

TRANSIT ORIENTED DEVELOPMENT: SOLUTION FOR URBAN SPRAWL IN AMRAVATI CITY

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Abstract

Wide scope of earning money, luxurious lifestyle, quality education, ample job opportunities are some of the reasons that people migrate from rural area to the city. Which automatically tends to increase in population and urban sprawl? Increase in population leads to increase in motorization at an alarming rate in Amravati city. Affordable vehicle price, ease to move with comfort, luxurious lifestyle, unsafe pedestrian pathways and lack of accessibility are some of the reasons that people prefer to travel by private vehicle. Traffic congestion, air pollution, and greenhouse gas emissions are all exacerbated by urban sprawl and inadequate land use planning. By luring development around transit stations, public transportation serves to reduce sprawl, and this development helps to fund public transportation by increasing ridership. A sustainable future requires collaboration between land use planning and transportation system design. One of the techniques for encouraging this integration is Transit Oriented Development. The challenges caused by sprawl in Amravati City are discussed in this study, and TOD is one of the remedies.

Keywords: TOD (Transit oriented development), Urban sprawl, public transport.

1. INTRODUCTION

Transit oriented development (TOD) is the creation of mixed land use, compact, walkable neighborhoods that encourage people to live near and use public transit. (Wangtu, 2017). The population growth of Amravati city is 17.52% in 2021 with rise in population from 650601 in 2011 to 764645 in 2021. As Amravati is a developing city, urbanization has increased tremendously in last few decades. This urbanization and poor land use planning leads to increase in traffic congestion, air pollution and greenhouse gases. Transit oriented development is a mixed-used development around a transit station to encourage people to use public transport and reduce reliance on private vehicle (Abdullah, 2016). The city's outskirts have the potential to house migrants but they'll need decent access and a network that's not congested. By promoting growth around transit stops, public transportation helps to reduce sprawl. As a result, the integration of land use planning and transportation planning is crucial. Planning for transportation systems is critical for a sustainable future and reducing urban expansion. Transit Oriented Development is one of the tools promoting this integration. This paper highlights problem arises due to urban sprawl and its alternative solution to reduce the sprawl.

Aim & Objective of paper

To review the work done by different researchers and to study the problem arises due to urbanization, inefficient public transport planning and propose Transit oriented development.

- To understand the concept of transit-oriented development (TOD)
- To solve problem, arise due to traffic congestion

2. TOD COCEPT

Peter Calthorpe, an American architect and planner, initially created TOD in 1990. A mixed-use area within 2000 feet of a transportation station and commercial center, according to him. TOD's goal is to create a walkable environment that encourages people to walk, bike, and take public transportation. TOD is a transit-oriented development pattern that incorporates integrated functions (compact development) in high-density regions, pedestrian development priority, and transit station accessibility.

To create a more pleasant urban environment, transit-oriented development (TOD) aims to improve the integration of land use and transportation networks.

TOD has grown in popularity as a solution to a variety of urban issues such as traffic congestion, affordable housing shortages, air pollution, and sprawl.

Transit Oriented Development (TOD) is any development, large or small, that is centered on a transit node and provides total ease of access to the transit facility, encouraging people to walk and take public transportation instead of driving.

Benefits of TOD

- i. Increase the use of public transit, walking and cycling
- ii. Better land use planning
- iii. Reduce traffic congestion
- iv. Increase economy
- v. Access to more job opportunities
- vi. Reduce air, noise pollution and greenhouse gases

Aspiration of TOD

- i. Prioritizing Public Transit Use and Reduce use of private vehicles
- ii. Diverse mix of land use
- iii. Reducing Trip length and number of trips
- iv. Capitalizing upon the land value potential

Guiding Principles

- i. Integration of Multi Modal
- ii. Connectivity from the First mile to the Last mile
- iii. Interconnected Street Network
- iv. Complete Street
- v. Non-Motorize Transport (NMT) Network
- vi. Traffic Calming Measures
- vii. Mix Land Use
- viii. Optimized Densities
- ix. Street Oriented Buildings
- x. Managed Parking
- xi. Informal Sector Integration
- xii. Housing Diversity

3. LITERATURE REVIEW

(Shen, 2020) developed the TOD index, which is used to measure geographical criteria and construct an index that reflects current TOD levels. A 10-minute walking distance of 800 m radius is designed to measure the TOD level of a station area using an index (Schlossberg, 2007), which is relevant to Addis Ababa's TOD planning. The variables that define the SMCA for the TOD index are given once the TOD research area has been defined. When such an index is produced for each station region, recommendations for improving TOD around stations can be offered.

(Ana Galelo, 2014) The definition of a TOD area (case study), the description of the variables to be used, and the equations under which these variables will be tested in order to find connections between the use of public transportation lines and station service area characteristics are all part of evaluating a TOD area. The analysis takes into account factors such as density and diversity in land use, as well as train supply in transportation. Aside from station definition, the correlations between these variables were investigated, leading to the development of a preliminary strategy based on binary regressions. This first regression exploratory study will also be confirmed by a multivariate regression analysis with more variables,

allowing for a more thorough examination of the relationships between land use and transportation characteristics.

(Aston, 2016) The goal of this project is to measure and compare the extent of transit orientation in catchment development for four different public transportation modes and 'no transit' catchments. The study sites were chosen via random sampling. The spatial profile was then created using automated queries. The three initial 'D' variables—density, diversity, and design were combined to create an overall 'TOD score,' which represented how transit-oriented an urban form was. The addresses of each transportation stop were obtained using Google Maps. The coordinates were obtained using Geo Planer V2.7.

(Widyaharia, 2014) seeks to discover some potential and opportunity TOD locations by 1) establishing criteria and indicators to analyse TOD potential location and opportunity. 2) analysing TOD potential places in the Metropolitan Bandung Area using criteria and indicators from multiple transportation system plans, and 3) evaluating the opportunity of TOD potential locations using criteria and indications from spatial plans. Survey research and analysis methodologies were used in the study.

(Urvi, 2015) Curitiba is considered as a model of Transit Oriented Development (TOD), which stipulates that residential, commercial, and recreational spaces be created in densely populated regions near public transportation facilities. Furthermore, rather than supporting segregated land use zoning, TOD promotes a land use mix to reduce travel distances. Roads will be built near new homes and businesses, each with access to the Green Line, a new bus-rapid transit route.

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4. MAJOR FINDINGS

It is vital to determine the existing state of the city before developing or regenerating any area. Every city has TOD, but the amount to which TOD is present must be determined. The TOD index is a metric for determining the amount of TOD in a given area. TOD Index provides

a quantifiable representation of TOD in a given area, which aids in TOD planning.

Benefits of TOD includes local job creation and better access to job, reduce air pollution and greenhouse gases, improve traffic congestion and health, city and neighborhood become more livable, cost and convenience saving and increase service income. Measure access to transit and consider setting city target includes a percentage of new development within a certain radius of transit stations, percentage of population living in TOD zones, percentage of population with access to public transport, identify where to apply TOD, node value, place value and market potential value. The ongoing planning of metro subway is also expected to take part in increasing the value of TOD. More than increasing land value, TOD are all about enhancing people's lives, health and well-being. The future of city living indeed lies on Transit oriented development.

Development of public transport is partially done in Amravati city by providing city bus service through Badnera railway station to Navsari road via sai-nagar, nawathe, rajapeth, rajkamal, panchavati, gadge nagar and shegaon naka. This study aims to identify some other locations which has potential and opportunities as TOD. This study also finds that why people rely on private vehicle rather using public transportation on provided transit nodes.

What is the relationship between TOD and Comprehensive Community Planning?

People, residences, businesses, and transit are all connected by transit-oriented development, as seen in this Venn diagram.

Because it fosters dense, compact urban destinations, transit-oriented development is compatible with Complete Community planning. The approach also emphasizes community integration of public transportation and walkability.

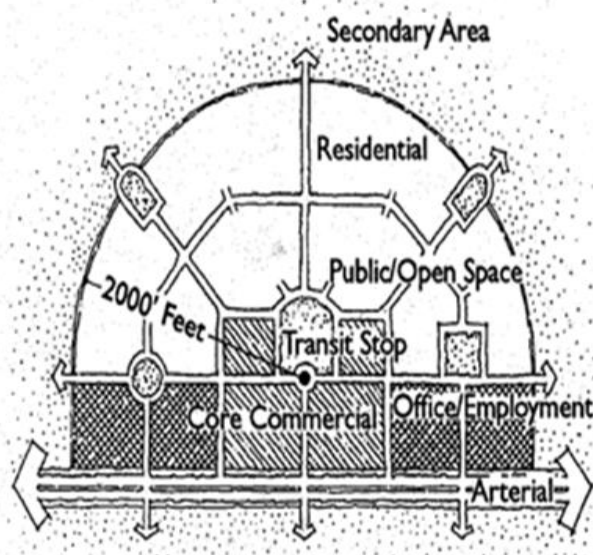


Figure 1 TOD: Planning for complete communities

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