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Feasibility of Providing a Skywalk for Pedestrian "A Case Study"

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Abstract

Walking is a widespread phenomenon yet by and large not considered as a mode of transportation since it doesn't utilize vehicles as modes. Pedestrians contain a substantial share in metro and additionally in mid size urban areas of India in spite of quickly developing number of vehicle. However there is negligence towards pedestrian behavior, flow characteristics, capacity of pedestrian facilities. Provision of grade separated facilities will ensure the movement of pedestrian safe, comfortable and also reduces the travel time. A study is conducted in Rajwada area of Indore to assess the feasibility survey of providing a grade separated facility (skywalk) for a distance of 1500 meters.

Keywords: Pedestrians, Transportation, Skywalk, Movement.

1. Introduction

The term "Pedestrian" is used to recognize the fact that the approach to pedestrian pathway development must be as scientific and systematic as the techniques which are applied to highway design and development.

Present approach for planning and designing pedestrian traffic is not user friendly. Funds allocated for pedestrian facilities is insignificant as compared to total cost of the project Due to inadequate facilities provided for the pedestrian movement, there exist a constant conflict between pedestrian and motor vehicles in sharing the limited space of road, resulting in pedestrian being involved or the cause of most of the road accidents. Need for innovative approach to ensure safe and secure movement of pedestrian traffic in along/across the congested road in urban areas.

2. Statement of Problem

Rapid urbanization has taken its toll on pedestrian safety levels, often the traffic engineers in order to provide better transportation facilities either fail to provide pedestrian facilities on the roadside or compromise the safety of pedestrians. So the need of the hour is to provide a safe environment for pedestrians without any conflicts with other modes of transportation. Today, the urban road networks are suffering from the problems like decreasing.

3. Study Area

Indore, a historical City situated on the banks of rivers Khan and Saraswati, is the largest City of 'Indore Agro Industrial Region' of Madhya Pradesh. It is almost centrally located on the fertile Malwa Plateau at latitude 22° 43' North and longitude 76° 42' East and is the nerve centre of the economic activities of the State. Rajwada is

the historical palace of the Holkars. Rajwada stands in the centre of the city. The new palace is on the northern side, while the old palace stands in the old part of the town. The old palace is a multi-storied building which also serves as a gateway of the Rajwada. It stands amongst the crowded streets of the Kajuri Bazaar and faces the main square of the city. The palace was once the centre of all the trading activities in the city.

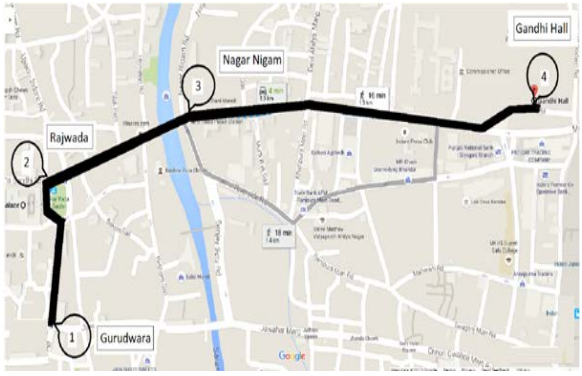


Fig 1 : Google map of study area

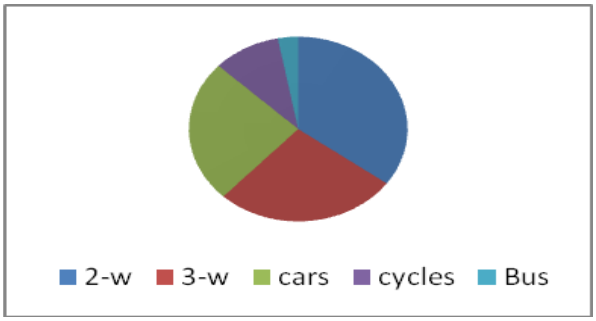
4. Survey Results

About 300 people participated in the survey. The survey has been carried out at different times of the day to observe the effect of traffic during rush hours and also during dull hours. The people from all age groups were asked to jot down their perception on the paper.

Field survey is done to explore the condition of the traffic and the crossing facilities. Video graphic technique is used to collect the field data like pedestrian volume, traffic volume, crossing time and pedestrian speed.

4.1 Vehicular Traffic Volume

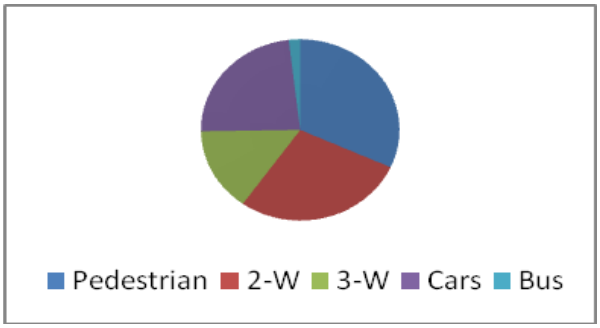
The bidirectional traffic volume of 92,247 vehicles was observed for the duration of 10 hour (11:00 AM to 9:00 PM) on a normal working day and composition is as shown in Graph 1. It can be seen from the figure that about 35% two wheelers, 27% three wheelers, 25% cars, 10% cycles and 3% mini bus constitute the vehicles composition.



Graph 1: Vehicle Composition

4.2 Composition of Traffic

The composition of traffic observed on this road as shown in Graph 2 indicate that the share of walk mode is high compared to other motorized and non motorized modes. The percentage combination to walk mode in total modal composition remains substantial throughout the day. The share of trips by walk is 32% is followed by two wheelers 28%, cars 23%, three wheelers 15% and 2% bus.

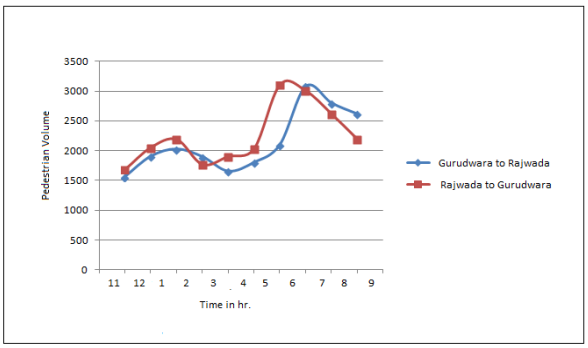


Graph 2: Traffic Composition

4.3 Hourly Pedestrian Flow

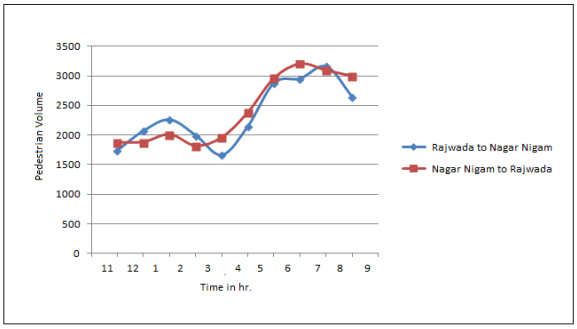
The hourly variation of a pedestrian for same duration of 10 hour passing through study stretch is presented in graph.3, 4& 5. Total no of pedestrians from Gurudwara to Rajwada was 21426 and from Rajwada to Gurudwara was 22550. Evening peak flow is found more prominent than the morning peak flow in both the directions, highest peak flow of 3112 is observed between 6:00PM

to7:00PM.



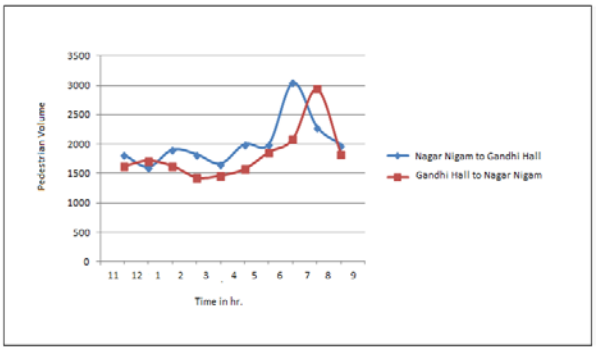
Graph 3: Hourly Pedestrian Flow between Gurudwara and Rajwada

Total no of pedestrians from Rajwada to Nagar Nigam was 23502 and Nagar Nigam from Rajwada was 22550. Evening peak flow is found more prominent than the morning peak flow in both the directions, highest peak flow of 3212 is observed between 5:00PM to 6:00PM.



Graph 4: Hourly Pedestrian Flow between Rajwada to Nagar Nigam

Total no of pedestrians from Nagar Nigam to Gandhi Hall was 20112 and from Gandhi Hall to Nagar Nigam was 18024 Evening peak flow is found more prominent than the morning peak flow in both the directions, highest peak flow of 3050 is observed between 5:00PM to 6:00PM.

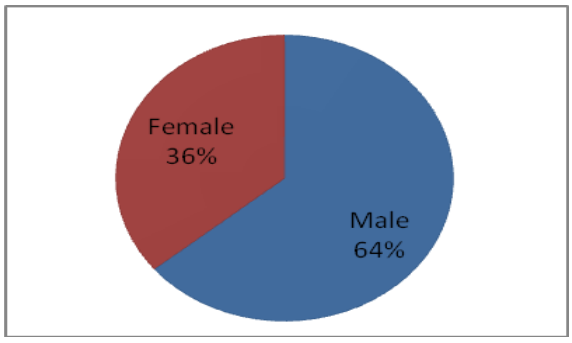


Graph 5: Hourly Pedestrian Flow between Nagar Nigam to Gandhi Hall

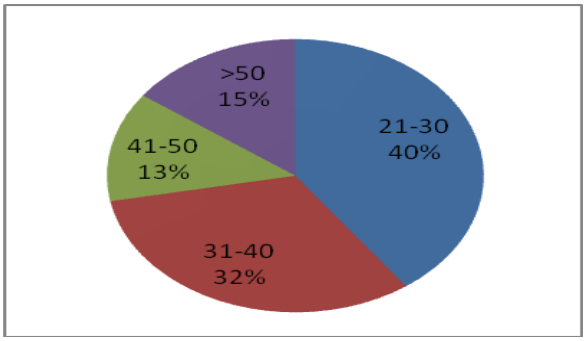
4.4 Analysis of Pedestrian Response

The pedestrians walking on the study stretch were asked a set of questions to understand their socio economic characteristics, trip purpose, frequency and willingness to use the proposed skywalk facility. The needs and perception varies with age and gender, keeping this in view, care was taken to select respondents to represent this parameters.

Out of total sample size 65 percent males and 35 percent females were interviewed with ages ranging from 15 to >50 years. In that 40% of the respondents were from 21-30 years. 32% of 31-40 years of age, 13%in 41-50 years of age and 15% more than 50 years of age. The graphs 6 & 7 shows gender wise and age wise distribution.

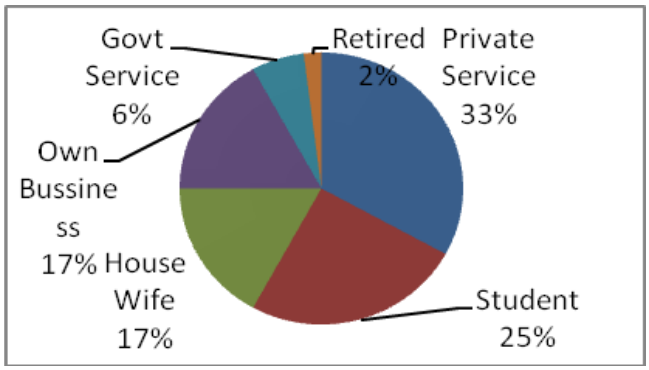


Graph 6: Gender Wise Distribution



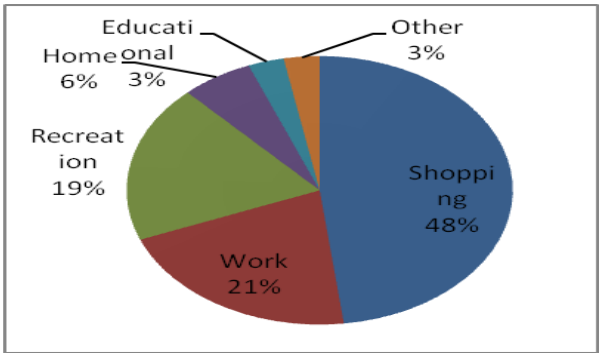
Graph 7: Age Wise Distribution

The profession wise distribution of pedestrian shows that 33% of total pedestrians are in private service, 25 %students, 17% House wife, 17% in own business and other 8% from government sector and retired person. The graph. 8 & 9 show Age and Profession wise distribution of pedestrian.



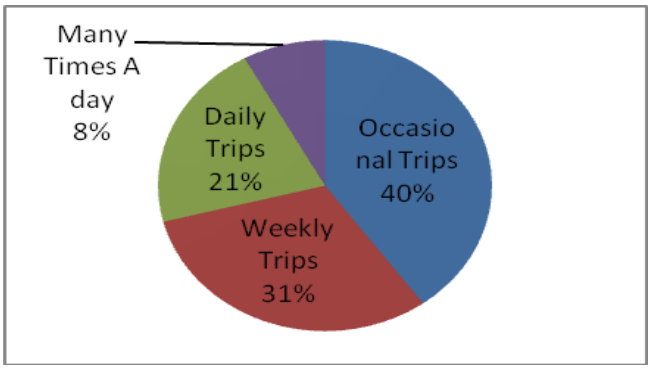
Graph 8**:** Profession Wise Distribution

There can be many purposes for a walk trip. But for the sake of objectivity they are broadly classified in to work, education, shopping, home, recreation etc. Rajwada being a wholesale market, the trip purpose for shopping is predominant. Distribution of the trip for shopping, work, recreation, home, educational, and other are 50%, 20%, 17%, 6%, 3%, and 3% respectively.

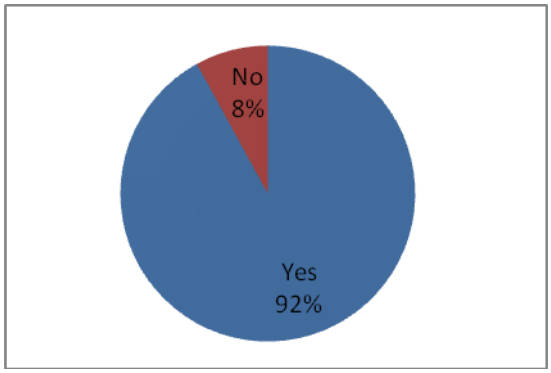


Graph 9: Trip Purpose Wise Distribution

The query pertaining to frequency of walk trip revealed that occasional walk trips on the study stretch were 39 % of the total trips, 31% of the trip were weekly and 20% daily, while 10% of the trips were either many times a day or alternate day. In Rajwada area due to heavy vehicular traffic and the encroachment on available sidewalk facility it becomes very difficult to walk. Skywalk was a welcome alternative to 92% of pedestrians, graph. 10 & 11 shows the trip purpose wise distribution and distribution regarding willingness to use proposed skywalk.



Graph 10: Trip Frequency Wise Distribution



Graph 11: Distribution by Willingness to Use Skywalk

5 Conclusions

Based on study following conclusions have been drawn as given below:

1. In Rajwada being a wholesale market, the trip purpose for shopping is predominant. Distribution of the trip for shopping, work, recreation, home, educational, and other are 50%, 20%, 17%, 6%, 3%, and 3% respectively.

2. Study area distribution of traffic is observed as share of walk trips is 32 % followed by two wheelers 28%, cars 23%, three wheelers 15% and 2% bus.

3. Total no of pedestrians is highest between Rajwada and Nagar Nigam ,evening peak flow is found more predominant than morning peak flow in both the directions , Highest peak flow of 3212 was observed between 5PM to 6 PM.

4. The query pertaining to frequency of walk trip revealed that occasional walk trips on the study stretch were 39 % of the total trips, 31% of the trip were weekly and 20% daily, while 10% of the trips are either many times a day or alternate day.

5. Skywalk is a welcome alternative for 92% of pedestrians.

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