

**A STUDY OF TRAVEL BEHAVIOUR OF  
STUDENTS OF A GATED UNIVERSITY**

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# CERTIFICATE

This is to certify that the work titled “**Evaluation of travel behavior of students of a gated university**” submitted by “**Tarun Sharma (081604), Sumit Jain (081605) and Pankaj Kaushal (071314)**” in partial fulfillment for the award of degree of **B.Tech** of Jaypee University of Information Technology; Wagnaghat has been carried out under my supervision.

DATE:

SIGNATURE

DR. AMIT GOEL

This work has not been submitted partially or wholly to any other University or Institute for the award of this or any other degree or diploma.

SIGNATURE

TARUN SHARMA

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PANKAJ KAUSHAL

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DATE:

TARUN SHARMA

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# SUMMARY

University students are part of a social group that tends to have complex and unique travel behaviour. Understanding the travel behaviour of students is a complex parameter to enable university planners to develop suitable interventions to achieve sustainable transport goals. Nowadays there are many universities carrying out different graduation and post-graduation programmes in remote areas. The students in these universities are living a totally different life style from those studying in universities located in Urban areas. The varied travel behaviour of students of universities located in remote areas, where transportation facilities are meagre, is an area of interest.

The main aim of this study is the evaluation of travel behaviour of students of a gated University with the help of a questionnaire survey. The sample population consists of students residing in the hostels located within the University campus.

The survey was conducted in Jaypee University of Information Technology (JUIT), Wagnaghat, Solan, Himachal Pradesh, India. The survey questionnaire includes questions about the choice of travel mode while going out of the university campus, trip length, trip duration, most preferred travel mode and other related information.

The survey data was analysed to determine the most preferred destination, the mode-share, and the cost- share of different modes. The trips were classified on the basis of purpose of the trips. Analysis is also done to determine the most preferred departure time from the origin and most preferred arrival time at the destination.

It was found that most preferred destinations are Solan side and Shimla side. For trips between JUIT and Wagnaghat, taxi and university bus have the largest mode share and for Wagnaghat and further destinations public bus has the largest mode share.



# CHAPTER 1– INTRODUCTION

University students are part of a social group that tends to have complex and unique travel behaviour. Understanding the travel behaviour of students is a complex parameter to enable university planners to develop suitable interventions to achieve sustainable transport goals. Nowadays there are many universities carrying out different graduation and post-graduation programmes in remote areas. The students in these universities are living a totally different life style from those studying in urban area universities and the different travel behaviour of students in remote area universities has always been a major concern and also the topic of our interest.

So we intend to conduct a travel survey in a well established university to get an idea about the travel behaviour of these students by determining various travel characteristics. The specific objectives of this project are listed in following section.

## **1.1. Objective**

The main objective of this project is to find out how students travel from one place to another. For this purpose, the travel behaviour of university students is required to be studied in detail with main focus on most preferred destination and mode share. Two main points are taken into account are following:

- a) Determine the most preferred destinations.
- b) Determine the mode share of students.

### **Mode Share:**

To study which travel mode is preferred by students and how preferred mode of travel changes with change in number of students accompanied by them during a trip. Therefore, we studied the Mode share distribution in detail with respect to gender, year, branch, purpose of the trip and monthly expenditure of the students.

### **Trip Length:**

The total trip length of an individual or group of students travelling together for a purpose is to be calculated. Average trip length can then be calculated from total trip length. Student's trip length and trip duration is also required to be found out. The main aim is to know the total trip time taken and total distance travelled by the students during their outings on the weekends i.e. Saturday/Sunday. The total time taken depends on the travel mode chosen by the students for the trip. With the help of individual student information, we can further analyse different parameters based on the gender, monthly expenditure, year and branch.

## CHAPTER 2 – LITERATURE REVIEW

This chapter examines the literature illustrating the study of travel behaviour. It is divided into four main sections. The first section explains about the data sources. The data requirements necessitate the various methods of data collection. The details of various travel surveys along with different features of data collection process are examined briefly in the second and third sections. In the last section few similar studies done in the past have been mentioned.

### **2.1.Data Sources**

Data is any kind of information gathered which would further help in achieving the objective by analysing it. Data gathered can be of two types:

#### **i. Primary Data**

It can be defined as data observed or collected directly from first-hand experience.

#### **ii. Secondary Data**

Any published data or the data collected in the past by the same or some other user is called secondary data.

Although secondary data analysis saves time that would otherwise be spent collecting data but information in it relates to past period. Hence, it lacks options and therefore, it has unsatisfactory value. Primary data is more accommodating as it shows latest information.

Surveys are a methodology for the collection of raw data. The data collected is then scrutinized to get useful information.

## **2.2.Types Of Survey**

This classification is done on the basis of design of questions:

### **i. Stated Preference Surveys**

Stated preference surveys gather responses or preferences of the respondents based on the hypothetical travel options given to them. The evidences suggest that the preferences derived from *stated preference surveys* are contingent on context also; it is extremely difficult to identify core preferences based on stated preference surveys as the stable core preferences may not exist prior to a choice. Of the various valuation techniques available, stated preference (SP) techniques are being used to an increasing extent. Indeed they are the only kind of technique suitable in many circumstances. (Kadiyali, 2006; Garber, 2009; O'Flaherty, 2006)

### **ii. Revealed Preference Surveys**

The *revealed preference surveys* collect information regarding the actual travel behaviour and travel characteristics of respondents. In this survey we design the questionnaire according to the place in which we are doing the survey. This survey is based on the facts that how one can go from one place to another. Fundamentally, the theory of revealed preference assumes an "autonomous self" nature of human beings like Household travel surveys which ask people what they actually did are a type of Revealed Preference survey. (Kadiyali, 2006; Garber, 2009; O'Flaherty, 2006)

## **2.3.Selection Of Survey Instrument**

Household surveys are common method to collect travel data. The various methods generally adopted for collecting travel data are briefly outlined in the following section. Surveys collect data from a targeted group of people about their opinions, behaviour or knowledge. Common types of surveys instruments are Personal interviews, telephone interviews and self-completed surveys:

### **a) Personal Interviews**

Face-to-face: involves trained interviewers visiting people to collect questionnaire data. It ensures a high response rate to a sample survey and trained interviewers gather better quality data. However, there are some disadvantages to this approach. Respondents may not always be available for interviews and the travel costs of the interviewer could be high. (Kadiyali, 2006; Garber, 2009; O'Flaherty, 2006)

Computer Assisted Personal Interviewing (CAPI): is a form of personal interviewing, but instead of completing a questionnaire, the interviewer brings along a laptop or hand-held computer to enter the information directly into the database. This method saves time involved in processing the data, as well as saving the interviewer from carrying around hundreds of questionnaires. However, this type of data collection method can be expensive to set up and requires that interviewers have computer and typing skills. (Kadiyali, 2006; Garber, 2009; O'Flaherty, 2006)

### **Telephone Interviews**

Telephone: involves trained interviewers phoning people to collect questionnaire data. This method is quicker and less expensive than face-to-face interviewing. However, only people with telephones can be interviewed. (Kadiyali, 2006; Garber, 2009; O'Flaherty, 2006)

Computer Assisted Telephone Interviewing (CATI): is a type of telephone interview, but with the interviewer keying respondent answers directly into a computer. This saves time involved in processing data, but can be expensive to set up, and requires interviewers to have computer and typing skills. (Kadiyali, 2006; Garber, 2009; O'Flaherty, 2006)

### **Self-Completed**

*Mail survey:* It is a relatively inexpensive method of collecting data, and one that can distribute large numbers of questionnaires in a short time. It provides the opportunity to contact hard-to-reach people, and respondents are able to complete the questionnaire in their own time. Mail surveys do require an up-to-date list of names and addresses, however. In addition, there is also the need to keep the questionnaire simple and straightforward. (Kadiyali, 2006; Garber, 2009; O’Flaherty, 2006)

A major disadvantage of a mail survey is that it usually has lower response rates than other data collection methods. This may lead to problems with data quality. Also, people with a limited ability to read or write English may experience problems.

*Hand-delivered questionnaire:* A self-enumerated survey where questionnaires are hand-delivered to people and mailed back by the respondent after completion (Kadiyali, 2006; Garber, 2009; O’Flaherty, 2006). This method usually results in better response rates than a mail survey, and is particularly suitable when information is needed from several household members. The hand-delivered with respondent mail-back method can reduce the cost of collecting forms and gives a greater sense of privacy for respondents concerned with someone entering their home or business to collect the forms.

## **2.4. Similar Studies**

We have studied various papers as reference for this project: **Limanond et al, (11-08-2010)** The study is to investigate the travel pattern of university students in Thailand which has received little attention in the transport field. The study analysed various aspects of travel pattern of university students, including trip generation, mode split, distance travelled and time spent on travelling. The study divided modes into 5 main modes i.e. Drive, walk, ride, bus, bike. The average trip generation and time spent on travelling of students on weekdays is more than weekends but the average distance travelled is less.

**Balsas Carlos J.L (01-06-2002)** The purpose of this paper is to know how college campuses encourage a mode shift from cars to others modes .The colleges are very distinct place for students of different income, backgrounds, study, and culture. So 8 universities were chosen and bicycle and walk are chosen as alternatives.

**Tya Shannon et al (27-12-2005)** The study is about encouraging the active forms of transport –such as walking, cycling. Study of adolescent shows that increasing physical activity has the potential to reduce depression and increase academic performance. Data was collected through online survey over 4-week period from May to June (2003).

## **CHAPTER 3 – METHODOLOGY**

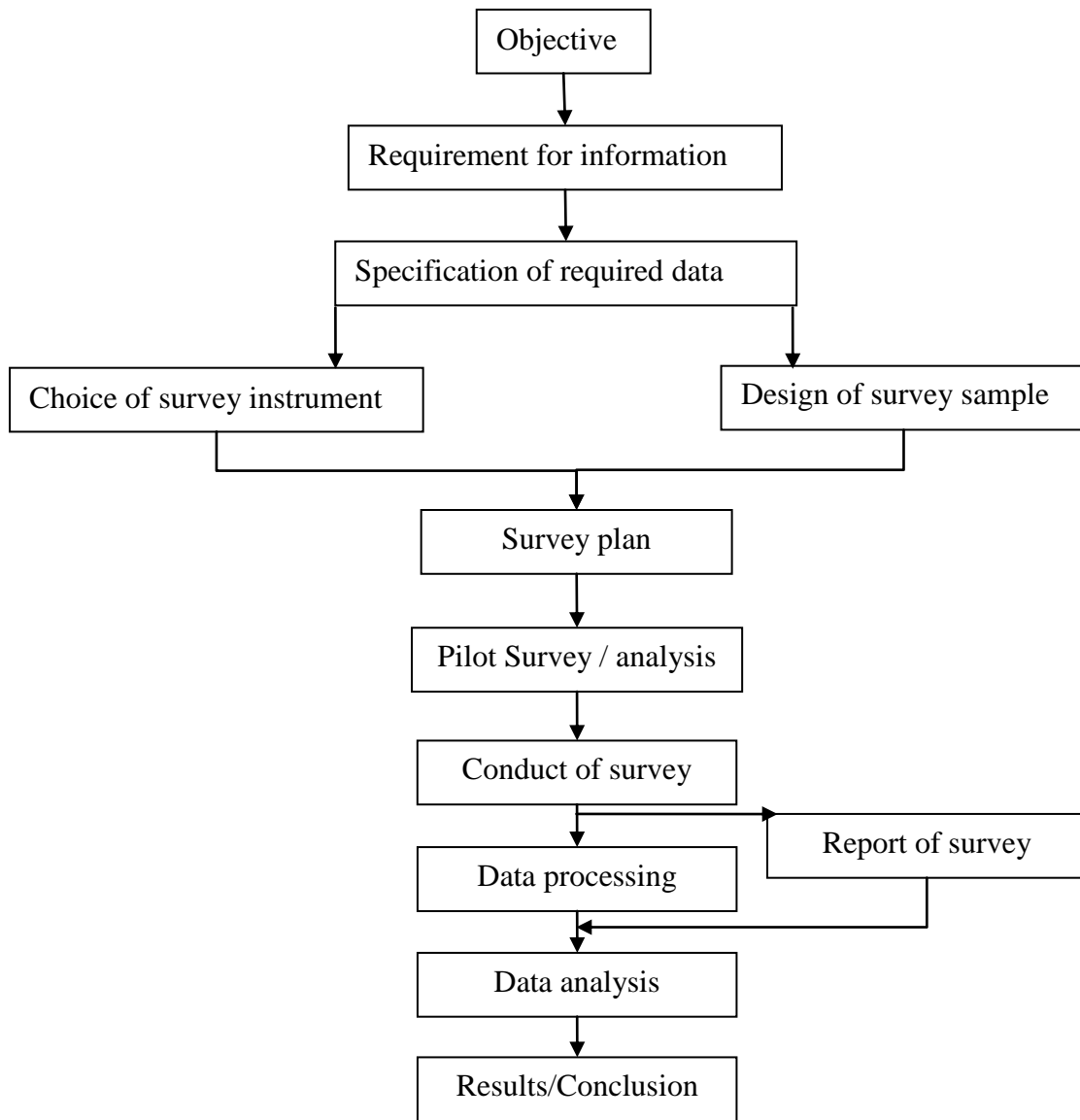
To achieve the objectives of this study, this chapter proposes an appropriate methodology for studying the travel behaviour. The following section presents a detailed step wise procedure for conducting a travel survey followed by figure 2.1 representing all the stages in the design and conduct of a survey. In further sections the study area and survey instrument selected for this survey have been mentioned in detail.

### **3.1.Basic Procedure**

- It begins with a consideration of the objectives of the exercise which determine the requirement for information and the availability of resources. It has to be decided that what is to be learnt from the survey and how the results will be used.
- Next step is to decide that who should be surveyed. Different population groups have to be identified and if surveying everyone is possible due to large population then it has to be decided that how to obtain a sample.
- Next step is to decide what information is needed to analyse and understand the results.
- Once the requirement for information has been known, then next step is to find out the most appropriate type of survey



- Next step is to brainstorm all the questions that are needed to get the required information. Also for multiple choice questions, the list of all possible answers has to be made.
- Now, after preparing the questions, design the questionnaire or interviews question list.
- Once a decision to proceed has been made the survey instrument to be used must be decided. Selection of survey instrument involves choosing the appropriate technique which is likely to be heavily constrained by the resources provided and by the various techniques available.
- It must be kept in mind that while some techniques may be ideal for collection of one type of data it may sometimes be appropriate to use another technique which while not so efficient for that item of data, may yield additional data at relatively little extra cost.
- Having chosen the survey instrument and defined the sampling strategy, the survey itself can now be planned. The plan should comprise a detailed schedule of all the procedures and stages required in the implementation of the survey and the production of reports.
- Next step is the pilot survey. It is a crucial part of the whole survey as it provides an opportunity for checking that all procedures, documentation and instruments are adequate. It is at this stage that problems with the survey instrument, the documentation and the staff training should be revealed so that remedial action can be taken.
- Then we conducted the main phases of our survey. Once the data was collected we begin with the analysis of the collected data.
- While analysis we were able to classify the data on the basis of factors affecting the travel behaviour and in the end we came with the conclusion.



**Figure 2.1 Stages In The Design And Conduct Of A Survey**

### **3.2.STUDY AREA: JUIT, Wagnaghat**

Jaypee University of Information Technology (JUIT) was selected as study area for this project. This site was chosen because this is well established and easily accessible site. This section provides general information and transport facilities at the site.

JUIT is a State (Private) University located in Wagnaghat, Solan, Himachal Pradesh, India. This university is basically resident university where almost 90% students and faculty members live on campus. The university mainly houses undergraduate, postgraduate and doctoral students studying engineering and applied sciences disciplines and the related faculty and staff members.

#### **3.2.1. LOCATION**

The university is located 3 kms off National Highway 22 (20 km away from Shimla) (from Wagnaghat) which runs from Kalka to Shimla (India).

The university campus is spread over 25 acres (100,000 m<sup>2</sup>) of the green picturesque slopes of Wagnaghat .Though the university campus is situated off the National Highway and can be reached by taxi cabs and auto-rickshaws available at University Gate and Wagnaghat. The nearest railway station is Kaithlighat, 4 kilometres from Wagnaghat and the nearest airport is Shimla. Regular bus service is available to Chandigarh, Delhi and most major stations of Himachal Pradesh and Punjab at Shimla and Solan bus stations.

#### **3.2.2. BOARDING AND RELATED FACILITIES**

About 90% of the students live on-campus. On-campus boarding capacity is for up to 1500 students. Single and double rooms are available with the former being slightly more expensive than the latter .Rest 10% students comes from the area within 3 km of radius or from Shimla and Solan.

### **3.2.3. TRANSPORTATION FACILITIES**

Transportation facility is provided by the university to faculty members residing in Shoghi and Wagnaghat. On weekends transportation facility to Wagnaghat is also available for students. Students generally do not have private vehicles and are dependent on taxis and auto-rickshaws. Taxis and auto-rickshaws are available for students standing outside the campus. Due to hilly terrain of the university bicycling is not at all an option. Walk is the only option for the active zones.

### **3.2.4. SURVEY INSTRUMENT**

After going through all the types of survey instruments, face to face personal interview was chosen as the method to collect data.

On comparing all the instruments, personal interview was found to be the most suitable method for JUIT as the study area and students as the target group. This method not only ensures a high response rate but also better quality data. Though it has limitations like unavailability of respondents at the time of interviewing and high travel costs but these could not create too much difficulty as the target group that was students residing in hostels inside the campus were easily accessible all the time besides the classes and small area of JUIT campus could not cause high travel costs inside the campus.

## **CHAPTER 4–DATA COLLECTION**

This chapter is to document the procedure followed for gathering travel related data for Jaypee University of Information and Technology (JUIT) and lists the findings flowing from it. As an initial step, the availability of existing datasets was checked. No dataset was found explaining the travel behaviour at JUIT. Hence the data was required to be collected by conducting surveys. Before collecting the data, an observational study was conducted to gain an understanding of the traffic and users at JUIT. The following subsection explains the detailed procedure of framing the questions for this travel survey and then constructing the questionnaire with a specific order of questions. In further subsections details of conducted surveys have been mentioned.

### **4.1. QUESTIONNAIRE DESIGN**

Well-defined goals are the best way to assure a good questionnaire design. When the goals of a study can be expressed in a few clear and concise sentences, the design of the questionnaire becomes considerably easier. The questionnaire is developed to directly address the goals of the study.

The aim is to study the travel behaviour of students and to fulfil this aim travel details such as about their needs/purposes, mode alternatives available to them and last but not the least their preferences need to be obtained.

It was decided to do the surveys for weekends only because it was observed that on weekdays other than Saturday and Sunday there were very few or no trips made by the students and the regular classes are a major reason for this.

Due to the unavailability of any secondary data goals could not be achieved without gathering primary data.

To collect the information mentioned above it was found best to directly ask the students instead of guessing the possibilities.

So first task was to design a questionnaire through which whole data that was needed was to be collected.

Now based on type of survey being done questionnaire can be designed in 2 types:

Stated preference and Revealed preference which has been explained earlier in detail in section 2.1.2 Revealed preference was chosen as the type of questionnaire design.

Designing started by first thinking of all the information that we need to collect. Starting with the factors that would affect the students' travel and framing questions for that. Then making the questions about the trips that could be made by the respondents.

Use simple and direct language. The questions must be clearly understood by the respondent. The wording of a question should be simple and to the point. Do not use uncommon words or long sentences. This will reduce misunderstandings and make the questionnaire appear easier to complete. One way to eliminate misunderstandings is to emphasize crucial words in each item by using bold, italics or underlining.

Finally questions were divided into two categories:

- Personal details
- Travel details

In personal details we included speculated factors like:

- Year,
- Branch,
- Gender,
- Home city,
- Monthly expenditure,
- Frequency of home visits, etc.

In travel details we included questions asking travel related data like

- Starting point and departure time

- Stop and arrival time
- Purpose
- Travel mode
  - Private car/Bike
  - Auto/Taxi
  - Public bus
  - University bus
  - Walking

Based on travel mode specific questions were asked for example,

- For auto/taxi → fare
- For public bus → government/ private and fare
- For private car/bike → own/ borrowed, shared ride and parking details
- For train → train route and fare

Remaining questions were common for all the choices for example,

- Other mode choices
- Fellow travellers

Once getting all the questions to be asked these questions were framed into a questionnaire and the formatting of this questionnaire was done with the help of an online survey tool namely *KWIK SURVEYS*.

While designing the questionnaire we kept some considerations in our mind. As a general rule, long questionnaires get less response than short questionnaires. Response rate is the single most important indicator of how much good the results could be. A low response rate could be devastating to a study. Therefore, everything possible to maximize the response rate must be done. One of the most effective methods of maximizing response is to shorten the questionnaire. It should be user friendly so that it would be easy to collect data and also easy analysis afterwards. It should not be time

consuming because it could bother the interviewee and might result in poor quality of data collected.

It was also found inconvenient to carry the long questionnaire every time while interviewing and hence a short questionnaire was designed which could gather all the information that a long one would do but with more convenience. A copy of short questionnaire has been included in APPENDIX.

## **4.2. DETAILS OF CONDUCTED SURVEY**

### **4.2.1. OVERVIEW**

Data collection has been done in 3 divisions: Pilot surveys, Phase I and Phase II. All the surveys were done on Sunday evening or on Monday or on Tuesday. No surveys were done from Wednesday to Saturday to eliminate poor quality of data. Mostly, the interviews were taken during the evening time. The respondents were interviewed at the cafeteria, tuck shop or were contacted in person at their respective hostel room.

For a population of 50,000 people a sample size of 20% is enough to get convincing results (Kaidyali, 2006).

### **4.2.2. SURVEY STATUS**

Initially, the pilot surveys were done. From the surveys it was found that the respondents were comfortable with the layout of questions and survey instrument. The same method was adopted for conducting main surveys i.e. Phase I and Phase II surveys were carried out. The current status of the surveys is given in the table 4.2.2.



<b>Survey phase details</b>	<b>Date</b>	<b>Day</b>	<b>Total responses</b>
Pilot Surveys	06-11-2011	SUNDAY	50
	07-11-2011	MONDAY	54
Phase I	20-11-2011	SUNDAY	3
	21-11-2011	MONDAY	102
	22-11-2011	TUESDAY	9
Phase II	22-04-2012	SUNDAY	60
	23-04-2012	MONDAY	50
			360

**Table 4.2.2 Details of the Pilot Survey, Survey Phase I, Survey Phase II**

### **4.2.3. DATA ENTRY**

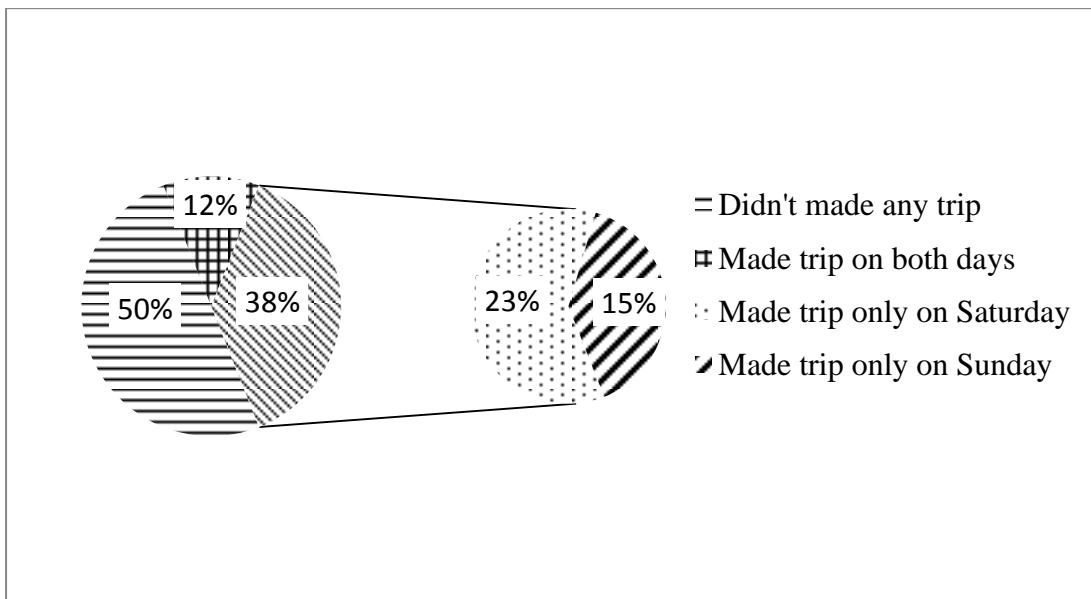
A different questionnaire was designed through the *KWIK SURVEY TOOL* which could gather responses online. But since the data is being collected manually so this questionnaire was used just for entering the data collected and then this tool could be helpful in making the analysis part a little bit easier.

## CHAPTER 5– DATA ANALYSIS

This chapter explains the variation of travel characteristics of JUIT students with respect to various factors. These factors include destination, mode share, purpose, cost share and time of travel. To study the travel behaviour the data collected has been analysed by transfiguring it into charts and graphs as shown in the following subsections.

### 5.1.Trip Generation Analysis

From Figure 5.1 it can be seen that an average of 50% students go out of the university campus on every weekend to solve their purposes and out of these around 12% students go out on both Saturdays and Sundays where as 38% students go out either on Saturdays or on Sundays. Also it was found that students going out on Saturdays only constitute around 23% of the total population while those going out on Sundays only constitute around 15% of the total population.



**Figure 5.1 Analysis on the basis of trip generation**

## 5.2. Mostly preferred Destinations

Figure 5.2 is showing the classification of trips on the basis of different destinations. It can be seen that about 40% of the students go towards Shimla side and 40% go towards Solan side with their varied purposes. And only 20% of the students go till Wagnaghat while other go through it to their respective destinations.

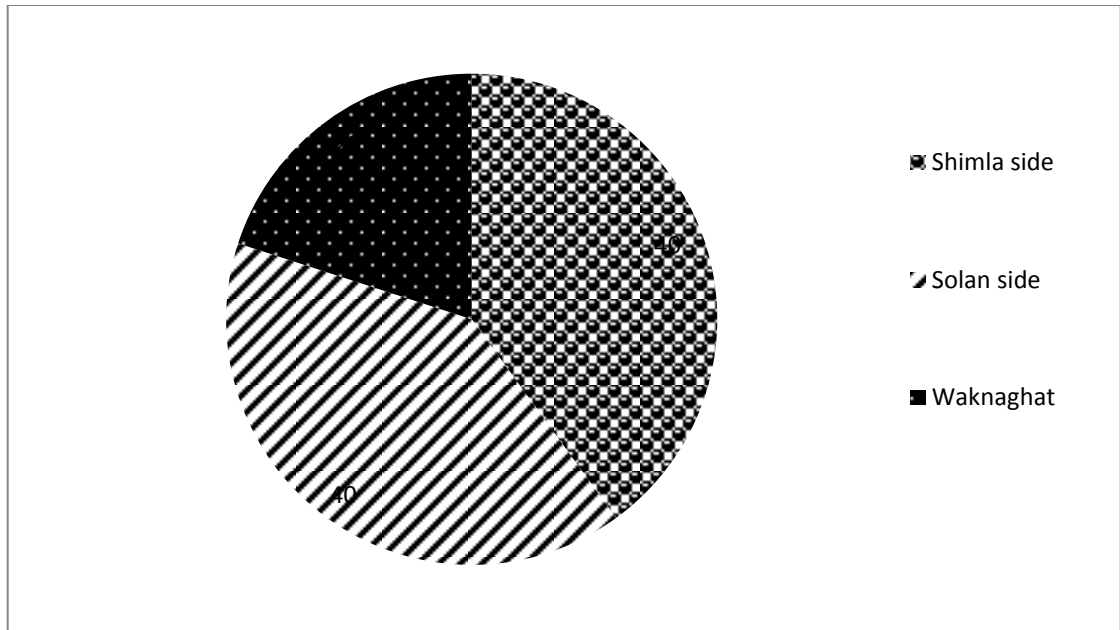


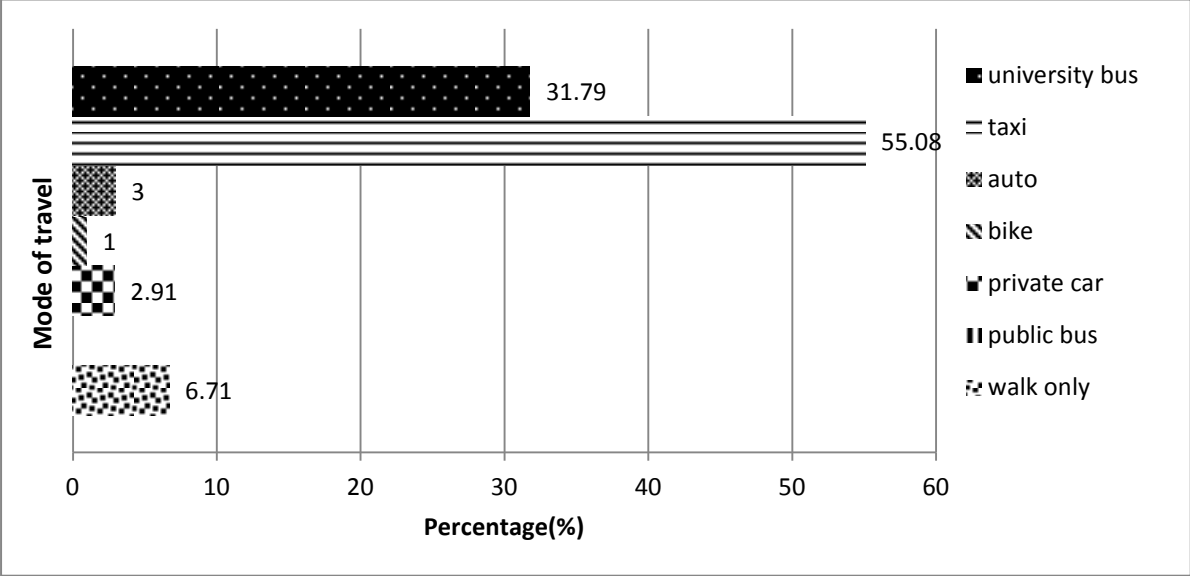
Figure 5.2 Most preferred destinations

## 5.3. Mode Share Analysis

Mode share has been calculated in the following column charts separately for different trips.

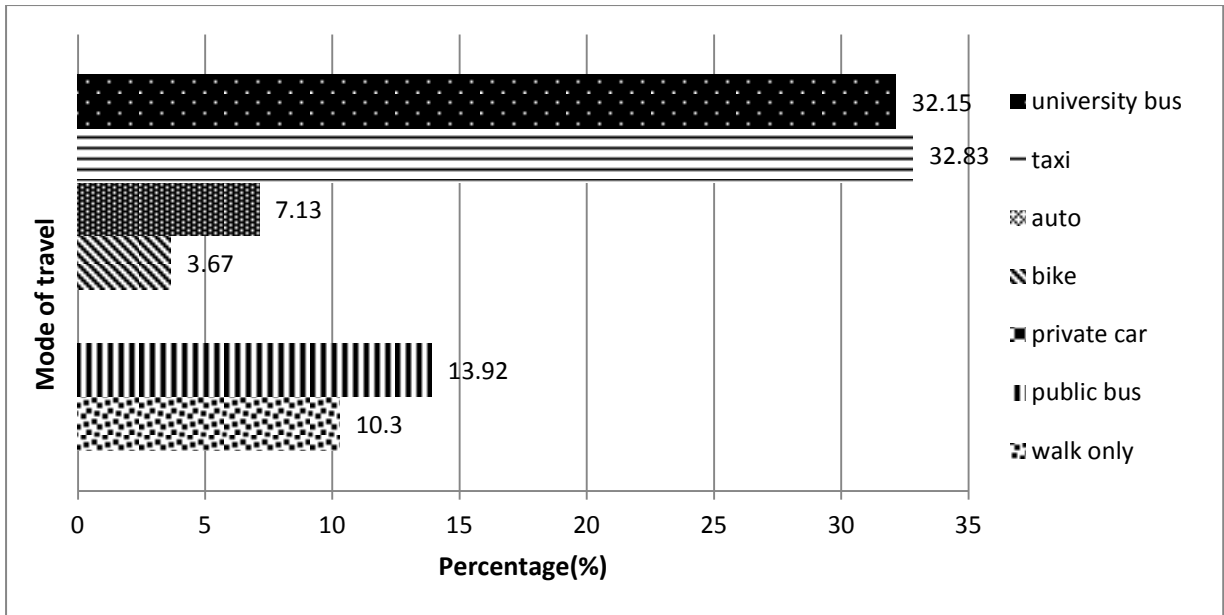
Figure 5.3.1 shows mode share for the trip from JUIT to Wagnaghat. The mode share of different modes has been specified in front of their respective bars. Taxi is the mode with largest mode share of 55.08% followed by university bus with its mode share equal to 31.79%. Rest of the modes have comparatively very small share. This shows that most of the students travelling from JUIT to WAKNAGHAT have chosen either taxi or

university bus as their mode of travel. The mode share of public bus is zero and the reason is unavailability of public buses at university gate (the public buses are plied to go by the Wagnaghat – Dumehar road and passes from near the thank you gate of the university and not from the university gate). Bike and private car have very less share because very few students have their personal vehicles. Small share of auto in spite of being cheaper than taxi is because only 2 autos are there to serve the students whereas the taxis are 22 in number. Also walking is chosen very rarely by the students to go from JUIT to Wagnaghat.



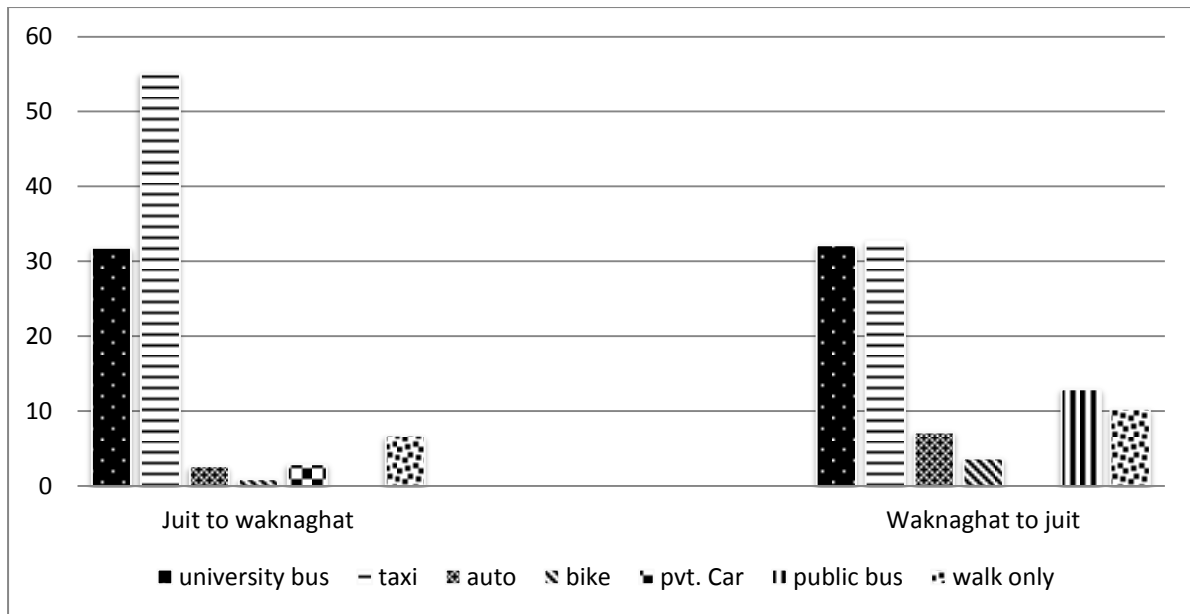
**Figure 5.3.1 Mode share of trip from JUIT to Wagnaghat**

Figure 5.3.2 shows mode share for the trip from Wagnaghat to JUIT. For this trip taxi and university bus are the major modes used with 32.83% and 32.15% as their mode shares respectively. The reason for their largest share is the good availability of these modes at Wagnaghat. The smaller share of public bus and auto is due to their comparatively low availability at Wagnaghat.



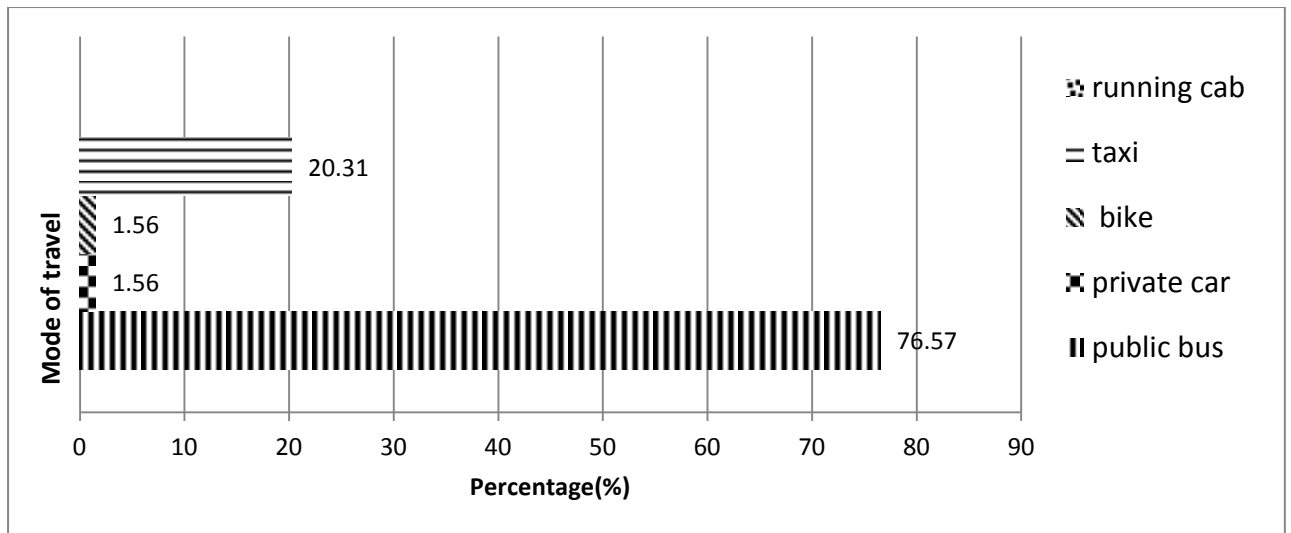
**Figure 5.3.2 Mode share of trip from Wagnaghat to JUIT**

In figure 5.3.3 we have compared the figures 5.3.1 and 5.3.2. It can be seen that share of university bus is same for both the trips and reason is the same availability of this mode at JUIT and Wagnaghat. Although the availability of taxi is also same at both the places but its share has reduced in the trip from Wagnaghat to JUIT. And at same time share of other modes like public bus, walk and auto has increased considerably. There are two reasons behind this – first is the increase in availability of these modes at Wagnaghat and second reason is that these modes charge very less as compared to taxi for the same trip. This resulted in a drop of share of taxi from 55.08% to 32.83%.



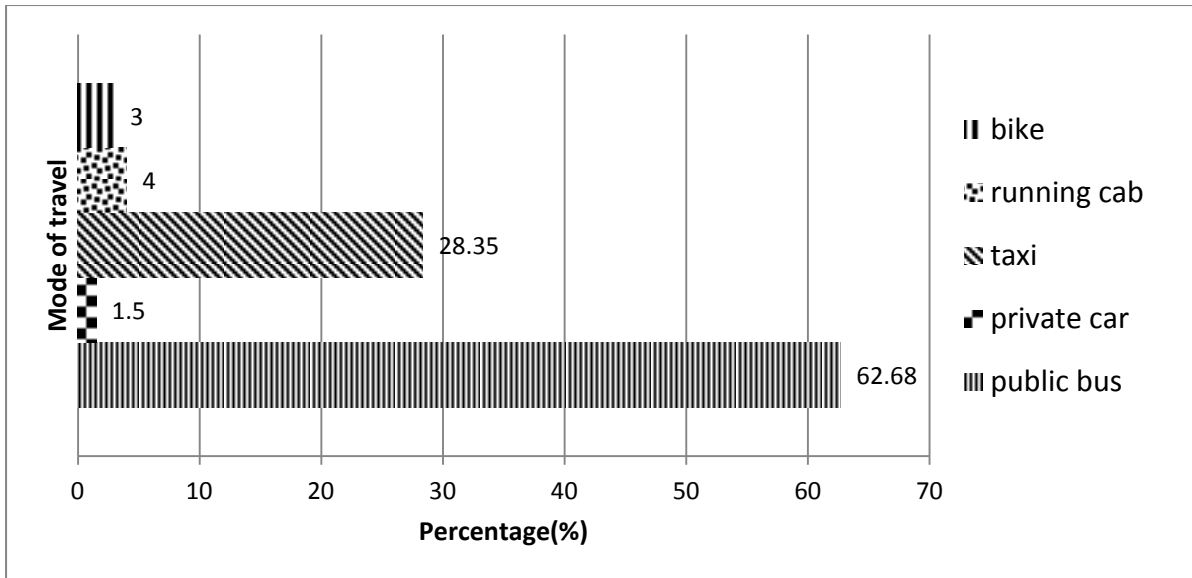
**Figure 5.3.3 Comparison between Mode share of trip from Waknaghat to JUIT and vice versa**

Figure 5.3.4 shows mode share for the trip from Waknaghat to Shimla among the modes available to make this trip. Public bus has the largest mode share with about 76.57% of students travelling by public bus from Waknaghat to Shimla. Second largest share is of taxi with 20.31% of students travelling by taxi. Rest of the modes have almost negligible mode share due to very low availability.



**Figure 5.3.4 Mode share of trip from Wagnaghat to Shimla**

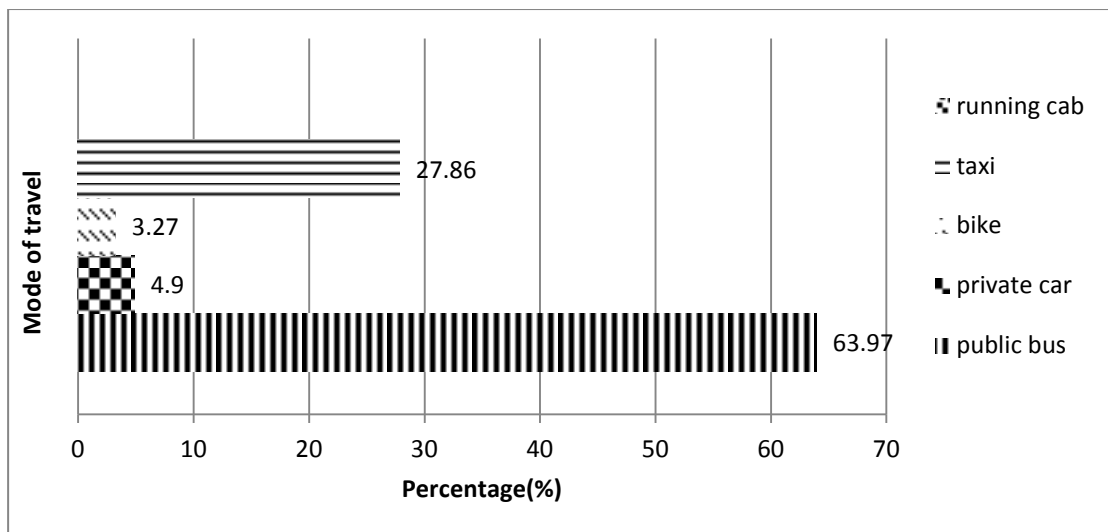
Figure 5.3.5 shows mode share for the trip from Shimla to Wagnaghat. Public bus has the largest mode share of 62.68% and Taxi has the second highest mode share of 28.35%. On comparing the figures 5.3.4 and 5.3.5 we found that mode share of Public bus decreases and that of Taxi increases. This is because the students travelling in small groups prefer Public bus while travelling to Shimla as it is much cheaper than Taxi but while travelling from Shimla to Wagnaghat they prefer to come in larger groups so that they can choose Taxi as their mode of travel with small per head cost. Students don't follow this travel behaviour while travelling from Wagnaghat to Shimla because they start their trip from Wagnaghat as per their convenience but the returning time to university campus is same for every one so they travel in large groups while returning to university. In figure 5.3.5 the mode share of running cab is 4% which was 0% in figure 5.3.4.



**Figure 5.3.5 Mode share of trip from Shimla to Wagnaghat**

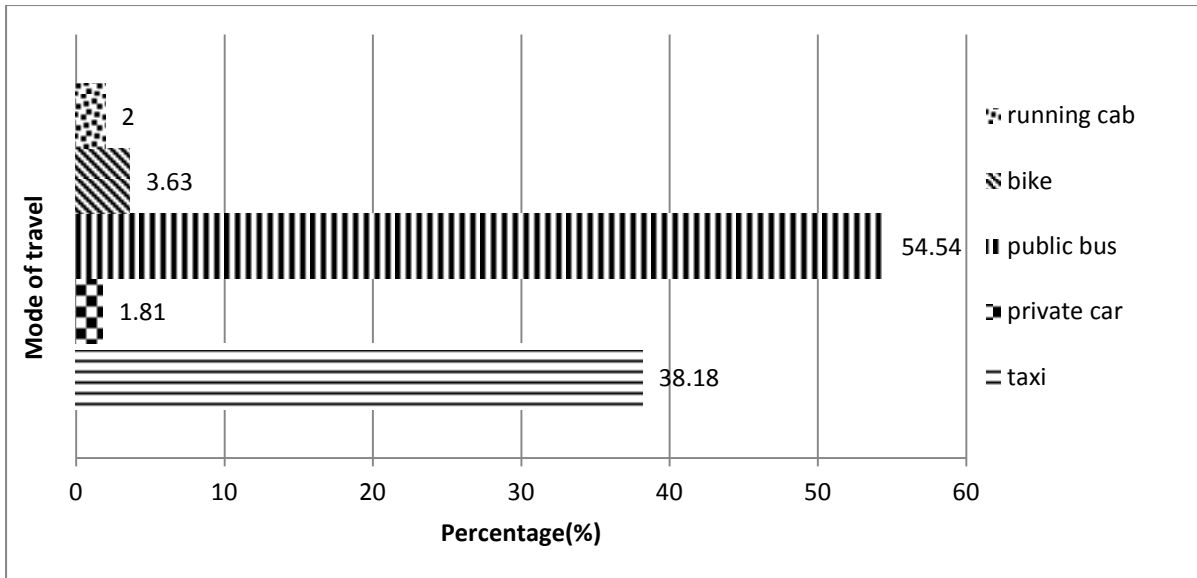
Figure 5.3.6 shows mode share for the trip from Wagnaghat to Solan among the modes available to make this trip. Public bus has the largest mode share with about 63.97% of students travelling by public bus from Wagnaghat to Solan. The reason for this attractiveness of public bus is its very low cost of travel and very good availability as compared to other modes. Taxi is the mode with second largest share of 27.86% and reason is its good availability but with a very high cost of travel as compared to other modes. The low mode share of other modes is due to very low availability.





**Figure 5.3.6 Mode share of trip from Wagnaghat to Solan**

Figure 5.3.7 shows mode share for the trip from Solan to Wagnaghat. Public bus has the largest mode share of 54.54% and Taxi has the second highest mode share of 38.18%. On comparing the figures 5.3.6 and 5.3.7 it was found that mode share of Public bus decreases and that of Taxi increases. Also it was seen that there is a very little use of Running Cabs while returning to Wagnaghat from Solan. The reason for this change in travel behaviour of students is same as it was in case of trips between Wagnaghat and Shimla.



**Figure 5.3.7 Mode share of trip from Solan to Wagnaghat**

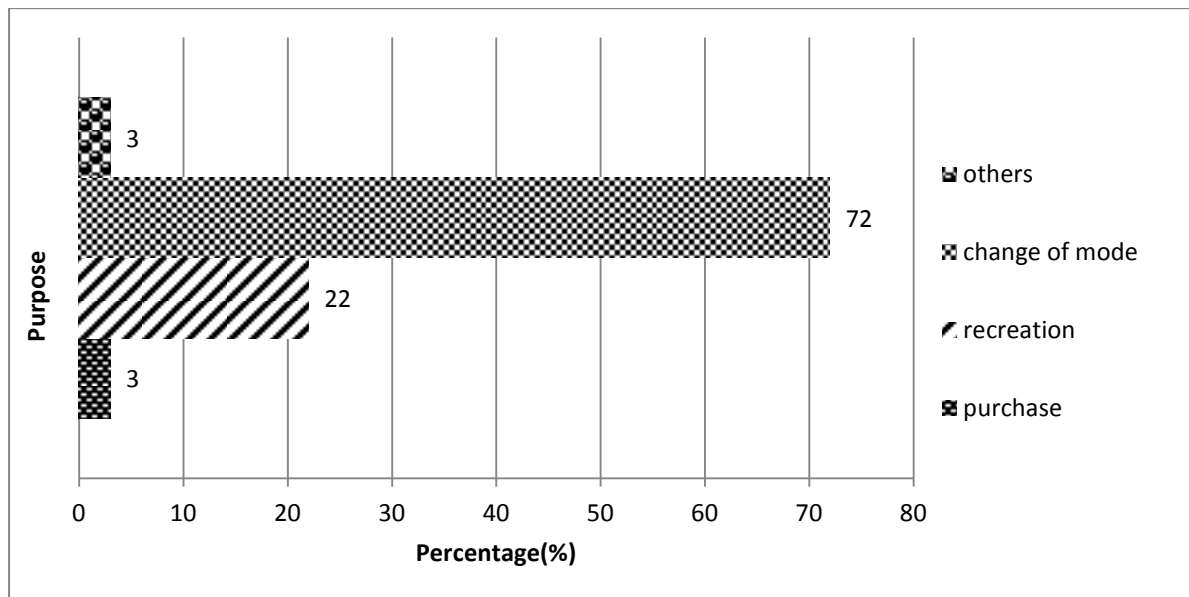
#### **5.4. Analysis On The Basis of Purpose of Travel**

Now trips made by students have been classified on the basis of purpose of their travel. The most common purposes of travel for the students are Change of mode, Recreation/Entertainment, Shopping/Purchasing and Going home. This classification has been done separately for different trips because destination of a trip varies with purpose and can be seen in figures 5.4.1, 5.4.2 and 5.4.3.

Figure 5.4.1 that 72% of the students travel to Wagnaghat to change their mode of travel. It means that 72% of the students were headed towards some other destination but had to pass through Wagnaghat for changing the mode of travel. This is a common practice of students and it can be seen from figures 5.3.1, 5.3.3 and 5.3.5.

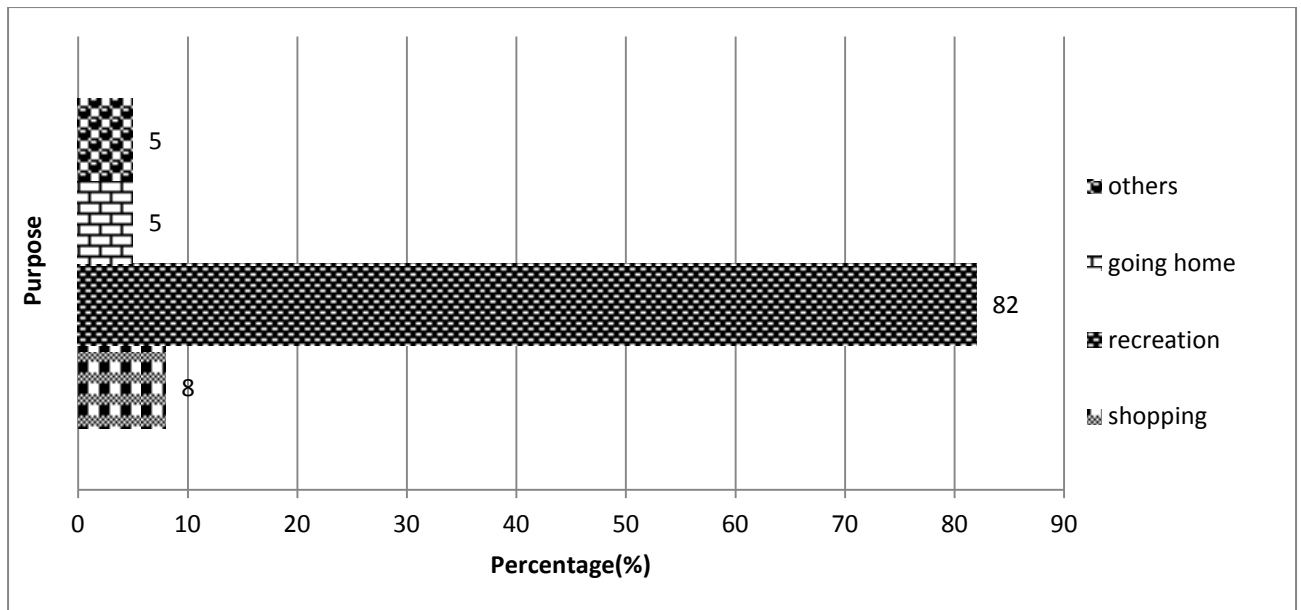
Large numbers of students travel from JUIT to Wagnaghat either by Taxi or by University bus. But after Wagnaghat students choose public bus as their main mode of travel. In this way change of mode takes place. Second most common purpose is

recreation/entertainment with 22% of the students going to Waknaghat with this purpose. Rest of the 6% students go for Purchasing or some other purpose.



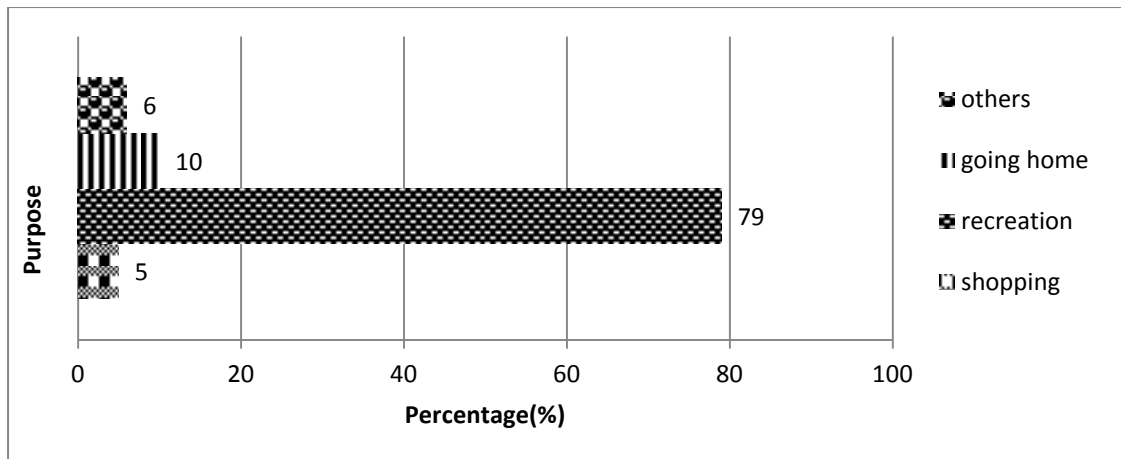
**Figure 5.4.1 Classification of trips from JUIT to Waknaghat**

Figure 5.4.2 shows that 82% of the students going towards Shimla side go with a purpose of recreation/entertainment, 8% go for shopping, 5% of them are those who have their families living in Shimla and they leave the university campus with a purpose of going home and rest 5% have some other purposes.



**Figure 5.4.2 Classification of trips towards Shimla side**

Figure 5.4.3 shows that 79% of the students going towards Solan side go with a purpose of recreation/entertainment, 5% go for shopping, 10% of them are those who have their families living in Solan and they leave the university campus with a purpose of going home and rest 6% have some other purposes.



**Figure 5.4.3 Classification of trips towards Solan side**

### **5.5. Cost Share Analysis**

Now cost share analysis has been done. The term cost share indicates the share of a mode in the total cost that students have to bear to complete the trip. Cost share is calculated by multiplying the mode share with cost per trip for that mode of travel. And it can be said that “more is the mode share and less is the cost share, more is the mode of travel preferred”.

Now in case of private car and bike, per kilometre cost has to be calculated. For this the average fuel efficiency of a private car is assumed to be 12 km/l and that of a bike is assumed to be 35 km/l. Also the petrol rates are taken as Rs 70 per litre (as per the rates in May 2012 in Himachal Pradesh). So cost per kilometre for bike has been calculated to be Rs 2 and that for private car to be Rs 5.834.

Table 5.5.1 shows the cost share of different modes available for the trip from JUIT to Wagnaghat. About 96.94% of money spent by the students to travel from JUIT to Wagnaghat is spent on travelling by Taxi. Remaining 2.64% is spent on travelling by Auto. Cost share of Walking and University bus is zero because the cost of travel by these modes is zero. Cost share of Private car and Bike is very less as only few students

have their personal vehicles. And cost share of public bus is zero because mode share is zero.

<b>MODE</b>	<b>MODE SHARE (%) (A)</b>	<b>COST/TRIP/ HEAD(RS) (B)</b>	<b>COST SHARE= (A)*(B)</b>	<b>COST SHARE (%)</b>
WALK	6.71	0	0	0
PUBLIC BUS	0	3	0	0
PRIVATE CAR	2.91	5.834*3	17.5	0.308
BIKE	1	2*3	6	0.105
AUTO	3	50	150	2.64
TAXI	55.08	100	5508	96.94
UNIVERSITY BUS	31.79	0	0	0

**Table5.5.1 Cost Shares Of Modes From JUIT To Wagnaghat.**

Table 5.5.2 shows the cost share of different modes available for the trip from Wagnaghat to JUIT. About 88.65% of money spent by the students to travel from Wagnaghat to JUIT is spent on travelling by Taxi, 9.62% is spent on travelling by Auto and remaining 1.13% is spent on public bus. Cost share of Private car and Bike is almost zero as only few students have their personal vehicles. Cost share of Walking and University bus is zero because the cost of travel by these modes is zero.

<b>MODE</b>	<b>MODE SHARE (%) (A)</b>	<b>COST/TRIP/ HEAD(RS) (B)</b>	<b>COST SHARE= (A)*(B)</b>	<b>COST SHARE (%)</b>
WALK	10.30	0	0	0
PUBLIC BUS	13.92	3	41.76	1.13
PRIVATE CAR	0	5.834*3	0	0
BIKE	3.67	2*3	22.02	0.60
AUTO	7.13	50	356.5	9.62
TAXI	32.83	100	3283	88.65
UNIVERSITY BUS	32.15	0	0	0

**Table5.5.2 Cost Share Of Modes From Wagnaghat To JUIT.**

Table 5.5.3 shows the cost share of different modes available for the trip from Wagnaghat to Shimla. Although the mode share of public bus is 76.57% but its cost share is only 15.57% whereas mode share of taxi is 20.31% but cost share is 82.60%. This is due very low cost of trip per head by public bus as compared to taxi. Cost share of Private car and Bike is almost zero as their mode share is very small.

MODE	MODE SHARE (%) (A)	COST/TRIP/ HEAD(RS) (B)	COST SHARE= (A)*(B)	COST SHARE (%)
PUBLIC BUS	76.57	30	2297.1	15.57
PRIVATE CAR	1.56	5.834*22	200.22	1.36
BIKE	1.56	2*22	68.64	0.47
TAXI	20.31	600	12186	82.60

**Table 5.5.3 Cost Share Of Modes From Wagnaghat To Shimla.**

Cost share of modes available is as shown in the Table 5.5.4. Taxi has the highest cost share of 87.50%. It is also found that while returning from Shimla to Wagnaghat students have one more option of running cab though its mode share and cost share are very less.

MODE	MODE SHARE (%) (A)	COST/TRIP/ HEAD(RS) (B)	COST SHARE= (A)*(B)	COST SHARE (%)
PUBLIC BUS	62.68	30	1880.4	9.67
PRIVATE CAR	1.50	5.834*22	192.522	1.00
BIKE	3	2*22	132	0.68
RUNNING CAB	4.47	50	223.5	1.15
TAXI	28.35	600	17010	87.50

**Table 5.5.4 Cost Shares Of Mode From Shimla To Wagnaghat.**

Table 5.5.5 shows the cost share of different modes available for the trip from Wagnaghat to Solan. Although the mode share of public bus is 63.97% but its cost share

is only 9.83% whereas mode share of taxi is 27.86% but cost share is 85.66%. This is due very low cost of trip per head by public bus as compared to taxi. Cost share of Private car and Bike are also not very high as only few students have their personal vehicles.

MODE	MODE SHARE (%) (A)	COST/TRIP/ HEAD(RS) (B)	COST SHARE= (A)*(B)	COST SHARE (%)
PUBLIC BUS	63.97	30	1919.1	9.83
PRIVATE CAR	4.90	5.834*25	714.67	3.66
BIKE	3.27	2*25	163.5	0.85
TAXI	27.86	600	16716	85.66

**Table 5.5.5 Cost Share Of Trip From Wagnaghat To Solan.**

Cost share of modes available is as shown in the Table 5.5.6. Taxi has the highest cost share of 91.38%. It is also found that while returning from Solan to Wagnaghat students have one more option of running cab though its mode share and cost share are very less.

MODE	MODE SHARE (%) (A)	COST/TRIP/ HEAD(RS) (B)	COST SHARE= (A)*(B)	COST SHARE (%)
PUBLIC BUS	54.54	30	1636.2	6.52
PRIVATE CAR	1.65	5.834*25	240.65	0.97
BIKE	3.63	2*25	181.5	0.72
RUNNING CAB	2	50	100	0.40
TAXI	38.18	600	22908	91.38

**Table 5.5.6 Cost Share Of Modes From Solan To Wagnaghat**

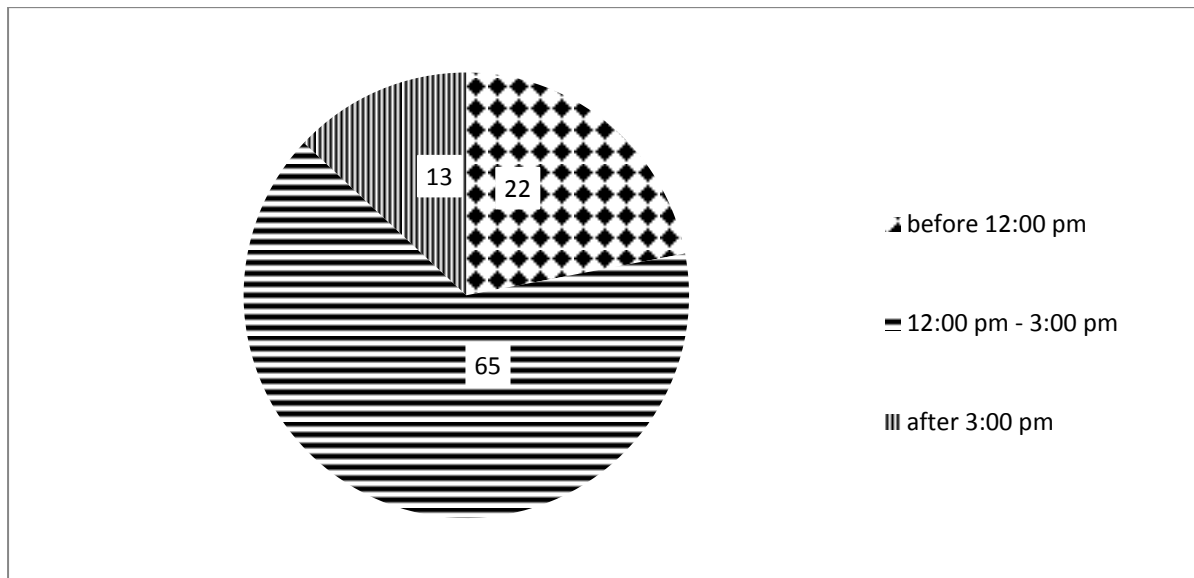
Above cost share analysis shows that taxi has comparatively the highest cost of travel and this is the only reason that it is way ahead than others in terms of cost share.



## 5.6. Time Analysis Of The Trips

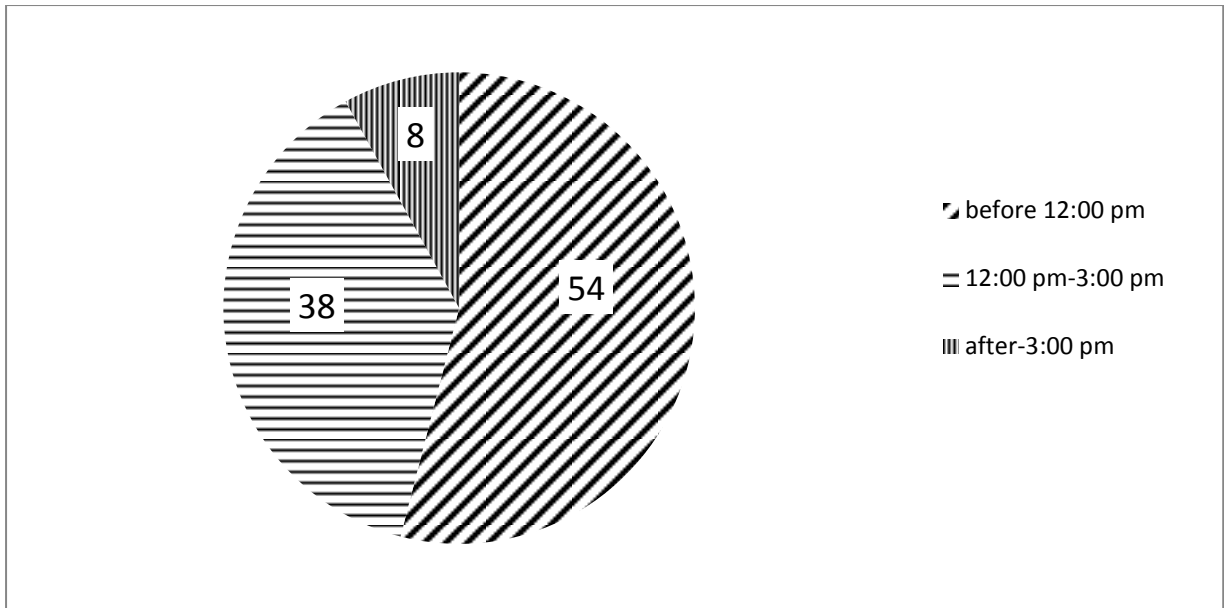
Now we have done the Time Analysis and found out the most preferred time of departure from various origins of trips and arrival at various destinations.

Figure 5.6.1 shows that while going from JUIT to Wagnaghat on Saturdays 65% of students prefer to depart between 12:00 pm to 3:00 pm, 22% prefer going out before 12:00 pm and few students are there who went out after 3:00 pm. This shows that the majority of students go out between 12:00 pm to 3:00 pm.



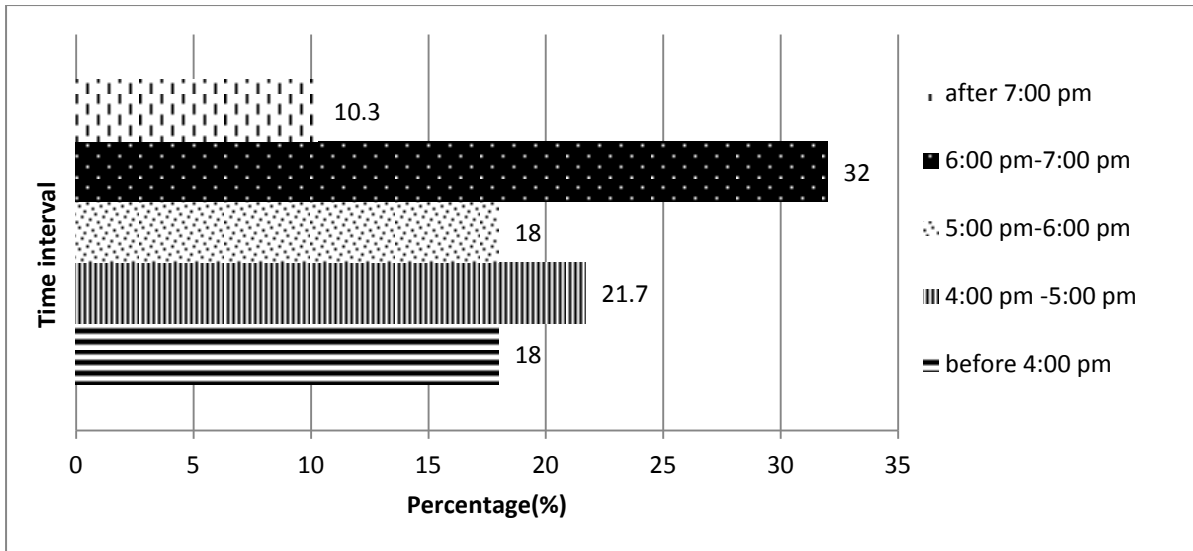
**Figure 5.6.1 Time analysis of trips from JUIT to Wagnaghat on Saturday**

Figure 5.6.2 shows that while going from JUIT to Wagnaghat on Sundays 38% of students prefer to depart between 12:00 pm to 3:00 pm while 54% prefer going out before 12:00 pm and few students are there who went out after 3:00 pm. This shows that the majority of students go out before 12:00 pm on Sundays. This change in trend of going out between Saturday and Sunday is because Saturday is not a holiday but a half working day and students have their classes till 12:00 pm. Therefore on Sundays majority travels before 12:00 pm and on Saturdays between 12:00 pm and 3:00 pm.



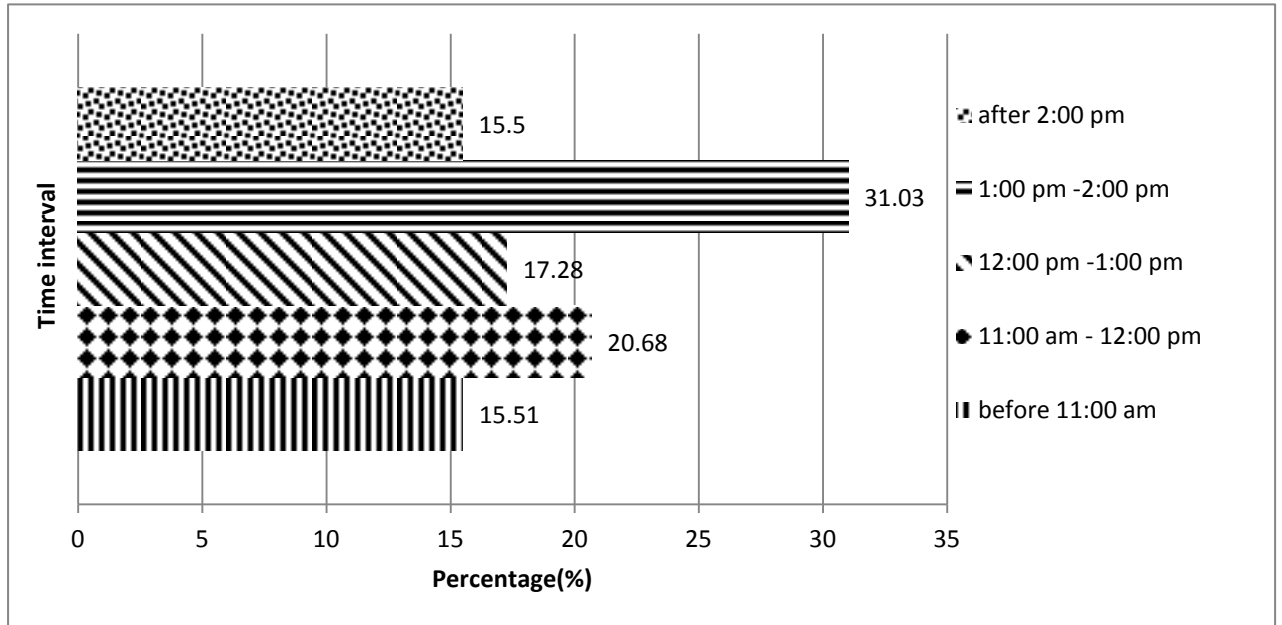
**Figure 5.6.2 Time analysis of trips from JUIT to Wagnaghat on Sunday**

Figure 5.6.3 shows the hourly distribution of students' travel from Wagnaghat to JUIT. It can be seen that most of the students come back to campus from Wagnaghat between 4:00 pm to 7:00 pm. 32% of the students depart from Wagnaghat between 6:00 pm to 7:00 pm, 18% between 5:00 pm to 6:00 pm and 21.7% between 4:00 pm to 5:00 pm. From remaining students 18% depart before 4:00 pm and 10.3% depart after 7:00 pm.



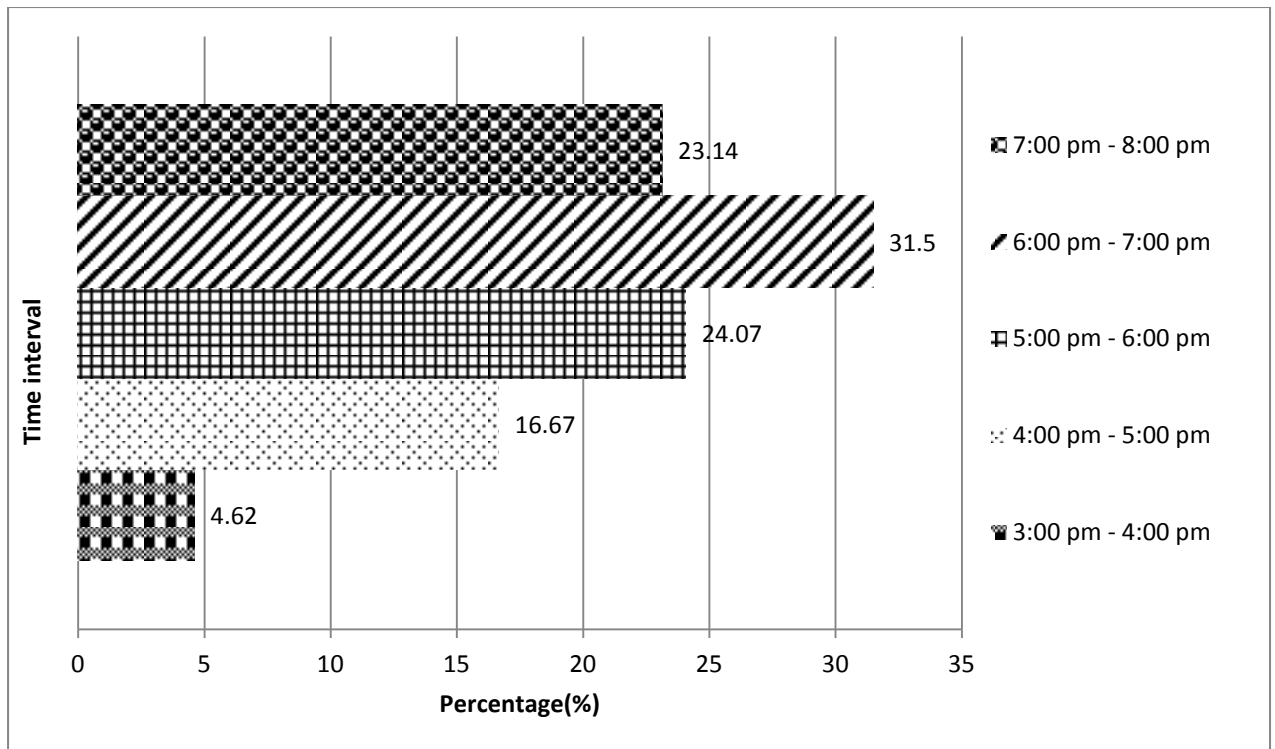
**Figure 5.6.3 Time analysis of trips from Wagnaghat to JIT**

Figure 5.6.4 shows the time distribution of trips made by students starting from Wagnaghat to their final destination (Shimla side or Solan side). It has been found that 31.03% of the students going out leave Wagnaghat for their destination between 1:00 pm to 2:00 pm, 20.68% between 11:00 am to 12:00 pm and 17.28% between 12:00 pm to 1:00 pm. Rest of the students start their trips from Wagnaghat in the proportion mentioned in the graph. So we can bring to a close approximation that a major percentage of students travel from Wagnaghat to their final destinations between 11:00 am to 2:00 pm.



**Figure 5.6.4 Time analysis of trips from Wagnaghat towards their final destination**

Figure 5.6.5 shows the time distribution of trips made by students ending at Wagnaghat from either Shimla side or Solan side. It can be seen that a large number of students reach Wagnaghat between 5:00 pm to 8:00 pm.



**Figure 5.6.5 Time analysis of trips from their final destination towards Wagnaghat**

## CHAPTER 6– CONCLUSION

This chapter documents the main conclusions of the study along with limitations of this study and future areas for investigation.

### 6.1. Conclusion

It is expected that the students residing at JUIT have complex travel behaviour and to study it, a comprehensive survey was conducted with a sample size of 20% of the total JUIT student population. The main objective of survey was to determine the **most preferred destinations** and **mode share** for different trips.

The students of JUIT generally go to either Waknaghat, towards Shimla side or towards Solan side on weekends. The proportion in which they go to their destinations is as follows: 40% students go towards Shimla side, 40% students go towards Solan side and remaining 20% go to Waknaghat.

To make these trips the various modes available are taxi, auto, university bus, public bus, walk, private car and bike. Now mode share of these modes has been calculated which would help in knowing and understanding the general tendency of students to choose a particular mode of travel for a particular trip under common circumstances. For trips between JUIT and Waknaghat it has been realized that the taxi and university buses have the largest mode shares. For trips between Waknaghat and Shimla side and between Waknaghat and Solan side public bus has the largest mode share.

It is very difficult to understand the students' tendency to select a mode of travel to complete a trip. Selection of mode varies with a number of factors like trip length, cost of travel, mode choice available, number of fellow travellers and also sometimes the time required by the mode to complete the trip. The complexity of mode selection is that it depends on all the above mentioned factors simultaneously.

Suppose a student has to travel from JUIT to Wagnaghat considering that he has all the mode choices available except public bus because he cannot board on a public bus from the university gate. Firstly we have to except a fact that cost minimization is a major factor affecting the mode selection decision. So the student will have a tendency to first select the university bus as his/her mode of travel because it is free of cost. Now if the university bus is not available at that time than second choice could be either auto, taxi or walking. The selection will now depend either on cost which the taxi has highest and walk has no cost or on time taken which the taxi has lowest and walk has highest or on number of fellow travellers or on availability. If he/she had been alone than he might not have chosen to walk till Wagnaghat but had he/she been accompanied than he/she might have chosen to walk (in case of no urgency) or he/she might have chosen taxi or auto as their mode and could have decided to split the travel cost among them. In case of mode selection for the trips between Wagnaghat and Shimla side/Solan sidewalk is not an option due to large trip length. University buses move between JUIT and Wagnaghat only and taxi and auto will be too costly for such long trips. Hence only suitable option left is public bus. But we can conclude with the fact that 'cost minimization' is a major factor which is well thought out by most of the students while mode selection.

Further, analysis has been done on the basis of purpose. The main purpose for trips from JUIT till Wagnaghat was change of mode and for trips from Wagnaghat towards Shimla side and Solan side was entertainment/recreation. It can be concluded from the above analysis that students could not find direct conveyance from JUIT to their preferred destinations by their preferred modes. So they have to stop at Wagnaghat to change to their preferred mode of travel that is public bus.

Analysis on cost share has been done which concluded with taxi as the mode having highest cost share for all the trips. The reason is the significantly large cost of travel by taxi.

Further, analysis on the basis of departure time and arrival time has been done. Most preferred time of travel have been obtained by this analysis (for more details refer section 5.6).

### **6.2.Limitations of this study:**

Although the scope of this survey was limited to study the travel behaviour, some limitations to the methodology applied were noted. These limitations are listed below.

- One major limitation of this study is that trips direct JUIT to Shimla side or Solan side are not considered.
- The outcomes of this study may be used as indicators for planning future transport facilities, but needs refinement through more studies for them to be used in general application.
- A sample size of 30% to 40% would have given more satisfactory results.

### **6.3.Future scope**

While conducting this study of travel behaviour several research areas were observed. These areas are listed below, which provide directions for further future study.

- More survey data can be collected and explored by considering various trip types.
- Demographic surveys can be conducted to get a better understanding of travel behaviour.
- Personal information has been collected but not used for analysis. Personal characteristics can be included in the study of travel behaviour.



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# APPENDIX

## SCHEDULE OF UNIVERSITY BUS ON WEEKENDS

### BUS TIMINGS ON SATURDAY

JUIT TO WAKNAGHAT	12.00 PM
	12.30 PM
LUNCH BREAK	12.30 PM TO 1.00 PM
JUIT TO WAKNAGHAT	1.00 PM
	1.30 PM
	2.00 PM
WAKNAGHAT TO JUIT	4.30 PM
	5.00 PM
	5.30 PM
	6.00 PM
	6.30 PM

## **BUS TIMINGS ON SUNDAY**

JUIT TO WAKNAGHAT	10.00 AM
	10.30 AM
	11.00 AM
	11.30 AM
	12.00 PM
	12.30 PM
LUNCH BREAK	12.30 PM TO 1.00 PM
JUIT TO WAKNAGHAT	1.00 PM
	1.30 PM
	2.00 PM
WAKNAGHAT TO JUIT	4.30 PM
	5.00 PM
	5.30 PM
	6.00 PM
	6.30 PM

**MOBILE NUMBERS OF CIVIL VEHICLES RUNNING BETWEEN  
JUIT AND WAKNAGHAT**

S.NO	DRIVER NAME	TYPE OF VEHICLE	MOBILE NO.
1	Rajesh Kumar	Van	94186-47059
2	Babu	Alto	98168-86702
3	Chander Shekhar	Auto	98168-86702
4	Rakesh	Sumo	94181-26998
5	Sashi	Sumo	98052-33040
6	Bobby	Auto	94186-41732
7	Baldev	Van	98161-99544
8	Prem	Van	88948-17198
9	Kapil Sharma	Van	98165-08543
10	U.K Thakur	Alto	98821-00140
11	Ramesh	Alto	94183-02487
12	Sandeep	Alto	98055-57761
13	Pappu Ram	Alto	98163-90419
14	Gopal	Sumo	94181-04713
15	Sanju	Qualis	98175-28960
16	Prakash	Alto	98165-08543
17	Raju	Sumo	98161-35252
18	Sanju	Alto	98172-49940
19	Raju Thakur	Alto	94184-12567
20	Lalit	Alto	98167-28806 94594-24689
21	Niraj	Eeco	88945-96119 86795-55521
22	Vicky	Alto	98172-32989

## PUBLIC BUS TIMINGS

<u>ORIGIN</u>	<u>DESTINATION</u>	<u>DEPARTURE TIME</u>
THANK YOU GATE	SHIMLA	7:00 AM
THANK YOU GATE	SHIMLA	7:45 AM
THANK YOU GATE	SOLAN	8:00 AM
THANK YOU GATE	SOLAN	8:30 AM
THANK YOU GATE	WAKNAGHAT	8:45 AM
THANK YOU GATE	SOLAN	9:30 AM
THANK YOU GATE	SHIMLA	4:00 PM
THANK YOU GATE	WAKNAGHAT	4:30 PM
THANK YOU GATE	SHOGI	5:45 PM
THANK YOU GATE	KALKA	6:00 PM
WAKNAGHAT	THANK YOU GATE	9:00 AM
WAKNAGHAT	THANK YOU GATE	2:00 PM
WAKNAGHAT	THANK YOU GATE	5:20 PM
WAKNAGHAT	THANK YOU GATE	6:15 PM
WAKNAGHAT	THANK YOU GATE	6:15 PM
WAKNAGHAT	THANK YOU GATE	7:00 PM

# SHORT QUESTIONNAIRE

## TRAVEL SURVEY FOR UNIVERSITY STUDENTS

### PERSONAL DETAILS

YEAR:		BRANCH:		HOME CITY:		GENDER:	
MONTHLY EXPENDITURE: Rs.				FREQUENCY OF HOME VISITS:			
ROOM: SINGLE / SHARED				PAYING EXTRA (in case of single room): YES / NO			
DRIVING LICENSE	2W- L P	4W- L P	ANY TRIPS MADE ON: SATURDAY		SUNDAY		

### TRAVEL DETAILS (SATURDAY)

**TRIP-1**

STARTING POINT: \_\_\_\_\_ TIME: \_\_\_\_\_  
 STOP: \_\_\_\_\_ TIME: \_\_\_\_\_  
 PURPOSE: \_\_\_\_\_ TRAVEL MODE: \_\_\_\_\_

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot Fee paid: \_\_\_\_\_

PUBLIC BUS: GOVERNMENT / PRIVATE

TRAIN ROUTE: \_\_\_\_\_ CLASS: \_\_\_\_\_

FARE / FEE PAID: \_\_\_\_\_

MODE CHOICES AVAILABLE: \_\_\_\_\_

ANY FELLOW TRAVELLER: NO / YES HOW MANY: \_\_\_\_\_

TRAVELLED FURTHER: YES / NO

**TRIP-2**

STARTING POINT: \_\_\_\_\_ TIME: \_\_\_\_\_  
 STOP: \_\_\_\_\_ TIME: \_\_\_\_\_  
 PURPOSE: \_\_\_\_\_ TRAVEL MODE: \_\_\_\_\_

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot Fee paid: \_\_\_\_\_

PUBLIC BUS: GOVERNMENT / PRIVATE

TRAIN ROUTE: \_\_\_\_\_ CLASS: \_\_\_\_\_

FARE / FEE PAID: \_\_\_\_\_

MODE CHOICES AVAILABLE: \_\_\_\_\_

ANY FELLOW TRAVELLER: NO / YES HOW MANY: \_\_\_\_\_

TRAVELLED FURTHER: YES / NO

**TRIP-3**

STARTING POINT: \_\_\_\_\_ TIME: \_\_\_\_\_  
 STOP: \_\_\_\_\_ TIME: \_\_\_\_\_  
 PURPOSE: \_\_\_\_\_ TRAVEL MODE: \_\_\_\_\_

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot Fee paid: \_\_\_\_\_

PUBLIC BUS: GOVERNMENT / PRIVATE

TRAIN ROUTE: \_\_\_\_\_ CLASS: \_\_\_\_\_

FARE / FEE PAID: \_\_\_\_\_

MODE CHOICES AVAILABLE: \_\_\_\_\_

ANY FELLOW TRAVELLER: NO / YES HOW MANY: \_\_\_\_\_

TRAVELLED FURTHER: YES / NO

**TRIP-4**

STARTING POINT: \_\_\_\_\_ TIME: \_\_\_\_\_  
 STOP: \_\_\_\_\_ TIME: \_\_\_\_\_  
 PURPOSE: \_\_\_\_\_ TRAVEL MODE: \_\_\_\_\_

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot Fee paid: \_\_\_\_\_

PUBLIC BUS: GOVERNMENT / PRIVATE

TRAIN ROUTE: \_\_\_\_\_ CLASS: \_\_\_\_\_

FARE / FEE PAID: \_\_\_\_\_

MODE CHOICES AVAILABLE: \_\_\_\_\_

ANY FELLOW TRAVELLER: NO / YES HOW MANY: \_\_\_\_\_

TRAVELLED FURTHER: YES / NO

**TRAVEL DETAILS (SATURDAY) CONT.**

<u><b>TRIP-5</b></u>			
STARTING POINT:	TIME:		
STOP:	TIME:		
PURPOSE:	TRAVEL MODE:		
-----			
PVT CAR / BIKE:	Own Vehicle/Borrowed Vehicle/Shared Ride		
Parking: On street / Parking lot	Fee paid:		
PUBLIC BUS:	GOVERNMENT / PRIVATE		
TRAIN ROUTE:	CLASS:		
-----			
FARE / FEE PAID:			
MODE CHOICES AVAILABLE:			
ANY FELLOW TRAVELLER: NO / YES          HOW MANY:			
TRAVELLED FURTHER:    YES / NO			

<u><b>TRIP-6</b></u>			
STARTING POINT:	TIME:		
STOP:	TIME:		
PURPOSE:	TRAVEL MODE:		
-----			
PVT CAR / BIKE:	Own Vehicle/Borrowed Vehicle/Shared Ride		
Parking: On street / Parking lot	Fee paid:		
PUBLIC BUS:	GOVERNMENT / PRIVATE		
TRAIN ROUTE:	CLASS:		
-----			
FARE / FEE PAID:			
MODE CHOICES AVAILABLE:			
ANY FELLOW TRAVELLER: NO / YES          HOW MANY:			
TRAVELLED FURTHER:    YES / NO			

<u><b>TRIP-7</b></u>			
STARTING POINT:	TIME:		
STOP:	TIME:		
PURPOSE:	TRAVEL MODE:		
-----			
PVT CAR / BIKE:	Own Vehicle/Borrowed Vehicle/Shared Ride		
Parking: On street / Parking lot	Fee paid:		
PUBLIC BUS:	GOVERNMENT / PRIVATE		
TRAIN ROUTE:	CLASS:		
-----			
FARE / FEE PAID:			
MODE CHOICES AVAILABLE:			
ANY FELLOW TRAVELLER: NO / YES          HOW MANY:			
TRAVELLED FURTHER:    YES / NO			

<u><b>TRIP-8</b></u>			
STARTING POINT:	TIME:		
STOP:	TIME:		
PURPOSE:	TRAVEL MODE:		
-----			
PVT CAR / BIKE:	Own Vehicle/Borrowed Vehicle/Shared Ride		
Parking: On street / Parking lot	Fee paid:		
PUBLIC BUS:	GOVERNMENT / PRIVATE		
TRAIN ROUTE:	CLASS:		
-----			
FARE / FEE PAID:			
MODE CHOICES AVAILABLE:			
ANY FELLOW TRAVELLER: NO / YES          HOW MANY:			
TRAVELLED FURTHER:    YES / NO			

## TRAVEL DETAILS (SUNDAY)

### TRIP-1

STARTING POINT:                          TIME:  
 STOP:    TIME:  
 PURPOSE:                                      TRAVEL MODE:

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot                          Fee paid:

PUBLIC BUS:                      GOVERNMENT / PRIVATE

TRAIN ROUTE:    CLASS:

FARE / FEE PAID:

MODE CHOICES AVAILABLE:

ANY FELLOW TRAVELLER: NO / YES                          HOW MANY:

TRAVELLED FURTHER: YES / NO

### TRIP-2

STARTING POINT:                          TIME:  
 STOP:    TIME:  
 PURPOSE:                                      TRAVEL MODE:

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot                          Fee paid:

PUBLIC BUS:                      GOVERNMENT / PRIVATE

TRAIN ROUTE:    CLASS:

FARE / FEE PAID:

MODE CHOICES AVAILABLE:

ANY FELLOW TRAVELLER: NO / YES                          HOW MANY:

TRAVELLED FURTHER: YES / NO

### TRIP-3

STARTING POINT:                          TIME:  
 STOP:    TIME:  
 PURPOSE:                                      TRAVEL MODE:

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot                          Fee paid:

PUBLIC BUS:                      GOVERNMENT / PRIVATE

TRAIN ROUTE:    CLASS:

FARE / FEE PAID:

MODE CHOICES AVAILABLE:

ANY FELLOW TRAVELLER: NO / YES                          HOW MANY:

TRAVELLED FURTHER: YES / NO

### TRIP-4

STARTING POINT:                          TIME:  
 STOP:    TIME:  
 PURPOSE:                                      TRAVEL MODE:

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot                          Fee paid:

PUBLIC BUS:                      GOVERNMENT / PRIVATE

TRAIN ROUTE:    CLASS:

FARE / FEE PAID:

MODE CHOICES AVAILABLE:

ANY FELLOW TRAVELLER: NO / YES                          HOW MANY:

TRAVELLED FURTHER: YES / NO



## TRAVEL DETAILS (SUNDAY) CONT.

**TRIP-5**

STARTING POINT: \_\_\_\_\_ TIME: \_\_\_\_\_  
 STOP: \_\_\_\_\_ TIME: \_\_\_\_\_  
 PURPOSE: \_\_\_\_\_ TRAVEL MODE: \_\_\_\_\_

---

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot Fee paid: \_\_\_\_\_

PUBLIC BUS: GOVERNMENT / PRIVATE

TRAIN ROUTE: \_\_\_\_\_ CLASS: \_\_\_\_\_

---

FARE / FEE PAID: \_\_\_\_\_

MODE CHOICES AVAILABLE: \_\_\_\_\_

ANY FELLOW TRAVELLER: NO / YES HOW MANY: \_\_\_\_\_

TRAVELLED FURTHER: YES / NO

**TRIP-6**

STARTING POINT: \_\_\_\_\_ TIME: \_\_\_\_\_  
 STOP: \_\_\_\_\_ TIME: \_\_\_\_\_  
 PURPOSE: \_\_\_\_\_ TRAVEL MODE: \_\_\_\_\_

---

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot Fee paid: \_\_\_\_\_

PUBLIC BUS: GOVERNMENT / PRIVATE

TRAIN ROUTE: \_\_\_\_\_ CLASS: \_\_\_\_\_

---

FARE / FEE PAID: \_\_\_\_\_

MODE CHOICES AVAILABLE: \_\_\_\_\_

ANY FELLOW TRAVELLER: NO / YES HOW MANY: \_\_\_\_\_

TRAVELLED FURTHER: YES / NO

**TRIP-7**

STARTING POINT: \_\_\_\_\_ TIME: \_\_\_\_\_  
 STOP: \_\_\_\_\_ TIME: \_\_\_\_\_  
 PURPOSE: \_\_\_\_\_ TRAVEL MODE: \_\_\_\_\_

---

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot Fee paid: \_\_\_\_\_

PUBLIC BUS: GOVERNMENT / PRIVATE

TRAIN ROUTE: \_\_\_\_\_ CLASS: \_\_\_\_\_

---

FARE / FEE PAID: \_\_\_\_\_

MODE CHOICES AVAILABLE: \_\_\_\_\_

ANY FELLOW TRAVELLER: NO / YES HOW MANY: \_\_\_\_\_

TRAVELLED FURTHER: YES / NO

**TRIP-8**

STARTING POINT: \_\_\_\_\_ TIME: \_\_\_\_\_  
 STOP: \_\_\_\_\_ TIME: \_\_\_\_\_  
 PURPOSE: \_\_\_\_\_ TRAVEL MODE: \_\_\_\_\_

---

PVT CAR / BIKE: Own Vehicle/Borrowed Vehicle/Shared Ride  
 Parking: On street / Parking lot Fee paid: \_\_\_\_\_

PUBLIC BUS: GOVERNMENT / PRIVATE

TRAIN ROUTE: \_\_\_\_\_ CLASS: \_\_\_\_\_

---

FARE / FEE PAID: \_\_\_\_\_

MODE CHOICES AVAILABLE: \_\_\_\_\_

ANY FELLOW TRAVELLER: NO / YES HOW MANY: \_\_\_\_\_

TRAVELLED FURTHER: YES / NO



