

DEVELOPMENT STRATEGIES FOR TRANSIT ORIENTED DEVELOPMENT

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Abstract – In India, Transit Oriented Development (TOD) is growing rapidly as a tool of sustainability. To decrease auto dependence, it is important to manage regional and urban growth, revitalize declining centers and suburbs, and integrate land use with balanced transport. TOD intends to reach these goals by forming compact, mixed-use, pedestrian-friendly neighbourhoods around major transport hubs. Both brownfield and greenfield development required TOD.

It provides india's cities with unique opportunity to address the challenges of growing motorization, rising disparity, decreasing urban quality, and climate change.

This paper is an aim to understand how TOD is integrated with sustainable neighborhood planning, as well as how this system is perceived in India vast diversity. The paper concludes by investigating the impacts of Transit Oriented Development on green field and brown field regions. Discusses the issues that need to be addressed in the Indian context prior to implementation, or may be preparing for future TOD initiatives.

Key Words: Transit oriented development, Mixed use development, Transportation, Mass rapid transit corridors.

1. INTRODUCTION

The Transportation system in developing countries like india is limited and poorly maintained. Because of india's growing economy and significant advancements in vehicle affordability, there was a significant increase in vehicle ownership. The demand for transportation services exceed the available road capacity, due to severe road congestion with severe socio- economic and environmental effects. This needs a transition away from individual vehicles or towards public transit. To encourage this development, The concepts of Transit Oriented Development (TOD) focus on compact growth within an easy walk of transit stations, bringing potential riders closer to transportation services, and encourage transit dependency.

Both greenfield and brownfield development require transportation planning In a lush green field. There is a TOD that can be planned from a greenfield development.

1.1 Why TOD ?

The Following are some of the Factors that are driving the TOD trend:

1. Rapidly increasing traffic congestion across the country.
2. Rapidly increasing pollution from motorized vehicles.
3. Increasing demand for a high quality urban lifestyle
4. Growing demand for more traffic free lanes
5. Family structure Changes: more singles empty nesters, etc.
6. Growing public support for smart growth on a national scale..

2. Literature Review

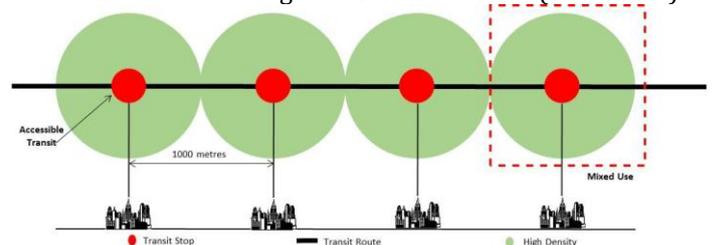
This section provides key examples of the major categories of literature helpful to understanding the potential of TOD as well as the problems that lead to sub-optimal outcomes. Transit oriented development is one of the strategies for reducing the negative effects of road congestion in cities by encouraging people to use public transportation .

The Rationalization of routes and charges will not only promote people to use public transportation, but it will also

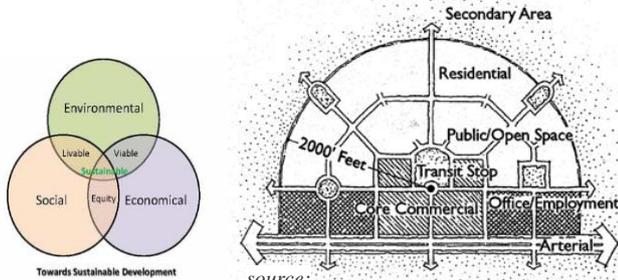
Increase safety and compensation for all those who work in the informal sectors

2.1 What is Transit-Oriented Development (TOD)?

Land use and transport planning are combined in TOD. It comprises the development of well planned, long-term urban expansion hubs with walkable, effective way to ensure and high density mixed-use development. Residents have access to open green and public spaces, and transit as well as other facilities will be used effectively at the very same time. TOD proposes to generate high density mixed-use development with in the transit station's effect zone , i.e. within walking distance of (500-800m).



In the case of a transit station or a corridor, the station spacing is around 1km, as shown in figure 1. TOD encourages pedestrian mobility to various destinations including such retail, leisure, and work.



source: <http://transportpolicy2013.blogspot.com/2013/06/transit-oriented-development-without.html>

TOD improves transit station preparation by establishing pedestrians and non-motorized transport (NMT) infrastructure that serves a great amount of people, improving the transit facility's passenger count and making the system more commercially and economically viable. So the transit passage features mixed land use, with transit stations that are either origin (housing) or destination(work), the passage would benefits on peak hour traffic in both directions.

2.2 Goals of TOD

The Primary Goals of TOD are to:

- Make public transportation more accessible and advanced to reduce reliance on personal vehicles and encourage frequent use.
- Advocate for a higher density and diversity of public transit options, resulting in locations that are worthy and thriving.
- Expand the network by providing a more advanced and diverse range of motorised and non-motorised nodes of transportation.

2.3 Needs of TOD in India

In a country like India, plenty of problems are occurring today, including severe overcrowding, deteriorated air quality, increasing greenhouse emissions from transportation, and so on.

A huge proportion of commuters do not use public transportation due to lack of enough numbers and overall experience with both the mode of communication, as well as difficulty in gaining simple access to it. In addition, it has been observed that india's transportation sector is extremely energy concentrated.

As a result, it is critical for india to incorporate TOD into its development and planning procedures in order to increase public vehicle ownership and encourage the use of public transit and non-motorized transportation (NMT).

2.4 Objectives of TOD

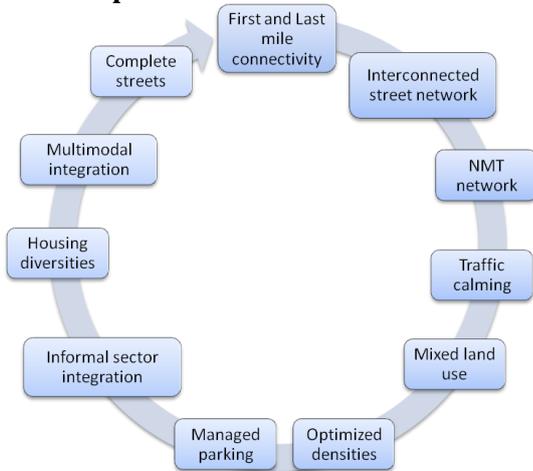
- To achieve success in its objectives, TOD combines land use and transportation planning to establish compact growth centres within a 500-800 m influence zone on either side of transit stations, i.e. locations within its range.
- To Stimulate the use of public transportation by establishing high density zones in the influence region, which would raise the percentage of residents/workers who use transit and walk on a daily basis, as well as reduce pollution and congestion in the area.
- To provide all essential necessities such as work/job, shopping, public services, and entertainment in the concentration zone through mixed -use development, resulting in resuced long commutes.
- To laying out an upgraded road network inside the development region to provide for safe and easy movement of NMT and passengers between various uses and transit hubs.
- To reduce the number of private vehicles on the road, as well as traffic and parking demand.
- To create an inclusive habitat in a densely populated area so that those who rely on public transportation can live within walking distance of transit terminals.

2.5 Principles of TOD

TOD Focuses on advanced, multi-use development around public transportation corridors such as metro rail, BRTS, and others. While transportation systems encourage transit-oriented development, enhancing accessibility and establishing easy-walk communities are also critical to discourage the use of personal vehicles, as seen by examples from throughout the world.



2.6 TOD components



2.7 Benefits of TOD

The advantages of transit oriented development have been well documented and recognized by planners all around the world. The pursuit of sustainability encompasses a diverse set of policy objectives that address environmental, social, and economic concerns. Successful TODs incorporate high quality shops, community facilities, and other services, ensuring that commuters and residents of neighbouring suburbs take advantage of local amenities while walking, cycling or taking feeder transportation. It provide cheaper public transport, better liveable environment and quality of life. It focuses on mixed use and high density development with affordable housing.

2.8 Types of transit oriented development in India

TOD policies for the major cities and towns are grouped into three categories based on a large number of studies.

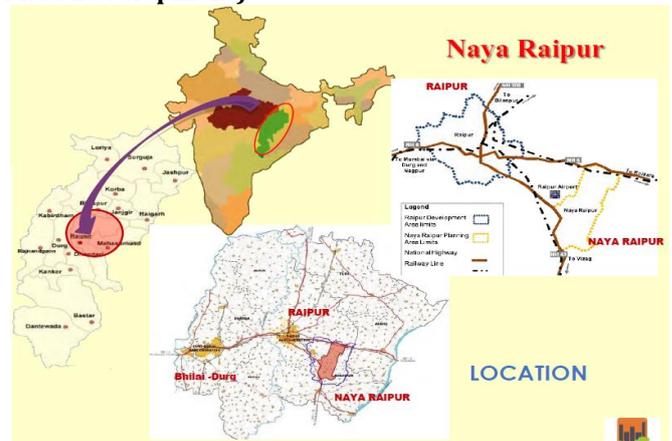
1. Area Level TOD
2. City Level TOD
3. Station Level TOD

As a result, the table below presents a critical examination of the policies stated by the governments of various cities and town on the basis of the above mentioned categories and indicators as well as the classification of the TOD level.

3. Case Study

3.1 NAYA RAIPUR

3.1.1 Case study on Naya Raipur TOD, India (Green Field Development)



‘Naya Raipur’ is to be developed into an advanced yet ‘green and smart city’

The capital city of Chhattisgarh, Naya Raipur ,based on the concept of transit oriented development, is being planned to be developed into a smart city. Sources cite - “The city will have an area of 95.22sqkm and is expected to be home to about 5.5lakh people by 2031.” The city is set to be the first greenfield transit oriented development (TOD) city in India and has been incorporating TOD as early as the planning stage. Transit-oriented development means development that is advanced, attractive, commuter friendly and is seamlessly blended with mass transit.

3.1.2 TOD in Greenfield context

A NEW CITY FOR SUSTAINABLE MOBILITY DESIGN

Extensively planned new cities offer the most needed solution to the nation’s urban pollution problems. TOD is an answer to the queries regarding creating high-quality sustainable communities and commute systems.

It tends to make people reconnect with the planning and development process of the concentrated area. Comprehensive infrastructure planning and establishment of commuter friendly public transport systems.

Political will and strong leadership support facilitate the development of community driven procedures and mechanisms.

Challenges/ Unknowns

- Population composition?
- Employment Generators?
- Local Real Estate Market capacity?

3.1.3 NAYA RAIPUR TOD VISION

The major goal of the Naya Raipur TOD study is to create a transit friendly structure that supports a variety of seamless self sufficient neighbourhoods in Naya Raipur, each with its own distinct personality, all linked to more sustainable and better mability options.



3.1.4 Approach for TOD implementation



Positive Outcome

1. Almost 100 % population dwelling within the same area
2. More Pedestrian centred and futuristic environment
3. Various transport modes to choose from
4. Advanced quality, safe and user friendly communities
5. Widespread and smart development

The concept of TOD is being adopted for Naya Raipur to make it a futuristic and smart city for sustainable living environment.

To bring about a reasonable reduction in private transportation by means of mixed use development.

3.2 kakardooma, Delhi

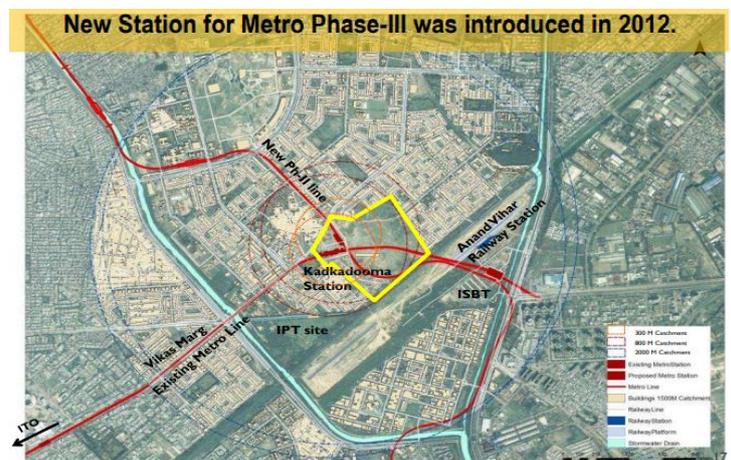
The Karkardooma TOD, a never before seen pilot project in the NCR, is being suggested. It's innovative and

promising in terms of achieving its goals related to public transportation development.

The project includes the formulation of 75 acres of land in East Delhi in accordance with Transit Oriented Development (TOD) guidelines and Smart city vision.

The project will be built in accordance with Transit Oriented Development (TOD) guidelines, with a 400 Floor Area Ratio (FAR).

Karkardooma will be the country's first TOD project, with 4800 houses, 80,000 Sq.mts. of retail space, a 5 acre park with sculptures and a Laser Park, and a circular skywalk. The development of an integrated hub that can bring together metro stations, housing and workplaces , as well as leisure spaces such as museums.



It has to be a mixed use development, and the distance from public transportation must be kept to a minimum.

The site is currently only accessible from the north side through a short stretch of Vikas Marg. The railway line and Anand Vihar station are a high tension line, and a proposed 24 m wide Zonal plan road.

● INTEGRATED NMT ROUTE WITH SKYWALK & CYCLE TRACKS

Proposed SKYWALK connecting the Metro Station concourse and buildings abutting the roundabout to achieve seamless & safe pedestrian movement.

CURRENT LAND USE PATTERN	
SITE AREA:	30.72 Ha
AREA UNDER SCHEME:	28.12 Ha
USE WISE DISTRIBUTION OF PLOTS:	
• COMMERCIAL USE:	1.48Ha
• RESIDENTIAL USE:	13.16Ha
• PUBLIC-SEMI PUBLIC:	4.27
AREA UNDER CIRCULATION:	5.00Ha
AREA UNDER OPEN SPACE:	4.25 Ha
GROSS FAR:	1.09
TOTAL BUILT UP AREA:	3,06,700 sq.m.
TOTAL BUILT UP AREA USES:	
• COMMERCIAL:	249000 sq.m.
• RESIDENTIAL:	14800 sq.m.
• PUBLIC-SEMI PUBLIC:	42700 sq.m.

3.2.1 Problem:

1. Relocation of current residents, particularly the poorer sections.
2. In the inner city slums, there are a lack of basic utilities and a sense of self-pride.
3. Displacement of street traders and hawkers.

3.2.2 Solution:

1. Comprehensive plan – Incorporate all socioeconomic groups in to community visioning and planning.
2. Provision of basic infrastructure and shared social facilities inside communities.
3. Provide specific hawker and vendor areas.

4. CONCLUSIONS

India, as a densely populated country, can benefit greatly from transit oriented development to alleviate traffic congestion in major cities, as well as encroachment, Environmental degradation, and densification issues. The rapid speed of urbanization in Indian cities has resulted in serious issues such as urban poverty, environmental degradation, traffic congestion and so on. In order to achieve sustainable city growth, we must address these issues.

Regional planning, city revival, suburban redevelopment, and walkable neighborhoods are all part of transit oriented development. It is fast sweeping the state with the creation of intriguing people places springing up in city after city.

Congestion, traffic jams, infrastructure stress, pollution, and other issues have resulted from rapid economic growth and urbanization. The limited Road capacity and therefore the increase in automobiles and population have resulted in congestion, delays and pollution.

A sustainable strategy is required to look after the economic process and alleviate the issues arising due to the growth. The above study concluded that TOD can be done in two ways - green field and brown field. The greenfield development can be done in newly development area where the area is developed or under develop where there is liberty for the development. We can enhance the connectivity of that area and cater to the future needs. Whereas in brown field development it is basically the redevelopment of old area or congested area where there are restriction for development. Development which can be resolved by implicating TOD strategies

which can transform a haphazard old area into a well established place, in a planned way. This approach has helped many cities reduce their carbon footprint while become more productive and more livable. Transit oriented development is additionally an effective solution to the serious problems of global climate change and global energy consumption. To some extent, creating dense, walkable communities will efficiently bring down the need for using personal vehicles and energy consumption.

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