



Study of existing core area's urban development related to mass rapid transit system: Formulating strategies and recommendations

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Abstract-- Mass Rapid Transit System (MRTS) has created a significant overall effect on the development growth pattern in the core areas of cities around the world, and has been operating along travel corridors, especially in and around these areas, resulting in a degradation of the overall urban fabric. It has also become clear that growth in these core parts of cities has been mainly unplanned, intermittent, and fragmentary, resulting in a chaotic spatial/physical environment. As a result, these critical areas need urgent attention in order to address the issues and prevent further degradation of the spatial surroundings. As a result, an analysis of the effects of MRTS on these core areas is expected in order to comprehend these projects, which are usually happening infrequently, and formulate necessary recommendations from an urban design standpoint. As a consequence, in this article, an attempt has been made to synthesise the findings of this research work in a systematic manner.

Keywords-- Core Area, Urban Development, Mass Rapid Transit System, Movements, Activities, Spaces, Forms.

I. INTRODUCTION

Core Area is essentially the middle portion of the city or metropolis, and has a high population density. Furthermore, it has a high concentration of spatial and physical growth. These central zones are often densely populated, congested areas with very little open spaces. They have a large population convergence and are also linked to the strong heritage of metropolitan cultures. These areas are now rotting due to a variety of factors, and this rot is posing a threat to the urban areas' heritage estimate. (Ghoshal M., 2017).



Fig. 1. Core area (Photo courtesy author, 2020)



Fig. 2. Central part with congestion (Photo courtesy author, 2020)

Urban Development is the method of expansion of an area within a city or town, or having similar characteristics. It has physical and spatial characteristics as well as natural, economic, social, cultural, and political manifestations.

A new construction on virgin land or a renewal of an existing fabric may be the spatial/physical mode of urban development.

A policy of land redevelopment in areas of low to high density urban land use is known as urban redevelopment (or renewal). It may also include enterprise displacement, building removal, person's relocation, and the use of eminent domain as a legal tool to seize private land for city-led construction programs. (Jain R., 2016).



Fig. 3. Urban development (Photo courtesy author, 2020)



Fig. 4. Development projects coming up (Photo courtesy author, 2020)

Mass Rapid Transit System (MRTS) is one of the most popular modes of public transportation used around the world to address intra-city transportation issues. It is now operational in over 100 cities around the world, with plans to expand to even more in the immediate future.

MRTS, with its improved connectivity and versatility, causes some dynamic shifts in a city's urban growth pattern. MRTS also serves as a tool for economic growth, and also these dedicated high-speed, high capacity highways increase intercity connectivity, pace, and connectivity, affecting the surrounding areas as well as the urban structure.(Kulkarni S.Y.,2011).

According to studies, MRTS is one of the most efficient transportation networks, and it has become critical for cities like Kolkata's spatial/physical, environmental, economic, and social development.

MRTS's subsequent impact has tremendous potential for urban spatial growth, which has already been generated in developed cities and largely exploited by commercial developers.

II. DISCUSSION

In this context, it has been also found that, most of the developed cities have already visualized sporadic, and piecemeal urban developments, producing a haphazard and disorderly physical landscape, largely influenced by unregulated market powers, as mentioned earlier with the arrival of MRTS and its subsequent effect.

It has been further ascertained that the developments have occurred in the Metro Rail Station zones, on existing well defined activity nodes of the city.

It has long been recognized that there is a symbiotic relationship between transit services and a specific type of community planning, and that the two mutually benefit and need each other. (Black A., 1995).

Much of the Urban Development involves fitting the transit systems to the existing spatial/physical environment of a city. (Lang J., 1994).

MRTS also provides connectivity to different parts of a city for a vast number of travellers, and has an effect on their movement pattern. (Yang et al, 2012, Zhao. 2011).

Several related inquiries have also been carried out in the cities by a few public institutions. These policies have only defined the impact areas and, without evaluating the extent of the impact, have developed general strategies for growth freezes or disjointed urban renewals.

This, too, are built on traditional urban planning paradigms and are haphazard in nature, with little regard for the applicable criteria, as described above.

In this perspective, this paper primarily focuses on formulation of strategies and recommendations from an urban design point of view of urban/spatial developments of Metro Rail Station Areas, situated in the core area of developed cities with particular emphasis on certain parameters and sub parameters.

In this regard, the most important strategies and recommendations formulated are as follow:

- Appropriate traffic control facilities should be provided to enable the proper operation of vehicular movements and their connecting loops, particularly in the case of large volumes of public and private vehicles that provide linkages to nearby magnets and

generators, as well as landmarks near Metro Rail Station Areas.

- New pedestrian loops must have appropriate traffic management systems to ensure the safe movement of a large number of pedestrians while also providing connectivity to local magnets and generators, as well as landmarks along Metro Rail Station Areas.



Fig.5. Secure Pedestrian movement



Fig.6. Vehicular and pedestrian movement

- Commercial activities, especially in the form of informal and formal shops that are haphazardly placed on either side of the Metro Rail alignment, should be properly located, along with future residential building projects, so that they blend in with the new developments in and around the Metro Rail Station Areas



Fig.7. Commercial activities



Fig.8. Formal and informal shops

- Near the Metro Rail Station Areas, there should be a proper system for regulating the density of spaces in terms of rising land prices, by implementing certain construction management regulations.
- In terms of land use, homogeneous activities such as residential, industrial, institutional, and recreational should be encouraged in a way that preserves the unique characteristics of each region.

- With the upcoming urban projects, residential developments should be strategically positioned in and near Metro Rail Station Areas.



Fig.9. Residential developments



Fig.10. Upcoming urban projects

- Multipurpose public spaces should be incorporated and well established, particularly in areas where commercial operations predominate, to meet the demand for other activities.
- There should be a proper system for regulating the density of spaces in terms of rising land prices, by implementing such development management regulations, in and near Metro Rail Station Areas.
- Appropriate mechanisms should be used to monitor the skyline of the overall urban type, thus restricting the intermittent and disorderly high-rise buildings that have sprung up around Metro Rail Station Areas.
- The general character of the architectural image, with a focus on the high rise and density of the urban fabric, in order to preserve the open space-built form relationship in new upcoming projects near Metro Rail Station Areas, should be taken utmost care.



Fig.11. High-rise and density



Fig.12. New developments coming up

III. CONCLUSIONS

In light of this discussion, and conclusion of the research work, focusing on MRTS induced urban growth in the developed cities, it is clear that MRTS has a major effect on the city's urban development process.

Despite the fact that this transit system is a highly effective means of urban growth, most projects in these cities are erratic, spontaneous, and piecemeal in nature, with the primary goal of optimizing financial returns.

This is because the issue of MRTS and the subsequent urban developments has not been adequately addressed, and as a result, there are no proper guidelines, to steer these developments in the desired direction, allowing for proper benefits.

Again, in order to understand the effect of MRTS on the urban development process holistically, further research work on the subject is required, focusing on particular areas of the cities for detailed case studies and thereby developing specific guidelines.

In the future, this will aid in the planning of appropriate interventions in the selected regions, as well as the advancement of alternative proposals, in order to guide the development trends in the desired direction and reap the desired benefits.

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