

Proposed Mobility Hub at Trivandrum

Anagha Vinod, Arsha Surendran Arya
Muraleedharan, Keerthi Chandran

B. Tech

Civil Engineering

Sree Buddha College Of Engineering for Women
Elavumthitta, Pathanamthitta

Aswathy Prakash

Assistant Professor

Civil Department

Sree Buddha College of Engineering for Women
Elavumthitta, pathanamthitta

Abstract— Based on the goal of reducing the usage of private vehicles thus reducing the vehicular trips, congestion, pollution etc. we proposed a Mobility Hub, is a principal focal point that links all public transportation services of the city. The hub shall be connected to all major routes of the city. Due to the smooth transfer of passengers from one mode to another the overall time taken for the journey is considerably reduced thereby attracting the commuters towards public transport system.

Keywords—Mobility hub

I. INTRODUCTION

The Mobility Hub is a principal focal point that links all public transportation services of the city together at a single facility, thereby encouraging increased use of public transportation services as well as transit oriented developments. It is a single facility that facilitates interchange between various modes of travel in the city. It facilitates smooth, safe and comfortable movement of passengers across various modes and also It enhances the utilization of public transport system of the city by offering seamless and safe transfer facilities between different modes.

Due to the smooth transfer of passengers from one mode to another the overall time taken for the journey is considerably reduced thereby attracting the commuters towards public transport system. The main components of the multi-modal mobility hub are transit station, mobility hub area and catchment area. Transit station is served by a higher order transit of the city. Mobility hub area includes transit station along with buildings like recreational, shopping, entertainment etc, and public spaces. Catchment area is the area of influence connecting the hub with the road network.

II. LITERATURE REVIEW

Lijuan Jiang et.al(2014): The possibility of converging of all existing modes at one hub is not always possible in the case of Indian cities. In such cases where physical integration between modes is not possible, integration can be done by operating shuttle services to those terminals.

Xiaoqing Dai et.al: Passengers would be provided with real time travel information in the form of announcements and display boards. The sign boards are displayed in the hub to help passengers

Joshua Engel et.al(2012): Mobility hubs are more than just transit stations. They vary in size, but generally comprise a rapid transit station and the surrounding area that can be comfortably accessed by foot, approximately an 800-meter radius.

Guanghou Zhang et.al (2011): In order to combine all modes of transport mobility hub were built. However, the hub should have sufficient space for parking, ingress, egress and circulation of all the modes of vehicles. It should be capable of accommodating the commuters from all the modes in terms of waiting areas, moving space and other public spaces.

III. METHODOLOGY

Our proposed mobility hub is located near Akkulam, Trivandrum in which both sides of the Parvathy Puthanar Canal has the biggest advantage due to its geographical location. This site is large in size with around 120 acres of less developed land available for development of the hub. The NH bypass and Kochuveili Railway Station are abutting this site on both sides. Airport is located around 6 km away from this site.

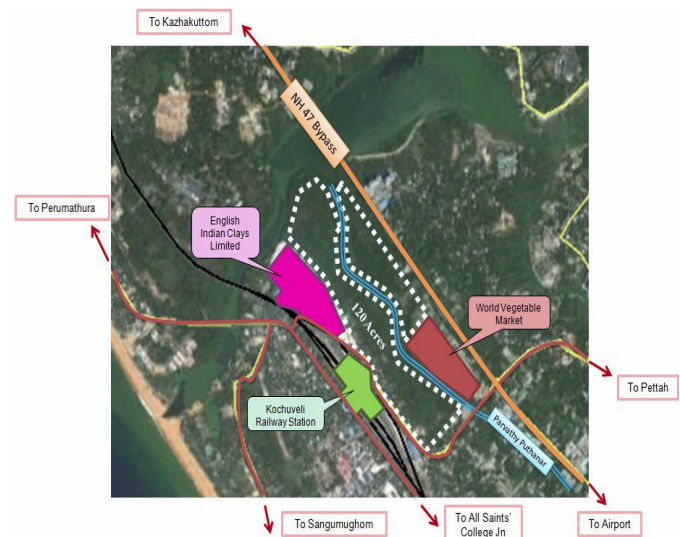


Fig 1. Location map

Airport can be accessed via the Bypass through shuttle service or through the ParvathyPuthanar Canal once it is cleaned up for navigation. property. The Kochuveli Railway station located on west side of the site is proposed to be developed as the secondary terminal of the city. The station has basic infrastructure facilities but passenger facilities can be improved. The station also lacks proper connectivity with the city. The Inland Waterways Authority of India (IWAI) has proposed the extension of National Waterway III (Kollam to Kottapuram) till Kovalam on the southern side via ParvathyPuthanar Canal. This would boost the tourism potential of this area by providing connectivity between the Veli-Akkulam region and Kovalam. The Akkulam and Veli lakes which have been already developed as tourist spots will benefit from the proximity of the hub and thereby the tourism potential of this region can be utilized properly. The connectivity to airport will be another advantageous factor in this aspect considering the tourism potential.

The components of the hub are listed below:

- Kochuveli Railway Station: The existing Kochuveli railway station is one of the influencing reasons for selection of the site at Akkulam to make the basic concept of multi-modal integration possible. To make the Project successful and viable, Kochuveli Railway station needs face lifting in terms of terminal facilities such as improved platforms, waiting area, information system, escalators etc. The rail services need to be improved such as increasing number of trains and their frequencies etc. However, the cost of these improvement proposals is not considered in the Project cost as improvement of railway station falls under Indian Railways purview.
- Bus Terminal: This is the major component of the proposed multi-modal transport hub with intra-city, inter-city and Omni bus services. The total area assigned for the bus terminal is 41,435 sq. m. The major components of the bus terminal are further sub-divided into the following two components:
- Bus Bays and Platforms: Bus bays for intra-city, inter-city and Omni buses have been allocated separately. The number of bus bays required has been arrived based on the demand assessment for the hub carried out by the Consultant. Idle parking facilities for government and Omni buses are proposed separately for smooth operation of buses at the hub. Drop-off facility is provided for intercity buses entering the hub. Platforms with a width of 6 m have been provided for the passengers to board/ alight the buses.
- Central Control cum Information/ Admin Block: The central control cum information/ admin block serves as the focal point of the hub. This is proposed to be developed as a common space where passengers will be provided with all the basic amenities. Total area of 3,252 sq. m. is allocated in the ground floor and 1,858 sq. m. in mezzanine floor for Central Control/ Admin Block. This block follows the concept of sharing of space for common utilities such as shops, waiting area, office spaces for various government and private bus operators, information boards, car rentals, tourism desks, ticket counters, small eateries, ATMs, pharmacy, rest rooms, lockers, water facility etc. This block is surrounded by a 10 m wide platform for the movement of passengers and to access the bus bays.
- Ferry Terminal: The concept plan also accommodates a ferry terminal within the hub in case inland water transport from Kottapuram to Kollam gets extended up to Kovalam. The area proposed for the ferry terminal is 500 sq. m. near the canal. The connectivity of ferry terminal to other terminals and the control and information centre is through pedestrian pathways.
- Subway to Kochuveli Railway Station: The connectivity to the existing Kochuveli Railway Station from the hub is proposed through a subway so that the passengers can directly reach the bus/ ferry terminal from the railway station and vice-versa.
- Parking: In addition to the idle bus parking facility, sufficient dedicated parking area is proposed for car, bike and auto type of vehicles separately. The parking area is proposed in such a manner that it is conveniently located near the entry of the hub.
- The parking area can be developed as multi storied parking facility in future when the demand exceeds the supply.
- Other Developments: This includes commercial and office space, hotels and restaurants. These facilities are provided between the Canal and NH-47 Bypass. This site has high commercial development potential as it lies between the IT Corridor of the city and the Trivandrum International Airport.
- Pedestrian Facilities: The concept plan has been prepared with sufficient priority to pedestrians. Footpaths of 2 m wide are proposed on both sides of the internal roads, wherever required.
- Landscape: Landscaping is proposed at various locations to improve the aesthetic appeal of the hub.

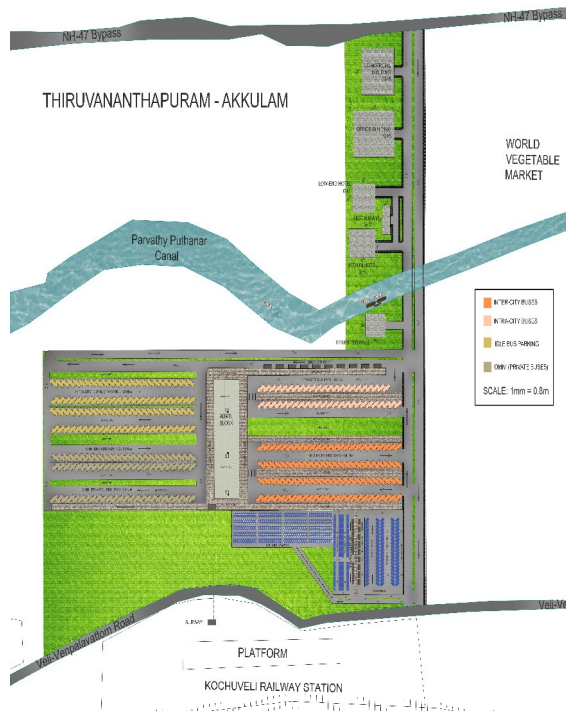


Fig 2.Site plan

The analysis of structure is done in ETABS software.

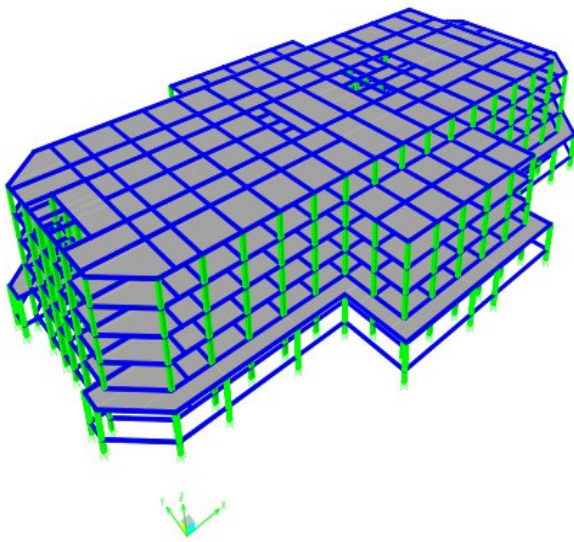


Fig 3.3D view

IV. CONCLUSION

This paper involves the method to increase the usage of public vehicles thus reducing the vehicular trips, congestion, pollution etc hard exudate. This hub increase in convenience for passengers transferring between modes through reduced modal interchange time, thereby reducing overall journey time and improved amenities for users of all the modes of transportation as a result of shared usage and savings in expenses.

REFERENCES

- [1] Guanghou Zhang, "Pedestrian Simulation Research of Multi-Mode Transfer Terminal", ASCE,2011
- [2] Joshua Engel et.al, "Mobility Hub Guidelines: Tools for Achieving Successful Station Areas" ,ASCE,2012
- [3] Lijuan Jiang et.al, "Research on Traveler Information Need in the Interior of Large-Scale Multi-Modal Transport Hub", ASCE,2014
- [4] Xiaoqing Dai et.al, "Design of Information Signs of Multi-Modal Travel at the Decision Points in a Comprehensive Transport Hub",2014
- [5] Ji-biao Zhou et.al, "A Critical Review of Pedestrian Traffic Characteristics in Urban Integrated Transportation Hub",ASCE,2015
- [6] Shunying Zhu et.al, "Traffic Distribution Forecast of Urban External Traffic Hub Based on Uncertainty",ASCE,2007