

National Transit Oriented Development (TOD) Policy

1. Background

- 1.1. India is urbanizing at a rapid pace with urban population rising much faster than its total population. Level of urbanisation has increased from 17.29% in 1951 to 31.6 % in 2011. India is competing with the fastest growing countries in the world. The urban population in India, which is nearly 377 million is poised to grow to 600 million by 2030. The urban population of India contributes 65% of country's Gross Domestic Product (GDP), which is expected to grow to 75% in the next 15 years. With India witnessing a high economic growth, Indian cities are growing at a rate faster than other cities in the world.
- 1.2. Urbanization has led to horizontal growth of the cities thus creating problems of urban sprawl. This has resulted in increase of trip lengths and higher usage of private vehicles, problems of pollution and increased demand of infrastructure. To address these issues, many cities have strengthened their public transport by developing mass rapid transit systems (MRTS) such as metro rails and Bus Rapid Transit Systems (BRTS). It is however, important to efficiently use these systems by integrating the land use with the transport infrastructure to make the cities livable, healthy and smart.

2. What is Transit-Oriented Development (TOD)?

- 2.1. TOD integrates land use and transport planning and aims to develop planned sustainable urban growth centers, having walkable and livable communes with high density mixed land-use. Citizens have access to open green and public spaces and at the same time transit facilities are efficiently utilized.

- 2.2. TOD focuses on creation of high density mixed land use development in the influence zone of transit stations, i.e. within the walking distance of (500-800 m)

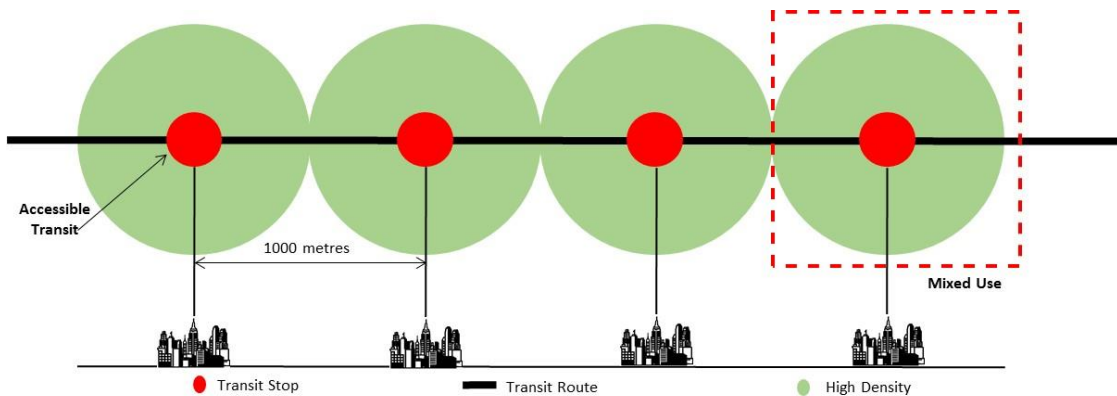


Figure 1: TOD along Transit Stations

transit station or along the corridor in case the station spacing is about 1km as shown in Figure 1. TOD advocates pedestrian trips to access various facilities such as shopping, entertainment and work.

- 2.3. TOD increases the accessibility of the transit stations by creating pedestrian and Non-Motorised Transport (NMT) friendly infrastructure that benefits large number of people, thereby increasing the ridership of the transit facility and improving the economic and financial viability of the system. Since the transit corridor has mixed land-use, where the transit stations are either origin (housing) or destination (work), the corridor experiencing peak hour traffic in both directions would optimize the use of the transit system.

3. Need for a National TOD Policy

- 3.1. As the cities are experiencing rapid growth, transit systems like metro rail, BRTS, etc. are being implemented to cater to the growing travel demand. It has thus become inevitable to have TOD for all such cities which have an existing mass transit systems or are planning to do so.
- 3.2. It is the responsibility of the state government to manage the urban spaces, however a National TOD policy would serve as guidelines and play a catalytic role in formulating state/ city level policies for promotion of transit oriented development

- 3.2.1. In this context, it is important for community-based organizations, practitioner, urban local bodies, state/ union territory (UT) governments, Central Government ministries/ departments/ agencies and all other stakeholders involved in the development of the city, to understand TOD, its benefits and implementation strategy.
- 3.2.2. National TOD policy shall be a guiding document for the Central Government ministries/ departments/ agencies to ensure that their schemes, policies, etc. encourage TOD in cities, especially those with upcoming mass transit systems.
- 3.2.3. This shall support states and cities to recognize public transport infrastructure as the core around which the future expansion of urban areas should be planned and the investments in public transport be directed accordingly.
- 3.2.4. This shall help all state/ UT governments and urban local bodies in formulation of TOD planning strategies.
- 3.3. It shall help in the active participation of all stake holders, Government and Non-Government organizations in implementing TOD.

4. Vision of TOD Policy

The vision of the policy is three fold:

- 4.1 **Enable Transformation:** to assist in transformation of cities from private vehicle dependent city to public transport oriented development,
- 4.2 **Accessible Public Transport:** to promote the usage of public transport by making it accessible, encourage green mobility by encouraging people to walk and cycle and at the same time curb pollution and other negative impacts of motorization.
- 4.3 **Compact Walkable Communities:** to create livable and affordable communities, which are compact and walkable.

5. Objectives of TOD Policy

TOD integrates land use and transport planning to develop compact growth centers within the influence zone of 500-800 m on either side of the transit stations i.e. areas within walking distance, to achieve the following objectives:

- 5.1. To promote the use of public transport by developing high density zones in the influence area, which would increase the share of transit and walk trips made by the residents/ workers to meet the daily needs and also result in reduction in pollution and congestion in the influence area.
- 5.2. To provide all the basic needs of work/ job, shopping, public amenities, entertainment in the influence zone with mixed land-use development which would reduce the need for travel.
- 5.3. To establish a dense road network within the development area for safe and easy movement and connectivity of NMT and pedestrians between various uses as well as to transit stations.
- 5.4. To achieve reduction in the private vehicle ownership, traffic and associated parking demand.
- 5.5. To develop inclusive habitat in the influence area so that the people dependent on public transport can live in the livable communities within the walkable distance of transit stations.
- 5.6. To integrate the Economically Weaker Sections (EWS) and affordable housing in the influence zone by allocating a prescribed proportion of built-up area for them in the total housing supply.
- 5.7. To provide all kinds of recreational/entertainment/ open spaces, required for a good quality of life in the influence area.
- 5.8. To ensure development of safe society with special attention to safety of women, children, senior citizen and differently abled by making necessary amendments to the building bye laws.

- 5.9. To prevent urban sprawl by accommodating the growing population in a compact area with access to the transit corridor, which would also consolidate investments and bring down the infrastructure cost for development.
- 5.10. To reduce carbon footprints by shifting towards environmentally friendly travel options for the line haul as well as for access and egress trips.

6. Principles of TOD:

TOD focuses on compact mixed use development around transit corridor such as metro rail, BRTS etc. International examples have demonstrated that though transit system facilitates transit oriented development, improving accessibility and creating walkable communities is equally important. Based on the objectives of National Urban Transport Policy, this TOD policy defines 12 Guiding Principles and 9 Supportive tools, as shown in Figure 2 and 3, for realizing the objectives of TOD.



Figure 2: TOD Principles

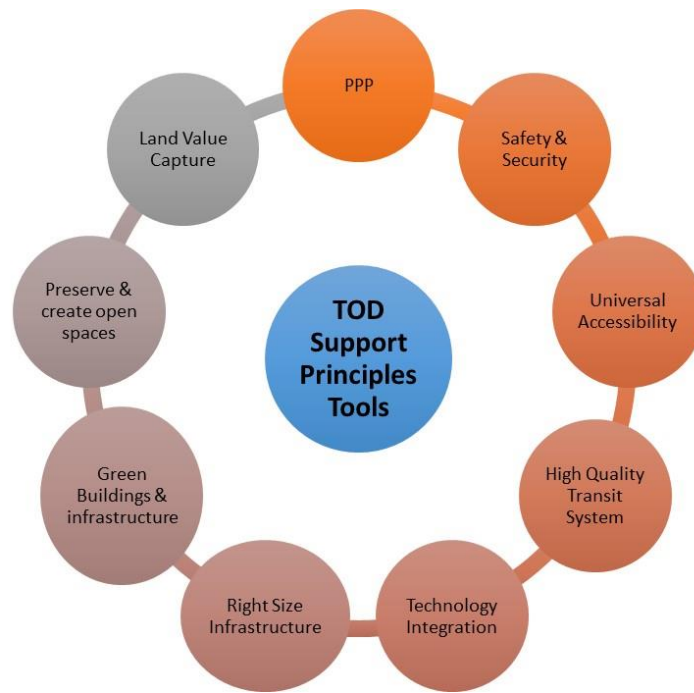


Figure 3: TOD Support Principles Tools

7. Approach for TOD Implementation

7.1. Influence Zone

7.1.1. The area in the immediate vicinity of the transit station, i.e. within a walking distance, having high density compact development with mixed land use to support all basic needs of the residents is called the influence zone of a transit station/ corridor.

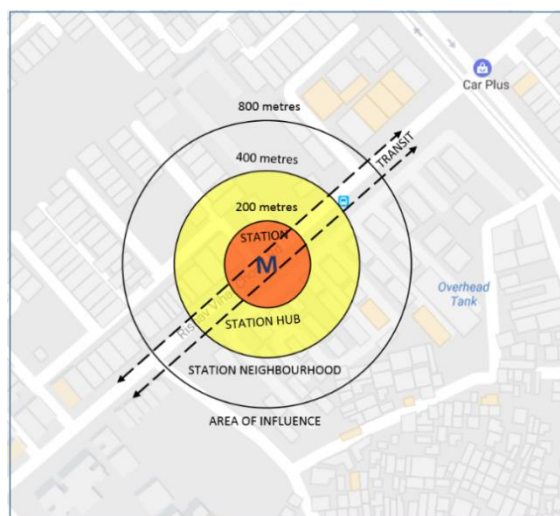


Figure 4: TOD Influence Zone

- 7.1.2. Influence zone is either established at a transit stations or along the transit corridors. It is generally up to a radius of nearly 500-800m of the transit station. Where the distance between the transit stations is less than 1 km and there is overlap in the influence area, it can be identified as a delineated zone (around 500m) on either side of the transit corridor within 10 - 12 minutes walking distance.
- 7.1.3. The area of influence, where the TOD is planned for implementation, should be demarcated and notified through master plan and local area plans before implementation. If in any case the TOD is to be implemented in a phased manner, the influence area of the TOD can also be notified in phases. The principles for delineating the influence area should be clearly indicated so that there is no speculation or confusion regarding the influence zone.

7.2. High Density Compact Development

- 7.2.1. TOD promotes densification in the influence area by providing higher Floor Area Ratio (FAR)/ Floor Space Index (FSI) and higher population & job density as compared to the area around and beyond the influence areas. To ensure sustainable development, the minimum FAR should be 300 - 500%, and can be higher, depending on the city size. This will promote higher concentration of people within the walking distances of transit station, thereby increasing the ridership of the public transport and resulting in increased fare revenue, pollution and congestion reduction.
- 7.2.2. It is not necessary to keep the density and FAR norms consistent for the influence areas across the city. It can vary depending on the infrastructure available, land use zoning, transit capacity etc.

7.2.3. Cities should follow green building norms, adopt renewal sources of energy such as solar and waste to energy options, adopt rain water harvesting and ground water recharge techniques, which would encourage water conservation, utilization of clean energy and promote sustainable waste management so as to make them self-sustaining through efficient use of resources and infrastructure.

7.3. Mixed Use Development

7.3.1. Mixed land use should be stipulated for development/ redevelopment in the TOD zone as it would reduce the need for travel by providing most of the activities such as shopping, entertainment and public amenities such as schools, parks, playgrounds, hospitals etc. within the walking distance of the residents. It would also improve the accessibility of the transit facilities and at the same time link origins and destinations, i.e. residences with work places or activity nodes. This would ensure better utilization of transit fleet by distributing loads in both directions, rather than creating unidirectional peak hour flows.

7.3.2. A blend of land-uses help in the optimization of physical infrastructure and resources, as all components like roads, parking, water, sewerage etc., remain functional at all times of the day.

7.3.3. The TOD benefits cannot be realized with the kind of developments that encourage the use of personalized vehicles. It is therefore imperative to restrict developments such as low-density housing, low-rise development, warehouses, petrol pumps/CNG stations, cremation ground and surface/Multilevel parking etc. in the influence area.

7.3.4. Mix of uses within the TOD can be achieved either by horizontal mixing i.e. separate activities in separate plots/ buildings or vertical mixing i.e. combining different activities within the same building.

- 7.3.5. To ascertain mixed use development along with the required street network and open spaces, the minimum plot area in the influence zone should be defined. The developer may, however, be permitted to undertake construction in a phased manner. In case, the individual landowners want to collaborate for development as per TOD norms, necessary provisions may be made to facilitate it. The landowner(s) may also be permitted to collaborate with developers in case they lack the required experience and institutional & financial capacity to undertake such development as per TOD norms. However, care needs to be taken that the amalgamated plots are redesigned to allow finer network of streets and dispersion of open spaces.
- 7.3.6. The mix of uses to be proposed shall be decided as per the local conditions and the trends in real estate market, however, the minimum percentage of built up area for housing, commercial and other amenities should be fixed. The use of balance built up area may depend on the prevailing market conditions and demand of the city.

7.4. Mandatory and Inclusive Housing

- 7.4.1. The cities should fix a minimum percentage (30% or higher) of allowed FAR for affordable housing (for example up to 60 sq.mt. area) in all development/redevelopment in the influence zones.
- 7.4.2. Housing in the influence zone should have a mix of all economic groups/ sections. The development control regulation should stipulate housing for Economically Weaker Sections (EWS) as well as LIG/MIG, or other types based on Census definition, in the influence area to give an opportunity to the people who depend on public transport for daily commuting to live in walkable neighborhoods.
- 7.4.3. The upper limit to the area of individual dwelling unit should be fixed as a regulatory component in the influence zones to ensure housing for LIG/MIG.

7.4.4. To ensure provision of EWS housing, a 10-15 percentage of built up area in the influence zone should be defined. This could be ensured by providing mandatory incentive of additional FAR for EWS housing. It should also be ascertained that only low income families/ individuals are provided ownership of these EWS units.

7.5. Multimodal Integration

7.5.1. The influence area should have high quality integrated multimodal transport system for the optimum use of the facilities by the residents/users. The system should have seamless physical connectivity, information integration and fare integration across modes so that the first and last mile connectivity does not become a bottleneck in the use of public transit systems by the citizens.

7.5.2. The transit system, including its stations, should be designed to provide high quality services that assure user satisfaction in terms of safety and comfort. The citizens should have barrier free access to all the required amenities in the transit system as well as around the transit centers.

7.5.3. The hierarchy of the facilities at the transit system should prioritize pedestrians followed by bicycle, feeder buses, drop-off facilities and park and ride facility in the given order.

7.5.4. The transit stations should have ample bicycle parking spaces with scope for future expansion if need arises.

7.5.5. Intermediate Public Transport (IPT), Non-Motorized Transport (NMT) and feeder buses perform a significant role in providing first and last mile connectivity to the populace beyond the influence zone. To ensure that the area around the transit station remain congestion free and to facilitate easy transfers, it is important to provide adequate parking and pickup/ drop-off facilities for the above modes at suitable locations at the stations and in the influence zone.

7.5.6. To support TOD, park and ride facilities may be provided, if needed. The facilities, with suitable pricing that deters private vehicle use, may be planned primarily at the end stations and can variably decrease according to the requirement on the intermediate nodes. On-street parking should be prohibited in the influence area and if necessary it should be priced higher than off street parking.

7.6. Focus on pedestrians, cyclists and NMT users

7.6.1. The streets should be designed for users of all age groups and for all types of commuters including pedestrians, bicyclists, motorists and transit riders. They should be safe and accessible by all.

7.6.2. The influence zone should have development in smaller blocks with a finer street network having provision for pedestrians, bicyclists and NMT users. This will create a grid of small, traversable blocks which has sidewalks and amenities like lighting and information signage etc. and ensure accessibility of the transit stations by pedestrians and cyclist.

7.6.3. Right of Way (ROW) should not dictate the pedestrian circulation network, it should rather be designed based on the pedestrian volume and adjoining land-use. Smaller ROWs should be made 'pedestrian and NMT only' or one-way streets so that pedestrian circulation is not compromised.

7.6.4. Continuous and unobstructed footpaths of suitable width should be provided on either side of the streets. To protect the footpaths from encroachment and parking, buffers or bollards etc. may be provided.

7.6.5. **Universal Accessibility:** All streets should be designed to meet or exceed the minimum standards stipulated for barrier free environment

by Government of India¹ to ensure universal accessibility for people with reduced mobility including visually and hearing impaired persons.

- 7.6.6. **Traffic Calming:** To promote a safe and secure environment for pedestrian and NMT users, necessary measures should be taken to reduce speed as well as volume of motorized traffic in the influence zone. On streets which are primarily designed for movement of pedestrian and NMT as well as those having ROW less or equal to 12m, the maximum speed limit should be restricted to 20 kmph by design by use of table top crossings, carriage way surfaces etc. For all other streets, in and around the influence zone, the speed should not exceed 40 kmph.

7.7. Street Oriented Buildings and Vibrant Public Spaces

- 7.7.1. Retail and other 'active uses' should be supported on the ground floor along the main streets, key intersections, stations and parking garages to ensure high quality pedestrian environments.
- 7.7.2. To promote natural surveillance of public spaces, all boundary walls and setbacks should be removed and buildings should be permitted up to the edge of the street. Also, the orientation of the buildings should be such so as to face the pedestrian facilities.
- 7.7.3. The streets should have a natural surveillance system by providing mixed-use active frontage, vending zones and avoiding opaque wall, which would ensure a safe environment for pedestrians, especially women, children and elderly.
- 7.7.4. Ground floor should support commercial activity, with at least 50% un-tinted transparent frontage.

¹ Guidelines and Space Standards for Barrier Free Built Environment for Disabled and Elderly Persons, CPWD (1998) (<http://cpwd.gov.in/Publication/aged&disabled.PDF>)

- 7.7.5. The height of compound wall, if present, should be transparent above 100 cm, with exception of high security government buildings.
- 7.7.6. The frontage of all parking structure/podiums or stilts on the ground floor should support active frontage on all primary streets.
- 7.7.7. **Street Vendors:** TOD aims at inclusive development wherein all users of the system are benefited. The street vendors are the eyes of the streets; hence the designated spaces should be created for them while designing the streets. However, care should be taken that the integration does not have negative affect on their business.
- 7.7.8. **Preserve Open Spaces:** All open areas such as amenity spaces, green spaces, playgrounds, parks and natural areas should be preserved as part of TOD. The open space provision within TOD should meet the Urban and Regional Development Plans Formulation and Implementation (URDPFI)² guideline of 10-12 sq.mt. per person.
- 7.7.9. **Safety and Security:** To ensure a safe and secure environment for pedestrian and NMT users, especially women and children, the influence zone should be designed to maximize natural surveillance. For this purpose, street lighting should be provided, active frontage and vendors zone etc. should be created. Further, facilities such a CCTV cameras and panic buttons etc. should also be installed for round the clock surveillance.

7.8. Managed Parking

- 7.8.1. To discourage the use of private vehicles and to manage parking in TOD, it is essential that the supply of the parking is reduced and made expensive within the influence zone.

² <http://moud.gov.in/link/urdpfi-guidelines.php>

- 7.8.2. On-street parking should be prohibited within 100 m of the transit station, except for freight delivery and pickup or drop-off of the differently abled.
- 7.8.3. The use of parking spaces within the influence zone can be maximized by sharing of spaces between uses that have demand during different times of the day. For example parking requirements for office/work can be shared with the parking spaces for residences as their hours for demands do not coincide with each other.
- 7.8.4. TOD aims to promote NMT which includes use of bicycle. Therefore, bicycle parking facilities should be provided at regular intervals and suitable locations within the influence zone. Public bicycle sharing systems may also be planned to promote the use of bicycles.
- 7.8.5. Parking should not be allowed in a manner wherein the aesthetics of the city is lost. The neighborhood is generally adversely affected by parking of vehicles in front of the buildings on the primary streets, therefore, on-street parking should be avoided. In case, if on-street parking is needed, it should be provided in a manner, wherein it acts as a buffer for the pedestrians and cyclists from motorized traffic.
- 7.8.6. To restrict unauthorized parking and to avoid congestion caused due to on-street parking, it is important to have an enforcement mechanism in place. Cities should have a parking policy with heavy penalty for unregulated parking in the influence zone and ensure that the same is implemented. Also the parking should have price variations according to time of day and duration of parking.

8. Value Capture Financing (VCF) for TOD

- 8.1. Value Capture is based on the principle that private land and buildings benefit from public investments in infrastructure and policy decisions of the Government. Part of the increment in value of land and building should be

captured to fund projects being set up for the public by the Central/ State government and the ULBs. The additional value is generated by actions other than the land owner's direct investment. Land value capture is distinct from the user charges or fees that agencies collect for providing services.

- 8.2. The investment in transit system as well as increase in FAR and provision for mixed use development would result in increase in value of land within the influence zone. Land Value Capture can be used as a mechanism to finance the required upgradation of infrastructure and amenities within the influence zone and expansion of the public transport system.
- 8.3. Value capture financing is an opportunity for the private sector because the projects are planned for the overall development, thus increasing the value and are also backed by the government.
- 8.4. In TOD influence zones, land value capture can be done through enhanced or additional land value tax³ or one time betterment levy⁴, development charges or impact fee⁵, transfer of development rights (TDRs)⁶, or other such mechanisms which have been adopted in various states across the country and abroad.
- 8.5. The resources generated through various mechanism should be credited into a TOD fund created for funding the infrastructure upgradation/ maintenance, enhancement of viability of transit systems, development and maintenance of transit corridor and public transport etc. within and beyond the influence zone. The fund should be in the form of an escrow account, from which financing is provided to various agencies for the identified activities and the balance can be used by the ULBs for other development purposes such as public transport expansion.

³ Examples – Tamil Nadu and Maharashtra

⁴ Example – Mumbai Metropolitan Development Authority (MMRDA) Act 1974 provides for levying betterment charges for specific projects. Hyderabad Municipal Corporation Act 1955 also provides necessary provisions

⁵ Example - Andhra Pradesh, Gujarat, Maharashtra, Madhya Pradesh and Tamil Nadu

⁶ Example – Maharashtra, Karnataka and Gujarat

- 8.6. The real-estate market can be erratic and therefore caution should be observed while estimating the revenue from land value capture. In case the revenues are lower than expectations, ULBs should prepare alternate financing plans to circumvent problems in implementing TOD.

9. Statutory Framework

- 9.1. TOD policy should be notified as part of the Master Plan/Development plan of the city. The policy document should clearly outline the importance of the high capacity transit networks in the city's development.
- 9.2. The vision of the Master Plan/ Development Plan should be resonated by all the stakeholders, especially those involved in infrastructure development and preparation of development plans. The building bye-laws and development control regulations would need to be amended to incorporate the changes required for implementing TOD.
- 9.3. The influence zone of the TOD should be clearly notified by the concerned authority (*see para 5.1 on Influence Zone above*).
- 9.4. To ensure that the infrastructure created in the influence zone is provided in a planned manner, the ULBs and the concerned authorities/agencies should prepare a comprehensive plan integrating all the utilities, physical infrastructure and essential facilities such as roads, sewers, drainage, electric lines, green spaces, police post, fire post, electric sub-stations, etc. The plan would be useful to assess the carrying capacity of the existing infrastructure and the upgradation needed to meet the increased demand once TOD is implemented.

10. Coordination and Implementation

- 10.1. Implementation of TOD would entail the involvement of various agencies for preparation of master plans or sector plans, reviewing the infrastructure building regulations, provision of public transport and traffic control, etc. Therefore, to

ensure the success of TOD, it is important that there is coordination between these agencies for efficient planning and implementation. For this purpose, a suitable institutional mechanism may be created in cities. An entity formed jointly by the Urban Local Body and the Development Authority would be most suitable for expeditious planning and implementation of the TOD; however, till the time such a body is set up, city development authority could coordinate the implementation. Adequate capacity building measures may also be taken by the state governments and urban local bodies to familiarize the officials with the tenets of TOD.

- 10.2. To ensure that TOD does not merely become a high density development along the transit, which may result in higher concentration of private vehicles and congestion, it is important that the ULBs make sure that all the important aspects of TOD, as given in earlier sections, are implemented in totality.
- 10.3. Cities should provide transparency and clarity in the policy and procedures for TOD, as well as the economic incentives for all stakeholders. This would allow multiple landowner to come together and build a consensus and save time in implementation of TOD.
- 10.4. For long term commitment of public agencies and private sector in implementing TOD, cities should create clear and fair rules for sharing of costs, benefits, and risk among the stakeholders.
- 10.5. Cities may encourage public private partnership in planning and implementation of TOD as well as infrastructure upgradation to foster the technical knowhow and financial capacity of the private sector.

11. Communications and Outreach

- 11.1. TOD, on wider board, needs the involvement of multiple agencies, both from the private as well as the public sector. It is important for all stakeholders to have a clear vision by which collective actions can be taken for successful

implementation of TOD. It is therefore essential to create awareness about TOD as it would enhance the success of its implementation.

- 11.2. Cities may launch awareness program about the components of TOD, its benefits, incentives to be reaped by the land owners, developers, infrastructure agencies and other bodies, reduced per unit cost for creating and maintaining infrastructure etc. and provide improved quality of life.