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DEVELOPING DIVERSE TRANSIT HUB FOR SURAT RAIL STATION

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Abstract - *The transportation systems of emerging countries face considerable challenges at the start of the twenty-first century. The highways are always congested, and access to economically significant centres is deteriorating. In response to the fast changing urban setting in terms of infrastructure, demographic shifts, social preferences, and sustainability considerations, Indian Railways has been proactive in presenting proposals and solutions for the restoration of old railway stations. Multimodal transportation may be a viable solution for some of these mobility issues. By mixing private and public transportation in a multimodal transportation system, users can benefit from the strengths of both systems while avoiding their drawbacks. The purpose of this dissertation is to strengthen the relationship between various modes of transportation that are close to each other as a multi-modal hub by redeveloping Surat railway station. As a result, the ultimate goal of a multi-modal hub is realised, which encompasses numerous modes and related services in order to create a higher degree of transportation network. Encourage the development of integrated traffic movement, transportation facilities, and associated services to meet the development's surroundings. The building of transportation infrastructure takes into account user demand, multiple mode connectivity, and passenger comfort.*

Key Words: Railway Station, Multi-Modal Transportation Hub, Redevelopment.

1. INTRODUCTION

The population has become more concentrated in metropolitan centres over the last five decades. According to 2015 Oxford University research, more than 80% of the world's population lives within an hour of a city, and automobile traffic and urban mobility are rapidly rising. Commuters swarm into transportation infrastructure during rush hour, jamming arterial and ring roads. Access to transportation hubs is critical for urban resilience and the economic viability of large cities in this setting. Reorganizing cities and promoting regional harmony would require a comprehensive strategy that includes transportation and urban planning. The transportation sector in developing countries has considerable challenges at the advent of the twenty-first century. The highways are always congested, and access to economically significant areas is deteriorating. Despite the quickly changing urban setting in terms of infrastructure, population upheavals, social preferences, and sustainability considerations, Indian Railways has been proactive in giving proposals and solutions for the restoration of ancient railway stations. Multimodal transportation may be a viable option for addressing some of these mobility issues.

1.1 Multi-Modal Transportation Hub

The phrase "transport hub" is increasingly being used by mobility experts. The term "multimodal" refers to the interconnection of multiple modes of transportation. Although the phrase alludes to a building or a site, its meaning encompasses a vast range of realities, functions, and activities.

Network effects and links between modes of transportation, or between lines within a mode, influence the effectiveness of public transit. Because they serve as both meeting points for modes and points of linkage, MTHs are crucial for ensuring that public transportation is utilised efficiently. The structuring of urban mobility systems is aided by interchange hubs. They connect cities and transportation networks, providing for seamless transitions between modes of mobility in the urban context. Multimodal transport hubs vary widely in terms of mobility, accessibility, and attractiveness from one nation or city to the next in terms of mobility, accessibility, and attractiveness, depending on the structural forms of transportation and the maturity of the urban fabric.

1.2 Benefits of Multi-Modal Transportation Hub (MTH)

- Intramodality
- Urban Fit
- Land Value Capture
- Passenger Facilities and Hub Administration
- Taking Safety Issues into Consideration

1.3 Methodology of work

The initial stage in this project is to identify the problem. The study's goal and objective are then defined. The next stage is to go over the literature review and find a case study that is relevant to the project. Then choose a study area for the stretch you want to work on. Then Gather both primary and secondary data. After that, analyse the data and make a recommendation based on it.

2. Study Area

Surat is located in Gujarat's southern region, in western India. It is India's fastest-growing smart city. It is located on the banks of the Tapti River, with an Arabian Sea beach to the west. Surat is a city in India with a population of 4.6 million people and a land area of 462.149 square kilometres (census 2011). Surat has a population density of 10052 people per square kilometre. The city is organised into nine zones, with two planning organisations in charge of city planning (SUDA and SMC). Surat is separated into seven zones in total. The smallest zone is the centre zone, which covers only 8.18 square kilometres, while the largest zone is the south-west zone, which covers 111.912 square kilometres.

Fig -1: Study Area

A number of studies on the railway station have recently been completed. Though the majority of research focuses on technical or transportation sciences, recent research has begun to focus on the station's greater social significance, which has altered over the past 150 years. The railway station is one of the most complicated social urban contexts, but social science has only recently begun to research it, and there is currently no comprehensive explanation of the findings.

3. Literature Review

The Shanghai Hongqiao Comprehensive Transport Hub features the least amount of information integration, but the most facilities and services integration, as well as the most ticketing and price integration. Multimodal services and tickets, such as time coordination, luggage delivery, and ticketing and exchange discounts, are all expected to rise in popularity. Furthermore, attitudes toward multimodal integration differ based on personal and travel characteristics, implying that future urban transportation hub design, operation, and administration should be centred on persons.

The personal and travel characteristics of passengers can have an impact on how they rate interchange services. Luggage delivery services were more important to the elderly; business passengers ranked time coordination lower than leisure travellers, and all other travellers rated information signs lower than commuters.

4. Case Study

Washington Union Station is a major railroad station, transit hub, and tourist destination in Washington, D.C. In 1907, it originally opened its doors. Union Stop is an intermodal complex that includes, among other things, a commuter rail station, the Washington Metro, the DC Streetcar, a bicycle facility, intercity bus routes, and a local Metrobus station. The station serves as the southern terminus of the nation's busiest passenger train route, which passes through major cities like Philadelphia, New York City, and Boston.

Metro in Washington, D.C. The Washington, D.C. Streetcar Routes for intercity buses Parking Service on the Grounds Valet Parking at the Taxi Stand Metro in Washington, DC the Streetcar in Washington, D.C.

To symbolically connect all means of transportation, increase the amount of natural light in station spaces. The new train shed serves as a focal point for interactions between the railway station and its surroundings on both a vertical and horizontal level.

The new platforms are significantly larger, longer, and straighter than the current platforms, and they can accommodate twice as many passengers each train and twice as many trains per hour.

These expanded platforms are especially significant for commuter trains with heavy passenger loads.

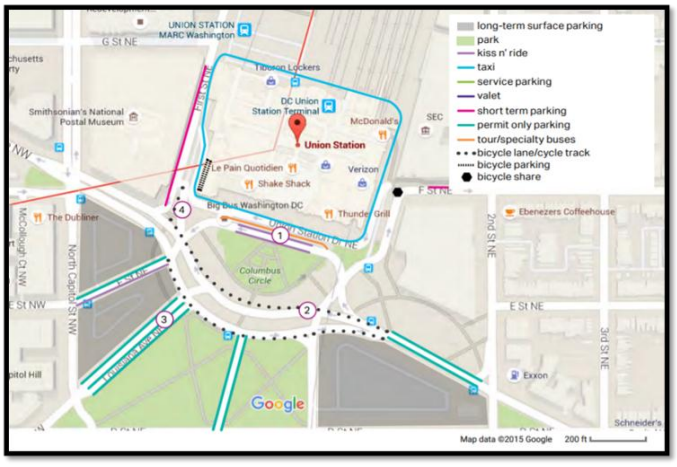
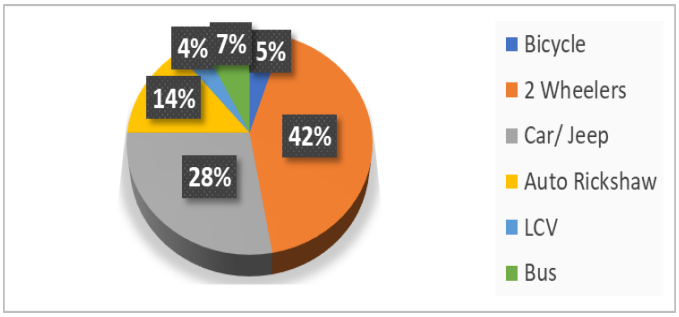


Fig -1: Connectivity at Union Station

5. Traffic Volume Count

The average traffic count at the railway station for the last seven days has been 3641.60 PCUs per hour. (7:45 p.m.–8:00 p.m.) Near the main entrance, which leads to the Bus Stop stretch, there was a significant amount of foot traffic. The majority of traffic is made up of pedestrians, and there are no provisions for their mobility. The most popular means of transportation is two-wheelers, followed by four-wheelers and auto rickshaws.



6. PLANNING PROPOSAL

Dedicated walkways and corridors for people and vehicular traffic are proposed. Separate GSRTC bus station, City bus depot, Rickshaw stand, and underground parking are all available. In the nearby, there is a commercial center. All railway facilities are available in the open and airy lobby.

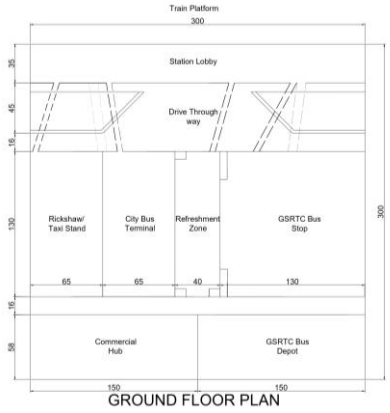


Fig -2: Planning Proposal

7. Conclusion

The application of the intermodal concept to rail services brings in a slew of new developments, one of which is the shifting function of railway stations. The growing number of passengers necessitates the use of innovative, cost-effective station designs. The ability to design stations has been improved. The building's shape grows increasingly complex. As a result, traditional stations are gradually being replaced by station complexes that offer additional amenities in addition to transportation. They serve as more than just a stopping point for trains to pick up and drop off passengers; they also serve as a point of entry and exit for communities.

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