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"EFFICIENT TRANSPORTATION SYSTEM FOR VISHWANIKETAN CAMPUS"

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Abstract - Commuting is the single largest impact a college/university has on the environment and represents a noticeable share of urban traffic or rural traffic, when the college/university is located within a city or outside the city. There is a large amount of literature on which policies could reduce car use and improve the environmental and social sustainability of commuting to college. According to WHO'S Global air quality database, They said 'with the economy booming in many of India's cities since the turn of this century the number of road vehicles have multiplied and outdoor air pollution has become a major health hazard and a major killer. The air quality index(AQI) for Maharashtra is 114 (poor) i.e. high rate of pollution. To overcome this issue, There are also headings under which the various transportation issues of college campus can be grouped. However, most studies focus, to the best of our knowledge, on effectiveness of various policies, and efficiency of transportation regarding the Vishwaniketan college, khalapur, on the basis of transport demand.

Key Words: College/university, students, commuting, efficiency, effectiveness, pollution.

1. INTRODUCTION

In recent times the staff and students of Universities have come to consider it their constitutional right to be guaranteed a place to park their cars on or very close to their campus. This attitude and the fact that there has been an increase in the use of private transport as well as a growth in Campus population well beyond the original size for whichland was acquired, have combined to produce congestion both at the accesses and at parkingareas on campus. The presence of different modes of travel such as pedestrian, car and bus on the same internal campus route system has led to a highly unsatisfactory situation. Separation of the modes is desirable if a safe and quiet atmosphere in keeping with a place of learning is to be achieved. However, the most serious problem in many cases is perhaps the lack of a logical long-range campus transportation plan. The apparent absence of staff or administrative effort to properly plan for future conditions may be due to many reasons but it can be said with certainty that the problem is unlikely to disappear and action is needed before it assumes crisis proportions.

The primary purpose of this transportation and parking study is to determine short-term and long-term recommendations to improve campus parking at Vishwaniketan Institute of Technology (Khalapur). The parking study initially evaluated existing conditions, determined primarily through reviews of background materials, limited parking occupancy surveys, and stakeholder input meetings. The examination of existing conditions provided the foundation from which future parking operations, management, and allocation strategies could be developed. Finally, parking alternatives were considered to address future needs, as well as improve the utilization and efficiency of existing parking resources. Future parking alternatives included potential parking supply changes, as well as general parking operations/management strategies and improvements.

1.1 Flexible Pavement

In simple terms, a **flexible pavement** can be defined as a **pavement** layer comprising of a mixture of aggregates and bitumen, heated and mixed properly and then laid and compacted on a bed of granular layer.

Typical cross section of a flexible pavement

Fig. 1 Flexible pavement cross section

1.2 Factors to be considered in design of the pavement

1. Contact pressure
2. Wheel load
3. Axle configuration
4. Moving loads
5. Repetition of Loads
6. Layered elastic model

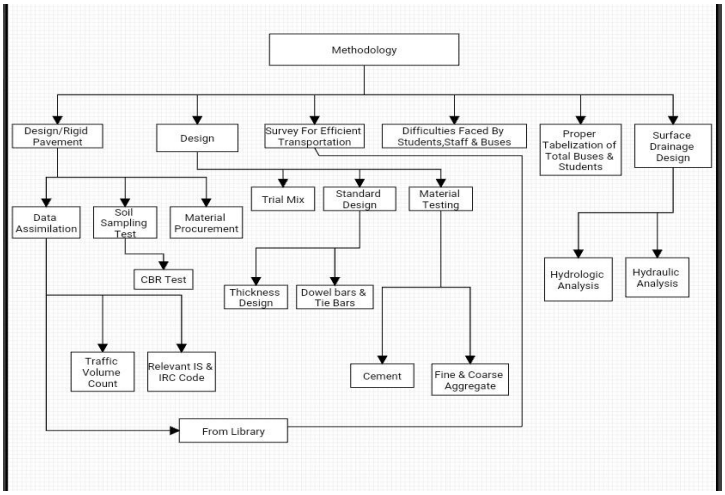
1.3 Efficient Transportation

Transportation is considered as an essential part of human life and backbone of national, regional and local economy. Transportation sector plays a crucial role in boosting up the life styles of common men by providing facilities and accessibilities as required to them.

Purpose - Transportation Planning can play an important role in an agency's or region's strategy to improve the performance of the transportation system. In its very simplest form, transportation planning consist of those activities that collect information on the performance of the existing transportation system; forecast future performance levels given expected changes to key factors such as land use, price of fuel, and growth in employment and identify possible solutions to expected problems in system performance.
Decisions about future transport strategy rely upon good information about the journeys currently being made by travellers. Safety to the staff involved and the general travelling public can be mitigated and data integrity improved by following the advice in this document.

Parking Surveys - Parking surveys provide the data upon which the parking policy for an area can be decided. The provision of parking is obviously a major factor, primarily for private cars, collage buses in the accessibility of an area. Parking management is also a most effective low-cost traffic policy instrument.
Vehicle parking spaces can be classified into: on-street or off street; public (i.e. available to the public) or private; formal (i.e. marked and controlled spaces) or informal. Other characteristics of parking are: dimensions and layout (including access roads); time controls;charges and costs; banned and restricted locations.

2. Methodology



3. Design of Pavement

Methods for design of rigid pavement :-

1. California Bearing Ratio Test (CBR)
   The CBR test is a penetration test developed by the California division of highways, as a method evaluating the stability of soil sub-grade and other flexible highway materials. The test results have been correlated with the pavement thickness requirements for highways and airfields. The CBR test may be conducted in the laboratory on a prepared specimen in a mould or in-situ in the field.

2. Sieve Analysis
   A **sieve analysis** (or **gradation test**) is a practice or procedure used in civil engineering to assess the particle size distribution (also called gradation) of a granular material by allowing the material to pass through a series of sieves of progressively smaller mesh size and weighing the amount of material that is stopped by each sieve as a fraction of the whole mass.

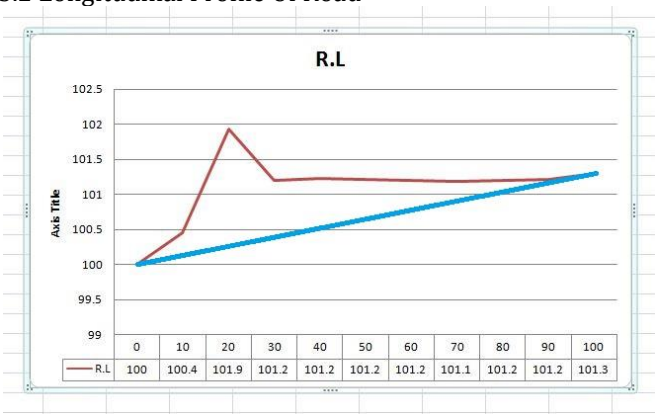
4. Survey for Transportation Management

4.1 Auto Level Survey
4.2 Traffic Count Survey

5. Calculations

5.1 Design Of Pavement Thickness By Group Index Method
Traffic observed in this road section is approximately 10 to 50 vehicles per day.
From the design charts, the combined thickness, of surface, base and sub-base course = **23cm**
The thickness of base and sub- base courses = **20cm**

5.2 Longitudinal Profile Of Road



X-axis shows chainage and Y-axis shows reduced level.
Blue line shows the longitudinal profile of road.
Red line shows the gradient of road.

Gradient of road is found to be **1 in 77**

6 . CALCULATIONS OF FLEXIBLE PAVEMENT DESIGN

- Liquid Limit Test:-

Liquid limit of soil sample was found to be 22%

- Plastic Limit Test :-

The plasticity index of soil was found to be 8.6

- Sieve Analysis Of Soil:-

Uniformity coefficient, Cu = D60 /D10
= 4.01
Coefficient of curvature, Cc = (D30)2 /(D60*D10)
= 2.012

D10 = particle size corresponding to 10% finer
D30 = particle size corresponding to 30% finer
D60 = particle size corresponding to 60% finer

- Proctor Compaction Test:-

The optimum moisture content of the soil sample =11.62%
Maximum dry density of the soil sample = 2.66%

- California Bearing Ratio (CBR) Test:-

The CBR value of soil sample =14.1%

7. Water Logging

Water logging: When water from any source find no path to escape or drain out and create a hazardous situation is known as water logging. Excessive rainfall, inadequate drainage sections, conventional drainage system with low capacity and gravity, natural siltation, absence of inlets and outlets, indefinite drainage outlets, lack of proper maintenance of existing drainage system, and over and above disposal of solid waste into the drains and drainage paths are accounted for the prime causes of water logging. From the observation of road network in RCC it has been found that during rainy season many roads are affected by water logging. This is cause due to absence of any drainage system, improper maintenance of drainage facilities etc.

8. Estimation & Costing

Description	Length	Breadth	Height	Quantity
Sub-grade	560m	5.5m	--	3080m^2
Sub-base	560m	5.5m	0.2m	616m^3
Wearing Course	560m	5.2m	0.03m	87.36m^3

Description	Quantity	Rate	Amount
Sub-grade	3080m^2	20	61,600 Rs
Sub-base	616m^3	210	129,360 Rs
Wearing Course	87.36m^3	250	21,840 Rs
Total Amount	--	---	**212,800 Rs**

8. CONCLUSIONS

In this project work, an attempt is to make Efficient transportation system in college campus , resolve water stagnation problem, proper parking arrangement , pavement design in front of hostel area.
The thickness of surface, sub-base and sub-grade is calculated as 23cm.
Total cost for constructing the road is calculated as 212,800 Rs

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