

New Initiatives towards Design of a State-of-the-art Service Bus Stand for Udupi City

¹Bhuvanamitra S, ²Karthik P, ³Vikas Rao N, ⁴Vikas Udupa, ⁵Prof. Dr. B. Radheshyam

^{1,2,3,4}UG Student, ⁵Professor & Head,
Department of Civil Engineering

Shri MadhwaVadiraja Institute of Technology and Management, Udupi, India

Abstract—Effective operation of urban bus system is vital for the development of any city. There is a widespread reliance on bus facility, providing mobility within urban areas throughout the country. Improved performance of urban bus service could essentially contribute to improved environmental conditions in medium sized cities like Udupi, by shifting mobility from private modes towards more efficient environmental-friendly and safer public travel modes. The existing service bus stand is located in the heart of the Udupi City and 4km away from the railway station. It lacks proper planning and good facilities for the commuters. During the peak hours the bus stand is too crowded and it has also led to so many accidents as well. The buses cause lots of air and noise pollution at that particular region which surely affect the health of the people. It also lacks proper parking facility for the buses and also for vehicles of the passengers. Hence, a proposal for new state-of-the-art service bus stand for Udupi city has been proposed by studying and suggesting solutions for the problems, in this technical paper.

Keywords: Service bus stand; Population; Parking facility, connectivity.

I. INTRODUCTION

Udupi – famously recognized as the temple town, is a small district in Coastal Karnataka. It is located at about 410 Km from Bengaluru, the capital city of Karnataka. Udupi is the district headquarters, lying between 13°20'20" N latitude and 74°44'43" E longitude with a total area of 68.23Sq. Km. It is well known for its rich culture, educational institutions and tourism. It is one of the fastest developing districts of our state and was declared as one of the cleanest districts in India. Students all around the globe study in reputed institutions of this place and also tourists keep visiting the famous temples of this town. It has got very good roads and better connectivity with other parts of the state as well.

The population increase has led to the increase in traffic in the city. Hence, the roads were widened in recent times, but this town lacks a well-planned and designed bus stand. The daily commuters and tourists are facing lots of problems due to this. Udupi has three main bus stands viz., Service Bus Stand, City Bus Stand and K.S.R.T.C. Bus Stand located in the heart of the city providing services to the public. The buses of service bus stand provide connectivity to major districts of Karnataka and taluks of Udupi. The buses originating from the city bus stand connect major parts of the city. K.S.R.T.C. buses provide inter-district and inter-state services along with city connectivity.

Out of these three, the most used bus stand by the public is the service Bus stand with an area of 7051 sq. m. At present, on an average 25 buses can be parked in this bus stand. Due to improper planning and minimum area, the parking facility provided for the buses is insufficient and has also led to congestion and accidents. The existing bus stand lacks in basic facilities like drinking water, washrooms, parking facility for the commuters, waiting lounges, helpdesk etc, which is the major requirement of a present day bus stand.

II. OBJECTIVES

Following are the objectives of the project, highlighting its importance:

- To design a well-planned, eco friendly, state-of-the-art bus stand for service buses, keeping sustainable development and passenger comfort as the main priority areas.
- To design an underpass connecting the city and service bus stand in order to avoid the crowd in the main street and also for the safety of the commuters.
- To carry out a survey with the stake holders regarding their requirements for the economic, environmental and health related issues and come up with an action plan with inputs from the domain experts.
- To effectively utilize the existing land available without causing problems to other properties.
- To reduce the pollution caused by the vehicles in and around the bus stand area.
- To improve the parking facilities for the buses and for the vehicles of the passengers.
- To provide facilities like washrooms, waiting lounge, drinking water, rest rooms, info desks etc.

III. LITERATURE REVIEW

CYPE-CAD^[1] is a “Software for Architecture, Engineering and Construction” ISO 9001:2008 – 2015. It is a software package which assists in carrying out the analysis and design of reinforced concrete and steel structures, subject to horizontal and vertical loads, for homes, buildings and civil work projects. Its use guarantees maximum analysis reliability and optimum drawing design.

Revit Architecture 2015^[2] is a “CAD Building information modeling” Initial release 5 April 2000, Developer Autodesk®, This software is specifically built for Building Information Modeling (BIM), empowering design and construction professionals to bring ideas from concept to construction with a coordinated and consistent model-based approach. It includes the functionality of all of the Revit disciplines (architecture, MEP, and structure) in one unified interface.

3ds Max 2015^[3], is a “3-D Computer Graphics” Initial release 1990, Developer Autodesk®, provides a comprehensive 3-D modeling, animation and rendering and compositing solution for architectural and engineering projects.

IV. METHODOLOGY

Firstly, a survey was conducted to know the problems of the existing service bus stand by interviewing daily commuters, drivers and conductors. The inputs given by them were noted down and considered during the design.

Next, data like total population of the entire district, number of buses registered under various buses associations, number of buses halting in the bus stand and accident details since 2012 were collected from Census Department, Canara Bus Operators Association and Traffic Police Station, Udupi City respectively.

A reconnaissance survey was conducted in the existing bus stand area followed by actual site survey in order to delineate salient points and also for the contour points using total station. The reference layout drawing of the land was obtained from the city urban local body. The points obtained from the survey were plotted on AutoCAD for further planning and design.

Based on the inputs received from the stakeholders, a plan of the new service bus stand was carried out.

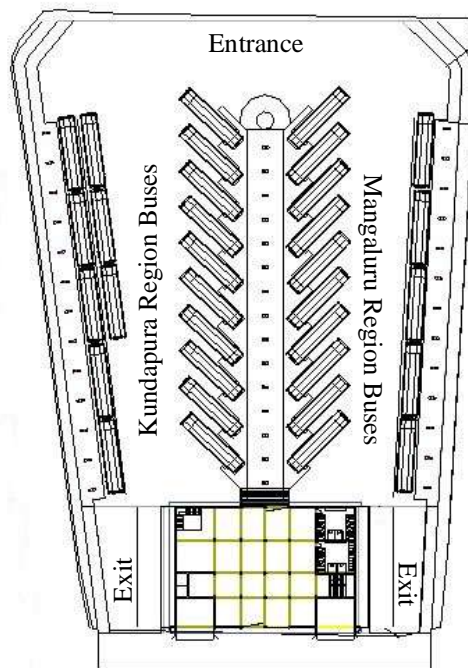


Fig. 1: Plan of New Service bus stand

The primary criteria was to bifurcate the bus traffic by dividing, the entire bus stand into two parts i.e. Kundapura Region (buses moving towards North) and Mangaluru Region (buses moving towards South) as shown in Fig. 1 for effective use of the space and parking of the buses. Separate bays are provided for Express buses on either sides of the bus stand. A G+2 building with basement parking is provided for basic facilities like drinking water, washrooms, hotels, commercial space, waiting lounge, helpdesk etc.

The structural analysis of the designed model was carried out using software called CYPE-CAD. Various checks were performed and drawings were derived from the software.

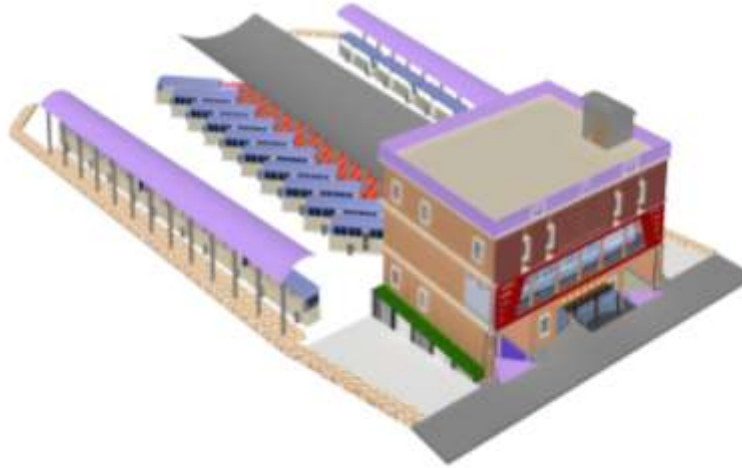


Fig.2: 3-D model of New Service bus stand

The 3-D modeling of the entire bus stand was carried out using various software packages viz., Autodesk® Revit Architecture 2015 and Autodesk® 3ds-Max Design 2015. Rendering of the 3-D model and walkthrough of the bus stand was also carried out using the same software packages

V. DISCUSSION

The existing bus stand is at an elevation of 2.0m from the road level. Due to this, at the entrance of the existing bus stand there is an unscientific ramp with high inclination which makes it difficult for the buses to enter the bus stand. In order to counter this problem, the elevation of the new bus stand is reduced to the road level for the movement of the buses in and out of the bus stand.

The existing bus stand has an average halting capacity of 25 buses whereas the new bus stand has a halting capacity of 36 buses; thereby overcoming improper parking and congestion of the traffic.

In order to minimize accidents and for the easy movement of the pedestrians an underpass is provided connecting service bus stand and city bus stand.

Basic facilities like drinking water, washrooms, hotels, basement parking for two wheelers and four wheelers, waiting lounge, helpdesk etc. are provided.

Green building techniques like Solar power generation, Rain water harvesting etc., are considered in the design of new bus stand keeping sustainable development in mind.

VI. CONCLUSION

The new bus stand promises improved safety and convenience for the commuters as it reduces pedestrian traffic and probable causes of the traffic jam. The halting capacity of the bus stand will be increased by 44%. The design minimizes the rate of air and noise pollution, crowd in the busy streets, enhances the parking facilities and provides maximum facilities to the passengers. The inclusion of green building and smart technologies will set a benchmark in the design of bus stands.

VII. ACKNOWLEDGEMENT

The student authors would like to thank Dr. B Radheshyam, Professor and Head and Mr. Ravikumar, Assistant Professor, Department of Civil Engineering, SMVITM, Udupi for helping us to take permission from concerned authorities. The authors are grateful to the District Commissioner and Superintendent of Police of Udupi District and also Commissioner of City Municipal Corporation of Udupi City for granting us permission to visit the site and conduct surveys.

REFERENCES

- [1] CYPE“SoftwareforArchitecture, EngineeringandConstruction”ISO 9001:2008 – 2015.
- [2] Revit Architecture 2015 “CAD Building information modeling” Initial release 5 April 2000, Developer Autodesk
- [3] 3ds Max 2015 “3D modeling, animation, rendering, and compositing solution for architectural purpose”. Developer Autodesk, Initial release 1990.
- [4] Traffic police station “Accidents details in and around service bus stand”, Udupi.
- [5] District census “Population of 2001 & 2011” Series-30, Part XII-B, Directorate of Census Operations, Karnataka.