

RAILWAY TRANSFERENCE URBANISM: RAILWAY STATION AS A POTENTIAL SOCIO-ECONOMIC URBAN COMPONENT

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Abstract

Railway transit corridor routes of 2855 Km in Bangladesh is cohesively integrated with important sections of the existing urban fabric of the country. Almost 65 million passengers and 2.52 million tons of freight are carried each year by railways in Bangladesh. At present, the role of railway transits and the urbanity surrounding railway stations in Dhaka city are almost greyed out to the least as they are neither encouraged nor promptly used as daily commuter modes. As a result, the ease of transference of urban people is now in an alarming condition throughout the city.

Theresearch focuses on formulating a land use policy that can promote the railway transference by improving the relations among the urban-built environment, user groups and their economic activities in the Tejgaon station area, a major railway transit of Dhaka city. Regarding the 1200 m radius of Transit Oriented Development (TOD), the study involved participants' observations including an ethnographic study and a questionnaire survey for the collection of both qualitative and quantitative data. The sample context Tejgaonis the core industrial area of Dhaka city that is adjacent to Kawran Bazar, which is the largest wholesale and retail kitchen raw market of the city. Kawran Bazar is intricately connected with the kitchen raw economy of at least twelve districts of the country.

This paper explores the transference potential of high speed locomotion of railway by finding and proposing new & efficient land use programs among the user group of the railway station, adjacent wholesale market economy and the neighbourhood units. Design strategies proposes balance of the 'non-place' with dynamic urban place. Finally, an integrated plan is suggested to balance different layers of urban movement for pedestrian, vehicular and locomotives to foster better mobility performance in each of aforementioned scenarios.

Keywords: Transference, Urbanism, Locomotion, non-place, TOD, community, Interaction

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Introduction

Railway corridor in Bangladesh has a long-established background since 1862. It is a principal mode of inland transports in the country that provides both freight and passenger services. The 2855 Km routes are integrated with many important urban sectors.¹After the birth of the nation in 1971, a few developments in the railway infrastructure and the networking system were undertaken throughout the country by Bangladesh Railway, a government managed transportation agency. Over the years, constructions and uses of flyovers and over passes have become essentials for people to navigate in Dhaka city. Dhaka city is desperately looking for transitoriented solutions for the unbearable daily traffic congestion. As a result, there are frequent attempts from the government to enforce new proposals concerning multi-layered multimodal transportation systems. The recently started construction of the Bus Rapid Transit (Dhaka BRT line), the Metro Rapid Transit (Dhaka MRT line) and the Dhaka-Chittagong Elevated Expressway (DEE) are some of the examples of the new Dhaka metropolitan transportation plan. The socio economic impact of these mega infrastructures are threatening the Dhaka city as the city is already faced with the worst form of an unplanned urbanization. Similarly, the required government attention to the already existing and poorly functioning railway sector is lacking. Alarmingly, the railway sector has been perpetually experiencing a serious negligence in its adequate developmental efforts. The result is the failure of achieving the aspired locomotive service as the daily commuter mode of Dhaka city.

Railway transference is the action of transferring people and freight by means of locomotives. On the other hand, urbanism is a lifestyle which can be defined as a complex state of social relationships. Prof. Ram Ahuja says,



Fig. 1: A diagram for Railway Transference Urbanism
Source: authors

Urbanism is a way of life which is characterized by certain elements such as transiency (short-term relations), superficiality, (impersonal and formal relations with limited number of people,) anonymity (not knowing names and lacking Intimacy) and individualism (people giving more importance to one's vested interests).²

This present research on the Railway Transference Urbanism approaches the urban intervention to create an efficient relationship between a railway station and the surrounding urban context.

French anthropologist Marc Augé (1995) has termed 'non-places' as places that are characterized by transience and uniformity rather than by rootedness and unique features. He focuses on spaces of circulation, consumption and communication, such as, airports, hotels, and

shopping malls. Another recent perspective on urban places has come from the assemblage theory and the actor-network theory. Drawing on the preceding theories, anthropologists, sociologists and geographers see urban places as inherently dynamic and heterogeneous. They understand places as made up of networked human and non-human elements (such as, buildings, water, trees, and garbage) (Fariás and Bender 2012).³ Accordingly, a railway station can be said as a 'non-place' which is the circulation and consumption place. This current research attempts to achieve a balance in the urban 'non-place' by means of dynamic and heterogeneous urban places.

Aims and Objectives

The study holds a differing view with respect to the aforementioned unfit mega infrastructural planning meant to solve transit oriented problems. Based on a substantial investigation of the physical attributes, the aim of this paper is to explore the design policy that can:

- create an efficient relationship between the user group of the railway station and the neighbourhood unit by balancing the 'non-place' with the dynamic urban place and
- approach an integrated plan for different layers of urban movements for pedestrians, vehicles and locomotives that can foster the mobility performance of each of the aforementioned sections.

This current study finds a differing view with respect to the recent practice of the mega infrastructural planning. Additionally, this present study attempts to explore the contributions and the potentialities of railway stations concerning transportations and solutions of transit oriented problems.

Limitations

The research was limited only around the 1200m radius area of the station to rethink and retreat the urban transit oriented neighbourhood, trying to achieve the desired solutions of urban transit oriented problems. But to handle the poor arrangement of transit oriented urbanity more effectively, for a mega city like Dhaka, a broader scale more than 1200m radius area would be examined. Among a number of methodologies, such as, behavioural map and space syntax, only the questionnaire method, ethnographic study and sectional analyses were used to conduct the research.

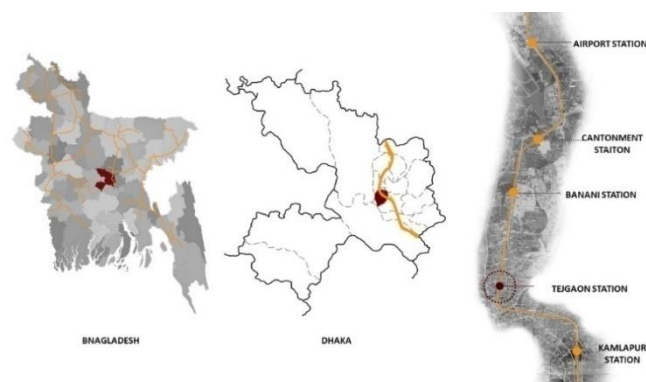


Fig. 2: Five major railway station in Dhaka city and Tejgaon Railway station (red marked)
Source: authors

Selected case

The study is executed in Tejgaon railway station area, at the centre of capital city Dhaka. This is one of the oldest railway stations in Dhaka city. The establishment time period of Tejgaon station central railway station Kamalapur is nearer. After 1971, while the Tejgaon area was evolved as an industrial nuclei of Dhaka city, the station was introduced as a freight station to serve the surrounding industrial area.

The area was an industrial hub comprised of many foods, pharmacology, news media, press and printing industries. The substantial relation of Tejgaon railway station with other important stations of different districts of the country made a significant contribution to the kitchen raw

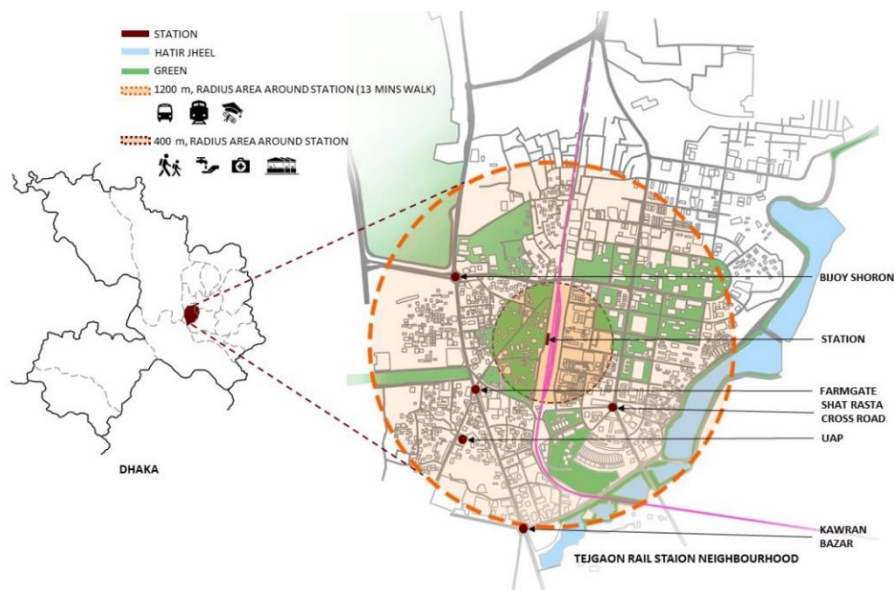


Fig. 3: 1200m radius area (orange outline) and 400 m radius area (red marked) around the station
Source: authors

depot economy around the area. Consecutively, two of the major wholesale and retail kitchen raw depots of Dhaka city- Kawran Bazar and Tejgaon are established to reinforce the kitchen raw economy of the city. This was the leading cause to fabricate the area as a commercial focus and soon the area became a highly engaged industrial and commercial zone. Some older residential areas coexisted with the commercial places, created an intricate relation between them. After the construction of the Dhaka-Mymensingh railway section in 1985, the station conformed to the passenger train halt. Many industrial and commercial workers commute regularly through the station. The complexity in the movement appears as the favourableness of the location and the ease of accessibility to the area allowed the establishment of a number of institutions in it. The oldest truck terminal of Dhaka city also occupied the surrounding station area to serve the kitchen raw depots to transport the kitchen raw in different end of the city. The area showed an entangled state of urban venture because of many irrelevant activities like navigations of students, trucks with freight and kitchen raw, industrial and commercial labours, general commuters and freight made the area in an.

Method and framework for research

Stage 1 - At the beginning, the study carried out a thorough literature search to gain a comprehensive knowledge and understanding about Railway Transference Urbanism. The major research objective was to understand the functional and operational legitimacy of the railway station. From the survey data, researchers categorised the class of the station based on the required performance (e.g. A class, B class, C class etc.) and the layout of the station by size and importance according to the type and volume of traffic handled (e.g. flag station, halt station, junction station, terminal station etc.).⁴ These were a guideline for design anticipation of the maximum intervention in station designing.

Stage 2 - This stage was to decide an area to survey depending upon the movement framework.⁵ The considered area for survey was decided on depending low intensity TOD (Transit Oriented Development) and high intensity TOD. 1200m radius area, 10 minutes walkable neighbourhood, around the station was considered as low intensity TOD and 400m radius area, 5 minutes walkable neighbourhood was considered high intensity TOD. The low intensity TOD was the lower impactful catchment area which was for a general survey while the high intensity TOD was the higher impactful catchment area decided for a thorough survey. The major site forces, which are the most impactful features were identified within the low and high intensity TOD. These were the most considerable elements to be handled at design development phases.

Stage 3 - Data collection and field survey for understanding the socio economic condition, making connections in transport routes and built environment and their character appraisal was conducted in this stage. Both qualitative and quantitative data were collected and compiled. For the quantitative data collection, authors physically surveyed the aforementioned 1200m and 400m radiuses to understand the tangible features of the area. It? Included:

- land use types
- Railway station programs & requirements
- Inter-relationship between built form and commercial activity
- inter-relationship between blocks, streets, buildings, open space, landscape and all the other features that make up urban areas
- Co-relation in transport routes, pedestrian street network, green corridor and service utilities
- Local context based morphology
- Informal economy & settlement pattern

The qualitative data are the intangible features, which were collected through intensive questionnaires and a mental mapping with an ethnographic research.³

Stage 4 - To identify the unreasonable and conflicting urban activity and space-use pattern, sectional configurations of different existing activity zones were analysed within the station property line of 400m radius distance.

Stage 5 - Finally, a base plan with future design issues was proposed regarding the aforementioned observation and analyses. The gross design decisions for creating urban connections and user activity zones in the station area were generated by a two dimensional understanding. The three dimensional exercises were conducted to get notion of exposure of commercial space from road, built mass from eye level and create the relation among the built form, street and human interaction.

Major site forces

1. **Pedestrian movement:** The adjacent streets are majorly occupied by pedestrians of institutional, residential and commercial communities. The station is significantly occupied by passengers who have to move closer to the station immediately after taking the exit from the railway station. The students of Tejgaon Government High School, Dhaka Polytechnic Institute (DPI), Government Science College and Bangladesh University of Textile Engineering (BUTEX) are major users of the Tejgaon railway station.



Fig. 4: Connection network and street user types adjacent to the station building, Diagram for railway station user percentage
Source: authors

2. **Residential area:** Three prominent residential areas of Tejgaon are Nakhal-para, Tajkuni-para and Tejturi-bazar. They all are situated within the 1200m radius area of the station. Multi layers of residential activities are generated around the station area induced by the residential community.
3. **Commercial-industrial activity:** Most noticeable feature of the area are the commercial blocks. The commercial-industrial activity made the area distinct from the other places of Dhaka city.



Pedestrian majority of different institute



Commercial building front rear the station road



Kitchen raw bazar for residential users



Residential building front adjacent the station road

Fig. 5: Different types of user patterns generated from different site forces
Source: author

Research issues and problem statement

A list of crucial problems was identified after conducting an intensive physical and questionnaire survey within 400m radius of the station surrounding.

▪ Inadequate station facility

The station doesnot provide adequate passenger facility, such as, waiting space, sufficient seating, food shops and magazine shops, and storages.

▪ Illegal placement of workshop and truck stand

The illegal metal workshops in purpose of servicing the trucks, occupied the legal property land of track stand. Consequently, the trucks illegally occupied the primary and secondary roads adjacent to the station area. The preceding is the main reason, which intrudes the usual vehicular movement on roads. It created both physical and visual obstructions for the station from the commercial zone. After evening, the truck stand becomes dark and empty. The free movement of common people ceases and the truck stand becomes a crime zone.

▪ Unused railway track

A serious functional disharmony is created by keeping the unserviceable freight wagons on the rail tracks.It harms the opportunity of utilizing the existing rail tracks. An abandoned situation is appeared because of these unused rail tracks with freights. It also hampers the movementof passenger wagon in sufficient numbers. The paralleled placement of unused freight wagon and illegal truck stand is a strongbarrier in communication and visual connectionbetween the station and opposite commercial zone.

▪ Lack of pedestrian facility

A huge number of pedestrians move through rail tracks in a risky way in orderto cross the station from one side to another. This causes many train accidentdeaths in different year.

▪ **Station front kitchen raw depot**

Illegal metal workshops, informal groceries and kitchen raw depots occupy both sides of the rail station. The kitchen depots include poultry, banana and egg supplies. The station front road always remains unhealthy and emits the odour of poultry and kitchen raw. Even the front road is always occupied by pickups or carrying vans, which transport kitchen raw materials.

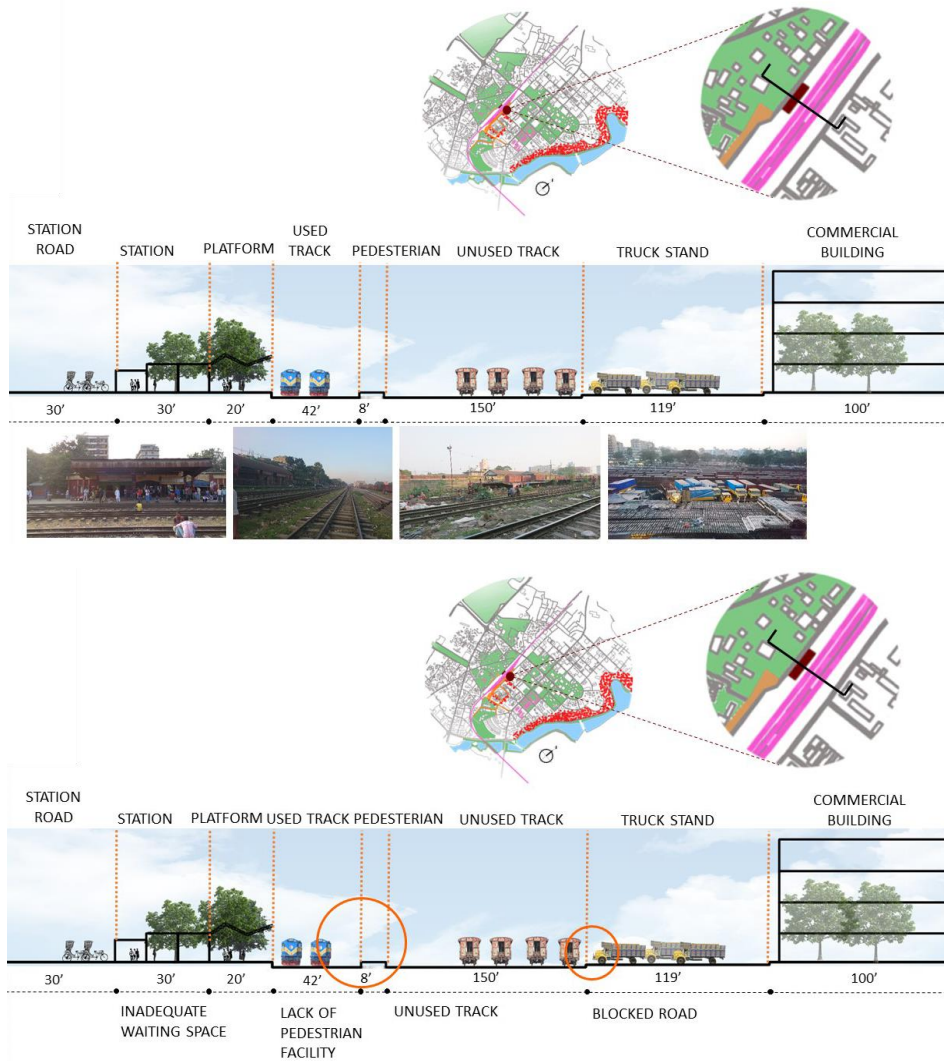


Fig. 6: Section through the station building
 Source: authors

▪ **Unsatisfactory station approach**

The station did not have demarked parking area or rickshaw stand. The poor standard of the entry did not carry the significance of a public building. The placement of the kitchen raw depot changed the character of the approach road into a narrow service road. Irregular maintenance of the road caused an experience of a hazardous travel for people.

▪ **Absence of public breathing space**

Almost 105 acres of commercial and industrial areas as well as three densely populated residential areas didn't possess any public gathering and breathing spaces. No children

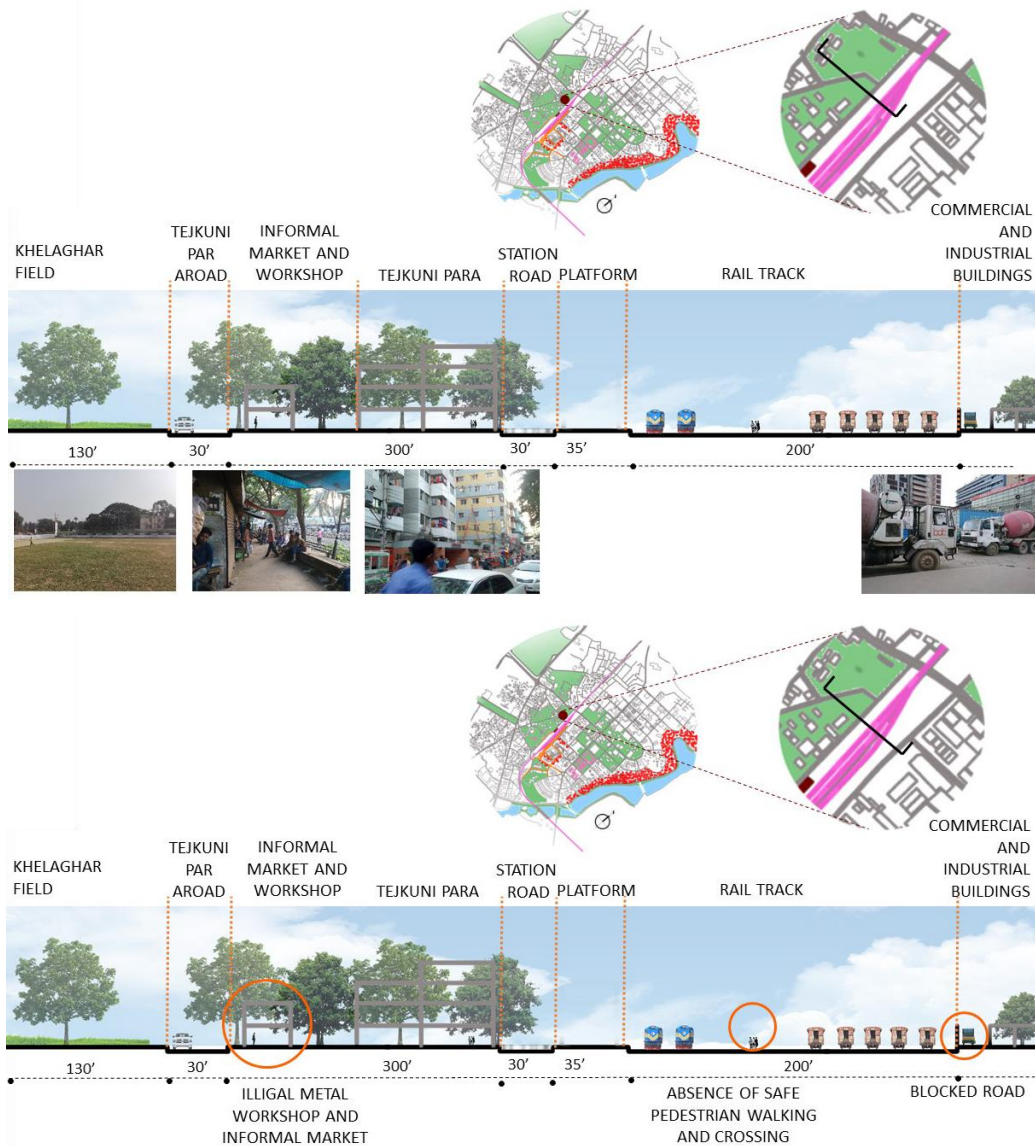


Fig. 7: Section through Nakhal para
 Source: author

playground except a small field called ‘Khelaghor field’ was located in the area. According to the questionnaire survey, around 98% of waiting passengers in the station also feel discomfort for deficient breathing space.

Proposals regarding intervention approach

Regarding the site forces and the problem identified, a base plan was proposed for design interventions. The proposal outlined a site area regarding the station property line, to approach the different layers of design interventions. According to the information collected from the field survey and newspaper reports, Bangladesh government was already rethinking and implementing new plan for issues identified as the major problem of the site. The base plan was prepared on four types of intervention while keeping in mind about the government future proposals about the area.

1. Proposing a well-designed urban accessibility. This approach was to creating successive connections to open up the physically and visually impermeable places to positive and accessible active places.
2. Redesigning the station.
3. Rethinking about the placement of kitchen raw depots, illegal workshops and truck stands.
4. Introducing residential and public activity zone rational with existing site forces in order to convert a 'non-place' to a harmonious place.

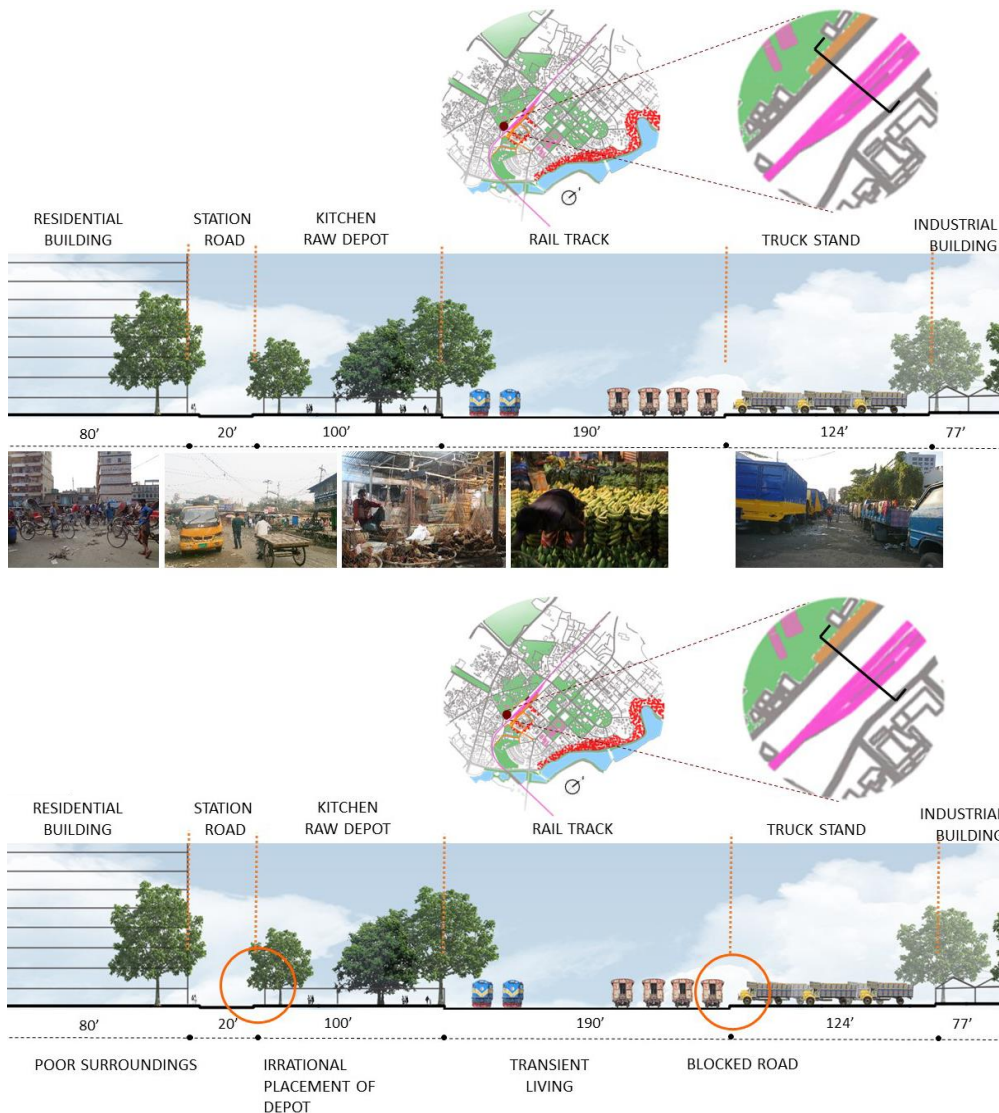


Fig. 8: Section through Tejturi-bazar
Source: authors

Strategy formulation for urban accessibility (no.1)

The existing vehicle and pedestrian movement patterns are extremely diverged from the station and the railway peripheral adjacent places. In the existing state, the western residential area was completely faced to the back of the station front. The movement pattern psychologically discourages people to use the station. The approach road of the station area was only used by a few numbers of station passengers and the people connected with the kitchen raw depot business. Most of

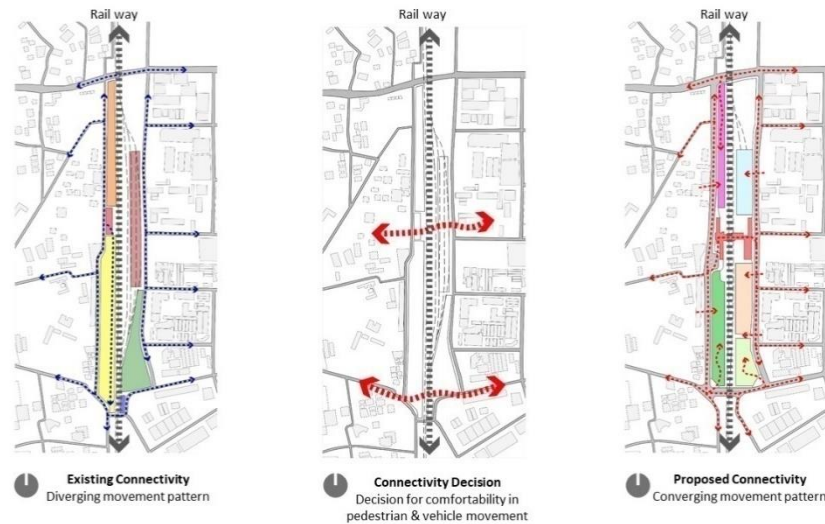


Fig. 9: Design intervention in connectivity
Source: authors

the road is blocked by pickups and vans. Similarly, the eastern commercial area was also faced to the back of the station area and was completely blocked by the truck stand and abandoned freight wagons.

Direct, attractive connections between key facilities, avoiding dead ends, help to create more convenient and comfortable places. An assessment of how best the site can be plugged into wider movement networks should aim to provide the maximum number of direct connections to main streets carrying through traffic. The more direct the links between main streets, the greater the potential for mixed uses (the links do not have to be vehicular).⁵

'Urban pedestrian connectivity' was the proposal of creating two basic linear connections to unblock the phenomena of physical and visual imperviousness. This provided a safe multi-layered pedestrian bridge over the station block and rail tracks, which will be the secondary connection between the residential and commercial zones. The bridge is not only a passing way but also a platform promoting socio-economic interactions connected with transits. Spaces for accommodations of small vendors that serve the rushing people are kept in the design consideration. The primary contribution was the creation of a safe and easy vehicular movement by redesigning the existing southern connectivity. The pedestrian circulations were opened up at a specific interval through the station peripheral area from both the commercial and residential zones.

Approaching with redesigning the station (no.2)

The existing station has already been frequently used because of the commuters of commercial



Fig. 10: Base plan for future design proposals
 Source: author

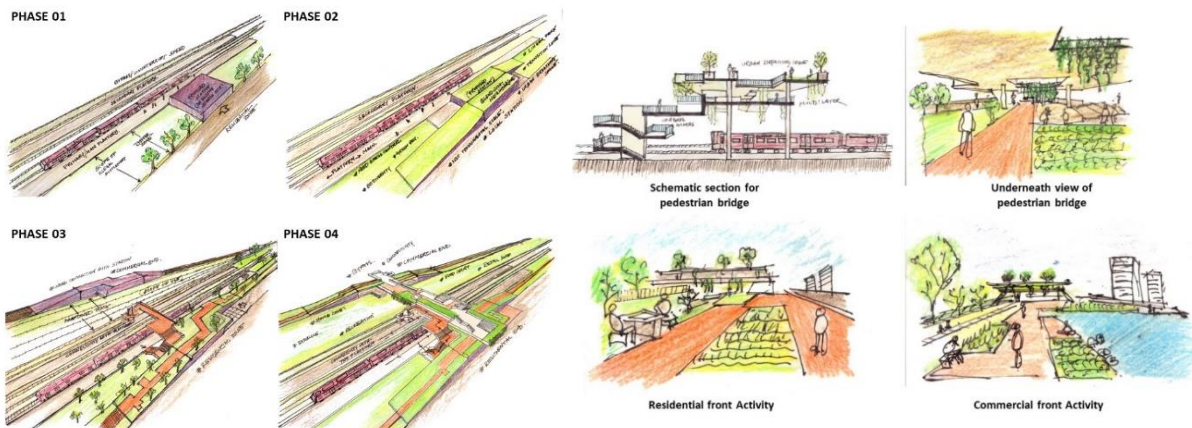


Fig. 11: The phases of exercising the form evolution of pedestrian bridge and station building (left), schematic community activity spaces (right)
 Source: authors

and industrial workers. Bangladesh Government already inaugurated two additional rail tracksparellel with the existing rail tracks along the Dhaka-Mymensingh rail route. Tejgaon rail station already has three running rail tracks. Around 198 numbers of unused rail tracks were proposed to be connected with new additional rail tracks. The abandoned freight wagons were proposed to be used as an infrastructural design element after retreating them. Immediately after the Tejgaon railway station is the Kamlapur railway station, the central and terminal station in Dhaka. Tejgaon rail station was sufficiently supported by shunting and locomotive yards of the Kamlapur station.

The station was termed as the 'shift and halt' maintaining the foot print of existing railway station. The station was redesigned with modern passenger facilities as sufficient passengers waiting space, ticket booking, storing, snacks, magazine stalls, properly shaded station platform and station officers and staff spaces. The station was designed not only for transition for passengers, but also as the integrated land scape element to mutually connect the residential and commercial areas. A parking space for rickshaws, auto-rickshaws and a few numbers of motor vehicles was designed in front of the station entry.

Dealing with relocating the illegal set-ups (no.3)

Bangladesh government already started to take steps in freeing important city centres from unplanned infrastructures and illegal set-ups. Dhaka City Corporation was supposed to relocate the entire kitchen raw markets of both Tejgaon and Kawran Bazar. Some remote places of Dhaka city, such as, Aminbazar, Jatrabari, Mohakhali and Lalbagh are the government selected places for relocating the kitchen raw depots.⁶ Tejgaon was aimed to be a commercial and institutional centre within the near future. Kawran Bazar was planned to be the central control hub of Dhaka BRT, MRT and DEE.⁷

Dhaka North City Corporation Mayor Annisul Haq made a successful campaign to clear the Tejgaon's illegal truck parking practices. The new proposal was to relocate the truck stand near Tongi bridge, Kanchpur bridge, Mirpur bridge and China Friendship bridge along Mawa route.⁸ The illegally located metal workshops and informal markets were to be shifted along with the truck parking.

It was proposed by the authors to utilize the abandoned freight wagons of Tejgaon railway station in design elements. The wagons were suggested to be utilized after required treatments to build the retail shops, food stalls and book stalls. The on running freight wagons were proposed to be relocated to the nearer Jaydabpur and Saiyadpur railway stations possessing locomotive yard. They already house huge numbers of freight wagons. Kamalapur railway station was also the large freight wagon shed to house the freight wagons kept in Tejgaon railway station in unplanned way.

Handling with 'non-place' to a harmonious place (no.4)

Lynch (1960: 4) argued that in the process of way-finding, people draw on an 'environmental image, the generalized mental picture of the exterior physical world that is held by an individual'. This image of the city, which Lynch also called a 'mental map', is produced in an interaction between individuals and their environment. It is shaped both by the people's immediate sensory experience of their surroundings and by memories of earlier experiences, and is important for both practical and emotional reasons. Lynch distinguished five elements in these mental maps: paths, edges, districts, nodes and landmarks. Nodes are focal points or intersections such as plazas or crossroads. Landmarks, finally, are conspicuous, easily identifiable reference points such as striking buildings, monuments or artworks.³

According to the design proposal, the immediate chunk of land availed after the relocation of the depots was designed as the 'Park' for playground, jogging space, outdoor gaming provision and canopy shaded park for residential users. Children of the residential area and many students of surrounding institutions regularly enjoy a green piece of land for playing.⁹ The pedestrian

circulation was maintained inside the park to the entry of the station. That would be a relaxing space for the regularly commuting students of nearer institutions.

People didn't move out of the main pedestrian flow. They stayed in it or moved into it, and the great bulk of the conversations were smacked in the centre of the flow—the 100 percent location, to use the real-estate term. There is a lot of apparent motions. But if you plot the orbits, you will find they are usually centered around the 100 percent spot."¹⁰

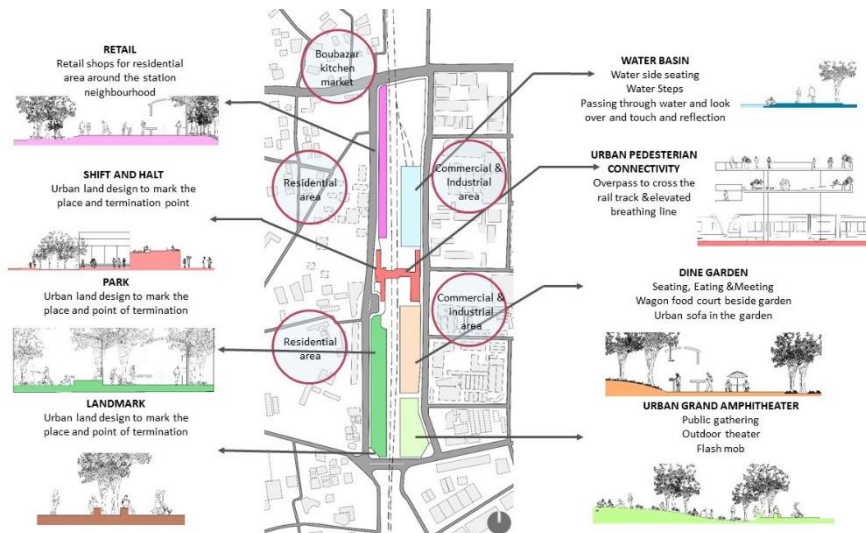


Fig. 12: Proposed master plan for Transit Oriented Development

Source: authors

'Land marks' were the plazas provided in design at the nodal point, i.e., at the turning point of the station approach road to create a mental map as a reference point for the urban people to navigate the place.

'Grand amphitheatre', a multipurpose flexible space was proposed at the place after shifting the truck stand. The public gathering space for commercial purposes, political purposes, annual sports arranged by institutions, flash mobs, cultural program like "mela", concert or open to sky movie theatre could be arranged in this flexible space.

A regular breathing space, encouraging the socio-economical interactional space for the commercial and industrial people was suggested as the 'Dine garden'. The place was thought as a piece of land supporting luncheons, gossiping, reading or arranging small meeting facilities. The dine garden could be the permeable place between the residential park and commercial place. The movement of trains runs in-between these places. The food stalls and book stalls were designed in the place.

One of the best things about water is the look and feel of it. But in many places water is only for looking at. Let a foot touch it and a guard will be there in an instant. It's not right to put water before people and then keep them away from it.¹⁰

The accessible 'Water body' at the commercial site was a design recommendation, which is meant to bring a lively environment and a social-interactional space to the commercial site. The water body was proposed to keep the place alive and populated, even after the commercial

activity stops. This natural element would be peaceful for both residential and transit passengers who travel through the station. The multi-layered bridge would be the stage for enjoying the look of the distant 'Water body'.

A narrow slit of space of the railway property was kept abandoned. The space was offered as 'Retail shops' to fulfil the daily need of the residential people. The shops were approached to be incorporated with wide pedestrian facility.

Further scope of study

Currently, the railway transference is the crucial issue in Bangladesh concerning transportation problems. Bangladesh Railway was suffering from lack of investment in proper design and maintenance of its every section. Even there is a huge deficiency in proper integrated planning to incorporate the railway transference with urban motor vehicular movement.

The multimodal transportation projects of Bangladesh Government became multiple new attempts to solve the extremely hazardous transportation and navigation problem in Dhaka City. But a single attempt to enrich the existing railway sector by properly planning, adequately designing and well-organized scheduling could be a noticeable successful way to solve the serious movement problems through the metropolitan city. The establishment of a rational connection of train stations with a large number of urban commuters and the surrounding urbanity would be a cost effective, time saving as well as a provident initiative to improve the entire commuting system in the country.

Further studies could be conducted on the strategic development and policy level designing for attaining a satisfactory railway networking system. It could be an avenue to continue the research to find a reasonable way to reduce the unreasonable attempt to superimpose the motor vehicular infrastructure by railway transportation.

Conclusion

The study was to explore the various scopes and opportunities from a case enduring a hostile condition of urban movement framework. The authors conducted the study with thorough survey according to the research methodology. The authors dealt the research findings with critical analyses to understand and realize the way of attaining the maximum transit oriented facilities while the delivering the maximum benefit to the surrounding neighbourhood. The questionnaire surveys an ethnographic study with mind mapping provided a guidance and acted as the initial point of prospective research issues.

In 1971, Lewis Mumford wrote "The prime purpose of passenger transportation is not to increase the amount of physical movement but to increase the possibilities for human association, cooperation, personal intercourse, and choice." (Transportation: "A Failure of Mind")

The design decisions created an efficient relationship between the user group of the railway station and the neighbourhood units. Some vital urban activity spaces were offered to balance the 'non-place' with dynamic urban places and to create the positive human interactions as human associations. The groundwork for redesigning the station maximized to open up the contribution and the potentiality of the station in transportation without constructing any mega

infrastructure for automobiles. Approaching an integrated plan for pedestrian users in different layers was a motivation for pedestrian users to walk along the surrounding urbanity. However, the more simplified outlines for basic design decisions were proposed to deal the entire unplanned and illegally organized places. The attempt was to foster the mobility performance in pedestrian, vehicular and locomotive movements.

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