

Planning and Designing of Nalasopara Bus Depot

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Abstract— A nation's progress and prosperity can be easily captured and analysed by looking into its public transport system and infrastructural development. Development and growth of the town largely depends on the efficiency of the transportation system within the town. Transportation and communication form of the case competency because it accelerate the pace of economic and commercial growth and helping to fulfill the concept of global village. The bus depots in Maharashtra are not developed which causes in downfall in revenue of state government. If we want to increase the revenue, we should develop the bus depots and should improve the condition of bus services. The main objective of project of the project is to increase the bus service quality through passenger's satisfactory survey. Due to lack of capacity and limited area expansion of existing bus terminal is not possible. Insufficient entry and exit width, inadequate number of bays adversely affects the functioning of bus of bus terminal. Further land acquisition is not possible so instead of planning for new design, redesign of existing bus terminal is the convenient option. Certain modifications must be incorporated in the existing design of the terminal so as to accommodate future expansion and congestion simultaneously. To redesign of the bus terminal with respect to modern planning criteria with basic facilities and infrastructure being develop to the Nalasopara city.

Keywords— Nalasopara city, global village, infrastructural development.

I. INTRODUCTION

1.1 General

Public transport holds center stage in the urban transport agenda. A well-functioning and sustainable city cannot be achieved without strengthening its public transport system. Infrastructure plays a vital role in the operation of an efficient, convenient and safe transit system (Trans Link Transit Authority 2011). When transit infrastructure is designed to enhance passenger experience, its attractiveness is ensured, making it a viable alternative to private motorized transport. The National Urban Transport Policy (NUTP) (MoUD 2006) recognizes that city dwellers are of utmost importance and that all plans must be centred on their common benefit. With reference to a focus on public transportation, the NUTP document emphasizes the following means:

1. Encouraging greater use of public transport and non-motorized modes by offering Central financial assistance for this purpose
2. Enabling the establishment of quality focused multi-modal public transport systems that are well integrated, and provide seamless travel across modes
3. Establishing effective regulatory and enforcement mechanisms that allow a level playing field for all operators of transport services, and enhanced safety for the transport system users
4. Building capacity (institutional and manpower) to plan for sustainable urban transport, and establishing knowledge management system that would service the needs of all urban transport professionals, such as planners, researchers, teachers, students etc.

A bus terminal is the point at the start/end of a bus route, where the vehicles stop, reverse and wait, before departing on the return journey. It also serves as a station for passengers to board and alight. Evidently, at a bus terminal, parameters addressing passenger and operator requirements overlap. It is the site for interchange between large volume of bus and passenger traffic. This demands that the facilities at a bus terminal be planned systematically and that user requirements be addressed in such planning, or else the lack of an efficient and functional environment will lead to friction, ultimately compromising the attractiveness of the bus system.

Buses are the predominant mode of motorized public transport in India. All Bus systems combined carry much more passengers than any other mass transit systems. A functional bus system is an essential element of both Intercity and Intracity public transport system. Bus stops, bus terminals and depots are the critical infrastructure components of a bus-based transit system. Bus terminals are the nodal points at the beginning and end of journey.

1.2 Objectives of the project:

- To provide adequate, economical, efficient, reliable, comfortable, safe and environment-friendly modern passenger transport services for the people.
- To create and improve infrastructure for modern Bus Terminals.
- To increase bus connectivity between rural and urban areas.
- To add/modify infrastructural elements like ATM, Shops, Hotels, Restaurants, Gym, Drivers conductors resting room.

1.3 Scope of the project:

To redesign of the bus terminal with respect to modern planning criteria with basic facilities and infrastructure being develop to the Nalasopara city. A detailed planning and design guideline for bus terminals can not only propel capacity building, but further drive the development of more responsive passenger-specific bus infrastructure.

1.4 Organization of project report:

This report is presented in a number of chapters, starting with Introduction and ending with Conclusion. Chapter 1 gives introduction to Bus Depot, objective and scope of the project. Chapter 2 presents previous work in the literature related to bus depots which includes 9 research papers. Chapter 3 light up on the proposed work in which methodology is explained. Chapter 4 gives summary of whole project. A chapter can be subdivided into sections, sub-sections and soon as to present the content discretely.

II. METHODOLOGY

In order to achieve our objective we have to take certain steps which will take us to the solution of the problem we are facing so following are the steps we will taking to achieve our objective.

**Table 3.1
Steps in Methodology**

Steps	Task
Step 1	Selecting of proper site of the bus depot for the redesign of the nalasopara bus depot
Step 2	Conducting survey for calculating the area of the depot
Step 3	Site visits to the Vadodara bus for getting planning idea, Visit to nalasopara bus
Step 4	Planning of depot building, Maintenance area, Parking Area, Staff Quarters.
Step 5	Design of building structure, Design of parking.
Step 6	Modelling

2.1 Selection of Site

The first involves identifying a suitable site and the second, initiating the planning process specific to its context. In the first phase, government officials and other stakeholders (such as the land owning agency, state transport undertaking (STU) etc.) identify a suitable site. Identifying an appropriate site is a critical component of project development. It must address two major considerations:

2.1.1 Location Attributes

Currently, the selection of a site for a bus terminal is governed primarily by the availability of land. However, other location attributes— passenger demand and the bus route network—should also be considered. If the site is not near trip generators, it may make access harder for commuters. Additionally, if it is off the serving route network, dead mileage will up the vehicle operating costs (Rodrique, Comtois & Slack 2013). The terminal's location also influences its revenue generation potential; easy accessibility will affect attractiveness for private investment, such as for commercial/real estate development.

In Maharashtra there is no such infrastructure for the depot buildings because of that the revenue of the government has reached to its lowest for the earnings from the State Transport (ST). If the depot buildings will be developed then the passengers can turn to the Public Transport which will help to increase the revenue of government.

We searched the existing bus depots which were not developed and not well planned. After shortlisting 3 depots which were Vasai, Nalasopara and Virar, we collect some data regarding the depots which were shortlisted. After some research and lot of discussion we finalize the Nalasopara bus depot to redevelop the bus depot.

The factors considered while selecting the Nalasopara bus depot were

- Area of the Depot
- Frequency of Passengers
- Available facilities on the depot

The depot has its own fuelling Station, own maintenance area to repair Buses. Everyday around 6000+ passengers travel from this bus depot. From this depot buses are departed and arrived from all over Maharashtra. After every 20 minutes the bus is departed to Thane. Other public transport which works from this bus depot is VVMT(Vasai-Virar Municipal Transportation) which circulates only in Vasai-Virar region.

2.2 Survey Carried

After finalizing the site for the development of the bus depot, the survey has to be carried to determine the actual area of the depot. After taking the permission from the concerned authorities we carried the compass survey, we got the area of the depot which is around the 7 acres.

Objective: To survey a plot bounded by a polygon (a pentagon in this case).

Theory: Traversing is a type of survey where the framework is formed by a number of connected survey lines. The directions of the survey lines are measured by a direction-measuring instrument (like theodolite), while the lengths are measured by a tape (or chain).

Bearing: The Bearing of a line is its direction relative to a given meridian and always measured in the clockwise direction.

Backward Bearing (B.B.): If the bearing of a line AB is measured from B toward A, it is known as Backward Bearing or Back Bearing.

Forward Bearing (F.B.): If the bearing of a line AB is measured from A toward B, it is known as Forward Bearing or Fore Bearing.

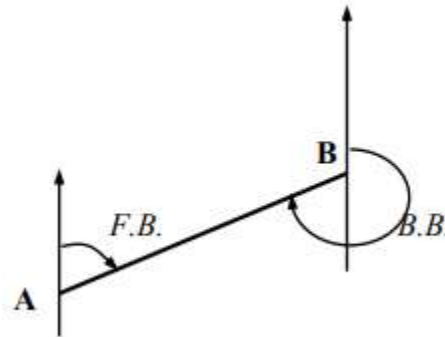


Fig. 1. Survey Bearings

Significance: The use of theodolite in traversing surveys is very fundamental and has become one of the most common methods in geomatic engineering work such as, general purpose angle measurement; provision of control surveys; contour and detail mapping; and setting out and construction work.

Instruments:

- A. Theodolite
- B. Staff Rod
- C. Drawing Sheet
- D. Drawing Board
- E. Measure Tape

Procedure:

1. It is required to run traverse ABCDEFGHIJKL.
2. The compass is centered over station A and is levelled.
3. Fore bearing at the line AB and the Back bearing at the LA line are taken by sighting the ranging rod at B and L respectively.
4. The line AB is measured.
5. The instrument is shifted to B and the Fore and Back bearing are observed.
6. These observation are taken at remaining station C to L.
7. If the error however between fore and back bearing of the line exceeds the limit of permissible error of reading the fore and back bearing of the line should be determined.
8. If on checking the error still persist it may be taken that the local attraction exists at one or both station provided there are no other error.
9. The bearing should be corrected before they are used in plotting.

General Remarks

- The readings on compass may vary due to local attraction or magnetic field.
- The focusing in order to avoid parallax may not be perfectly done.

2.3 Site Visit

The Vadodara bus station is the central bus station serving the city of Vadodara in Gujarat, India. It was built under a public-private partnership between the Gujarat State Road Transport Corporation (GSRTC) and realty firm Cube Construction. Built at a cost of 114 crore, the five-storey terminus is spread over 2.4 lakh square feet. Called the Ved Transcube Plaza, it has the Vadodara Central Bus Terminal as well as a commercial complex. The terminus handles over 800 buses and as many as 28,000 to 35,000 passengers daily.

The Bus Terminal was inaugurated by Prime Minister Narendra Modi on 15 February 2014. In all, the commercial complex is expected to have 400 retail shops of an average 250 to 350 square feet each, a flea market, a food court with 22 outlets, a seven-screen multiplex run by PVR Cinemas and a 100-room budget hotel

2.4 Planning considerations

The planning stage for bus terminal development includes steps necessary for undertaking detailed infrastructure planning. These steps include understanding the principles of bus terminal planning, developing an understanding of key project ingredients, initiating project development requirements (such as site identification), and developing a detailed project brief.

The structure will be of Basement+G+4 which will consist of shopping area, waiting area, commercial area, game zone, conference hall, banquet, multiplex, food zone, lodge, etc. There will be another building on the depot will be consist of parking of buses, maintenance area, fuelling station, staff offices, staff restroom, etc.

III. CONCLUSION

As the population of the capital rises rapidly and more and more people coming to the town for work and different purposes the need of much larger, sufficient, and safer, with compatible movement of buses new revised bus terminal is needs to be adopted in the near future to avoid any problems that can be raised due to old structure. After redesigning of such bus terminal it will beneficial for the daily users and government for revenue generation itself.

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