted only if clubbed with terminal and in the form of mixed-use development site)
7. Cremation ground
8. Stand-alone Multi Level Parking without on-site mixed use.
9. Open ground parking lot (if provided shall be counted as FAR consumption)
10. Any trade or activity involving any kind of obnoxious, hazardous, inflammable, non-compatible and polluting substance or process shall not be permitted.

PROFILE OF GURGAON

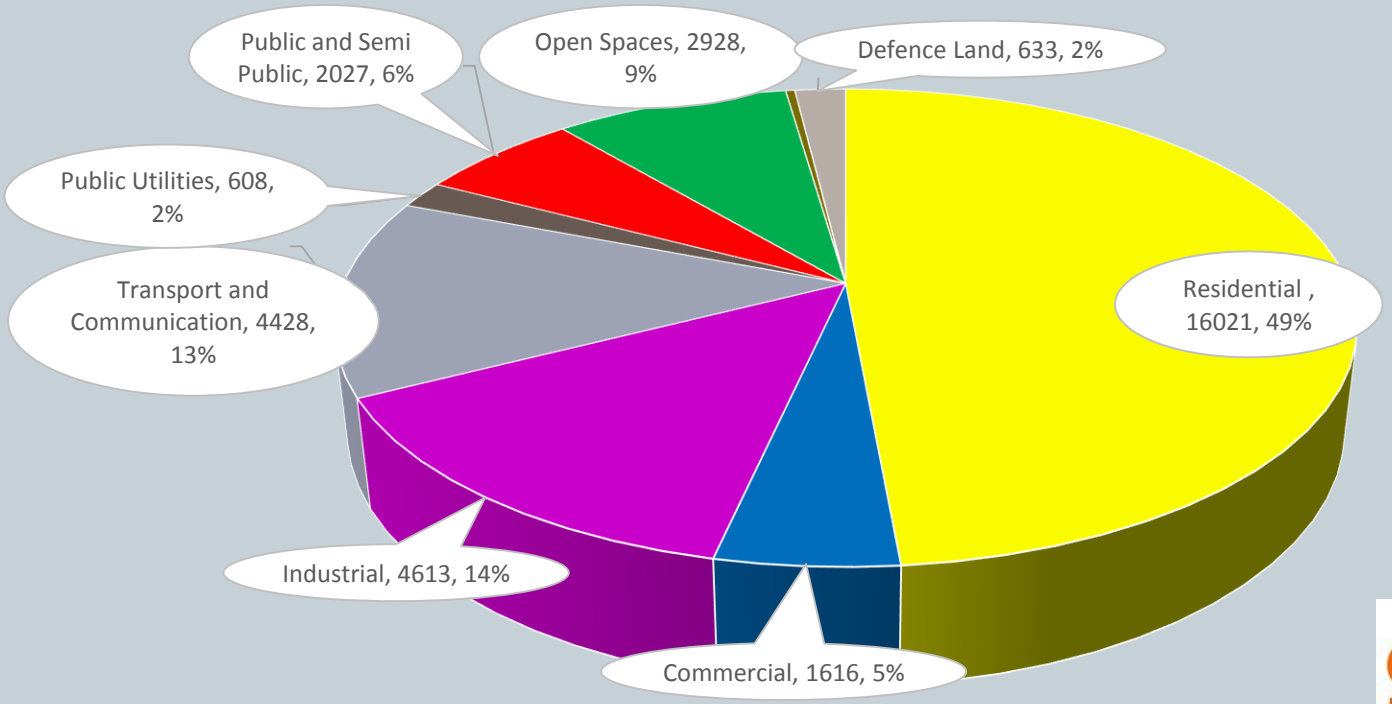
CITY PROFILE- GURGAON

1. Gurgaon falls in the Southern most region of the state of Haryana and has become a major centre for I.T. Industry, electronics, ready-made garments, pharmaceuticals, apart from automobile manufacturing hub in the country.
2. The Gurgaon-Manesar Urban Complex, is situated on prime location on NH 8, only at a distance of **4 kms** from the Indira Gandhi International **Airport**.
3. The **cyber city** developed on an area of about **100 acres** is an IT Hub of the State.
4. The city's population is expected to increase from 22 lakhs presently to **41.65 lakhs by the year 2031** as per the Development Plan of Gurgaon-Manesar Urban Complex (GMUC).
5. As per Integrated Mobility Plan of Gurgaon (2010), Gurgaon-Manesar Urban Complex is expecting to generate a total employment of about 50 lakhs.


GURGAON - MANESAR
URBAN COMPLEX - 2031 AD
FINAL DEVELOPMENT PLAN FOR CONTOLLED AREAS
DENOTED ON DRG.NO.-D.T.P.(G)1936 DATED 16.04.2010
UNDER SECTION 5 (7) OF ACT NO. 41 OF 1963
Approx 90% developed
Approx 20% developed
DELHI STATE
IMT MANESAR
LEGEND:-
LAND RESERVAT

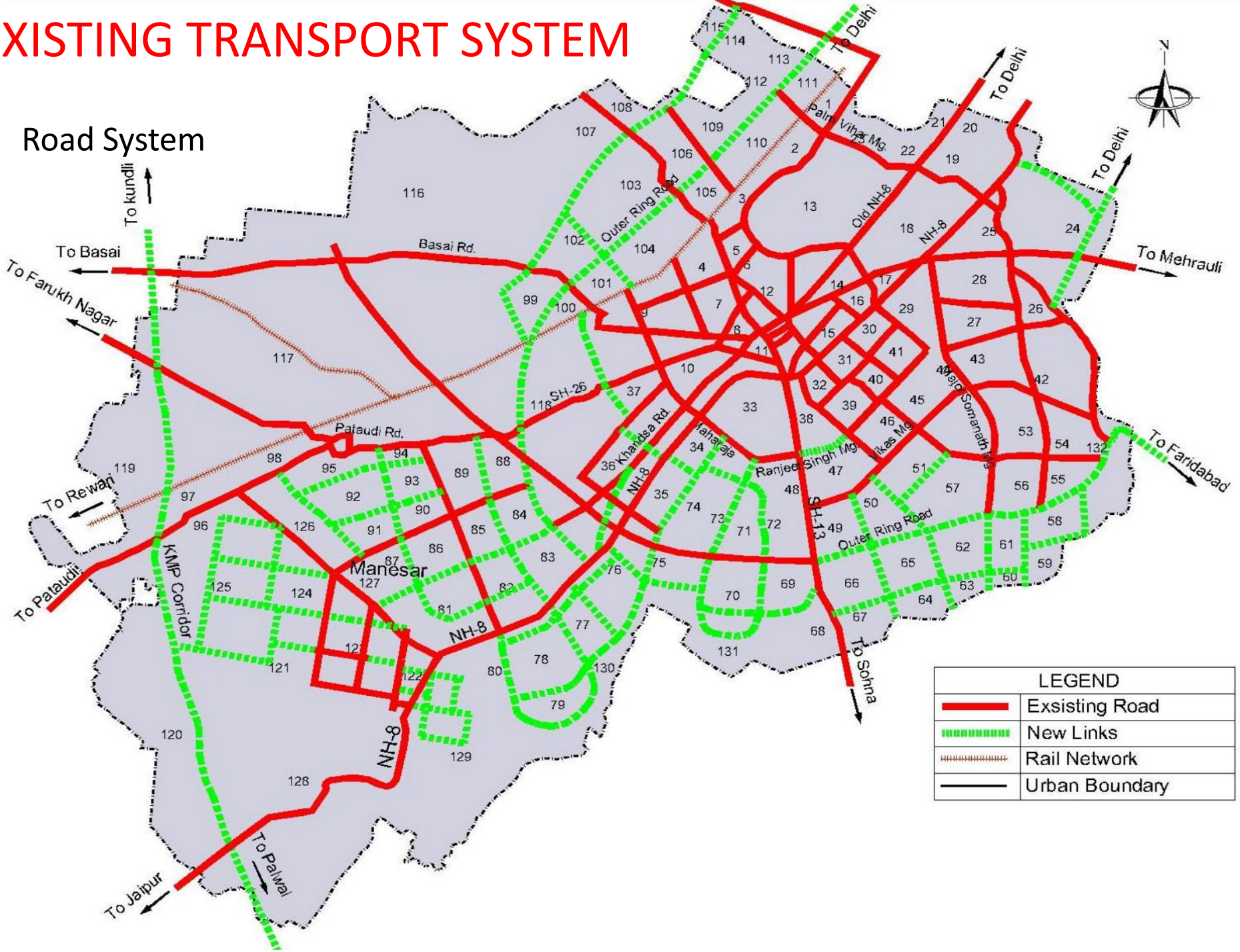
PROPOSED LAND USE 2031

Sr No.	Land Use	Area (in hectare)	In %
1	Residential	16021	48.57
2	Commercial	1616	4.90
3	Industrial	4613	13.98
4	Transport and Comm.	4428	13.42
5	Public Utilities	608	1.84
6	Public and Semi Public	2027	6.14
7	Open Spaces	2928	8.88
8	Special Zone	114	0.35
9	Defence Land	633	1.92
	Total	**32988**	100.00



EXISTING TRANSPORT SYSTEM

1. Road System



Registered vehicles Growth Trends

- On an average **250 vehicles** are getting registered **daily**, in which two wheelers and cars constitute about two- third;
- During past four years, vehicle registration has marked a **growth rate** more than **20% per annum**;
- Particularly personal modes have registered a very high growth rate, **cars** are growing at the **rate of 30%**, while **two wheelers at 22%;**
- Due to the absence of public transport in Gurgaon, **Intermediate Public Transport modes** are **adding** more in the vehicle population.

SOURCE: IMP, GURGAON (2010)

TRAFFIC CHARACTERISTICS

Peak hour movement

- Average : 130141 trips/day
- Two Wheeler : 57441 (44%)
- Car : 44174 (34%)
- Auto rickshaw : 12909 (10%)
- Public Transport :15617 (12%)

Delhi – Gurgaon movement (Peak Hours)

- Daily trips : 64327
- Two wheelers : 9649 (15%)
- Car : 32164 (50%)
- Public Transport : 22152 (35%)

SOURCE: IMP, GURGAON (2010)

2031 Transport Indicators Gurgaon)

Indicators	Do Nothing	Benchmark
Average Journey Speed	11 Kmph	30 kmph
Public Transit Share (motorised)	4%	70%
Walkability (Footpath Length / Road Length	5-10%	100%
Cyclability (Cycle path Length / Road Length	0%	30-50%
Fatality Index (Fatalities/ Lakh Population)	20+	Reduce by 50%
On- Street Parking Index	30-50%	0-5%
Non-Motorized Travel Index	15-20%	30-50%
Emissions/hr (per square km)	5 kg	Reduce by 50%

Source: IMP Gurgaon, 2010

Public Transport

1. Presently served mainly by intermediate public transport like mini buses and shared Auto.

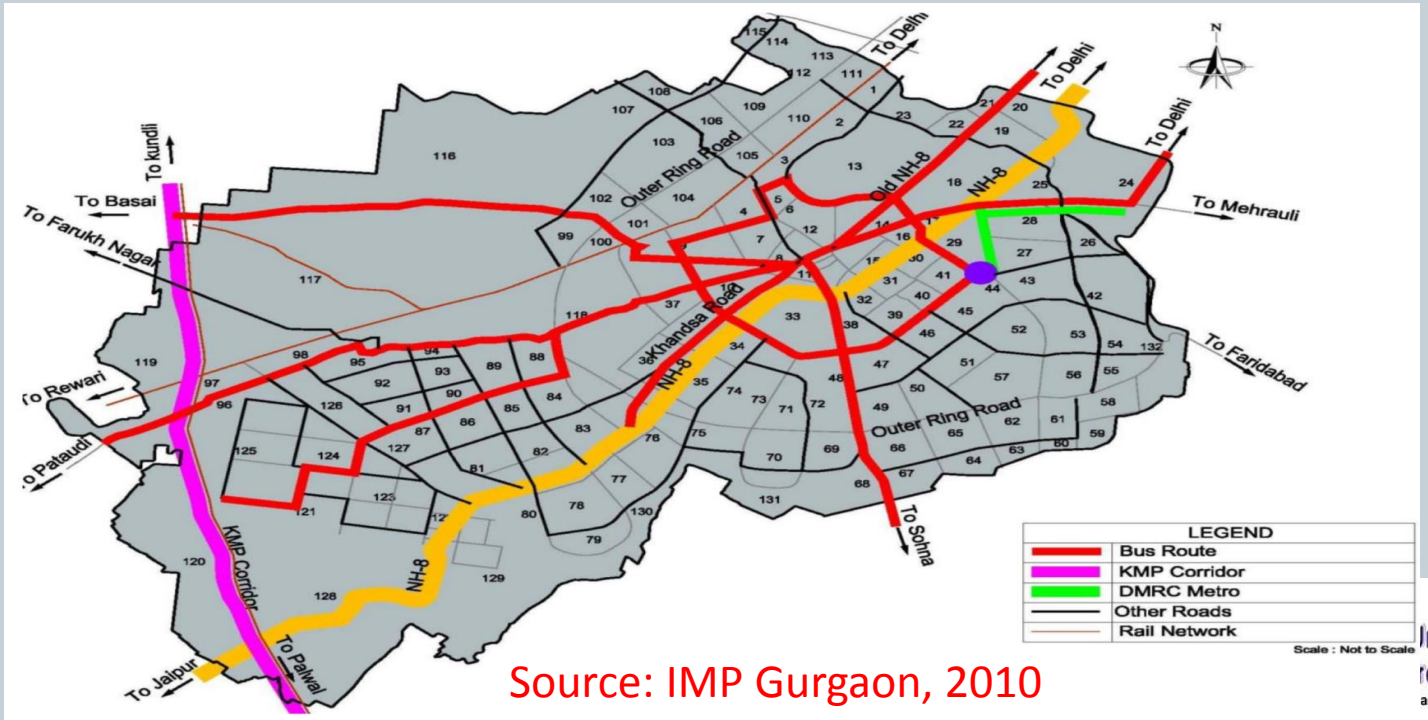
2. The requirement of mass transport system has been tested with the transport demand for 2011, 2021 and 2031.

3. It is expected that the Passenger Per Hour Per Direction (PPHPD) in the transit network, along many of the major corridors, would be more than 10000 PPHPD.

Source: IMP Gurgaon, 2010

Public transport Proposals

1. No organised bus services presently.
2. Bus augmentation alone will not be able to cater to the increased public transit load. The strategy for Public Transport improvement hence will be:
   - Introduction of an organised bus transport immediately.
   - Higher Order Mass Transit System in the future



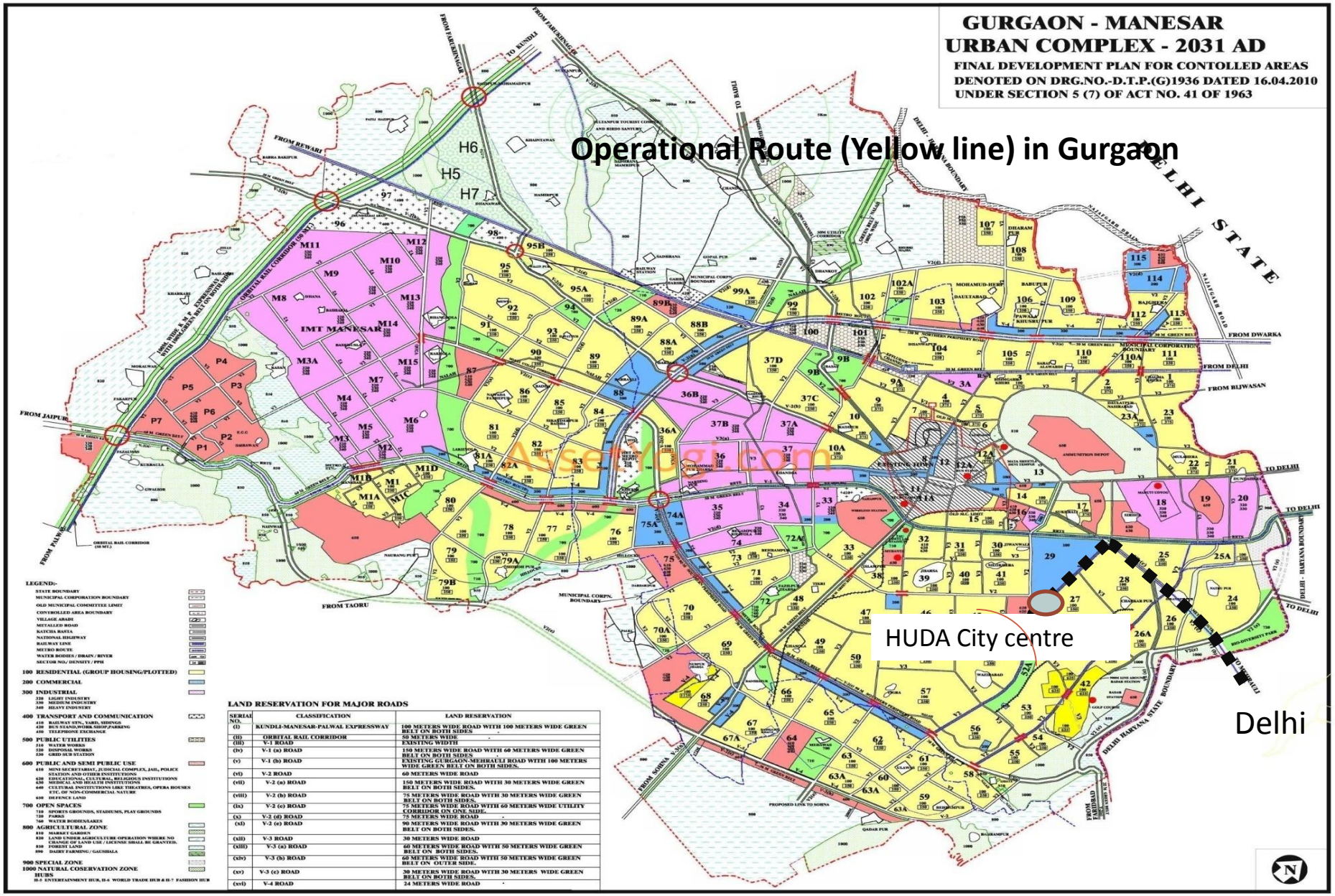
Source: IMP Gurgaon, 2010

Haryana TOD Policy

- Introduced on 9th Feb 2016
- Intense zone –First 500M,
- Transition zone- between 500-800 m on the identified MRTS corridors

METRO ROUTES (WITHIN HARYANA TERRITORY)

Sr. No. HHHH	Metro Corridors	Remarks
1	Delhi Metro extension (popularly known Yellow Line) along Gurgaon- Mehrauli road upto Sector -29 (HUDA City Centre),**Gurgaon.** There are 5 stations in Gurgaon. First is Dronacharya.	Operational
2	Rapid Metro developed in PPP mode by DLF Ltd in collaboration with HUDA in **Gurgaon.** This metro connects Yellow line at Sikandarpur Station	Operational
3	Metro Link along Northern Periphery Road as proposed in the Final Development Plan 2031 AD of **Gurgaon**-Manesar Urban Complex.	In-principle approved by the Govt.
4	**Metro Link along Southern Periphery Road as proposed in the Final Development Plan 2031 AD of Gurgaon- Manesar Urban Complex**	**In-principle approved by the Govt.**
5	Metro Link from Badarpur (Delhi) to Ballabgarh, District **Faridabad.**	Operational upto YMCA Chowk Faridabad



Master Plan -Gurgaon Manesar Urban Complex – 2031 AD

Planning Parameters

Purpuse	TOD Zone	Maximum Ground Coverage	FAR	Population Desnisities
Group Housing	Intense	40 Percent	3.5	600 (±10 percent)
	Transition	40 Percent	2.5	430 (±10 percent)
Integrated Commercial /mix land use	Intense	40 Percent	3.5	-
	Transition	40 Percent	2.5	-
IT /ITES	Intense	40 Percent	3.5	-
	Transition	40 Percent	2.5	-

Parking Norms

Up to 100 sq m Carpet area dwelling unit	0.5 ECS
100-150 M	1.0 ECS
More than 150	15 ECS
COMMERCIAL AREA @50 M	1.0 ECS

Applicability

1. In case of approved projects where the 75% of the permissible ground coverage has already been utilized, the benefit of FAR of 3.5 or 2.5 shall be allowed to be availed, even if demolition of only part ground coverage is sufficient to avail the benefit of additional FAR.

2. Existing or under construction developments, where no third party rights have been created, may be allowed additional FAR under this policy as per norms of ground coverage, green area etc. In such cases, the required density will be achieved proportionate to the additional FAR being permitted. As addition of floors in the existing towers will have the limitation of increasing or decreasing the size of the dwelling units, minimum density norms would not be made applicable in such cases. However, such benefit on existing or under construction developments shall be allowed only after structural stability of the existing and proposed constructions is certified by reputed institutes like NIT, IIT, PEC, etc.

3. Revision of building plans for the approved projects where 3rd party rights have already been created, may be allowed to be availed, provided consent of all the stakeholders is taken in accordance with the policy relating to 'Revision of Layout Plan in respect of Residential Plotted Colony and Building Plans of Group Housing Colony' issued by this Department *vide* memo No. Misc- 2157/7/16/2006-2TCP dated 28.01.2013 and as modified from time to time.

4. In case of conversion of plotted colony into mixed land use, the land owners of plots in a compact block of plotted colony having an area of 0.5 acre and abutting 18 mtrs/24 mtrs wide roads may also be permitted to convert their plots into group housing colony for re-densification purposes. However, in all such cases, the Government will decide such approvals on case to case basis keeping in view the light, ventilation, privacy etc. of the surrounding areas & provision of adequate parking within the composite plot.

Applicability

7. Subsequent to these amendments, building plans shall be sanctioned with higher FAR as per provisions of this policy.

8. The identification of new corridors for MRTS shall be done by the Haryana Mass Rapid Transit Corporation (HMRTC). The State Government will approve the corridor on the recommendation of HMRTC and such corridors shall be considered as included in the Annexure to the policy.

9. Each applicant shall submit a detailed technical proposal with respect to the utilization of the proposed enhanced FAR and density arising out of the TOD scheme. The Director of Town and Country Planning, after satisfying himself with regard to the suitability of the above proposal/amendments shall recommend to the Government for sanction of the proposed FAR and density under the TOD scheme in each individual case.

10. In case of greenfield Metro Projects like on SPR and NPR etc., the existing licencees need to get the permission within a period of six months from the date from which the proposed policy is made applicable. Thereafter, they would have to deposit 15% extra "Infrastructure Augmentation Charges" for every six months delay. This window of grant of higher FAR to the existing/new licences in the TOD influence zone is proposed to be made available for a period of two years from the date of notification of the proposed policy to ensure generation of adequate revenue for financing Metro Projects in a time bound manner. The licences of existing licensed projects willing to avail additional FAR under this policy will submit application for permission for additional FAR alongwith charges like scrutiny fee, conversion charges, licence fee, IDC payable at the time of grant of permission.

Primary data to be collected in Phase-2

- **PRIMARY SURVEYS**

1. Land use survey along existing metro operational corridor and SPR (yellow line)
2. Metro user surveys (metro users covered at HUDA city Centre Metro Station)
3. Real Estate Surveys / BUILDERS SURVEY

- **SECONDARY DATA (DMMRCL)**
- Metro ridership and station loads
- Number of licence granted on SPR and status of construction and areas available for future development and NMT

Thanks