

4.6 Traffic and Transportation

4.6.1 Current situation

Vijayawada is well connected with most parts of the state and the country through roadways, railways and airways. It holds the distinction of being one of the major railway junctions in the state and is connected by the two National Highways - NH 5 connecting Chennai and Kolkata and NH 9. It can be said that no other city in Andhra Pradesh has such connectivity through the network of roads, rails and waterways. The non-transport demand in the city is largely met by the following criteria:

- Bus transport contributing to 17% of the travel demand (the only public transport mode)
- Para transit (3 seated auto rickshaws and cycle rickshaws) contributing to nearly 45% of the total travel demand (modal split) with a mode share of 22.3%
- Two wheelers and three wheelers with a mode share of 36.5% and modal share of about 28% to 30%
- Non-motorised transport (NMR) using bicycles (85% of NMR), rickshaws, etc. to around 10% of the city traffic needs.

As part of the preparation of master plan for Vijayawada, a comprehensive traffic study and survey was taken up to analyse the traffic and transport scenario in the city. The survey included O-D surveys, volume count surveys, speed and delay surveys, parking survey, pedestrian volume survey and travel characteristic survey. These study results are referred to in this document wherever necessary.

4.6.2 Traffic Flows and Travel Demand

Vijayawada city is stretching day by day due to its increased population and commercial activities. The new human settlements are coming up in the city at the outskirts and along the two high ways i.e. NH-5 and NH-9. Two high ways are passing through the city. The traffic volumes on these roads cause heavy conjunction, accidents, reduced average speed, etc. There are three canals and one rivulet passing through the city, which makes the users/ traffic to take round about travel. Due to fast urbanization and development of the city in terms of various activities like industrial, commercial and residential, traffic volume has increased enormously. Haphazard development, narrow streets, congested junctions; unorganized parking has all created hindrance to the smooth flow of the traffic.

While traffic from the highways was allowed to pass through the city, the need to divert the traffic and provide a free flow to highway traffic resulted in the formation of a bye-pass to the city. A second road bridge across the river Krishna connecting Chinnakakani has further eased the pressure over the Prakasam barrage resulting from the inter and intra-regional traffic. The traffic and transport features that have been observed during the review of the master plan for Vijayawada are described below.

- Ribbon development consisting of shopping and commercial centres along the highways has resulted in hampering the free flow of traffic.
- Encroachments of hawkers and timber merchants along the arterial roads of the city has resulted in congestion of these areas and the consequent narrowing of the area available for movement of highway traffic.

- Road intersections along the highways are improperly planned and executed.
- Lack of adequate parking space in commercial areas has resulted in Kerb side parking causing bottlenecks in the existing narrow streets and roads.

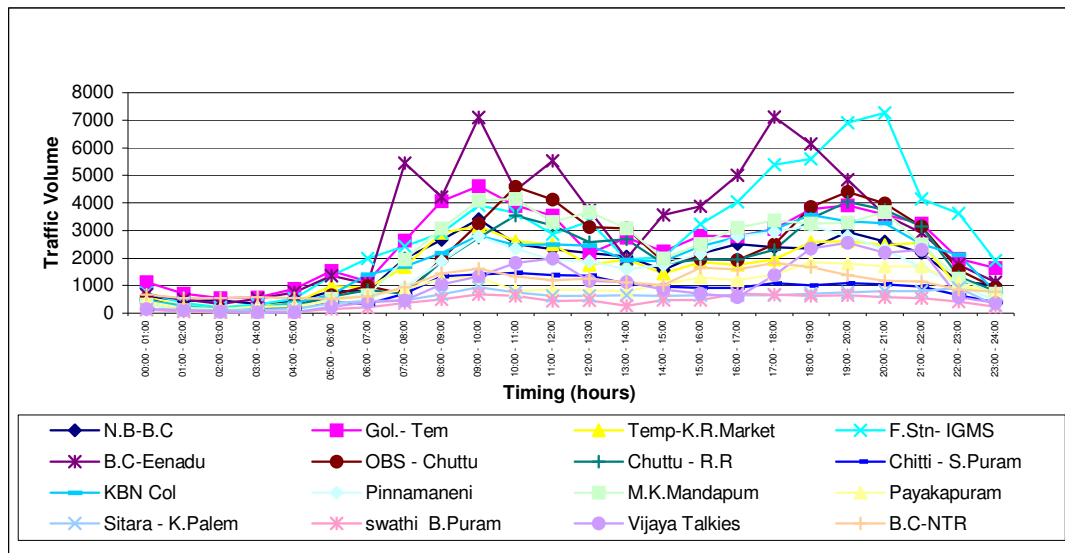
The information provided is of the volume count surveys that have been conducted at 19 locations to realistically understand the traffic flow characteristics. Of them, 12 Intersection counts are simultaneously done. The maximum traffic flow over 24 hours duration has been observed. The directional split of traffic indicates that on most of the roads, the flows are almost of equal intensities in the range of 56/44. But on the stretch Kanakadurga Temple towards barrage, the directional split in PCUs is low in the range of 26/74. The traffic flow on major arterials is given in [Table 4.5](#)

Table 4.5: Traffic Flows on Major Arterials

S. No.	Name of the Road	Traffic Flow		Directional Split	
		Vehicles	PCU	Vehicles	PCU
1	NH-5 (NTR Col. Jn-R.R)	20689	35871	48/52	52/48
2	NH-5 (Benz Circle-NTR Col. Jn)	25883	42346	46/54	49/51
3	NH-5 (Netaji Bridge Jn. - Benz Circle)	42190	63269	44/56	44/56
4	NH-9 (Gollapudi - Temple)	56292	67904	43/57	44/56
5	Temple - K.R. Market	39087	34950	50/50	53/47
6	Bander Road (Fire Stn. - IGMS)	72293	59030	56/44	59/41
7	Bander Road (IGMS - Benz Circle)	71742	57988	54/46	58/42
8	Bander Road (Benz Circle - Eenadu)	87515	87470	38/52	41/59
9	Eluru Road (Old Bus Stand - Chuttugunta)	49855	40570	49/51	47/53
10	Eluru Road (Chuttugunta - R.R)	44354	36148	42/58	41/59
11	Gollapudi - Tunnel Road	17464	16336	46/54	46/54
12	Chittinagar - Satyanarayanapuram	19206	15402	54/46	52/48
13	Temple - P.Barriage	43602	55757	22/78	26/74
14	Pejbinipeta Road (Sitara - Railway Stn.)	44164	33630	46/54	47/53
15	KBN Col. Road (Kothapet - Chittinagar)	45101	39662	45/55	47/53
16	Pinnamaneni Road (P.Road - N.Convent)	35620	25547	49/51	48/52
17	Madhukalamantapam - Sidharatha	50760	37574	49/51	50/50
18	Puspha Hotel - M.K.Mandapam Road	39502	29204	61/39	62/38
19	Payakapuram Road (Sing Nagar - P.puram)	22793	21054	55/45	52/48
20	NTR Col. Jn. - Towards Autonagar	10964	11648	60/40	56/44
21	Exec. Club - Towards Autonagar	24372	20502	34/66	35/65
22	Sitara - Kummaripalam	12891	11211	50/50	51/49
23	Swathi - Bhavanipuram	9467	8243	33/67	31/69
24	Veterinary Jn. - Route no.5	13147	9148	60/40	59/41
25	Vijaya Talkies - Nakkala Road	23905	18786	46/54	47/53

Source: Vijayawada Master Plan document

Figure 4.3: Temporal Variation at Mid-Block Locations



The peak hour share on the various corridors range between 5% to 14% of the total traffic. The modal composition on the corridors indicate that on an average, the motorised passenger vehicles constitute 69%, the goods vehicles constitute 7% and non motorised traffic constitute 24% of the total traffic. Two wheelers and auto rickshaws are observed to be having higher share compared to other modes and these are in the range of 36.5% and 22.3% respectively. Where as cycles are contributing 16%, other passenger vehicles are observed to contribute only 1% to 6% of total traffic across all the major corridors. The traffic flows at various internal cordon points are given in [Table 4.6](#)

Table 4.6: Traffic Flows at Internal Cordon Points

S. No.	Internal Cordon Points	Traffic Flow/Day		Directional Split	
		Vehicles	PCU	Vehicles	PCU
1	IC 1: Near Govt. Hospital (KR Market-Bus Stand)	54927	48534	53/47	53/47
2	IC 2: Near Pejbinipet (Rly. St. - Nuzvid)	44164	33630	46/54	47/53
3	IC 3: Near Chuttugunta Jn. (Old Bus St. - Gunadala)	44354	36148	42/58	41/59
4	IC 4: Near Sidhartha Acad. (Madhu Gardens - Gunadal)	50760	37574	49/51	50/50
5	IC 5: Near IGMC Stadium (Fire St. Benz Circle)	72293	59030	56/44	59/41

Source: Vijayawada Master Plan document

The vehicular trips are converted into passenger trips by making use of average occupancy levels obtained from the respected O-D surveys. The average occupancy levels observed for different modes at all internal cordon points are presented in the [Table 4.7](#)

Table 4.7 : Average Occupancy at Internal Cordon Points

S. No.	Mode	Occupancy
1	SC/MC/Moped	1.48
2	Auto/Tempo	3.29
3	Car/Jeep	3.19
4	Bus	32.63
5	Cycle	1.21
6	Cycle Cart /Rickshaw	1.76

Source: Vijayawada Master Plan document

Based on the observed occupancy pattern of the passenger vehicles at all internal cordon points, the vehicular trips have been converted into passenger trips and presented in [Table 4.8](#) Total observed passenger trips are found to be in the order of 6.25 lakhs, indicating that the intensity of travel demand across the internal cordon points is substantially high.

Table 4.8: Passenger Trips at All Internal Cordon Points

Location	Two Wheeler	Auto/Tempo	Car/Jeep	Std. Bus	Other Pass.	Cycle	Cycle Rickshaw	Total
IC 1: Near Govt. Hospital (KR Market-Bus Stand)	16241	44916	2732	30871	180	15097	7740	117777
IC 2: Near Pejbinipet (Rly. St. - Nuzvid)	22754	34606	2393	10306	0	14068	9532	93659
IC 3: Near Chuttugunta Jn. (Old Bus St. - Gunadala)	26974	41306	7226	27565	50	11140	10124	124385
IC 4: Near Sidhartha Acad. (Madhu Gardens - Gunadal)	25153	18933	7506	12278	60	8077	5745	77752
IC 5: Near IGMC Stadium (Fire St. Benz Circle)	48797	46010	35396	61066	0	13423	6879	211571

Source: Vijayawada Master Plan document

4.6.3 Vijayawada Road Network

NH5 and NH9 are passing through the heart of the city resulting in the outflows and inflows of heavy vehicular traffic. The city does not have any ring road/ flyovers to facilitate the external traffic to flow without entering into the core city. The city even does not have specific diversion routes. Further, the expansion of the city along the NHs and SHs is resulting in frequent congestions and increased accidents on highways.

The average carriageway width of arterials, sub arterials and collector roads including all-important roads in Vijayawada is 8.5m, 7.0m, and 7.5m respectively. The average percentage of road network is in between 12% to 14% the total city area, which is inadequate to address the travel demand. The main circulation pattern inside the city is established by arterials and

sub-arterials. Circulation is only through existing streets and, the street network is neither junction ally developed as a system, nor adequate in width to carry the increasing traffic flow.

The Vijayawada city traffic consists not only of fast moving motor traffic but also of primitive modes of transport such as manually drawn carts and pushcarts. There is a considerable increase in the volume of motor vehicles, cycles and pedestrian traffic due to increased and high population density. Because of low speed vehicles that forms the considerable part of the mode split, the carrying capacity of road is affected resulting in frequent congestions.

The VMC is keen on improving the road infrastructure in order to cope up with the increased travel demand and insufficient parking. Recently it has spent about ten crores of rupees in developing the major roads. Existing and new colonies are being connected to the arterial/sub arterial roads by improving the road infrastructure in the colonies. The break-up of the road infrastructure is as follows:

Table 4.9: Road infrastructure

Type of road	Length (km)
Cement Roads	190
B.T.Roads	625
Metal Roads	175
Others	210
Total	1200

4.5.4 Vehicular Growth and Composition

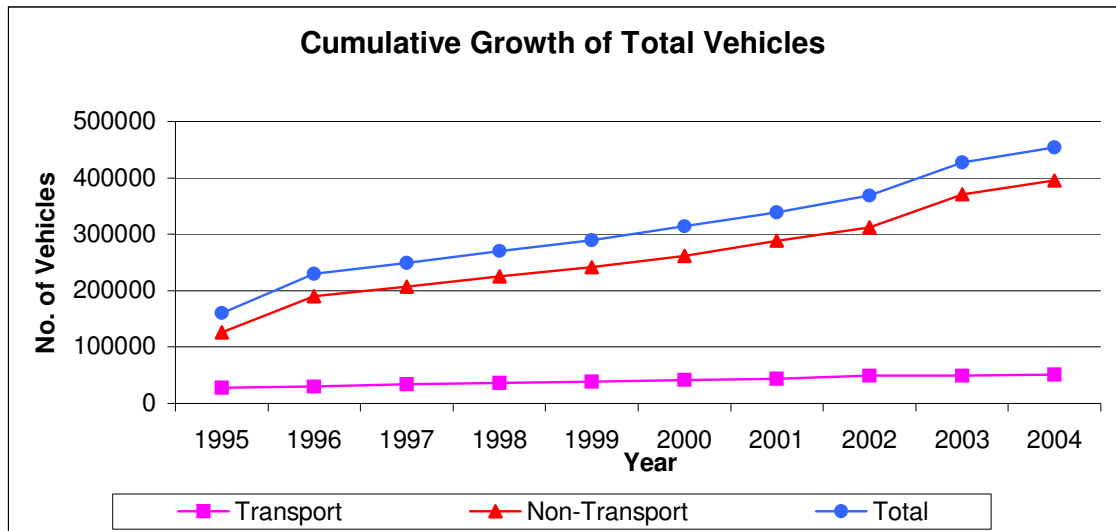
The total number of vehicles registered in Vijayawada Regional Transport Office as on 31-03-2004 was 4, 53,815. Among these, 50808 are Transport Vehicles (Public Carriers) and 3, 95,151 are Non Transport Vehicles (Private). Details of growth of vehicles are shown in [Table 4.10](#); and a graph representing cumulative growth of total vehicles against Transport and Non transport vehicles is shown in [Fig 4.4](#), and cumulative growth of Transport and Non Transport vehicle against individual modes are shown in [Fig 4.5 and Fig 4.6](#) respectively.

Table 4.10: Growth of Vehicles in Vijayawada Region

Year	Transport	Percentage Increase	Non-Transport	Percentage Increase	Total	Percentage Increase
1995	27499	-	125765	-	153264	-
1996	30242	9.97	189794	50.91	220036	43.57
1997	34563	14.29	207591	9.38	242154	10.05
1998	36418	5.37	225299	8.53	261717	8.08
1999	37977	4.28	241588	7.23	279565	6.82
2000	42029	10.67	261656	8.31	303685	8.63
2001	43306	3.04	288509	10.26	331815	9.26
2002	48742	12.55	312384	8.28	361126	8.83
2003	49002	0.53	370990	18.76	419992	16.30
2004	50808	3.69	395151	6.51	445959	6.18

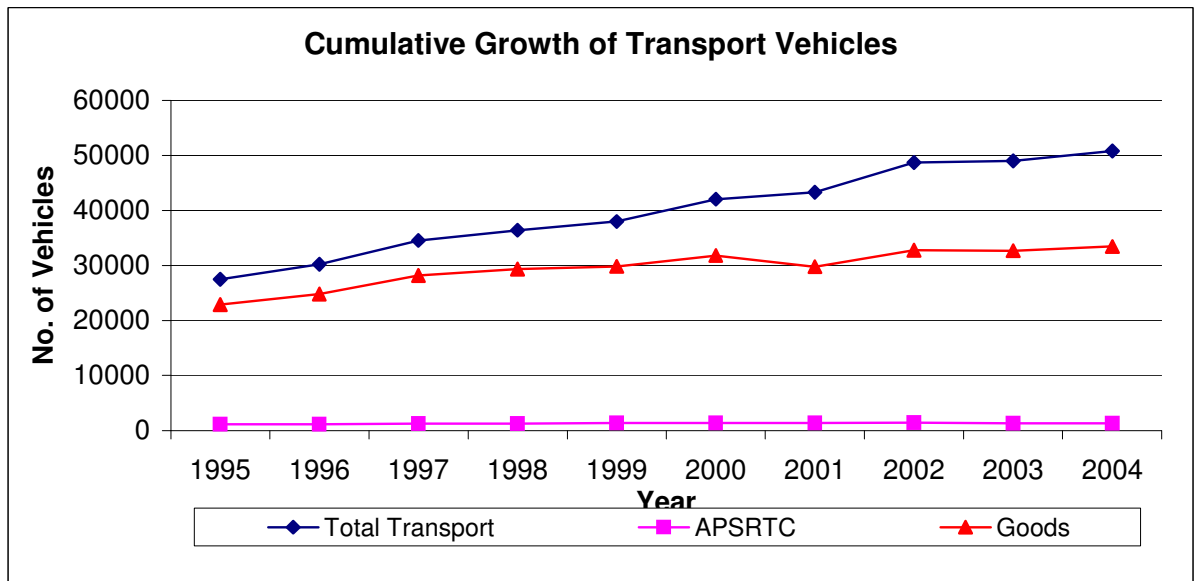
Source: RTA, Vijayawada

Figure 4.5: Growth of Total Vehicles in Vijayawada Region



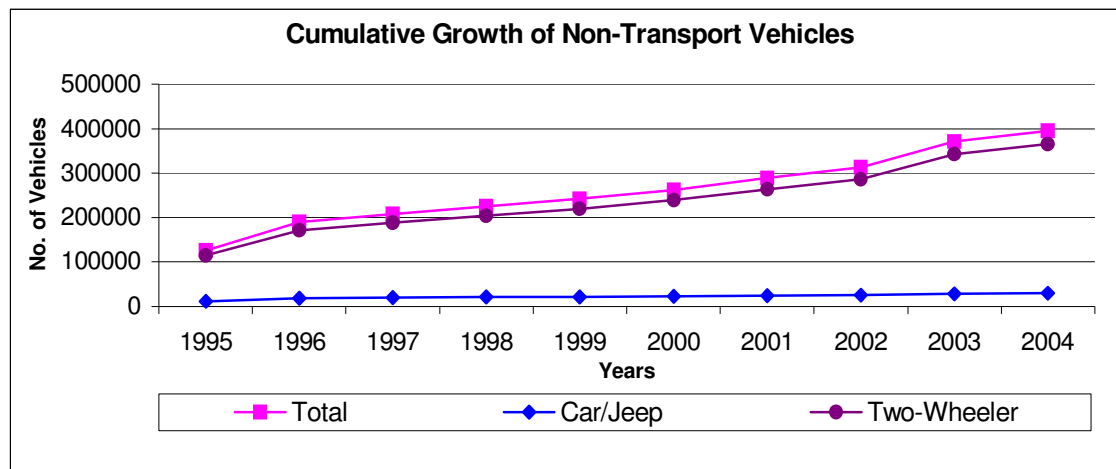
The growth of transport vehicle is minimal compared to Non Transport vehicles and more specifically there is no significant growth of transport vehicles since 2002. Within the non transport, the growth of public transport buses (RTC) is negligible during the last decade. This implies that there is enormous growth in the private transport particularly two wheelers, adding to the present traffic congestions.

Figure 4.6 : Growth of Transport Vehicles in Vijayawada Region



As regards the growth of Non Transport Vehicles individually, the growth of Cars/Jeeps is constant when compared to growth of two wheelers. It is evident that the growth in the non transport part is mostly due to growth in the two wheelers. The cumulative growth of all passenger vehicles is as shown in the [Fig 4.7](#)

Fig 4.7 : Growth of Transport Vehicles in Vijayawada Region



The composition of traffic for all outer cordon locations when combined are 67%, 12% and 21% amongst passenger, goods and non-motorized traffic respectively. *Table 4.11* gives the composition of traffic at outer cordons. The composition of passenger vehicles is high in the range of 70% to 80% at Sitanagaram and Milk Project entries, due to restriction of heavy traffic at these external cordons

Table 4.11: Composition of Traffic at Outer Cordon Locations (%)

Location	Passenger				Goods				NMT				Total
	Two wheelers	Car	Bus	Other Pass.	LCV / Tempo	Truck	MAV	Tractor	Cycle	Cart /Rick.	Drawn and	Others	
OC1: NH-9(Vij-Hyd)	31.93	9.99	6.49	21.28	3.94	12.32	5.51	0.47	7.20	0.82	0.01	0.05	100
OC2: NH-5(Barrage)	37.29	4.78	3.58	42.12	0.56	0.07	0.00	0.07	10.18	1.35	0.00	0.00	100
OC3 : Vij- Milavaram	33.04	0.66	5.84	34.24	1.29	0.15	0.00	0.35	23.53	0.90	0.00	0.00	100
OC4: Vij-Payakapuram	26.54	3.54	3.24	32.62	1.48	3.13	0.16	0.76	24.35	4.07	0.05	0.06	100
OC5: Varadhi (Towards Guntur)	23.62	14.43	8.19	9.06	4.85	12.80	8.90	0.48	14.09	3.58	0.00	0.00	100
OC6: Ramvarappadu (Towards Vizag)	30.42	10.81	4.62	21.41	3.30	10.17	7.97	0.44	9.53	1.28	0.02	0.03	100
OC7: Kamayyatopu (Towards Bandar)	20.22	7.74	12.97	20.65	4.75	10.06	2.22	0.38	16.01	4.93	0.04	0.03	100
OC8: Vij-Enamalakuduru	29.62	1.28	1.28	19.46	0.88	0.80	0.00	0.75	27.62	17.87	0.44	0.00	100
Average	29.08	6.65	5.78	25.10	2.63	6.19	3.09	0.46	16.56	4.35	0.07	0.02	100

Source: Vijayawada master plan

4.6.5 Public Transport System

The predominant Public Transport modes in Vijayawada are City Buses and Auto-Rickshaws. There are three other types of services like Sub-Urban, Moffussil and ordinary services along with City Buses and they are operating from 5 depots. There are 358 buses plying through 119 routes and, serves around 2 lakh passengers per day in and around the city. Auto

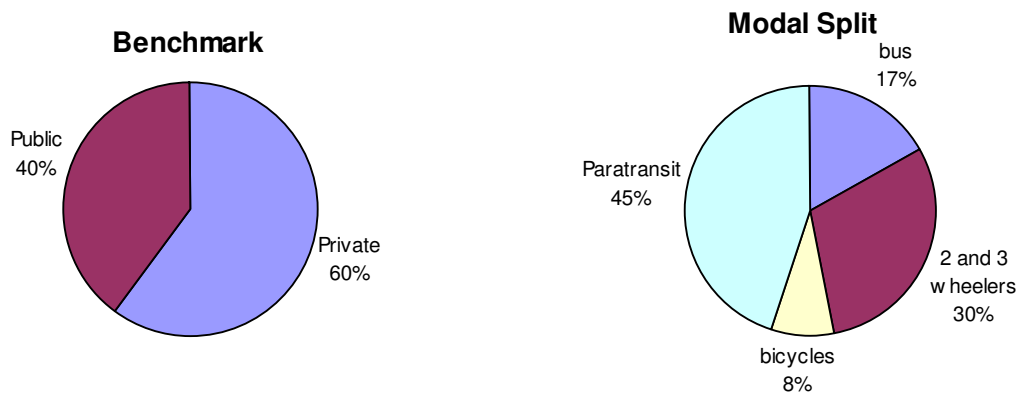
rickshaws ply on almost on all major routes. Presently, the shared-auto services are more in the city to all other surrounding areas of the city except near railway station and Bus Stand areas. The seating capacity of auto-rickshaw is 3+1, it is observed that the average passenger occupancy in auto-rickshaw during peak and non-peak hours was 6 and 4 respectively. The seating capacity of city buses is 56, but was observed that the average passenger occupancy during peak and non-peak hours for city buses was 60 and 15 passengers respectively. The other mode of travel for the city observed as cycle rickshaw in almost all locations, but cycle rickshaw cater to short trips only.

Table 4.12: Share of Public Transport

s.no.	City population (in millions)	Desired share of public transport (%)
1.	0.5-1.0	25
2.	Above 1.0 and upto 2.0	30-40
3.	2.0 to 3.0	50-60
4.	3.0 – 5.0	60-70
5.	5.0 plus	70-85

Source: “Traffic and Transportation policies and strategies in urban areas in India”, Ministry of Urban Development, GoI – 1998

figure 4.6.5 : Share of Public Transport



4.6.5.1 Operational Characteristics

Table 4.13 depicts Public Transport/Intermediate Public Transport operational characteristics in detail.

Table 4.13: Public Transport/Intermediate Public Transport Operational Characteristics

Parameters	City Bus	Auto Rickshaw	Cycle-Rickshaw
Operation period (hrs)	16 to 18	0 to 24	8 to 20
Trips per day	15	8	7
Avg. trip length (km)	16	7	3.5

Source: Primary Survey and APSRTC, 2004

The operation period of city bus and cycle rickshaws are about 8 to 20 hours, where as for auto rickshaws it is 0 to 24 hours. The average numbers of trips per day by city bus, auto rickshaw and cycle rickshaws have been observed to be 15, 8 and 7 respectively. Trips made by auto rickshaws are varying from location to location and, maximum number of shared trips has been observed on Eluru road, Bandar road, and on Prakasham barrage. The average trip length (ATL) for city buses is around 16 km., for auto rickshaw is about 7 km and for cycle rickshaw, it is about 3.5 km.

4.6.5.2 Fare structure

The fare structure pertaining to various modes of transport is explained below:

City Bus

The following *table 4.14* gives break-up of fare structure for city buses.

Table 4.14 : Fare Structure for City Buses

S.No	km	Fare (Rs)
1	2	2
2	4	3
3	6-8	4
4	9-10	5
5	10-15	6
6	15-20	7
9	More than 20 (within municipality limit)	8

Source: APSRTC, Vijayawada

Auto-rickshaws

RTO had fixed minimum fare of Rs. 4/- per kilometer with subsequent increase by Rs. 3/- for each additional km. and its part traveled by the passenger(s).

4.6.6 Parking

4.6.6.1 Parking Characteristics

To understand the parking demand and parking durations at different locations, parking surveys were conducted at all pre identified potential parking areas along with the existing off street parking areas. This survey has been conducted by registration number method by patrolling the parking area at every half an hour interval. The parking survey locations are categorized according to locations, which can collectively serve the parking demand generated at those points.

4.6.6.2 Identification of Traffic Attraction Zones

As inferred from the parking survey analysis, the significant parking locations with high parking demand are Around Kaleswar Rao Market, BRP Road, Canal Road and Cross Roads of Besant Road from Eluru Road to MG Road. These areas are basically commercial centers or activity areas. Parking demand is directly dependent on activity. If the activity in any particular area of the city increases, the parking demand would increase proportionally. The

parking demands at these areas at each individual spot are analyzed and combined demand has been drawn.

4.6.6.3 Parking Accumulation and Duration

Peak parking demand, parking durations and turnovers at different locations have been analyzed. The location-wise parking duration has also been analyzed in terms of short, medium and long-term periods VIZ. less than or equal to 1hour, 1-4 hrs and more than 4 hrs respectively. The significant parking locations with high parking demand are Kaleswar Rao Market, BRP Road, Canal Road, Railway Station West Booking, NTR Complex on Prakasham Road and Cross Roads of Besant Road from Eluru Road to MG Road.

The salient findings of the parking study are:

- The maximum parking demand is around Kaleswar Rao market and, it is in the range of 5770 vehicles during the peak period from 10:00 a.m. to 12:00 noon, inclusive of off-street parking lots.
- Out of total parked vehicles in the study area, the share of two wheelers is in the range of 76% whereas for cars and auto rickshaws, it is 10% and 14% respectively.
- The average share of short, medium and long term parking demands at all the on street parking locations are 74, 19 and 7 percent respectively.

4.6.7 Per Capita Trip Rate (PCTR)

Trips performed on an average day in Vijayawada Urban Area for all purposes are 10, 41,904 (including walk and excluding return home trips) and 6, 25,144 (excluding walk and excluding return home trips). The per capita trip rate (PCTR) for Vijayawada Urban Area works out to be 1.04 and per capita vehicular trip rate is estimated to be 0.62. This indicates that majority of the inter-zonal trips are performed by vehicular modes and most of the intra-zonal trips are done by walk.

4.6.8 Institutional arrangements

The facilitation and monitoring of traffic and transportation in the region is done by multiple agencies. No single authority is solely accountable for providing transport services, resulting in overlapping of functions and functional and spatial fragmentation.

Key Issues

- The developments that are envisaged in the Master Plan will have a direct bearing on the city. The service sectors will be strained due to the influx of population and other activities.
- Institutional accountability and spatial and functional fragmentation.
- Increasing the share of public transport to the desired levels.
- No detailed master plan for road and traffic/ transport infrastructure development.
- Increased travel times due to insufficient links across canals/ nalas.
- Heavy traffic congestion in CBDs.
- Traffic menace due to increased Para transit (Rickshaws and autos) and private vehicles
- Traffic safety
- Absence of link roads and bye-pass roads causing traffic problems.
- Poor pedestrian infrastructure (RUBs/ RoBs/footpaths, pedestrian crossings, etc.)
- Environmental deterioration due to motorized traffic.
- Inadequate parking