



## **Parking Survey-Methodology and Case Study of CBD (Market Area) of Gadag**

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### **Abstract**

In this research, in order to maintain the traffic condition and adequate traffic flow for market area, Gadag. So, to overcome with traffic flow and parking problems with the growing population of vehicles the problem of parking has assumed serious proportions. At the present situation at market area in Gadag parking problem is a major issue as ourselves being a localities facing parking problems and traffic flow, as road is getting acquired by vehicles parked at road side. So, the research has been taken up to study and understand the vehicle parking issues and to suggest suitable parking pattern. The research is carried out for a stretch of 967mts which has maximum amount of traffic flow, at presently road side parking is carried out alternate days on either side of road. As the place is located as C.B.D (Central Business District) we have an expectation of increase of traffic flow and parking problems in future. To overcome the current situation and to avoid future problems proper measures needs to be carried out.

**Keywords:** Traffic flow, Vehicle parking, Central Business District.

### **1 Introduction**

As the world's population increasing day by day, with the need of transportation vehicle population is also increasing its been a major issue for not having a proper parking facility. The study area selected is been located at market area Gadag (CBD). Once the nature of the study is identified, the study area can be defined to encompass the area of expected policy impact. The study area need not be confirmed by political boundaries, but bounded by the area influenced by the transportation systems. The boundary of the study area is defined by what is called as external cordon or simply the cordon line.

- 967mts main stretch with parking and traffic flow problems
- 485mts Intersection of road which is connected to main stretch

Studies must be conducted to collect the required information about the capacity and use of existing parking facilities. In addition, information about the demand for parking is needed.



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can be for on-street and off-street parking. The general methodology for both the surveys is similar, though minor details can be different. This method consists of making periodic observations of parked vehicles on each Patrol.

The Field Data sheet of Parking space inventory and Parking usage survey by Patrol for study area on working day is shown in figure 2 and table 1 and 2 respectively.

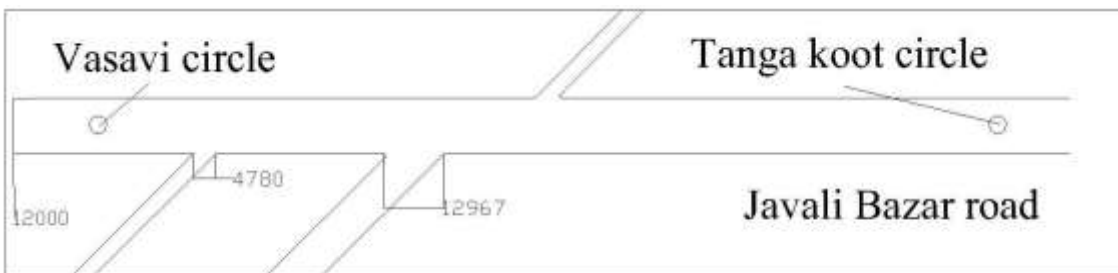


Figure -2 parking space inventory for Javali Bazaar road

Table-1 Field data sheet for Parking space inventory

Average Vehicles Parked Per day				
Sl no	Road	Days		
		Working days	Saturday	Sunday
1	Station Road	277	314	278
2	Old bus stand Road	160	195	159
3	Nam-Joshi Road	240	240	278
4	Javali Bazar Road	116	119	101
	Total	793	868	816

Table-2 Field data sheet for spot speed survey along Chenamma circle to Hubballi sport club on working day

Timing	Average no of vehicles parked at JAVALI BAZAR ROAD		
	WORKING DAYS	SATURDAY	SUNDAY
7:00-7:30	15	13	18
7:30-8:00	15	15	22



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8:00-8:30	15	12	24
8:30-9:00	17	12	27
9:00-9:30	22	18	34
9:30-10:00	25	18	31
10:00-10:30	29	27	34
10:30-11:00	36	38	31
1:00-1:30	109	137	89
1:30-2:00	103	134	114
4:00-4:30	48	70	54
4:30-5:00	53	75	53
5:00-5:30	64	69	50
5:30-6:00	63	62	53
6:00-6:30	92	75	64
6:30-7:00	99	75	46
7:00-7:30	110	109	88
7:30-8:00	128	110	74

### **3 Analysis and Results**

Different types of data were collected for different types of methods. The methods used are traffic volume survey, spot-speed and moving car observer method and data is collected and analyzed to get the desired results. Following are the results obtained.

#### ***3.1 Data Analysis for Parking Space Inventory***

From the observation comparing the average number of vehicles parked per day and the existing capacity of study area parking turnover was found to be

For working day parking turn over = parking volume / number of bays available for parking.

For working days =  $793 / 980 \times 100 = 80.91\%$

For Saturday =  $868 / 980 \times 100 = 88.57\%$

For Sunday =  $756 / 980 \times 100 = 77.14\%$

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*Table 3 Data analysis for parking space inventory*

Average Vehicles Parked Per day				
Sl no	Road	Days		
		Working days	Saturday	Sunday
1	Station Road	277	314	278
2	Old bus stand Road	160	195	159
3	Nam-Joshi Road	240	240	278
4	Javali Bazar Road	116	119	101
	Total	793	868	816

**3.1 Data Analysis for Parking accumulation curve**

The data collected in survey by patrol was manually analyzed separately for each stretch and the following observations were made.

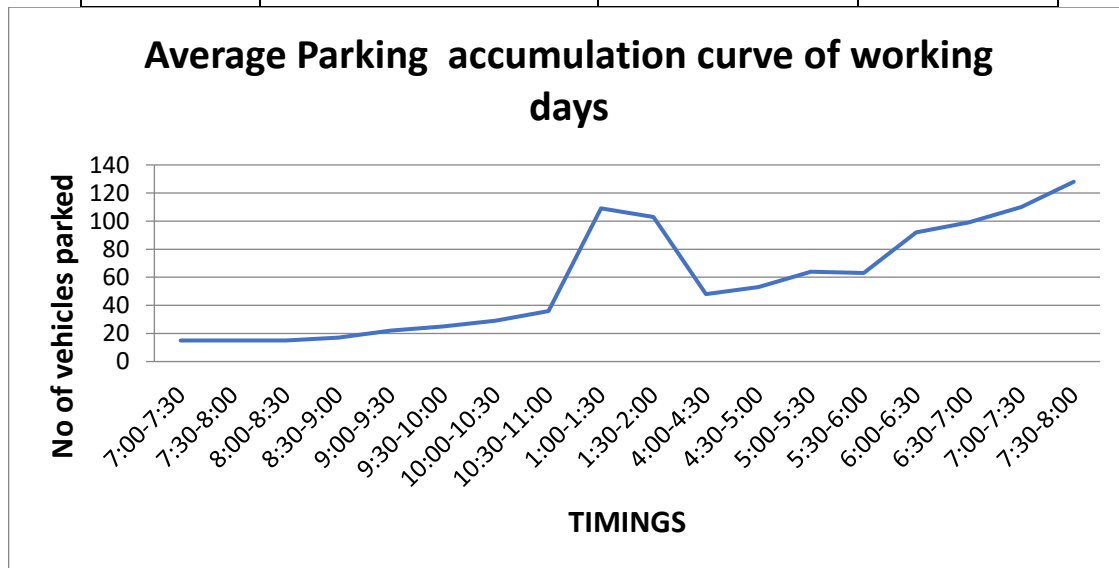
The parking accumulation curves for the selected stretches in the study area i.e., Javali bazaar, Nam-joshi, old bus stand, and station roads are shown and explained in table number 4 and 5 & figure number 3,4,5,6,7,8,9,10,11,12,13 and 14 respectively.

*Table 4 Average no of vehicles parked at Javali bazaar street*

Timing	Average no of vehicles parked at JAVALI BAZAR ROAD		
	WORKING DAYS	SATURDAY	SUNDAY
7:00-7:30	15	13	18
7:30-8:00	15	15	22
8:00-8:30	15	12	24
8:30-9:00	17	12	27
9:00-9:30	22	18	34
9:30-10:00	25	18	31
10:00-10:30	29	27	34
10:30-11:00	36	38	31

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1:00-1:30	109	137	89
1:30-2:00	103	134	114
4:00-4:30	48	70	54
4:30-5:00	53	75	53
5:00-5:30	64	69	50
5:30-6:00	63	62	53
6:00-6:30	92	75	64
6:30-7:00	99	75	46
7:00-7:30	110	109	88
7:30-8:00	128	110	74



*Figure -3 parking accumulation curve for javali Bazar Street on working days*

This is parking accumulation curve of Javali Bazaar Street of working day is seen in above chart in this the maximum accumulation is observed at 7:30-8:00pm of 128 number of vehicles



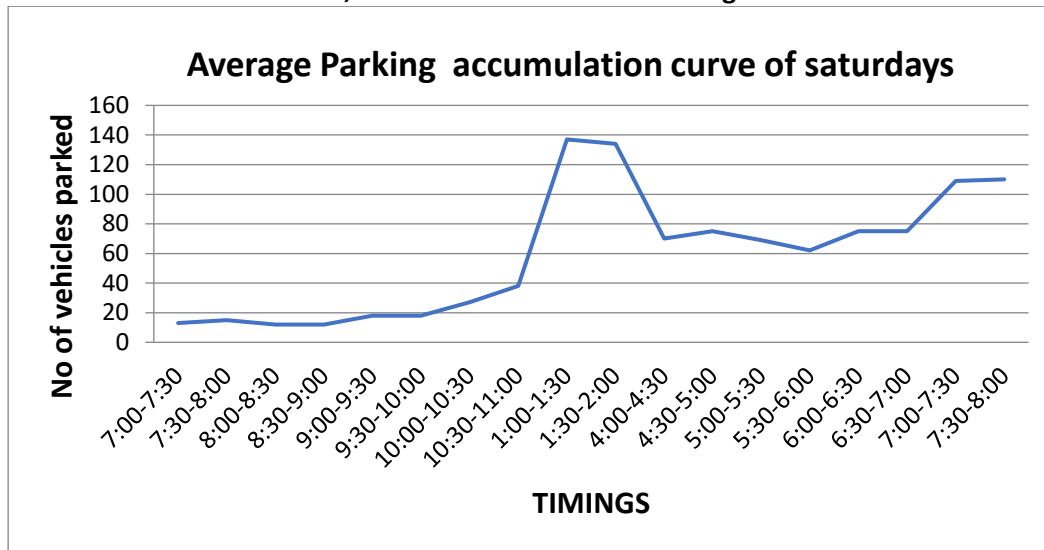


Figure -4 parking accumulation curve for javali Bazar Street on Saturday

This is parking accumulation curve of Javali Bazaar Street of Saturday is seen in above chart in this the maximum accumulation is observed at 1:00-1:30 of 137 number of vehicles

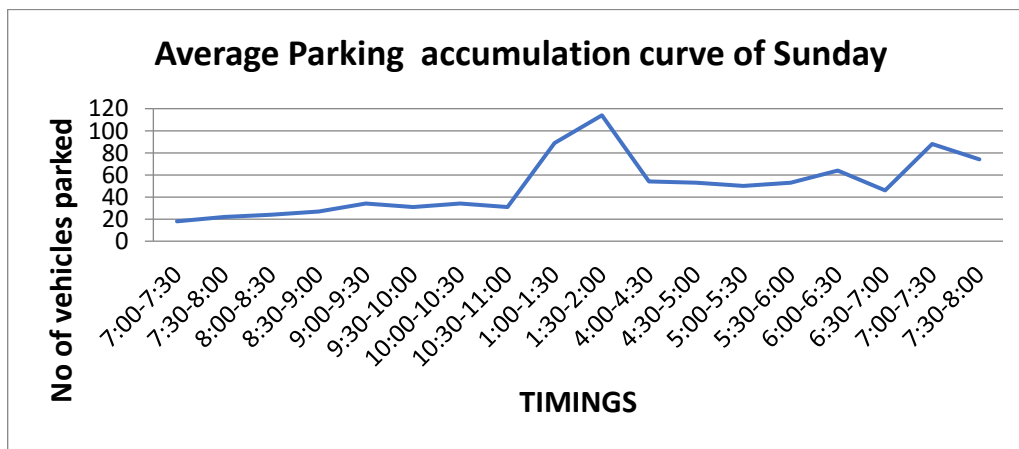


Figure -5 parking accumulation curve for javali Bazar Street on Sunday

This is parking accumulation curve of Javali Bazaar road of Sunday is seen in above chart in this the maximum accumulation is observed at 1:30-2:00 of 114 number of vehicles



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*Table 5 Average no of vehicles parked at Station road*

Timing	Average no of vehicles parked at STATION ROAD		
	WORKING DAYS	SATURDAY	SUNDAY
7:00-7:30	13	11	12
7:30-8:00	14	11	16
8:00-8:30	18	18	21
8:30-9:00	23	27	22
9:00-9:30	28	43	32
9:30-10:00	42	49	37
10:00-10:30	102	95	96
10:30-11:00	137	134	111
1:00-1:30	158	308	250
1:30-2:00	161	358	235
4:00-4:30	184	181	124
4:30-5:00	200	188	134
5:00-5:30	219	163	198
5:30-6:00	229	166	209
6:00-6:30	224	249	250
6:30-7:00	224	274	258
7:00-7:30	255	266	285
7:30-8:00	264	290	306



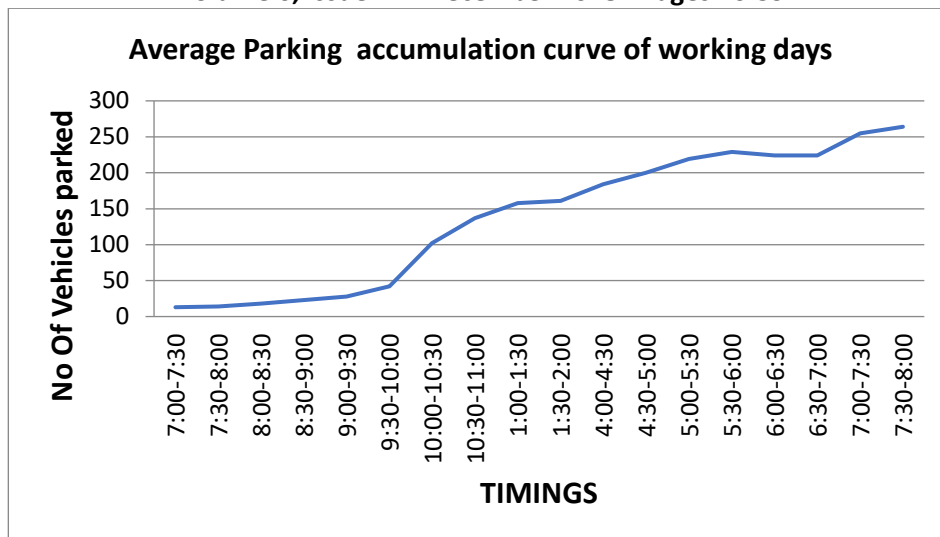


Figure -6 Parking Accumulation curve of station road on working days

This is parking accumulation curve of Station road of working day is seen in above chart in this the maximum accumulation is observed at 7:30-8:00pm of 264 number of vehicles

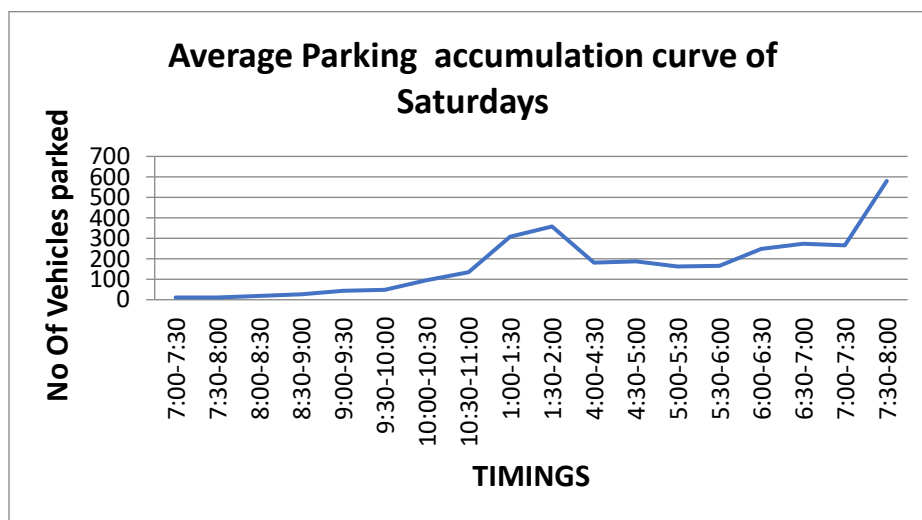


Figure -7 Parking Accumulation curve of station road on Saturday

This is parking accumulation curve of Station road of Saturday is seen in above chart in this the maximum accumulation is observed at 7:30-8:00pm of 580 number of vehicles

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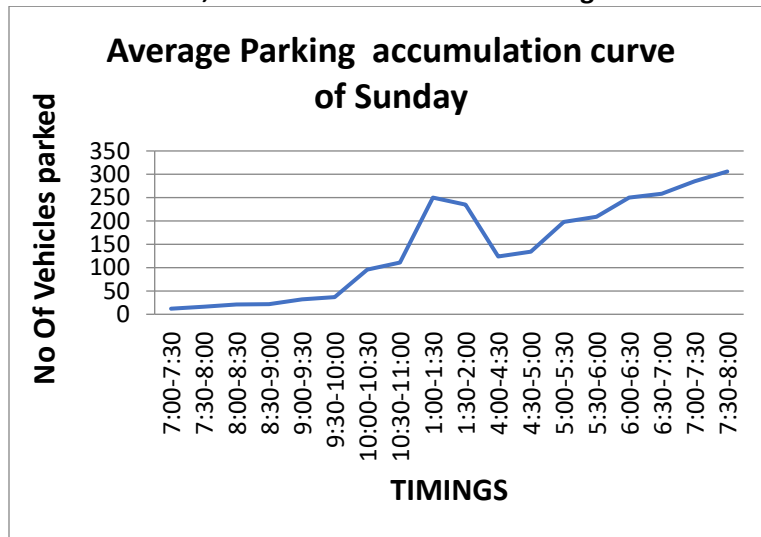


Figure -8 Parking Accumulation curve of station road on Sunday

This is parking accumulation curve of Station road of Sunday is seen in above chart in this the maximum accumulation is observed at 7:30-8:00pm of 306 number of vehicles

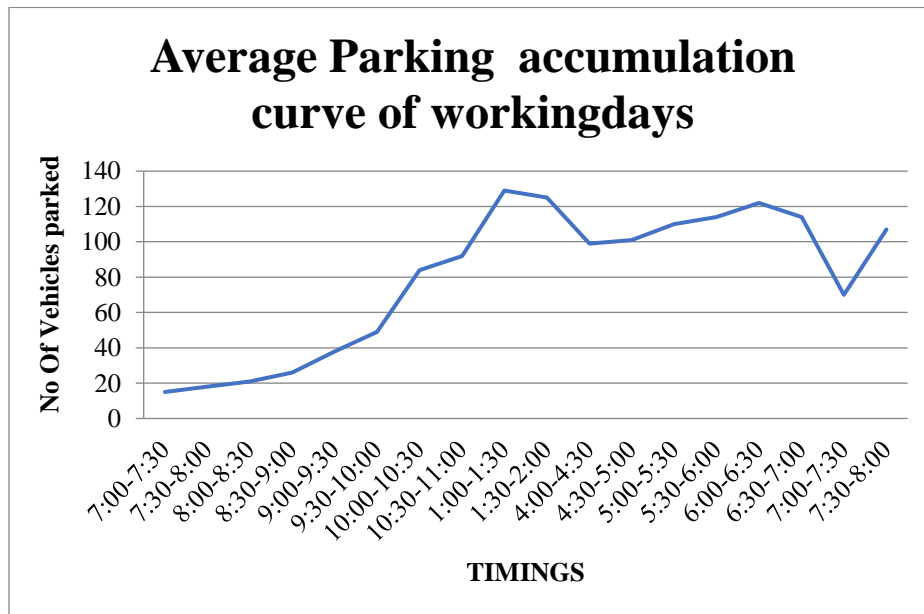


Figure -9 Parking Accumulation curve of Old bus stand Road on working days

This is parking accumulation curve of Old bus stand road of working day is seen in above chart in this the maximum accumulation is observed at 1:00-1:30pm of 129 number of vehicles

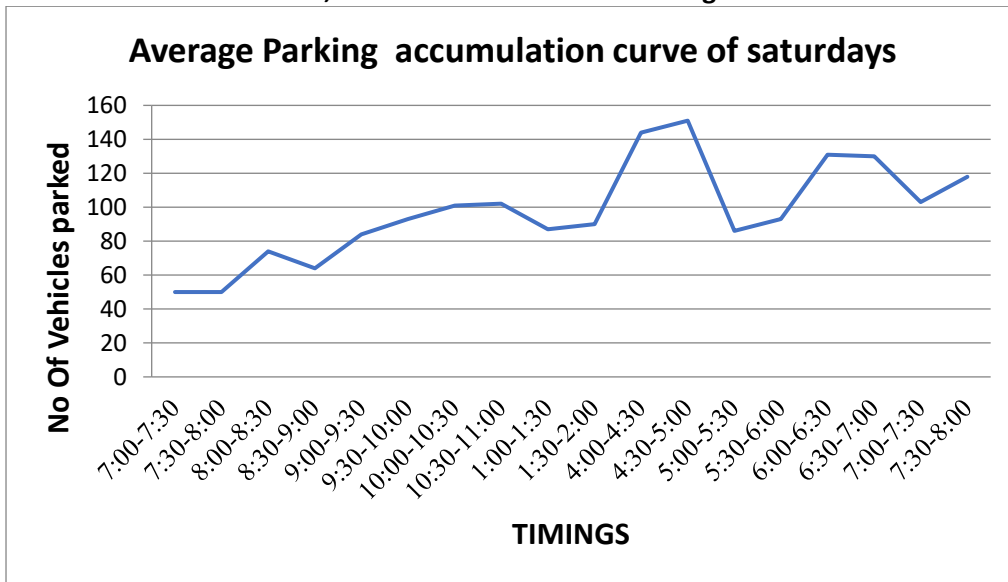


Figure -10 Parking Accumulation curve of Old bus stand road on Saturday

This is parking accumulation curve of Old bus stand road of Saturday is seen in above chart in this the maximum accumulation is observed at 4:30-5:00pm of 151 number of vehicles

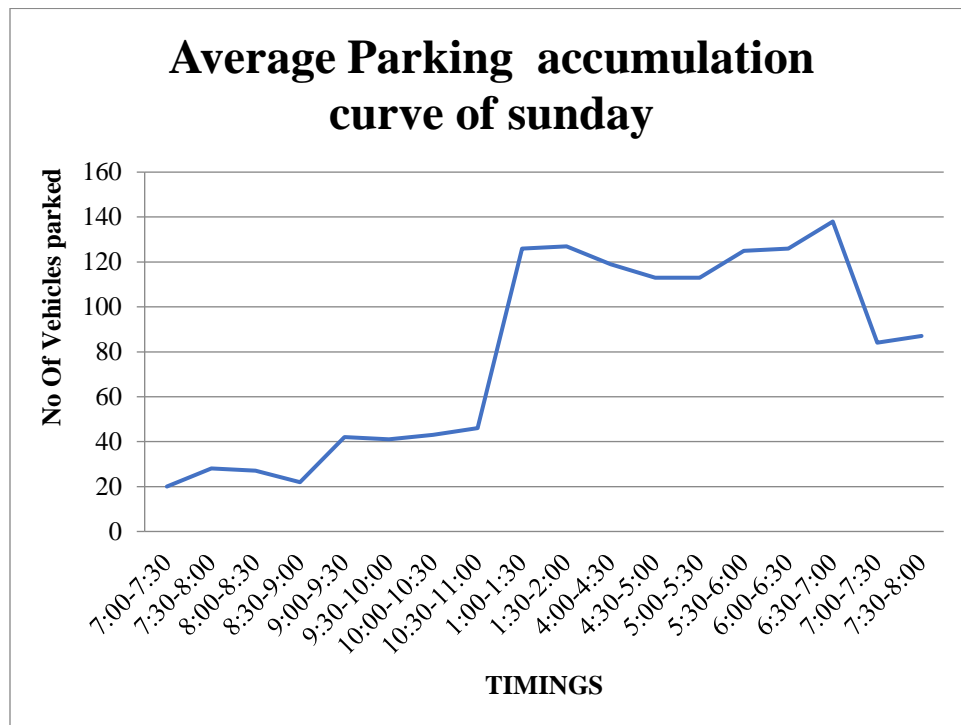


Figure 11 Parking Accumulation curve of Old bus stand road on Sunday

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This is parking accumulation curve of Old bus stand road of Sunday is seen in above chart in this the maximum accumulation is observed at 6:30-7:00pm of 138 number of vehicles

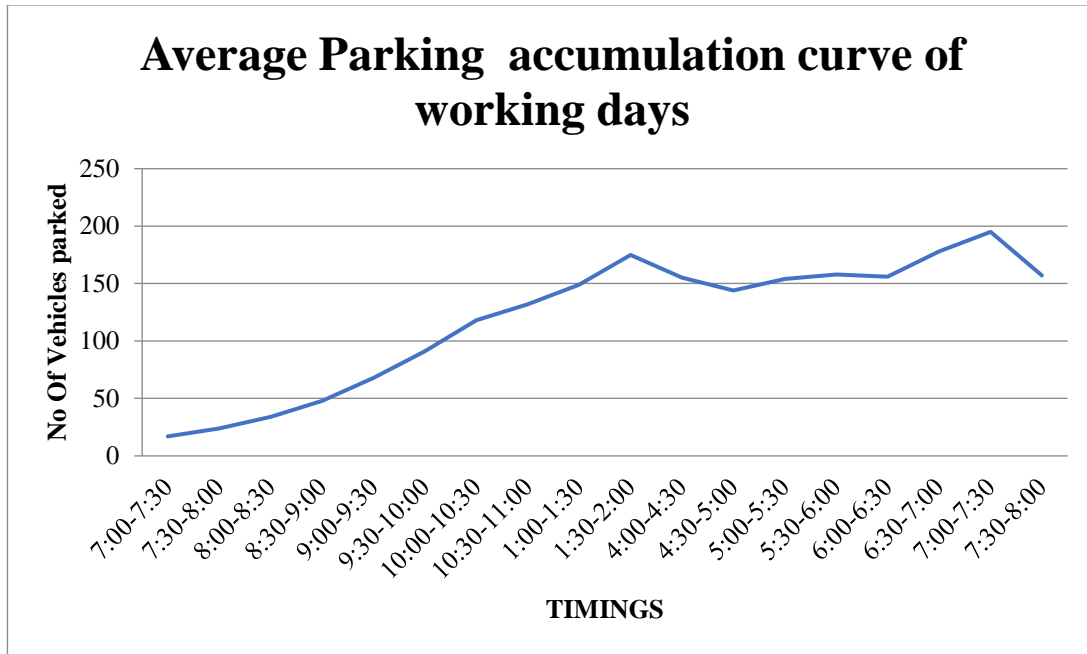


Figure 12 Parking Accumulation curve of Nam-joshi road on working days

This is parking accumulation curve of Nam-Joshi road of working day is seen in above chart in this the maximum accumulation is observed at 7:00-7:30pm of 157 number of vehicles

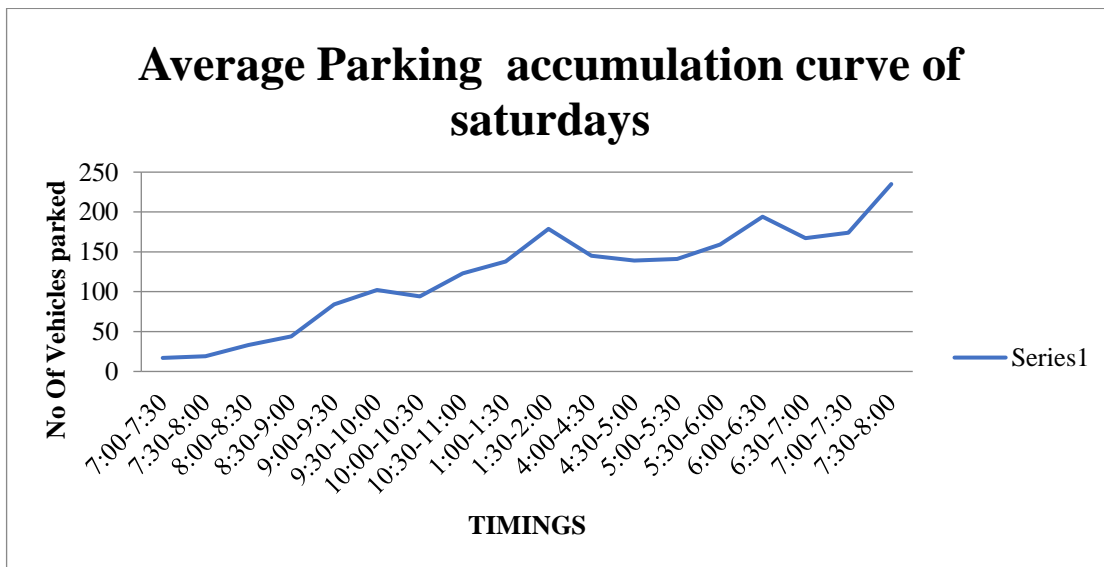


Figure 13 Parking Accumulation curve of Nam-joshi road on Saturday

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This is parking accumulation curve of Nam-Joshi road of Saturday is seen in above chart in this the maximum accumulation is observed at 7:30-8:00pm of 235 number of vehicles

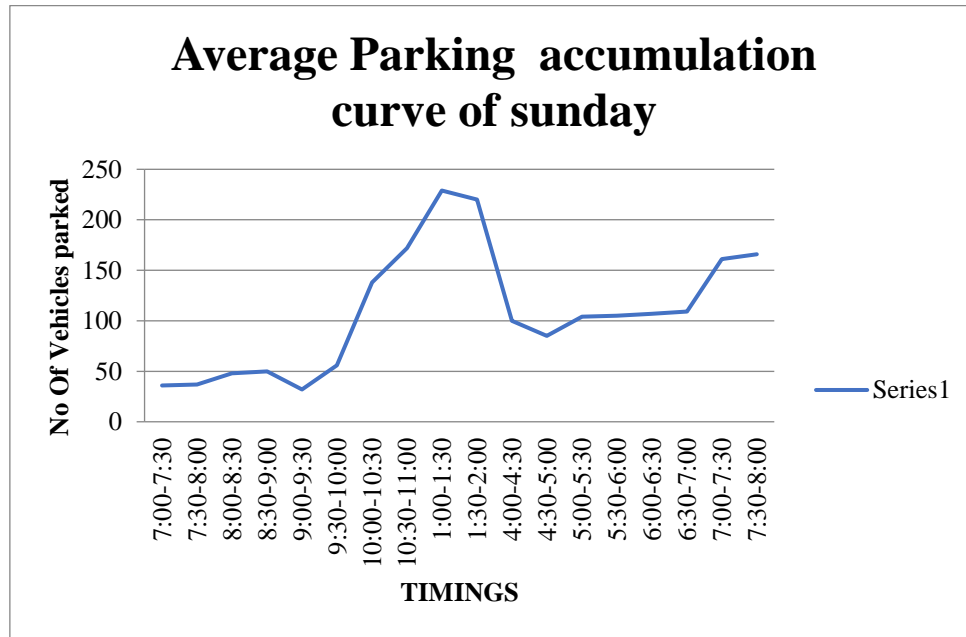


Figure 14 Parking Accumulation curve of Nam-joshi road on Sunday

This is parking accumulation curve of Nam-Joshi road of Sunday is seen in above chart in this the maximum accumulation is observed at 1:00-1:30pm of 229 number of vehicles

**4 Conclusions**

Study of parking facilities are very complex process as it has to undergo numerous collection of data and analysis for the same. After thorough observation of data analyzed following conclusions were made.

1. From the observation it was evident that the station road in the study area has the maximum number of vehicles parked per hour during peak hour i.e., 1060 vehicles per hour on Saturday. Similarly on working day it was found to be 528 vehicles per hour and on Sunday it was 612 vehicles per hour.



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2. It is concluded from parking analysis throughout the survey the maximum percentage of vehicles parked in the study area are found to be short term parkers. i.e whose number of times seen throughout the survey seems to be between 1 to 3.
3. From the parking space inventory study we conclude that parking accommodation seems to be critical in the study area i.e parking turn over on working day, Saturday, and Sunday was found to be 80.91%, 88.57% and 77.14% respectively.
4. At last we conclude that the existing condition the parking in the study area is neither adequate nor inadequate but seems to be critical.
5. Since Gadag is one of the major city in north Karnataka and as it is observed from the past studies that the traffic is growing day by day and so are the issues related with parking a proper preventive measures has to be taken by the local government bodies.

## 5 References

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