

Study on Transit Oriented Development

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Abstract - Transit Oriented Development (TOD) is gaining popularity as a tool to achieve sustainable development, particularly in India. Transit-Oriented Development (TOD) presents unique opportunities for Indian cities to meet the challenges of rapid motorization, rising inequity, deteriorating quality of the urban realm and climate change. TOD majorly deal with mix land-use such as residential, commercial, public space and serve around transit stations for pedestrian-friendly movement. 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. This paper studies the concept of TOD, its advantages, Challenges and Case Study.

Key Words: Transit Oriented Development, Land Use, Transportation, Mixed Land Use

1. INTRODUCTION

Transit Oriented Development is important for any development, macro or micro that is focused around a transit node and it make easy ease of access to the transit facility to the people to walk and use public transportation over personal modes of transport. This is an attempt to build the compact cities and thus decreasing the dependency on the outer fringe area which highly encourage the shift from non- motorized to motorized modes of travel. Approach to TOD development is very much dependent on establishing mixed land use zones.

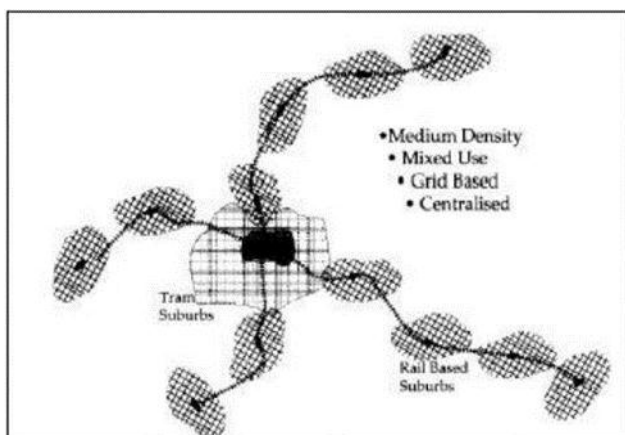


Fig -1: Transit City Conceptual

Source: Newman P.W.G and J.R Ken Worthy, "The land use-transport connection: an overview, land use policy, 1996

The primary goals of TOD are to:

- i. Reduce/ Discourage private vehicle dependency and induce public transport use- through design, policy measures and enforcement.
- ii. Provide easy public transport access to the maximum number of people within walking distance- through densification and enhanced connectivity.[1]

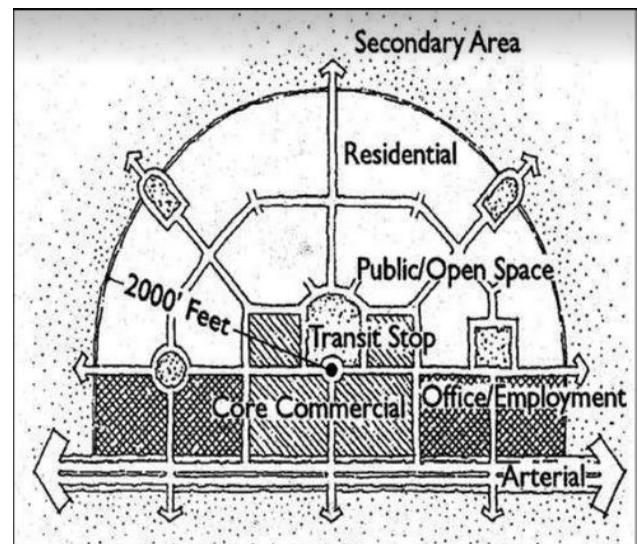


Fig -2: Concept of TOD by "Peter Calthorpe"

1.1 Types of TOD

Two types of TOD's may be developed: "Urban TODs" and "Neighborhood TODs."

- **Urban TOD:** Urban TODs are located on the Trunk Line Network at light rail stops or at bus transfer stations. Because they are adjacent to the major spine of the regional transit system, these TODs may have a higher percentage of job-generating uses and may be developed at higher commercial intensities and residential densities.
- **Neighborhood TOD:** Neighborhood TODs are located on feeder bus lines within 10 minutes travel time from light rail stops or bus transfer stations. These TODs should

place a greater emphasis on residential uses and local-serving shopping.[2]

1.2 Key Parameters of TOD

The TOD Parameters are the 3 Ds below

- **Density** (For adequate population density for transit ridership transit)
- **Diversity** (Mixed Use, Mixed Income that use transit)
- **Design** (Safe, comfortable, Active (24X7) Environment created by promoting walkability and access to transit

The 3 Ds define the density, mix of uses and connectivity required within walking distance of transit stations to encourage transit use and a 24-hour environment around transit station.[2]

1.3 Benefits of TOD

- The benefits of transit-oriented development have been extensively written about and endorsed by planners worldwide.
- The pursuit of sustainability includes a wide range of policy goals that address environmental, equity, and economic conditions.
- Social benefits is the reduction in commuting time and high quality service characterised by frequent, dependable arrivals and departures, clean, safe and attractive carriages and an appealing station environment.
- Successful TODs integrate quality retail, community facilities and other services which ensure commuters and residents of nearby suburbs utilise local services as they walk, cycle or arrive by feeder transport.[3]

Table -1: Benefits of TOD

Class	Public sector benefits	Private sector benefits
Primary	Increase ridership and farebox revenues	Increase land values and rents
	Provide joint development opportunities	Increase affordable-housing opportunities
Secondary/ Collateral	Increase property and sales tax revenues	Increased physical activity
	Reduce sprawl/conserves open space	

1.4 Challenges of TOD

One of the biggest challenges is that the regulatory framework of most municipalities is not supportive of TOD. It is common for cities to have zoning ordinances and land development codes designed for automobile-oriented, single-purpose, suburban-scale development.

- Resolving the conflict between transit node and desirable place
- Parking
- Gentrification
- Willingness from stakeholders

2. LITERATURE REVIEW

In this section, various research papers, articles and case studies are referred.

- In this paper author started with literature review & concept of TOD, after that author had explored demographic information, characteristic of Salaya district, and demands from local communities about land use planning, transitioning to public transportation system. Author collected 2 parts of data, first from several focus group meeting having the topic of discussion on land use map and transportation such as main road, alleys, and pedestrian walkways and second from questionnaire surveys. In quantitative analysis population was composed of 3 major groups. The first group was the local people who live in the Salaya station area, second group was the passengers of Salaya Station & The third group was users of the station and the people come through use area surround the station or work. The analysis revealed that majority 62% of community group was female & 62.7% female passenger. [4]
- This paper aims to examine the general research question of whether the experience of RTOD is different over time for stations built on infill and greenfield sites in relation of five specific hypotheses. Study related to changes in the population and employment size, development intensity, detailed land use pattern, and travel behavior of people living around transit stations along two railway lines in which one primarily running through greenfield sites and the other running through infill sites & then compare within a time span of 5 years before, 5 years after & 10 years after. [5]
- The goal of this study was to build a methodology to modify these land uses using soft computing, GIS, and simple Genetic algorithm. The methodology was applied to two sectors of Naya Raipur in GIS using a 50 m x 50 m grid and spatial data were added. Genetic algorithm is a heuristic process of optimization based of natural selection and genetics. It uses objective functions to

measure suitability. This study defines objective functions based on TOD characteristics. [6]

- iv. Firstly, research paper begins with TOD definition, concept, implementation advantages, principle, location demarcation of TOD hubs & nature of project with TOD. Discussed some case studies of urban centers that utilized TOD were investigated to draw lessons as well as to probe the validity and success of the concept. Studied some cities case studies like Fruitvale, Rosslyn, Arlington & Other cities in the United States, such as Denver (Colorado) and Portland (Oregon), have provided further evidence that TOD is an excellent tool to revitalize communities. [7]

2.1 Case Study of Ahmedabad

Ahmedabad is the largest city in Gujarat with a population of 5.57 million in an area of 450 square. The Ahmedabad Municipal Corporation (AMC) was established in 1950 under the Bombay Provincial Municipal Corporation (BPMC) Act, 1949. In the year 2008, around 180 square kilometers in the west and 80 square kilometers in the east were added to the city, bringing the total area of the city to 450 square kilometers. Apart from the area under AMC, growth centers of Kalol, Dehgam, Sanand, Mehmedabad and Bareja, 169 villages fall within the jurisdiction of Ahmedabad Urban Development Authority (AUDA) which is responsible for planning and development functions in its jurisdiction. As of 2011, the area within AUDA's jurisdiction has a population of 6.35 million in an area of 2,433 square kilometers. Currently, the 2021 Comprehensive Development Plan is in force. It presents immense opportunities for inner city densification and compact development centered on the BRT network in place and proposed metro rail alignment.

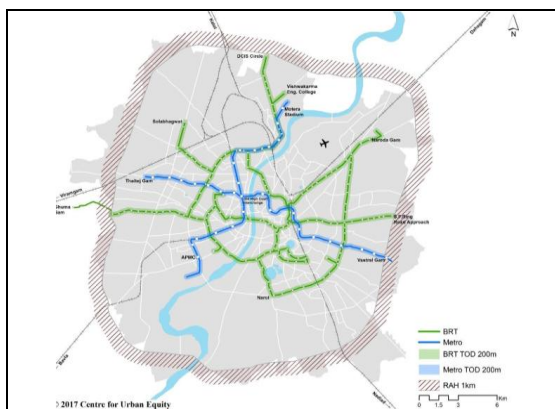


Fig -3: BRT and MRT (proposed) network in Ahmedabad

The Ahmedabad Urban Development Authority (AUDA) has commissioned planning firms to prepare Local Area Plans (LAPs) for the areas that come under the TOZ. Some of these plans have been prepared and public opinion sought on them. These are currently pending with the state-level planning agency for approval.[3]

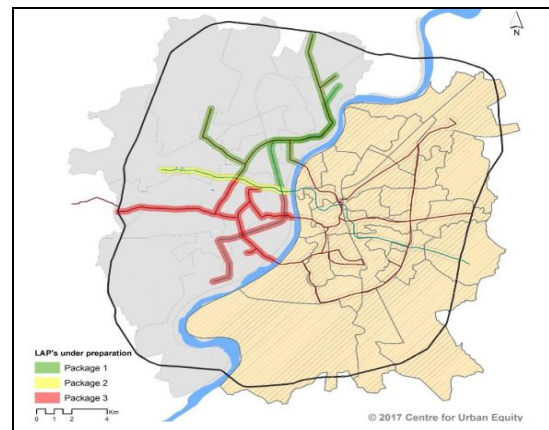


Fig -3: BRT and MRT (proposed) network in Ahmedabad

3. CONCLUSION

This paper presents a comprehensive review of literature on TOD and identifies good practices. It is certain that TOD has been a success in many countries and is a very able technique of travel demand management and promoting public transport use. But considering the status of the transport sector, its bearing on society, the complexity of relation between various stakeholders and political motivation, it is imperative to address this concept in new light.

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BIOGRAPHIES



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