

## **Study of How Transit Oriented Development involves urban growth and mass transit corridor of any City**

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### **Abstract:**

The main concept to write this paper to understand better view of TOD by its roles, concepts and basic structure. Cities and towns play a critical role in promoting economic growth and prosperity. In the coming years, as India becomes increasingly urbanized, urban areas will play a key role in sustaining high rate of economic growth. Rapid Growth of urbanization will bring serious problems such as traffic congestion, environmental problems, land uses and other related problems. Transit oriented development (TOD) is a type of urban development which maximizes the amount of residential, business and other spaces within a walking distance from public mass transport. It is the creation of compact, walkable, pedestrian, oriented mixed-use communities centered around transportation system. TOD has been widely accepted in recent years as an important urban development policy. It might be difficult to introduce new form of development in metropolitan areas which has already existing well established transit system and other development. Financing of these projects has been one of the major issues for the authorities to deal with. The large projects affect existing city development and other facilities.

**Keywords:** TOD; Urban Growth; Mass transit corridors; Mass transit system; role of TOD

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### **I. INTRODUCTION:**

The distribution of the urban population by city size varies widely and is skewed towards larger cities. A specific feature of urbanization in India is increasing metropolitanization, that is, the growth in the number and size of cities with more than one million. The trends indicate continued urbanization and metropolitanization in the coming year. However, the number of metropolitan cities, those with more than one million population, has increased considerably during this period. From 35 in 2001, the number of metropolitan cities increased to 50 according to the 2011 Indian census<sup>1</sup>. Of these 50, eight cities (Mumbai, Delhi, Kolkata, Chennai, Hyderabad, Bangalore, Ahmedabad and Pune) have more than 5 million population.

Due to this heavy population in urban areas, which affect with the various impacts like traffic congestion, noise and air pollution, improper land use, waste of time, economic growth, fuel wastage etc. The general policy should be designed in such a way as to reduce the need to travel in personalized modes and promote public transport, particularly in the mass transport system. Much needs to be done for public transport to play an important role in the life of a city. Public transport systems in cities have not been able to keep up with rapid and substantial increases in demand in recent years. As a result, people have turned to custom modes such as mopeds, scooters, motorcycles and cars and intermediate audience. Transit Oriented Development (TOD) can directly benefit a transit agency through increases in passenger numbers and revenue. TOD can also have a positive impact on society by reducing car use and reducing the number of vehicles on the road network and reducing congestion. Which is in dire need of pressure on the surrounding environment, thus achieving a healthy environment.

### **II. LITERATURE REVIEW**

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## **2.1 Concept of Transit Oriented Development (TOD)**

TOD is a straightforward concept: concentrating a mix of moderately dense, pedestrian-friendly development around public transit stations to promote the use of public transportation, increase walking and cycling trips, and other alternatives to private car use. TODs were first introduced in 1990 by American architect and planner Peter Calthorpe. According to Peter Calthorpe, TODs are: "Mixed-use community within an average walking distance of 2,000 feet from a transit stop and a major business area<sup>2</sup>. Transit Oriented Developments (TOD) are claimed to have the ability to reduce the number and average duration of car trips by providing better accessibility to jobs and other non-car destinations and by encouraging sustainable modes by providing a pedestrian-friendly environment and transit services.

Objectives of TODs are:

- Provide public transportation with easy access to the maximum number of people within walking distance, through enhanced densification and connectivity.
- Provide safe pedestrian and bicycle travel in and out of the station area.
- Promote a mix use of uses to ensure the efficient use of transit, to promote increased ridership during peak and off-peak hours in all directions.
- Provide mix of housing types and sizes and including housing for a range of different income levels.
- Provide a safe and attractive street for all users which provides connectivity from all areas.
- Promote a balance between the intensity of TOD and the capacity of the multimodal transportation infrastructures provided and affected by TOD.
- Providing publicly accessible, high quality, usable open spaces.

## **2.2 TOD Planning Process**

Although the planning process of TOD for any city is a case specific and needs to address local issues rather than general.

- Assessment of capacity of station area development and Mass – transit system: In this step employee and housing pattern in and around the station is assessed with respect to capacity of public transportation to reduce traffic.
- Fixing Mix land Use Objectives: Proper land use objectives are depending upon the existing pattern, architecture and social needs.
- Creating Cycle: Rickshaw infrastructure for non-motorized transportation system is an essential element of planning.
- Identify TOD- Ready areas: Identifying areas which are conceptually ready for TOD planning.
- Affordable Cost of housing and infrastructure.

## **2.3 Benefits of TOD**

The advantages of TOD that could increase the comfort of living in the future are summarized as:

- Increase the number of passengers in transit and improve the efficiency and effectiveness of investments in transit services.
- Decrease in regional congestion, air pollution and greenhouse gas emissions due to the reduction driving
- Walkable communities promote healthier and more active lifestyles.
- Provide employment and economic growth opportunities.
- Reduce infrastructure costs
- Increase public safety
- Contribute to more affordable housing
- Helps conserve natural resources and open spaces.

## **2.4 Role of TOD in Urban Planning**

Chatrali Shirke<sup>3</sup>, The TOD concept is gaining great momentum in India as it is promoted as one of the sustainable planning tools for decongesting areas in metropolitan cities in India. Another important reason behind TOD's popularity in developing countries like India is the new METRO projects being built in various metropolitan cities. However, it is of utmost importance to consider the impact of TOD on various existing infrastructure facilities, such as roads, as well as on the traffic itself, long before implementing TOD. While forming a policy for DOT, it is necessary to decide on vertical development, which will be allowed by that policy in the form of FSI.

Robert Cervero<sup>4</sup>, Case experiences in Bogotá, Colombia and Ahmedabad, India, underscore that short-term mobility advances prevailed over long-term urban growth configuration. The experiences in Bogotá and Ahmedabad suggest that the failure to take advantage of compact and mixed-use development near stations is because BRT systems are seen primarily as investments for mobility and not for city configuration. In both cases, engineering and cost minimization principles generally prevailed over urban planning and development maximization. In an attempt to save on investment costs, the path of least resistance was often chosen. This has meant locating BRT lines and stations on busy midways, often with poor pedestrian access, to reduce the acquisition of rights-of-way and avoid the cost of demolition and relocation of buildings.

Yingqun Zhang<sup>5</sup>, Analyzing the distribution of different urban elements, the urban structure can be understood in multiple perspectives. According to land use data, urban functional areas such as industry multiple perspectives. Based on land use data, urban functional areas such as industrial areas and residential areas are distinguished. Building or employment densities and residential areas can be distinguished. Building densities or employment densities can help to identify the polycentric structure, and high-density places are always considered city center and sub-centers. In the field of identifying urban structures, most of the existing studies emphasize sub-centers. In the field of identifying urban structures, most of the existing studies emphasize how a given urban element influences urban form and therefore only focuses on geographical distribution certain urban element.

Richard D. Knowles<sup>6</sup>, A search was conducted in Scopus using the term Traffic Oriented Development and each author subsequently read 623 English abstracts for the period 1993-2018 and generated an independent structured literature review that seeks to summarize the development course of TOD. Only journal articles and book chapters were evaluated. The document in its final form includes references to 140 studies, all read cover to cover. The selection of the material was made based on the relevance of the resource for the narrative of the article, the impact factor of the host journal for the articles and the impact of each academic outing, which can be interpreted by the number of its citations. The three authors then compared and synthesized their independent written results to create a unique "bigger picture" narrative.

Arati Siddharth Petkar<sup>7</sup>, Mumbai, the economic capital of the nation, is a very dense city in the state of Maharashtra. It faces the main problems of traffic congestion. To alleviate increasing traffic congestion by reducing private property in the region and to complement various public transportation initiatives, the Mumbai Metropolitan Region Development Authority (MMRDA) is implementing metro and monorail systems along the congested corridors of the Mumbai region. The implementation of large-scale transit projects requires a large financial backing. These large-scale projects, when implemented, affect the existing city structure. The addition to the existing network of the Mumbai transportation system, which consists mainly of buses, railways, and taxis, would have its own impact on overall passenger statistics. This change in the passenger pattern would also have an impact on the station area.

### III. CONCLUSION

Future developments and the evolution of modern cities require a perspective of sustainable development and integrated management of existing resources. TOD can be used as a strategy to solve the existing problem of traffic congestion, environmental pollution, low efficiency in land use and urban growth problems. for all kinds of cities. TOD will generally be adopted as a real choice for car-oriented urban planning and design.

India, which is a dense nation, can primarily use transit-oriented development to reduce congestion problems faced by major cities, as well as the problems of encroachment, environmental degradation and densification. The study proposes a simple but scientific methodology to find the impact of TOD on LOS of existing infrastructure facilities such as roads and transit systems before planning and implementing TOD. As urban growth moves to the cities of the developing world, there are unprecedented opportunities to link land development and transit infrastructure. This will help make decisions regarding requirements for improvements to current infrastructure facilities, as well as transit services. Furthermore, the results obtained from the TOD impact analysis will be useful to determine the threshold values of possible vertical development in terms of FSI. This threshold value is based on the ability of infrastructure and traffic to support development.

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