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Simulation Of On-Street Parking Under Heterogeneous Urban Traffic Scenarios

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Abstract - *On-street Parking is one of the problems for urban traffic flow. The ill-effects caused by parking are congestion, accidents, obstruction to firefighting operations, environment. On-street parking is one of the key causes for congestion. This project reports on a study on impacts of on-street parking in traffic flow. The study was carried out in Tiruppur. The area of Tiruppur city is 159.6 sq.km and the population is 8,77,778. This data mainly focuses on the city and not the whole Tiruppur districts area. Two sites were selected for study, on relatively busy roads serving retail and business activities. Avinashi- Tiruppur road and PN road was taken. The distance covered is 500m. The survey was done on Tuesday, Thursday and Saturday i.e. two-week days and a day in week end. The survey was conducted for 1hr 15minutes (9.00 am - 10.15 am) in Tuesday, Thursday and 5.00 pm – 6.15 pm in Saturday. The inflow and outflow data of traffic was received from videos taken using video cameras. The surveyed was conducted 3 times for each road on different days and also the data of vehicle parked are taken manually. The data such as vehicle type and entering time was extracted from video using Manual Count Made Easy speech recognition software developed at IIT Madras. A microscopic simulation program PTV-Vissim is a multimodel simulation software which is used in this project. With the help of it, the roads were created and traffic flow was simulated. Hence the importance and possibility of simulating a real-world field traffic has been shown with a collected data.*

Key Words: PTV VISSIM, Simulation, MCME Wiedemann model, Speech recognition

1.INTRODUCTION

Parking is one of the serious problems that is to be faced by the traffic engineer and urban planner. Before any action is taken for the betterment, the surrounding conditions s should be formulated. The basic data such as availability of parking space, its usage and parking demand are very essential. If the system is implemented it will also be necessary to know how much to charge for parking and the effect of pricing policy. Parking survey is meant to supply all kinds of information such as the growth in population of motor vehicles, parking problems with serious proportions. A systematic study of parking demand, parking characteristics and regulatory measures that are possible for controlling provides a great help to the traffic engineers as well as town planners. A survey was carried out in India and it is roughly estimated, that in a year in which 8760 hours the car runs for an average for only 400 hours leaving 8360 hours when it is parked. The concentration of human activities is increased on limited land, both in terms of commercial activity and residential activity causes the parking problem. Every vehicle owner would wish to park the vehicle as closely as possible to his destination so as to reduce his/her walking distance. The result is great demand for parking space in central business district and activities concentrated areas. Transportation management and planning has played an important role in urban planning. The paper discusses the use of virtual reality (VR) technique in traffic simulation to communicate design alternatives to decision makers and public audiences. Thus, to support the decision-making process. The study documents the application of PTV-VISSIM a microscopic simulation model, MCME.

Cliftonville parking survey report [6] - The parking survey was conducted within the Cliftonville West ward and comprised twenty-three 'sections'. These included whole roads, sections of roads and two public car parks. The aim of the survey was to provide a 'snapshot' of the parking situation within the designated area. In order to draw comparisons and increase the validity of the findings, the area was surveyed on three separate occasions, one weekday morning (10am), one weekday evening (6pm) and one weekend morning (Saturday 10am).

A. J. Aderamo and K. A. Salau [7] did a study in which they examined the pattern and problems of on-street and off-street parking in Ilorin and the factors contributing to them. Parking demand models have been built for estimating on-street parking and off-street demands of selected streets and parking facilities in Ilorin. This will go a long way in assessing the parking needs of the different parts of the city. Further, it is recommended that a more effective traffic management system should be evolved for Ilorin. With the high rate of growth of Ilorin, traffic and parking problems should not be left until they attain the level of larger urban centers in Nigeria

Jin Cao, Nikias Vasileios and Monica Menendez [8] conducted a study on on-street parking near the intersections and their effect on traffic. In that paper, they try to define a minimum distance from the intersection to the parking area, so the traffic delay caused by parking manoeuvres will be minimized without reducing the parking done in the street.

Sahan Wijayaratna [9] carried out a study on the impacts of on-street parking on the capacity of road. The survey done on the field are utilized to measure the time taken to complete manoeuvres of parking and the resulting queues that occurred on the metropolitan roads in Sydney. The study utilizes field surveys to measure the time taken to complete parking manoeuvres and the resulting queues that occur on metropolitan roads in Sydney. The results of the study are that there is greater reduction in capacity of the lane which is adjacent to the parking lane. Here the restricted time of an on-street parking zone is short.

Dr. Jalal Abdul Jabbar [10] carried out a survey for urban traffic management. The study mainly deals about to provide high efficiency in on-street parking controls which is key to traffic management.

Olorunfemi Samuel Oluwaseyi, Olowosegun Adebola, Koffi Ayadu Edwin, Okoko Eno. E and Mobolaji [11] conducted a survey in Lokoja, Nigeria about traffic problems due to on-street parking. The study was conducted using field observations and questionnaire to collect data were traffic congestion and on-street parking is prominent. The results were that ineffectiveness of traffic devices, inadequate parking, offloading bays and not proper loading i.e. absences of loading etc. caused traffic congestions and on-street parking in that region.

City of Cambridge [12] - The Cambridge Core Areas Parking Master Plan Study was conducted. The study needed two basic data, the parking demand and parking supply. The team surveyed the needed components. All the off-street parking and on-street parking was inventoried. The parking supply inventory for off-street parking. The survey conducted for every hour during the weekdays from 6:00 AM to 12:00 AM i.e. 18-hours per day and during Saturday from 10:00 AM to 7:00 PM i.e. 9-hours per day.

Charles Peprah, Charles Y. Oduro and Kafui Afi Ocloo [13] carried out a survey in Kumasi metropolis on pedestrian safety and on-street parking based on the issues of culture and attitude. These factors cause danger to pedestrian safety, congestion and inconvenience to many other issues. In the light of culture and attitude the factors restrict the pedestrian safety on road and on-street parking, It came to light that the practices of some commercial operators and motorists with systematic and purposive sampling techniques, impede the safety of pedestrians and flow of vehicles.

2. SITE OVERVIEW

Tiruppur was constituted as Municipality during the year 1947. It was upgraded as Special Grade Municipality during 1983 and upgraded as Corporation from 1.1.2008. The total area of the Municipality is 27.19 Sq. Km with 52 wards. Total population as per 2001 census is 3,51,501 the floating population of the town an average 1,50,000, 85% of the people commute in their own vehicle which creates more and more parking problems in the main areas.

2.1 SITE VISITED

- Kumaran Road.
- P.N Road.
- Avinashi Road (Pushpa).
- Avinashi Road (S.A.P Theatre)

2.2 SITE CHOSEN

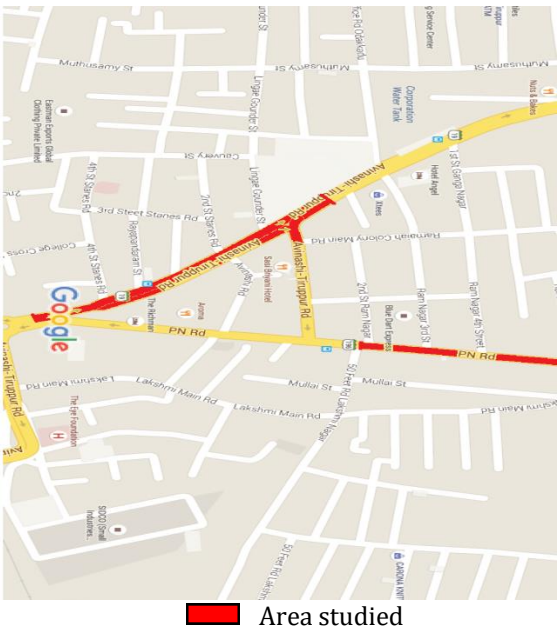

Fig – 1: Map of area studied

2.2.1 P.N ROAD

It is a major road. During peak hours there is high traffic in the road. There is no street parking allotment in the road. The carriage way width is 3.5m. Both parallel and perpendicular type of parkings can be provided.

Fig – 2: Parking at PN Road

2.2.2 PUSHPA ROAD

It is an one way road. It consists of two number of outlets. There is no parking at junction. Both type of parking can be provided. It is the most crowded area.

3.SOFTWARE BACKGROUND

The calibration of microscopic traffic simulation models is an area of intense study; however additional research is needed into how to select which parameters to calibrate. In this project a procedure was designed to eliminate the parameters unnecessary for calibration and select those which should be examined for a VISSIM model. Before using the VISSIM the count of the vehicle is made easily by using Manual Count Made Easy(MCME).

3.1 MANUAL COUNT MADE EASY(MCME)

Data extraction from video has always been a tedious task for transportation engineers. Manual Count Made Easy (MCME) is a powerful tool that can be used for this purpose. It is a graphical user interface which works on the principle of speech recognition. It makes data extraction simpler and easier. Classified vehicle count can be obtained more easily and with greater accuracy with the use of MCME. It is developed in the programming language C SHARP(C#). Another major advantage with this application is that it is portable.

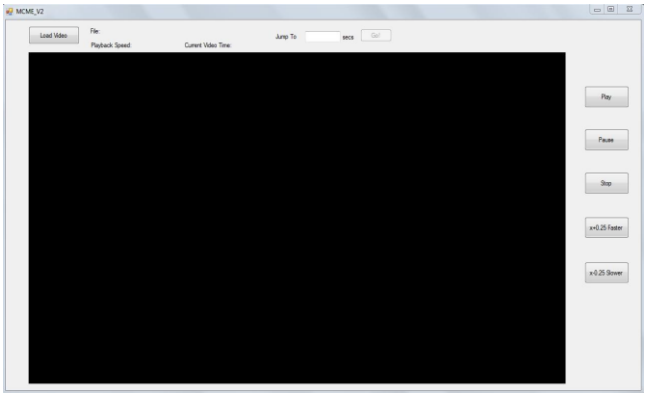

Fig – 3: MCME V2 Interface

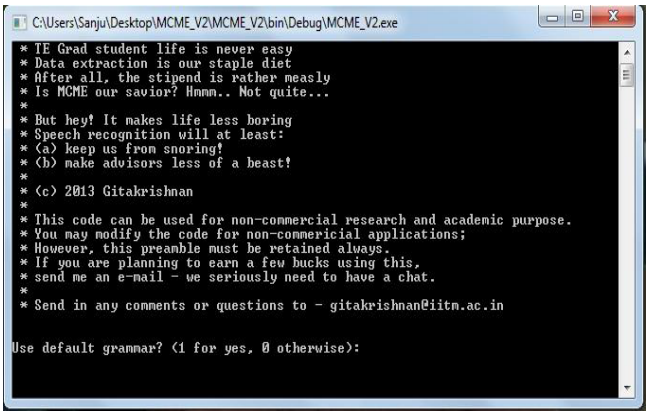

Fig – 4: Speech Recognition

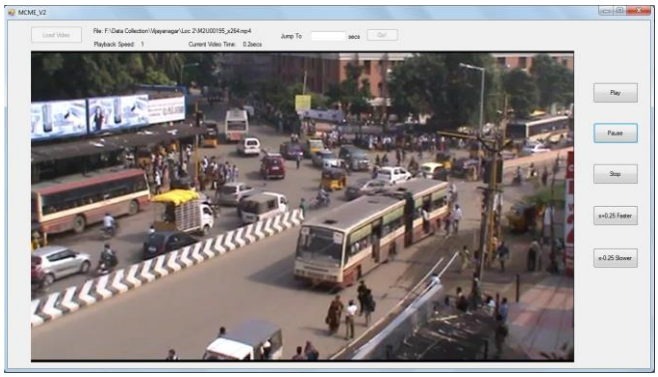

Fig – 5: MCME V2 Video

3.2 VISSIM

PTV Vissim 8.0 is the leading microscopic simulation program for modelling multimodal transport operations and belongs to the Vision Traffic Suite software. Realistic and accurate in every detail, Vissim creates the best conditions for you to test different traffic scenarios before their realization. Vissim is now being used worldwide by the public sector, consulting firms and universities. In addition to the simulation of vehicles by default, you can also use Vissim to perform simulations of pedestrians based on the Wiedemann model.

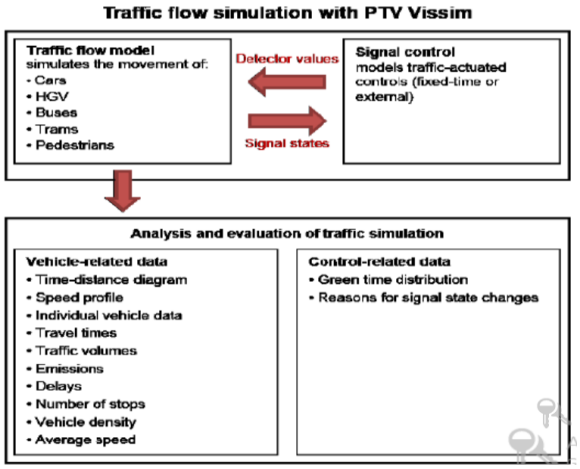

Fig – 6: Traffic flow simulation

4.METHODOLOGY

4.1 PROBLEM DEFINITION

In this study an effort was made to reduce the parking problem in some main areas of Tiruppur city during the peak hours in the morning and in the evening using simulation. Since parking varies with time in each area, respective space and type of vehicle has also been recorded. Total number of vehicles were also recorded during the study.

4.2 TRIAL DATA COLLECTION

First, the trial of data collection was done in the selected sites. It was done for 15 minutes in the form of video at sites entry point and exit point at the same time.

4.3 FINAL DATA COLLECTION

Data were collected with help of taken video. The videos were taken during morning (9.00 am to 10.15 am) and during evening (5.00 pm to 6.15 pm) and with those videos, type of vehicles and their counts were calculated. The two sites video (PN road, Pushpa road) were taken during weekdays and Saturday. The vehicle which parked between the inlet and outlet of sites were noted manually. Data were tabulated for convenient.

The following parameters like

- Total vehicle volume per hour.
- Percentage of vehicle crossing.
- Vehicle composition.
- Type of vehicles crossing the area during the study.
- Inlet and outlet time of the vehicle were recorded in order to have a brief study of parking in Tiruppur city.

4.4 DATA COLLECTION

From the video, inlet and outlet were taken from Pushpa road and PN road. Then the number of vehicles and types of vehicles were calculated. Number of vehicles parked in the road were calculated manually.

4.5 DATA EXTRACTION

Data's were extracted by using MCME and PTV VISSIM software's. In MCME software the video that was taken at entry and exit of the site was allowed to run separately. While the video is playing the default words such as

- Dough – Two-wheeler
- Teen – Three-wheeler
- Fore – Four-wheeler
- Mid – Light commercial vehicles
- High – Heavy motor vehicles

Should be said manually and the speech will be recognised. the type of the vehicle with its entry time for the video taken at entry of the site and similarly for video taken at exit of the site. The time of passage of vehicle and its type will be collected in a form of file.

4.6 SIMULATION ANALYSIS

The network trace was the survey is carried out is drawn and the parking is provided. The extracted data using MCME software are entered in the software and simulated.

5.DATA EXTRACTION AND ANALYSIS

5.1 DATA EXTRACTION WITH MANUAL COUNT MADE EASY (MCME)

Manual Count Made Easy (MCME) is selected. Dual windows will open, in the first window the video is to be selected. When the video is selected, on the other window the voice recognition will start. To continue the data which had already presented is to be selected by entering 1 or changed by entering 0. Now the voice recognition starts, tell the type of vehicle entering the area by name provided for each type of vehicle and when the video is completed say "stop" the extraction of the data will be stopped. The data collected will be present in the notepad, then save the file using a name.

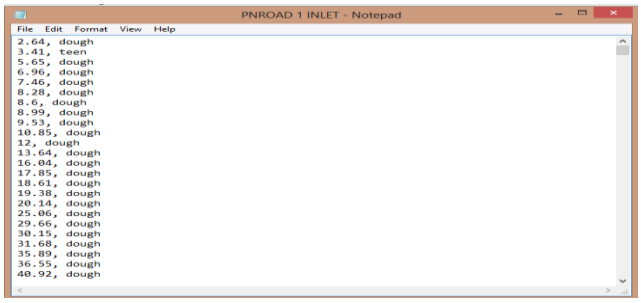

Fig – 7: P.N Road Inlet Data 1

5.2 PARKING DATA COLLECTION AT PUSHPA ROAD AND P.N ROAD

The data is collected from 9.00 am to 10.15 am in Avinashi Road (Pushpa Road) and P.N road. Parking data was collected manually, in which the type of vehicles, their parking time (entering time) and leaving time (exit time) is taken. Then the vehicles are classified according to the type separately and each vehicle parking time is calculated and average is taken separately.

Table – 1: Average number of vehicles parked at Pushpa road

LOCATION	TYPE OF VEHICLE	NUMBERS	PARKING TIME (MINUTES)
	BIKE	1	5
	BIKE	2	5
	BIKE	3	7
	BIKE	4	6
	BIKE	5	4
	BIKE	6	6

	BIKE	7	10
	BIKE	8	7
	BIKE	9	14
	BIKE	10	13
	BIKE	11	18
	BIKE	12	5
	BIKE	13	15
	BIKE	14	23
	BIKE	15	10
	BIKE	16	13
PUSHPA ROAD	BIKE	17	16
23.02.2016	BIKE	18	33
TUESDAY	BIKE	19	15
	BIKE	20	22
	BIKE	21	15
	BIKE	22	22
	BIKE	23	33
	BIKE	24	13
	BIKE	25	15
	BIKE	26	22
	BIKE	27	20
			AVG=14.185
	CAR	1	10
	CAR	2	9
	CAR	3	23
	CAR	4	1
	CAR	5	11
	CAR	6	12
	CAR	7	16
	CAR	8	25
	CAR	9	23
	CAR	10	21
	CAR	11	18
	CAR	12	15
			AVG=15.333
	VAN	1	11
	VAN	2	10
	VAN	3	7
	VAN	4	2
	VAN	5	10
			AVG=8.00
	LORRY	1	16
	LORRY	2	12
			AVG=14.00

Table – 2: Average number of vehicles parked at P.N road

LOCATION	TYPE OF VEHICLE	NUMBERS	PARKING TIME (MINUTES)
	BIKE	1	12
	BIKE	2	18
	BIKE	3	10
	BIKE	4	10
	BIKE	5	13
	BIKE	6	19
	BIKE	7	18
	BIKE	8	17
	BIKE	9	15
	BIKE	10	15
	BIKE	11	13
	BIKE	12	15
PN ROAD	BIKE	13	7
5.03.2016	BIKE	14	15
SATURDAY	BIKE	15	12
	BIKE	16	10
	BIKE	17	15
	BIKE	18	12
	BIKE	19	6
	BIKE	20	13
	BIKE	21	12
	BIKE	22	15
	BIKE	23	13
	BIKE	24	17
	BIKE	25	15
	BIKE	26	12
	BIKE	27	20
	BIKE	28	16
	BIKE	29	13
	BIKE	30	14
	BIKE	31	16
	BIKE	32	15
	BIKE	33	10
	BIKE	34	7
	BIKE	35	11
	BIKE	36	8
	BIKE	37	9
	BIKE	38	6
			AVG=14.184
	CAR	1	5
	CAR	2	16
	CAR	3	15
	CAR	4	33
	CAR	5	18
	CAR	6	10
	CAR	7	15
	CAR	8	9
	CAR	9	12
	CAR	10	12
	CAR	11	5
	CAR	12	5
	CAR	13	3
			AVG=12.153
	VAN	1	18
	VAN	2	15
	VAN	3	18

	VAN	4	12
	VAN	5	17
	VAN	6	9
	VAN	7	5
			AVG=13.428

5.3 EXTRACTION OF DATA

The data extracted using Manual Count Made Easy Software (MCME) is entered in the sheet. The total amount of vehicle is collected according to the vehicle classification given for every 60 seconds and the data's such as volume, vehicle composition is collected from it.

Table – 3: Volume and Composition of Vehicles at Pushpa road

Sec	Sec	BIKE	AUTO	CAR	LCV	HCV	TOTAL	VOLU-ME
0	60	25	4	16	8	1	54	3240
60	120	21	2	5	2	0	30	1800
120	180	29	2	3	3	1	38	2280
180	240	25	1	3	1	1	31	1860
240	300	20	1	11	3	2	37	2220
300	360	27	4	4	3	2	40	2400
360	420	49	0	6	1	1	57	3420
420	480	45	2	7	2	1	57	3420
480	540	36	3	13	2	4	58	3480
540	600	68	2	6	4	2	82	4920
600	660	18	0	6	1	0	25	1500
660	720	42	1	5	1	2	51	3060
720	780	28	2	3	0	1	34	2040
780	840	15	2	3	3	1	24	1440
840	900	32	0	3	1	0	36	2160
900	960	55	0	9	3	4	71	4260
960	1020	33	0	2	2	3	40	2400
1020	1080	54	0	7	3	4	68	4080
1080	1140	28	1	4	2	2	37	2220
1140	1200	34	3	11	5	5	58	3480
1200	1260	58	2	4	4	2	70	4200
1260	1320	30	0	9	2	2	43	2580
1320	1380	55	0	4	1	2	62	3720
1380	1440	37	1	3	1	3	45	2700
1440	1500	40	3	11	7	2	63	3780
1500	1560	29	3	10	3	2	47	2820
1560	1620	76	0	0	0	0	76	4560
1620	1680	55	0	0	0	0	55	3300
1680	1740	0	0	50	0	0	50	3000
1740	1800	0	0	58	0	0	58	3480
1800	1860	30	2	7	2	4	45	2700
1860	1920	54	1	6	3	3	67	4020
1920	1980	39	1	13	2	2	57	3420
1980	2040	59	3	12	5	1	80	4800
2040	2100	38	2	15	2	1	58	3480
2100	2160	44	1	5	2	5	57	3420
2160	2220	34	0	5	3	2	44	2640
2220	2280	47	0	8	1	3	59	3540
2280	2340	42	2	6	0	3	53	3180
2340	2400	40	1	4	2	2	49	2940
2400	2460	45	2	8	2	1	58	3480
2460	2520	45	3	8	1	3	60	3600
2520	2580	42	0	5	2	1	50	3000
2580	2640	32	1	4	2	1	40	2400
2640	2700	49	1	9	5	5	69	4140
2700	2760	28	1	9	1	2	41	2460
2760	2820	41	1	8	2	6	58	3480
2820	2880	31	3	2	2	4	42	2520
2880	2940	37	0	7	4	5	53	3180
2940	3000	35	0	4	3	2	44	2640
3000	3060	37	0	7	6	1	51	3060
3060	3120	23	1	6	3	1	34	2040
3120	3180	20	1	2	3	2	28	1680
3180	3240	28	2	4	3	1	38	2280
3240	3300	22	1	2	2	3	30	1800
3300	3360	37	1	8	3	2	51	3060
3360	3420	29	0	5	3	2	39	2340
3420	3480	21	0	9	1	2	33	1980
3480	3540	44	2	8	6	3	63	3780
3540	3600	48	1	11	5	5	70	4200
3600	3660	51	0	7	2	5	65	3900
3660	3720	43	0	15	4	3	65	3900
3720	3780	47	1	5	6	1	60	3600
3780	3840	45	1	9	3	2	60	3600
3840	3900	47	1	8	3	0	59	3540
3900	3960	38	3	8	3	6	58	3480
3960	4020	39	1	8	4	6	58	3480
4020	4080	42	0	11	7	3	63	3780
4080	4140	42	1	7	7	0	57	3420
4140	4200	47	1	11	0	0	59	3540
4200	4260	34	1	13	5	4	57	3420
4260	4320	44	0	8	4	3	59	3540
4320	4380	64	0	12	4	3	83	4980
4380	4440	33	2	4	7	3	49	2940
4440	4500	40	1	8	5	3	57	3420
	SUM	2841	86	617	213	170		
VEHICLE COMPOSITION							3927	
		0.723	0.022	0.157	0.054	0.043	1	

TABLE – 4: Time and Volume of vehicle

Time (s)	60	120	180	240	300	360	420	480	540	600
Volume of vehicle	54	30	38	31	37	40	37	57	57	58

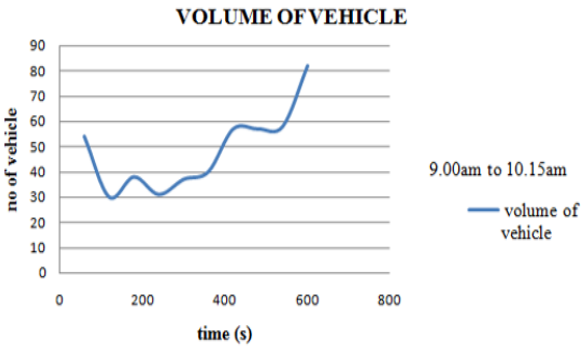

Fig – 8: Graph 1 between Vehicles and Time

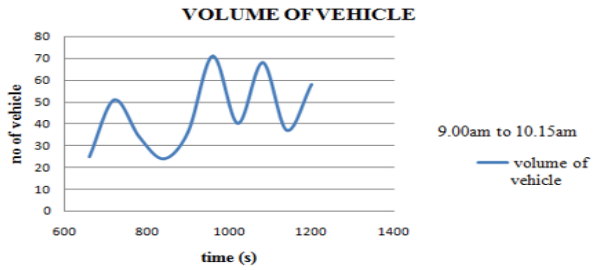

Fig – 9: Graph 2 between Vehicles and Time

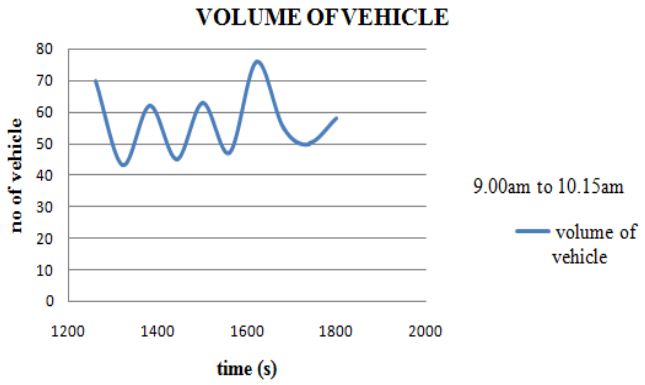

Fig – 10: Graph 3 between Vehicles and Time

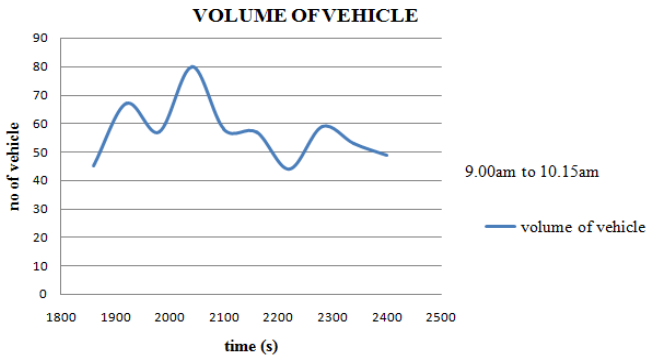

Fig – 11: Graph 4 between Vehicles and Time

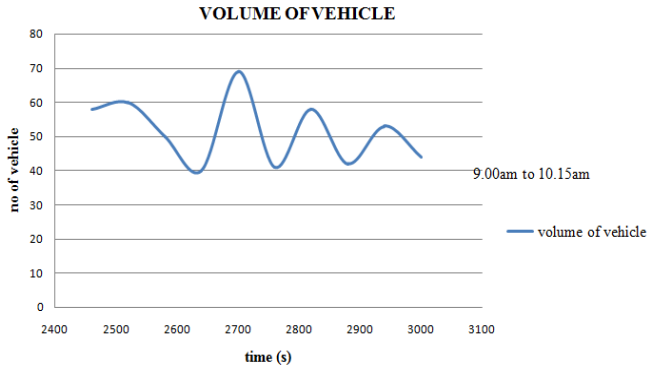

Fig – 12: Graph 5 between Vehicles and Time

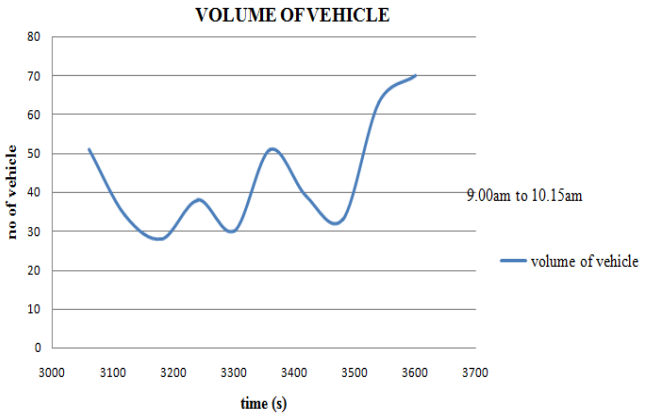

Fig – 13: Graph 6 between Vehicles and Time

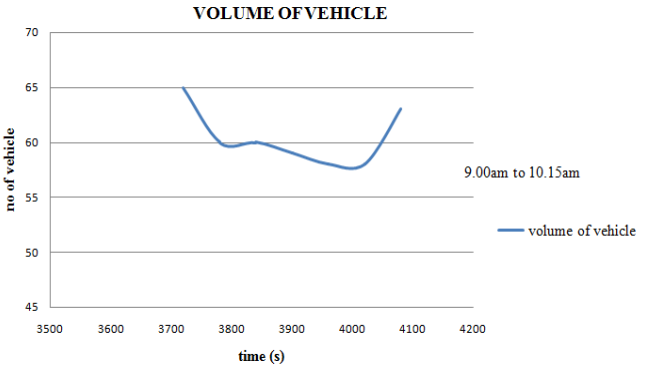

Fig – 14: Graph 7 between Vehicles and Time

Table – 5: Volume and Composition at P.N road

Sec	Sec	BIKE	AUTO	CAR	LCV	HCV	TOTAL	VOLUME
0	60	31	1	0	0	0	32	1920
60	120	54	0	2	1	0	57	3420
120	180	39	0	2	2	0	43	2580
180	240	24	1	3	1	2	31	1860
240	300	18	1	12	3	2	36	2160
300	360	14	1	4	1	2	22	1320
360	420	22	2	6	2	0	32	1920
420	480	27	1	10	5	3	46	2760
480	540	22	0	6	2	2	32	1920
540	600	28	0	6	4	3	41	2460
600	660	18	1	5	3	3	30	1800
660	720	40	0	3	2	2	47	2820
720	780	38	0	6	1	4	49	2940
780	840	18	1	5	5	1	30	1800
840	900	26	2	2	5	3	38	2280
900	960	29	0	3	0	2	34	2040
960	1020	19	1	7	5	2	34	2040
1020	1080	22	1	12	3	3	41	2460
1080	1140	25	0	8	4	4	41	2460
1140	1200	21	0	12	3	1	37	2220
1200	1260	30	1	6	4	1	42	2520
1260	1320	26	1	8	3	0	38	2280
1320	1380	29	0	5	8	3	45	2700
1380	1440	35	0	4	4	0	43	2580
1440	1500	21	1	7	9	1	39	2340
1500	1560	36	2	5	2	4	49	2940
1560	1620	29	1	3	2	2	37	2220
1620	1680	38	3	8	3	1	53	3180

1680	1740	40	0	2	1	0	43	2580
1740	1800	30	2	4	2	1	39	2340
1800	1860	40	4	6	4	2	56	3360
1860	1920	33	0	4	5	1	43	2580
1920	1980	32	1	4	0	0	37	2220
1980	2040	30	1	3	1	1	36	2160
2040	2100	30	0	3	3	1	37	2220
2100	2160	27	1	5	2	0	35	2100
2160	2220	33	1	1	1	2	38	2280
2220	2280	26	0	7	2	1	36	2160
2280	2340	33	2	6	5	3	49	2940
2340	2400	33	1	5	3	3	45	2700
2400	2460	35	1	4	2	1	43	2580
2460	2520	35	1	4	1	1	42	2520
2520	2580	28	1	3	3	2	37	2220
2580	2640	26	1	3	3	3	36	2160
2640	2700	35	0	3	4	2	44	2640
2700	2760	23	2	4	6	2	37	2220
2760	2820	17	0	0	3	2	22	1320
2820	2880	25	0	1	4	4	34	2040
2880	2940	25	1	3	4	2	35	2100
2940	3000	37	1	1	4	1	44	2640
3000	3060	31	1	4	1	1	38	2280
3060	3120	28	0	1	5	3	37	2220
3120	3180	26	1	5	4	3	39	2340
3180	3240	23	0	3	5	2	33	1980
3240	3300	30	1	4	4	4	43	2580
3300	3360	32	1	2	3	0	38	2280
3360	3420	28	0	5	6	2	41	2460
3420	3480	30	2	4	3	1	40	2400
3480	3540	30	1	2	5	2	40	2400
3540	3600	26	2	5	3	1	37	2220
3600	3660	28	1	2	4	2	37	2220
3660	3720	32	1	7	1	0	41	2460
3720	3780	23	0	2	3	2	30	1800
3780	3840	23	0	5	3	1	32	1920
3840	3900	25	1	4	2	1	33	1980
3900	3960	33	1	1	2	1	38	2280
3960	4020	34	1	0	2	2	39	2340
4020	4080	41	1	2	1	2	47	2820
4080	4140	33	1	1	5	2	42	2520
4140	**4200**	31	2	5	3	4	45	2700
4200	4260	38	0	5	7	0	50	3000
4260	4320	42	1	5	5	1	54	3240
4320	4380	38	0	5	5	3	51	3060
4380	4440	29	0	4	0	2	35	2100
4440	4500	29	11	9	5	5	59	3540
	SUM	2215	73	328	237	133		
	VEHICLE COMPOSITION						2986	
		0.742	0.024	0.110	0.079	0.045	1	

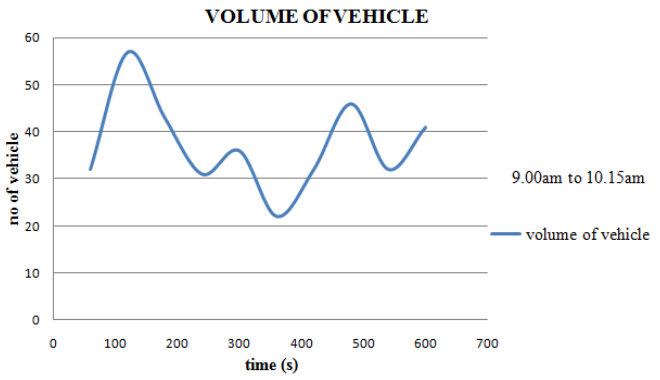

Fig – 15: Graph 1 between vehicles and time

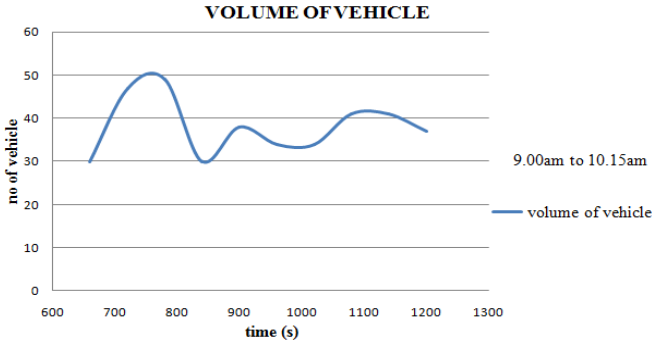

Fig - 16: Graph 2 between vehicles and time

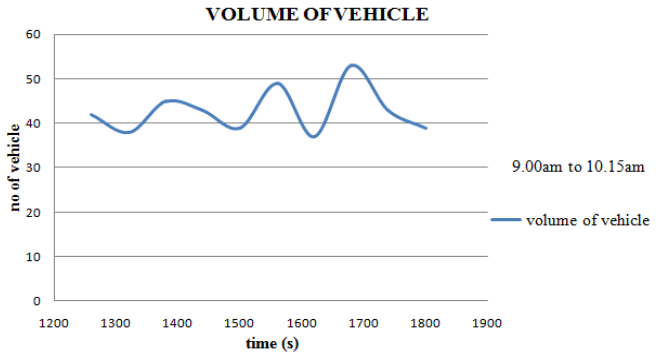

Fig – 17: Graph 3 between vehicles and time

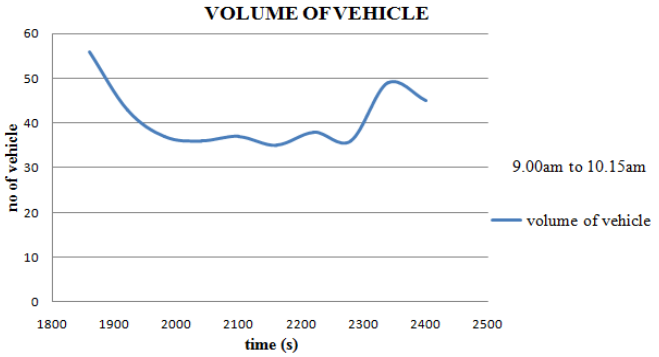

Fig – 18: Graph 4 between vehicles and time

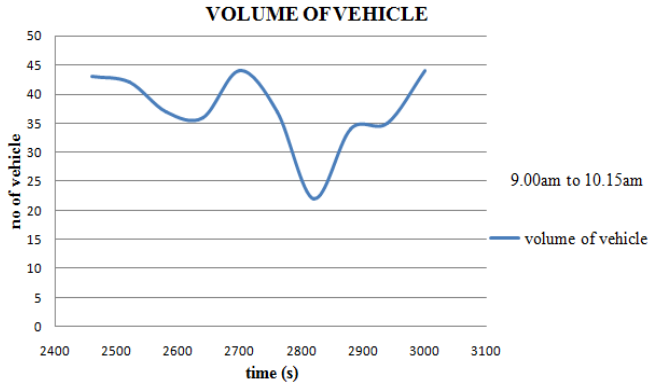

Fig – 19: Graph 5 between vehicles and time

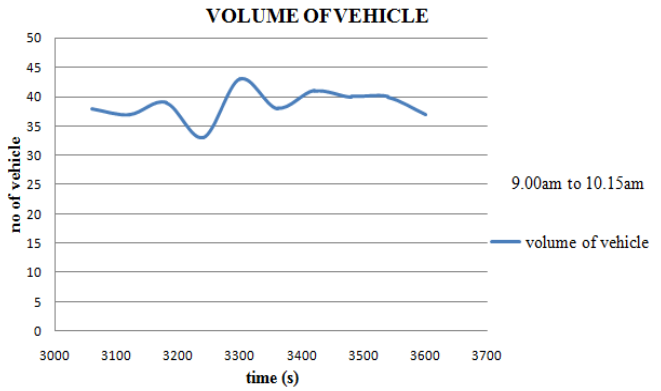

Fig – 20: Graph 6 between vehicles and time

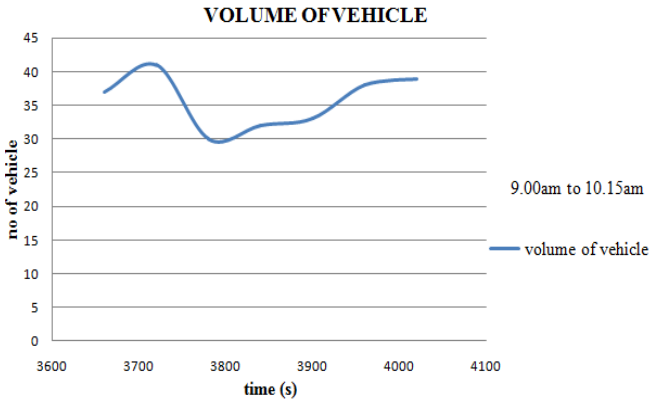

Fig - 21: Graph 7 between vehicles and time

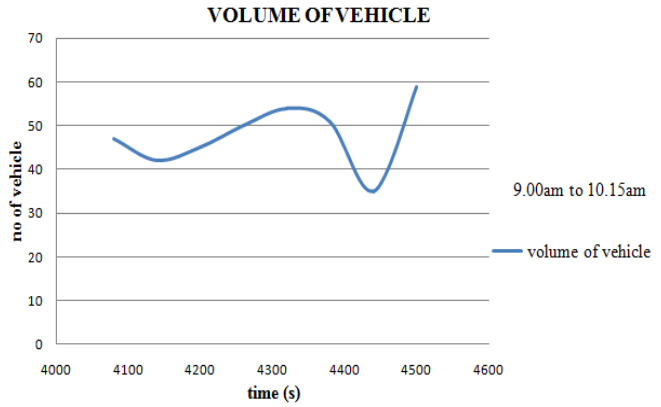

Fig – 22: Graph 8 between vehicles and time

6. SIMULATION

VISSIM makes it possible to present the simulation and evaluation results for different scenarios and planning cases indifferent easy to understand and thus convincing forms such as detailed reports, various versions and impressive 3D animated graphics – enabling also "nonprofessional's in traffic engineering" to make informed decisions.

6.1 SIMULATION ANALYSIS

Open the Vissim software and save a new network file. Simulation parameters should be defined. Selecting Background option in PTV VISSIM software. Window gets open. Open the images in window at the saved area. Then the image gets open as a background image to draw the network. Select the link option. Draw the network. Trace the particular network in which the survey to be carried out. Select the vehicle routes option. Right click on the network in the area where the inflow of the traffic starts. Drag the cursor from that point to the point where the data is to be calculated and select that point. Then create a separate lane for parking with needed width on left and right side of the carriage way and enter the type of vehicles, flowing speed and their parking time. Select the parking lot option and right click on the point in the lane and drag to the point needed. Select traffic option and click on vehicle composition. Enter the volume of vehicle for every 60 seconds. After providing all the details necessary, select the simulations option i.e, simulate the traffic flow.

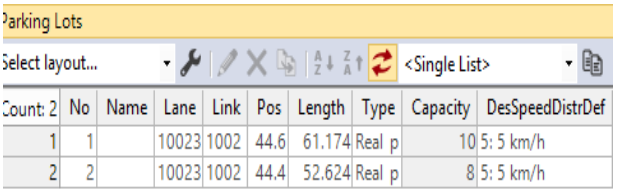

Fig - 23: Parking lots

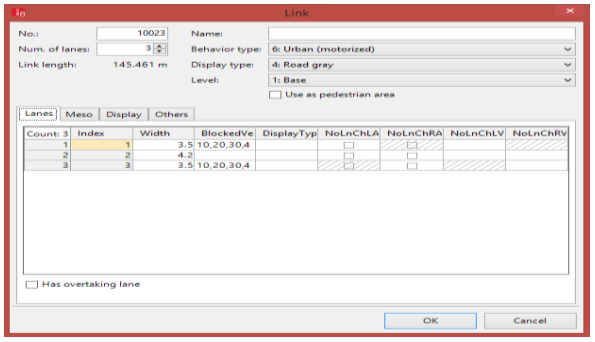

Fig – 24: Link

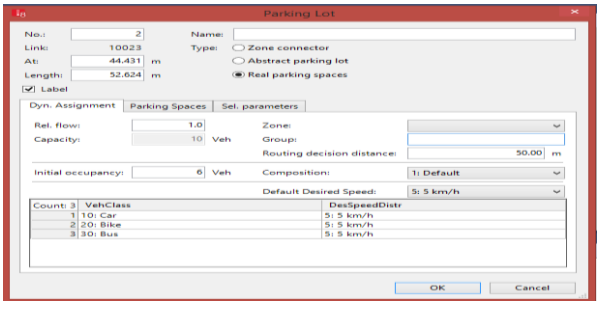

Fig - 25: Dynamic Assignment

Table – 6: Vehicle inputs/Vehicle volume by time interval

COUNT	NAME OF THE ROAD	LINK	TIME	VOLUME	VOLUME COMPOSITION
1	P.N	10023	0-60	3300	A
2	P.N	10023	60-120	1800	A
3	P.N	10023	120-180	2340	A
4	P.N	10023	180-240	1920	A
5	P.N	10023	240-300	2220	A
6	P.N	10023	300-360	1320	A
7	P.N	10023	360-420	1920	A
8	P.N	10023	420-480	2700	A
9	P.N	10023	480-540	1920	A
10	P.N	10023	540-600	2300	A
11	P.N	10023	600-660	1800	A
12	P.N	10023	660-720	2160	A
13	P.N	10023	720-780	2760	A
14	P.N	10023	780-840	1800	A
15	P.N	10023	840-900	2280	A
16	P.N	10023	900-960	2040	A
17	P.N	10023	960-1020	1980	A
18	P.N	10023	1020-1080	2460	A
19	P.N	10023	1080-1140	2460	A
20	P.N	10023	1140-1200	2220	A
21	P.N	10023	1200-1260	2880	A
22	P.N	10023	1260-1320	2580	A
23	P.N	10023	1320-1380	2220	A
24	P.N	10023	1380-1440	1740	A
25	P.N	10023	1440-1500	2520	A
26	P.N	10023	1500-1560	3120	A
27	P.N	10023	1560-1620	1980	A
28	P.N	10023	1620-1680	2160	A
29	P.N	10023	1680-1740	1920	A
30	P.N	10023	1740-1800	2700	A
31	P.N	10023	1800-1860	2340	A
32	P.N	10023	1860-1920	1980	A
33	P.N	10023	1920-1980	2220	A
34	P.N	10023	1980-2040	1860	A
35	P.N	10023	2040-2100	1980	A
36	P.N	10023	2100-2160	2400	A
37	P.N	10023	2160-2220	3000	A
38	P.N	10023	2220-2280	2160	A
39	P.N	10023	2280-2340	1260	A
40	P.N	10023	2340-2400	2940	A
41	P.N	10023	2400-2460	2220	A
42	P.N	10023	2460-2520	2280	A
43	P.N	10023	2520-2580	2160	A
44	P.N	10023	2580-2640	2160	A
45	P.N	10023	2640-2700	1380	A
46	P.N	10023	2700-2760	2530	A
47	P.N	10023	2760-2820	2220	A
48	P.N	10023	2820-2880	2880	A
49	P.N	10023	2880-2940	1740	A
50	P.N	10023	2940-3000	2220	A
51	P.N	10023	3000-3060	2340	A
52	P.N	10023	3060-3120	2040	A
53	P.N	10023	3120-3180	2040	A
54	P.N	10023	3180-3240	1680	A
55	P.N	10023	3240-3300	2520	A
56	P.N	10023	3300-3360	2400	A
57	P.N	10023	3360-3420	2520	A
58	P.N	10023	3420-3480	2220	A
59	P.N	10023	3480-3540	2160	A
60	P.N	10023	3540-3600	2460	A
61	P.N	10023	3600-3660	1880	A
62	P.N	10023	3660-3720	1920	A
63	P.N	10023	3720-3780	1980	A
64	P.N	10023	3780-3840	2100	A
65	P.N	10023	3840-3900	3360	A
66	P.N	10023	3900-3960	3780	A
67	P.N	10023	3960-4020	2760	A
68	P.N	10023	4020-4080	3000	A
69	P.N	10023	4080-4140	3120	A
70	P.N	10023	4140-4200	3120	A
71	P.N	10023	4200-4260	2220	A
72	P.N	10023	4260-4320	3780	A
73	P.N	10023	4320-4380	2880	A
74	P.N	10023	4380-4440	4740	A
75	P.N	10023	4440-4500	4140	A

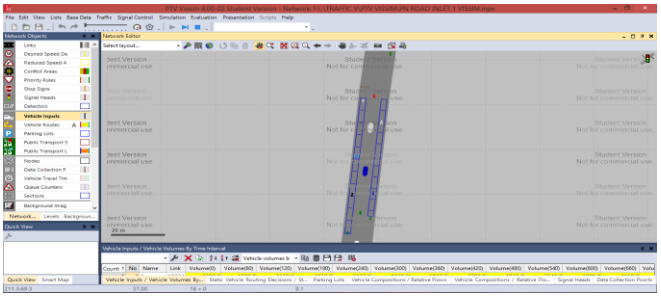

Fig – 26: P.N road layout in which vehicles are parked

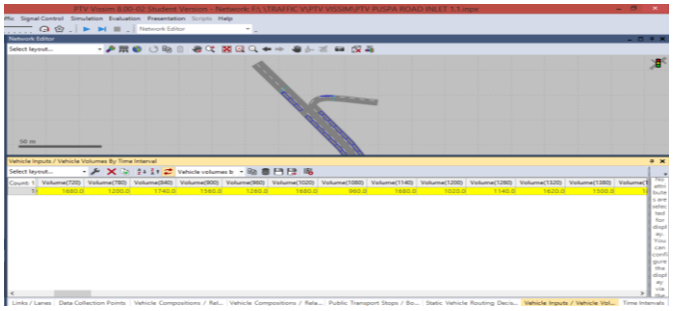

Fig – 27: Parking lots and vehicle composition

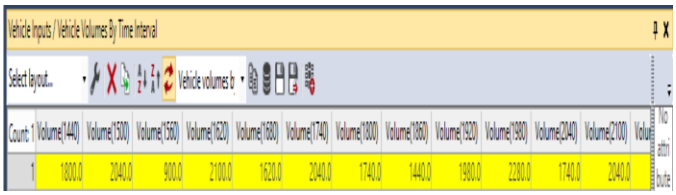

Fig – 28: Vehicle input/ Vehicle volume by interval 2

7.RESULT

With the data collected from the method mentioned above, the current on-street parking situation
has been simulated.

8.CONCLUSION

Thus, the parking study is completed by collecting data 3 times for 2 sites. Video recording is done for data collection which is more accurate and does not consume more time. Hence it reduces the manual errors in data collection and time consumption. This video file is converted in to text file

by using MCME V2(Manual Count Made Easy). The collected parking data is used for simulation. Simulation is the best way to give justification for this problem. It is the modern method of giving solution.

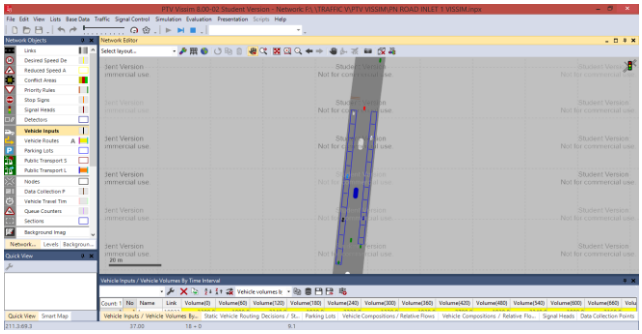

Fig – 29: On-street parking model

8.1 FUTURE SCOPE

Calibration and Validation are the future scope for this study. More rigorous calibration has to be done for default parameter for suitable real-world condition. Even though it is a German based software the parameters can be converted into Indian condition. Here the data for different days can be calculated. Validation is the result obtained from outflow should be equal to result obtained by simulation

ACKNOWLEDGEMENT

I express my deep sense of gratitude and heartfelt thanks to Mrs. P. Jenitta, M.Tech (Transportation Engineering), who is currently pursuing Doctor of Philosophy in Germany for her valuable guidance with constant encouragement, motivation and help from the beginning, finalizing the work and taking necessary corrections which triggered me to a great extent in completing the work successfully.

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