Evaluating the State of Transit Oriented Development in NCR

Naga Swetha Pasupuleti, Ph.D., [1]
Pulkit Narula 2

[1]Professor, Department of Civil Engineering, Noida Institute of Engineering and Technology, Noida
[2]Graduate Student, Department of Civil Engineering, Amity university.

ABSTRACT

To analyze the crisis characterized by levels of congestion, noise pollution, traffic fatalities, transportation connectivity, security, proper maintenance and public facilities along transit stations and discussed about the important points that should be kept in mind during the transit oriented development. Various challenges and their possible solutions are also mentioned that has to be worked out in the future and some other features for transit orient development of Delhi NCR metro stations. The main purpose achieved is the innovative ideas which done to improve the conditions of the metro stations so a model has been made to show the advance methods at a number of metro Station to deal with the work agendas and transit oriented development in metro station.

INTRODUCTION

A **transit-oriented development** (TOD) is a mixed-use residential and commercial area designed to maximize access to public transport, and often incorporates features to encourage transit ridership while dissuading the ownership of automobiles. Pedestrian and transit-oriented development (TOD), in which residential and mixed-use buildings are planned around public transport, cycle networks, and pedestrian facilities, is critical in order to move away from urban sprawl and car dependency. Metro's Transit-Oriented Development Program serves a unique and critical implementation-based role that is unmatched in other regions around the country.

The TOD Program is designed to provide incentives, primarily in the form of modest funding grants, to private developers to build higher-density, mixed-use projects located near transit. The program is structured to encourage projects that "push the envelope" in terms of density or building type, acknowledging that these projects are often more expensive to build or carry additional risk. The Program's strategies for maximizing TOD potential include:

• Contributing to local identity through multi-year investments in catalyst projects and place-making elements.

• Creating market comparable for higher-density mixed-use development near transit and in centres.

• Cultivating developers with expertise in higher-density and mixed-use development in suburban settings.

• Building community acceptance of urban style building types in suburban communities

Development near and around transit systems to promote transit ridership is one such sustainable development strategy. The site identified falls in a strategic location acting as a transition area. The use of developments of the metro facilities has been provided and various literature reviews have been witnessed according to the life and enhancements of the Metro

life. This TOD witnessed great advancement in life of future generations and thus overcoming in problems which are being faced day to day life.

LITERATURE REVIEW

Graham Currie takes a critical look at the strengths and challenges of bus-based transit systems compared to rail in relation to TOD. Concluded by summarizing the relative strengths and challenges of BRT and local bus services compared to rail. The findings of the review are used to identify ways in which bus-based TOD might be better planned and implemented. Daniel Hess and Peter Lombardi the majority of research addresses TOD in green field sites located primarily in suburban places in growing regions Findings reveal that (*a*) the literature appears to be consistent and confident in outlining the public policies that encourage TOD; (*b*) researchers tend to focus on TODs in suburban and green field areas of fast-growing regions in the western and southern United States; (*c*) TODs in older cities are not well publicized and are largely ignored by the literature; and (*d*) researchers who study inner-city TOD usually focus on the lack of it, or any type of development, in economically depressed areas. The conclusion of several researchers that a strong local economy is key to successful TOD offers a clue as to why recently built TOD is largely absent from many older, slow-growth cities like Buffalo, New York, and St. Louis, Missouri. Taotao deng and John D Nelson considers in turn the impact of BRT examining technical performance, cost issues and land development impact. The paper concludes that appropriately designed and operated BRT systems offer an innovative approach to providing a high-quality transport service, comparable to a rail service but at a relatively low cost and short implementation time. Keith Bartholmew confirms that the market shift is, indeed, being capitalized into real estate prices and demonstrates that the amenity-based elements of transit-designed development play an important positive role in urban land markets, independent of the accessibility benefits provided by transit. **Julie Campoli** defines Density is often defined in terms of population per square mile, but such a crude measure makes it difficult to understand the relationship between density and city life. We need to think about urban density by including the density of jobs, schools, and services such as retail, transit, and recreational facilities. Fitting more amenities into a neighbourhood within a spatial pattern that invites walking will create the type of built environment that offers real transportation options. Researchers delving into the question of how urban form affects travel behaviour identify specific characteristics of place that boost walking and transit use while reducing. **Gabe Klein with David Vega-Barachowitz** demonstrates how to affect big, directional change in cities—and how to do it fast. Klein's objective is to inspire what he calls "public entrepreneurship," a start-up-pace energy within the public sector, brought about by leveraging the immense resources at its disposal. Klein offers guidance for cutting through the morass, and a roadmap for getting real, meaningful projects done quickly and having fun while doing it.

DATA COLLECTION

The data surveys have been taken place for know the exact conclusions, thus a process was very successful made to provide visual survey inception and personal interview questionnaires which has made our task more reliable and easier from before. Specific surveys on regular basis and information have been recorded under notes and in images. Specific mobility has been considered along with internet, data reviews. Through literature reviews and other online resources during the last few months our work of achieving the ultimate goal towards the innovative idea has been achieved duly. Through the specific offices which had been visited by us to maintain the advance knowledge of the aspects of particular stations.

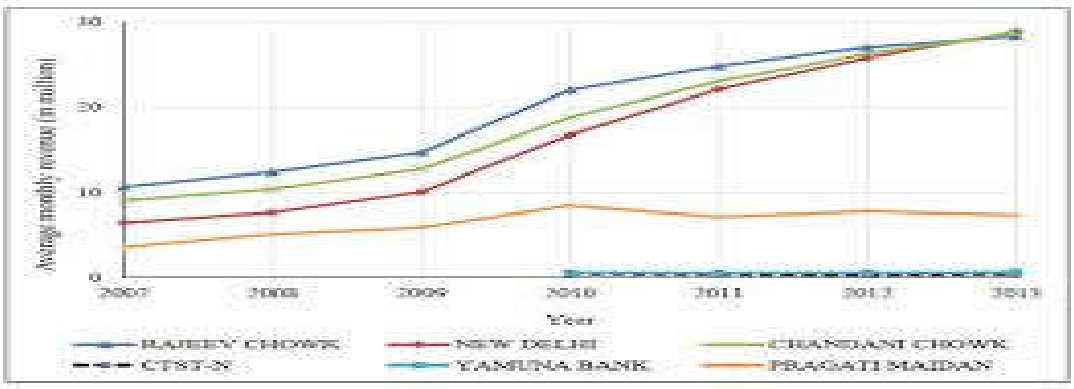

FIGURE 1.1 LINE MODES OF DELHI METRO SPECIFIC STATIONS

RESULTS AND DISCUSSION

Metro station has high maintenance in their periphery but some crises which are being characterized are duly explained as;

- No parking facility for vehicles.
- Highly congested traffic mobility.
- No hygienic toilets are provided for the public. No proper card recharge queue system which is the reason of congestion and thus a common man suffers.
- Security issues are always there, pick picketers have been the ones who have made their way in this metro station.
- Transportation connectivity is at a total chaos.
- No advancement in public connectivity towards nearby hospitals and schools.
- No greenery is there which makes it highly polluted.
- Less space and highly congested due to largest market of Delhi located here and at peak hours the station premises remains fully packed, it is the main reason and thus leading to chaos at any time of the day.
- Station doesn't have basic connectivity of transportation which leads to unbearable circumstances.
- Security of the station needs to be emphasized. .
- Congestion due to hub of all interconnected routes has made polluted and all time traffic zone.
- ATMs are placed for emergencies. Thus this includes the challenges which are being faced by passengers as it is very unhygienic.
- To explore the developments of the station, the whole lot of station is full of patients who doesn't get place in hospital sleeps at station premises, thus it is very unhygienic and proper steps have to be taken in such conditions.

The metro stations come under this unconvinced are as follow: Patel Nagar Metro Station - No Parking facility, Rajendra Place Metro Station - Security issues, Karol Bagh Metro Station – No Public toilets, Shadipur Metro Station – Connectivity issues regarding transport, Chattarpur Metro Station–CCTV issues, Saket Metro Station – highly congestive,AIIMS Metro Station – unhygienic , Qutub minar Metro Station – no foot over bridge.

FIGURE 1.2 POSSIBLE MODEL OF INNOVATIVE IDEA

CONCLUSIONS

The concluding part of this report is that we have made a proper 3D model in terms of giving a innovative and intelligent idea towards a building society by making a parking zone which is not there at Patel Nagar metro station and hence created a huge impact in a systematic way of processing and deliberately a great move towards implementing transit orient development.

The policies with setting computable standards that best represent the objectives and goals of the transit oriented development for individual departments, such as: -

- Benchmarking the quantitative requirements for demarcating TOD potential sites, desirably for sites that can hold on to higher densities and mixed uses with efficient street connectivity.
- Corresponding requirements of the catchment zone with those of the mass transit, housing, employment and infrastructure capacities to maintain even-handedness.
- Standardizing the desirable land use mix to promote a vibrant environment and to prevent unsafe single-use neighbourhoods.
- Normalizing benchmarks for affordable and inclusive housing along the transit corridor to prevent unauthorized developments and lessening commuting costs for the lower economic group.
- Provision for flexibility in the design so that the development can adapt to the local context, trend and market requirements.
- A model based on the innovative ideas and results towards transit orient development is prepared on the parking facility issues.
- Thus that model will easily show how the transit stations.
- Future stability on crisis which are being faced can be reduced by providing this parking solution and thus model has been made by working on these steps to reduce the traffic jams and congestions and chaos all around.

Thus a model has been made by us showing the TOD acting around the area of Patel Nagar metro and thus making it highly impressive in terms of condition and results are highly achievable. Thus an innovative idea occurring in this tod is that the “parking facility has been shown by making it worth for public use at specific Patel Nagar metro station.

REFERENCES

- Bae, C., “Orinoco Station, Portland, Oregon: A Successful Transit Oriented Development Experiment?” Enno Transportation Foundation, Inc., Washington, D.C., Transportation Quarterly, Volume 56, Issue 3, January 2002, Pp. 9-18.

- Brodd, D., "Accounting For Multimodal System Performance In Benefit-Cost Analysis Of Transit Investment," Conference Proceedings, "Seventh National Conference On Light Rail Transit: Building On Success—Learning From Experience," Baltimore, MD, Transportation Research Board And The American Public Transit Association, November 1995, Pp. 184-190.
- Building A Community Vision: Transit-Oriented Development Case Studies," P. 6.
- Building A Community Vision: Transit-Oriented Development Case Studies," City Of Seattle Station Area Planning Program, P. 22.
- Characteristics Determine Auto Ownership And Use?" Transportation Planning And Technology, Vol. 25, March 2002, Pgs. 1-27.
- Charlotte Region Transit Station Area Joint Development Principles, Provided By Wade Carroll.
- CIDOC-SHF. (2012). Estado Actual De La Vivianaan México 2012. Mexico: Housing Research And Documentation Centre Foundation And Federal Mortgage Society.
- City Of Copenhagen. (2010). Copenhagen City Of Cyclists. Bicycle Account 2010. Copenhagen: City Of Copenhagen.
- CONAPO. (2007). Projections De La Población De México 2005-2050. Mexico: National Urban System.
- CONAPO. (2012). Sistema Urbana Nacional 2012. Mexico: National Urban System.
- Dena Pelzer And Gerald Antler, P. 16.
- Denmark: From The Finger Plan To Crested. Journal Of Transport Geography 22: 251-61.
- Denver, And The Twin Cities. Cambridge: Lincoln Institute Of Land Policy. Recovered July 11, 2013,
- Estimated Private Investment Needed Is $6.1 Billion. "Central Corridor Improvement Analysis", Bonestroo Engineering, April, 2010.
- Executive Summary Of The Proposed East Boulevard Escape Plan.
- Gorton, Gary B. (2008). The Subprime Panic. Working Paper 14398. Cambridge: National Bureau Of Economics Research.
- Greene, David. (1992). Vehicle Use And Fuel Economy: How Big Is The "Rebound" Effect? The Energy Journal 13: 117-43.
- Hass, Peter, Stephanie Morse, Sofia Beeker, Linda Young Y Paul Ealing. (2013). The Influence Of Spatial And Household Characteristics On Household Transportation Costs. Research In Transportation Business & Management 7: 14-26.
- Henry Markus, King County Department Of Transportation, Transit Oriented Development Section, Email Correspondence, 7/9/02. See Also King County Transit-Oriented Development Website, 7/3/02, Currently Found At Http://Www.Metrokc.Gov/Kcdot/Alts/Tod.
- Herbert Atienza, "Apartments To Go Up At Overlake Park & Ride; Plan Is To Combine Affordable Housing, Commuter Parking In $40 Million Project," Eastside Journal Online, 10/19/2000, Currently Found At Http://Www.Eastsidejournal.Com/Sited/Retr_Story.Pl/31952.
- Hickey, Robert. (2013). The Role Of Community Land Trusts In Fostering Equitable, Transit-Oriented Development: Case Studies From Atlanta,
- Holtzclaw, John, Robert Clear, Hank Ditmar, David Goldstein, And Peter Haas, "Location Efficiency: Neighbourhood And Socio-Economic
- Lerner, Wilhelm. (2011). The Future Of Urban Mobility. Frankfurt: Arthur D. Little
- Littman, Todd. (2011). Rail Transit In America. A Comprehensive Evaluation Of Benefits. Victoria, Canada: Victoria Transport Policy Institute.

- LSE Cities. (2012). Going Green. How Cities Are Leading The Next Economy. London: London School Of Economics And Political Science.
- Mexico 2007: Federal Mortgage Society And Housing Research And Documentation Center Foundation.
- National Housing Program, 2008-2012. DOF 30-12-2008.
- Plan," Metro Planning Department, Revised 2007, Page 5.
- Putnam, Robert. (2000). Bowling Alone: The Collapse And Revival Of American Community. New York: Simon & Schuster.
- Regional Transportation District (RTD) Website, "Transit Oriented Development," Currently Found At Http://Www.Rtd-Denver.Com.
- Rob Gorman, Project Manager, Seattle Department Of Transportation, Phone Conversation, 7/26/02.
- Sam Bennett, "Program's Goal Is More Homeowners And Fewer Drivers," Seattle Daily Journal Of Commerce Online Edition. 11/10/99, Currently Found At Http://Www.Djc.Com/News/Re/10060559.Html?Cgi. For A More Detailed Explanation Of The Location Efficient Mortgage® Program, See The Section Of The Literature Review Entitled "Other Community Approaches To Becoming Transit Friendly."
- Sam Bennett, "Program's Goal Is More Homeowners And Fewer Drivers," Seattle Daily Journal Of Commerce Online Edition. 11/10/99, Currently Found At Http://Www.Djc.Com/News/Re/10060559.Html?Cgi. For A More Detailed Explanation Of The Location Efficient Mortgage® Program, See The Section Of The Literature Review Entitled "Other Community Approaches To Becoming Transit Friendly."
- Sector Housing Program, 2001-2006. DOF 23-05-2002.
- Southeast Orlando Sector Plan Website, 7/10/02, Currently Found At Http://Www.Cityoforlando.Net/Planning/Deptpage/Sesp/Sespvisi.Htm; See Also Shane Largent, 6/21/02.
- Suburban Mobility Authority For Regional Transportation (SMART)—Welfare To Work." Welfare Information Network Promising Practices, August 2000, Currently Found At Http://Www.Welfareinfo.Org/Suburbanmobility.Htm.
- Transit-Oriented Development And Centres Program: Annual Report 2007," Portland Metro, November, 2007, Pg. 2.
- Transit-Oriented Development And Urban Centres Implementation Program: Work
- Transit-Oriented Development And Urban Centres Implementation Program Work Plan," Planning Department, Portland Metro, Revised November, 2007, Pg. 2.
- Uri Avon, Robert Carver, And Boyd Cable, "The Transit/Land Use Plan For Charlotte Mecklenburg, Session Series: Integrating Land Use And Transportation Planning: A Case Study Of Charlotte-Mecklenburg", Prepared For The 1999 American Planning Association National Planning Conference