VIJAYAWADA MUNICIPAL CORPORATION

REPORT ON URBAN TRANSPORT & BRTS FACILITIES IN VIJAYAWADA CITY FOR JnNURM Plus

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CHAPTER-1

INTRODUCTION

City Profile

Vijayawada, one of the thirty-five metropolitan cities in the country, is the third largest city in the state of Andhra Pradesh after Hyderabad and Visakhapatnam, located on banks of river Krishna. Vijayawada has considerable historical importance and cultural heritage. It is considered as the agricultural and commercial capital of Andhra Pradesh. The Vijayawada Urban Agglomeration has a population of 1.01 million as per 2001 census. Vijayawada Municipal Corporation is more than a century old and has been constituted as a municipality in 1888 with an area of 30 sq.km. It was upgraded as a Municipal Corporation in 1981.

Vijayawada is a major railway junction connecting north and south India. The rail and road trunk route link Madras, Delhi, Calcutta and Hyderabad at Vijayawada, which is one of the largest railway, centers in South India. Vijayawada is a major tourist destination in the state having a number of pilgrimage and historical sites. The most prominent ones being Prakasam Bridge, Kanaka Durga Temple, a 56 feet Stupa on the Gandhi Hill, a Planetarium and the Mogalrajpuram caves, which are in the entire south India. The other famous caves are the Undavalli caves, situated about 8 Kms from Vijayawada. These caves were built in 7^{th} century A.D.

Vijayawada urban agglomeration consists of Vijayawada Municipal Corporation (VMC), Mangalagiri Municipality and four panchayats. As per 2001 census it has a population of 1.11 millions. The VMC has a population of 0.85 millions and Mangalagiri Municipality has a population of 0.06 millions and the rest of the population is spread in the panchayats and peri - urban areas. The table 1.1 gives the population details of the urban agglomeration.

City / Town	Area (Sq. Kms.)	Population in lakhs			Growth rate (1991-2001)
		1981	1991	2001	
VMC	61.88	461772	701827	845217	20.40
Mangalagiri town	10.49	46172	59152	62048	0.49
Others (20Gs + 4P)	38.07		84777	121159	47.00
Kanuru (P)	9.00	9690	23597	30696	30.10
Prasadampadu (og)	2.43	5300	6489	10487	61.60
Ramavarapadu (P)	3.37	7646	8418	12808	52.20
Yenamalakuduru (P)	4.17	7217	17331	25463	46.90
Tadepalli (P)	19.18	24542	28942	41705	44.10
VUA	110.44	613756	845756	1033562	22.20

Vijayawada Municipal Corporation is leading the way in incorporating and implementing Information Technology as a tool for providing better citizen services and administrative efficiency. Dynamic information about all utilities and services provided by the government and private sectors that help make life easier for the citizens is made available by Versatile Online Information for Citizen Empowerment (VOICE) Kiosks. VOICE allows the information to be updated according to the requirement and the importance of the information. Vijayawada Municipal Corporation has demonstrated its commitment to developing slums and poor communities. VMC has implemented a Slum Improvement Project with the support of Overseas Development Administration (presently renamed as Department for International Development), Government of UK.

In continuation of its citizen friendly and pro-poor approaches, the VMC has prepared a City Development Plan for the city for enabling poverty reduction and comprehensive development.

City Development Plan under JnNURM

The Government of India has launched 'Jawaharlal Nehru National Urban Renewal Mission' in the current year 2005-06. To access the funds under JnNURM, the city is required to prepare City Development Plans (CDPs) and implement a set if reforms at the state and the city levels by entering into a tripartite agreement. The VMC and the Mangalagiri Municipality have consolidated the earlier City Development Plan and the Municipal Action Plans respectively and strengthened them. The CDP also took the inputs from studies viz., the Master Plan for preparation under the VGTM UDA. This document is result of extensive consultations with stakeholders of both in the VMC and Mangalagiri Municipality as per the guidelines of Jawaharlal Nehru National Urban Renewal Mission.

CHAPTER-2

DEMOGRAPHY, ECONOMY, LAND USE

Vijayawada, thirty fourth largest urban agglomerations in the country, consists of the Vijayawada Municipal Corporation (VMC), Mangalagiri municipality, 4 panchayats and outgrowths. Vijayawada Municipal Corporation constitutes about 3.91 % of the total urban population of the state. Vijayawada is the third largest city in the state with a population of 845217 as per census 2001.

Population growth - VMC

S.No.	Year	Population	Decadal growth rate (%)
1	1961	230397	42.93
2	1971	317258	37.70
3	1981	461772	45.55
4	1991	701827	51.99
5	2001	845217	2043

The city has witnessed a rapid growth over the past five decades with an average decennial growth rate of 39.72 %. During the period 1981-91 the net growth has been about 51.9% attributed to a large influx of the rural population to the city. However, during the past decade 1991-2001, the growth has stabilised with a decadal population growth of 20.4 %.

Population Growth – VMC

Year	Population (lakh)	Annual exponential growth rate (%)
1981	4.61	4.5
1991	7.01	5.2
2001	8.45	2.1
2005 (Estimated)	10.01	1.5
2011 (Projected)*	11.77	1.3

The contributors to population growth are mainly the natural increase and the in migration from the surrounding villages.

Composition of Growth - VMC:

Composition	**Population increase during**			
Year	**1981-91**	**% of total**	**1991-2001**	**% of total**
Natural	97300	38%	80,000	53%
In-migration increase	100000	40%	69455	47%
Jurisdictional change	50000	20%	-	-
Total increase	247300		149455	

The population of VUA has increased from 8.45 lakhs (0.84 million) in 1991 to 10.34 lakhs (1.03 million) in 2001. The growth of population was about 37.8% during 1981-91 and 22.2% during 1991-2001.

Population trends - Vijayawada Urban Agglomeration (VUA)

City / Town status	**Area (Sq. Kms)**	**Population in lakhs**			**Growth Rate (1991-2001)**
		1981	***1991***	***2001***	
VMC	61.88	461772	701827	845217	20.4
Mangalagiri town	10.49	46172	59152	62048	0.49
Others (2OGs+4P)	38.07		84777	121159	47.0
Kanuru (p)	9.00	9690	23597	30696	30.1
Prasadampadu (og)	2.43	5300	6489	10487	61.6
Ramavarappadu (p)	3.37	7646	8418	12808	52.2
Yenamalakuduru (p)	4.17	7217	17331	25463	46.9
Tadepalli (p)	19.18	24542	28942	41705	44.1
VUA	110.44	613756	845756	1033562	

The Vijayawada urban agglomeration consists of the areas under Vijayawada Municipal Corporation, Mangalagiri municipality, gram panchayats and outgrowths of Kanuru, Prasadampadu, Ramavarappadu, Yenamalakuduru and Tadepalli.

The VUA is growing faster than the two other metropolises of Andhra Pradesh viz., Hyderabad and Visakhapatnam. From figure 2.2 it is clear that while VUA experienced a decadal growth of urban agglomeration during 1999-2001, Hyderabad and Visakhapatnam Urban Agglomeration experienced growth rates during the same period. An important feature is that the areas around the corporation areas experience faster growth indicating the need for integrated and comprehensive development.

Another important feature is that the areas around VMC have shown a very high growth. This is indicative of the growth pattern of VUA.

Future Growth Pattern:

The rates of growth of population experienced by Vijayawada Urban Agglomeration during 1991 and 2001 will continue in future though at a lesser rate. The projections indicate that the agglomeration would house a population of 14.5 lakhs in 2011 and 19.9 lakhs in 2021 including the population of the city.

Population Projections – Vijayawada Urban Agglomeration

City / Town status	**Area (Sq. Kms)**	**Population in lakhs**			**Density (Pop / Sq. Kms.) 2001**
		2001	***2011***	***2021***	
VMC	61.88	845217	1177577	1640630	13658
Mangalagiri town	10.49	62048	84871	110452	3540
Others (2OGs+4P)	38.07	121159	185497	240107	
Kanuru (p)	9.00	30696	53401	73949	3410
Prasadampadu (og)	2.43	10487	14485	18483	4315
Ramavarappadu (p)	3.37	12808	17198	21588	3800
Yenamalakuduru (p)	4.17	25463	42066	56098	6106
Tadepalli (p)	19.18	41705	58347	69989	2174
VUA	110.44	1033562	1447945*	1991189*	9612

***** The population projection of 3.3% is based taking into account the rapid growth in the margins. A recent survey of households for distribution of ration cards indicates that the actual population of the City now would be somewhere in the vicinity of 1.5.

Emerging Issues

The Vijayawada urban agglomeration is experiencing population growth rates higher than the state. In the next two decades it is expected to touch 2 million mark. Most of the growth is taking outside the VMC area in the urban agglomeration. This necessitates integrated planning, development and service delivery.

The basic services like traffic, public transport, fire etc are with parastatals. But unlike Hyderabad, since Vijayawada is a small City, there is adequate co-ordination between the VMC and the para-statals. But as the City expands and the roles of para-statals become more intensive, the problems of co-ordination are bound to become an issue. The State Government is already attempting to formulate an Agency for Hyderabad, which would encompass all the basic services. The same model can be extended to the other cities in due course.

Economic Base

Occupational Pattern

As per the 2001 census over 30% of the total population comprises of the city work force and the occupational pattern of Vijayawada indicates that it is a major centre for tertiary activities. While 69.37% of the total workers in 1991 belonged to the tertiary sector, the proportion has increased to 71.81% of the total work force in 2001. On the other hand there has been a decline in the proportion of workers in the secondary sector from 27.57% to 21.64% during 1991 and 2001 respectively.

Trade and Commerce

The city of Vijayawada is traditionally the main agricultural market centre for Krishna basin. It acts as a major commercial centre to a host of wholesale and retail activities dealing in consumer goods, textiles, automobiles, industrial products etc. It is also a major trading, place for processed Virginia Tobacco, Cotton and Turmeric. The agricultural commodities produced in this part of Andhra finds its market in Vijayawada both for local consumption and export. Vijayawada is also known for its Mango exports, generating Crores worth to turnover, annually.

Work Force Participation in Vijayawada Urban Agglomeration

	Population	**Main workers**	**Marginal Workers**	**Non workers**	**Work force**
VUA	1033562	320159	22093	691310	33
VMC	845217	255880	16187	573150	32
Mangalagiri	62048	24026	2038	35984	42
Others	95601	30739	3668	61194	36

Economic Base, Registered Manufacturing and Services

Economic base	**Years**	
	2001	**2005 (Estimated)**
Manufacturing (Units)	3111	3828
Employment (Nos.)	21301	24738
Production (Rs. Cr.)	95	118
Value added (Rs. Cr.)	04	06
Services (IT. Etc.)	5838	6288
Employment	107616	112765
Production or quantum of business (Rs.Cr.)	260	293
Value added (Rs. Cr.)	12	15

CHAPTER-3
MUNICIPAL INFRASTRUCTURE

The Municipal Corporation Vijayawada (VMC) is responsible for the delivery of variety of functions like Water Supply, Sewerage, Sanitation, drainage, solid waste management, roads and transportation to the citizens and has taken long strides in this regard. It has also been dealing with medical relief, preventive medicine, sanitation and conservancy, maternity and child welfare, control of food adulteration and some other functions under the Public Health regulations.

Water Supply

Sources of water

In Vijayawada, the drinking water is being supplied to the citizens by tapping water from three different sources - 1) Surface water source 2) Ground water source 3) Infiltration galleries. Vijayawada Municipal Corporation supplies about 191 MLD of water to the city as of 2004. Being located on the bank of the river Krishna, the main source of water for the city has been the river Krishna drawing around 131.66 MLD. The city also depends on ground water resources. VMC draws about 45.4 MLD from bore wells located at different parts of the city. In addition to that, around 13.6 MLD water is drawn from infiltration galleries. The surrounding zones like Mangalagiri, Kanura and Tadepalli draw water from River Krishna and are supplying to the citizens at 110 lpcd per capita supply.

Storage

Surface water is pumped into the service reservoirs after primary treatment. There are 25 tanks for Krishna river water as source with total capacity of 24 ML. The water from the bore wells is pumped into the OHTs directly. There are 6 OHTs with ground water as source and a total capacity of around 4 ML. The reservoirs have a total supply capacity of around 55 MLD.9 NOs Boosters are used at different places to meet the required pressure.

Service area

The area under Vijayawada Municipal Corporation jurisdiction is around 58 sq km and the corporation is divided into three circles to facilitate efficient delivery of services. The corporation is responsible for providing potable drinking water to all these three circles. The respective local bodies are responsible for water supply in the surrounding zones.

Service Coverage

The total installed capacity of water from the three sources is around 191 mld. As per the Corporation, only 77% of the area is covered with the water supply network and only 30% in the surrounding zones. The piped water supply network in the city is inadequate The city has over 56,000 water connections in the city and around 2300 connections on an average in the surrounding zones. Percentage access to piped water supply is around 50% in general areas and 20% in slums. In addition to that, the city has 4700 public stand posts for water supply to the weaker sections of the society, who cannot afford individual connections. Majority of the connections are unmetered and the average per capita consumption of water is estimated as157 lpcd. Actual duration of water supply varies from place to place in the city depending on the ground level of location and distance from supply reservoirs. As per the primary household survey, 1% of HHs are supplied for an hour, whereas 63% of HHs get for 2 hrs and 36% for more than 2 hours.

House Service Connections

Water is supplied to the citizens in the form of house service connections, public taps and hand pumps. The houses not served by house service connections and public taps are served by hand pumps provided by the VMC. Though the average water supply in the city is around 157 lpcd, only 27% of the city houses have individual house connections. And the situation is even worst in surrounding zones. The data indicates the requirement for increase in house service connections in the city.

Quality of water

Quality of the water supplied by the corporation is maintained as per specifications of CPHEEO manual i.e. turbidity less than 5 NTU, Ph value between 6.5 to 8.5 and residual chlorine will be at 0.20 ppm.

Water Tariffs

There are about 60,000 household connections and about 10,000 metered connections of various kinds. The un-metered domestic connections are charged a flat rate, with the Below Poverty Line (BPL) consumers being charged half the rate at which the Above Poverty Line (APL) consumers are charged. The tariff structure is shown in Table below:

Sl. No	Category of Connection	Connection Charges (Rs.)	Monthly Tariff (Rs.)
1a	For Residential Houses	5,525/-	80/-
b	Residential houses under NSDP	2,525/-	40/-
c	Residential houses under BPL	1,200/-	40/-
d	Residential houses (Apartments)	¾" – 45,000/- 1" – 60,000/- 1 ¼" – 80,000/- 1 ½" – 1,00,000/-	Rs.100/- + Rs.8.25/- per every additional 1000 Ltrs.
2	For Shops, Restaurants, Clinics etc.,	12,000/-	• Up to 25,000 Ltrs – Rs.100/- + Rs.15.75/- per every additional 1000 Ltrs. • Up to 50,000 Ltrs – Rs.100/- + Rs.18.40/- per every additional 1000 Ltrs. • Above 50,000 Ltrs – Rs.100/- + Rs.21.00/- per every additional 1000 Ltrs.
3	For Corporate office, Hostels, Kalyanamandapam, Cinema Theatres, Educational Institutions and other commercial establishment and Factories, Pharma companies etc.,	¾" – 45,000/- 1" – 60,000/- 1 ¼" – 80,000/- 1 ½" – 1,00,000/-	

Sewerage:

For the purpose of providing and maintaining the sewerage system, Vijayawada City is divided into four zones namely, central zone, western zone, eastern - southeastern zone and northern zone. The existing UGD system mainly covers the central zone of the city. The numerous natural and man-made canals along with the major railway lines traversing the city essentially determine the boundaries of each sewerage zone.

Network coverage

The central area is divided into 7 blocks. Vijayawada city is divided into three circles and, for easy maintenance these circles are further divided into four zones. These zones are further divided into simpler blocks. According to primary sources, the sewerage connections at individual house level are very less in the city. Circle-I have no underground sewerage system and the sewage is led into open drains.

The existing sewerage scheme serves around 2.50 lakh population with scientific method of treatment. The sewage schemes for the entire central area has been functioning with 18000 sewerage connections, covering only around 10% of the population. However, in slum areas the access to sewerage connections is very low around 2%. And in case of surrounding zones, sewerage network is absolutely not existing.

Sewerage Distribution Network

The Central area in the corporation is divided into seven drainage blocks in consideration of the railway lines and irrigation canals alignments. The sewage from these seven blocks are collected by gravity and pumped to pumping station. From this pumping station the sewage will be pumped to the treatment works.

Sewage Treatment Plants

The total sewage generation in the corporation limits is estimated to be 148 MLD. The two existing STPs has utilizable capacity of around 20 MLD are put in to operational, which is very low. The treatment plants have been devised based on the conventional method of treatment with oxidation ponds and the digester. The final treated wastewater will be let out in to the Budameru after achieving the desired effluent standards. Out of the total sewage generated, only 10% of it is treated and disposed. There is a necessity to commission additional STP in the city to treat the remaining 128MLD of sewage before disposal. By 2011 and 2021, the quantity of sewage generated is estimated to be 94 MLD and 131 MLD respectively.

Sewerage Tariffs

The tariff for individual household closet is Rs 25 per month. The tariffs for sewerage connections is indicated in the table below:

Sl. No.	Category of Connection	For First Water Closet (Rs.)	For Every Additional Water Closet (Rs.)	Monthly Tariff (Rs.)
1	For Residential houses	2,500/-	1,250/-	25/-
2	For Shops, Restaurants, Clinics etc.,	8,000/-	8,000/-	75/-
3	For Corporate office, Hostels, Kalyanamandapam, Cinema Theatres, Educational Institutions and other commercial establishment	10,000/-	8,000/-	125/-
4	Factories, Pharma companies etc.,	20,000/-	20,000/-	150/-

Storm Water Drains

Vijayawada's wastewater is getting drained through all the existing number of systems of drainage. These drainage systems empty their waste loads into water bodies, watercourses, most of them outside the city and some within. Largely, these recipient bodies are government owned, may be by Revenue department/Irrigation department/PWD/ULBs. For using them for installation of the mini-treatment units, only permission for 'right to use' is required. In this context, it is to be realized that these very places are being used as waste disposal bodies for years.

Current Scenario

The city has an undulating topography characterized by small and large hillocks scattered in the city. The entire southern part of the city slopes down towards the river Krishna in the south while, the central part slopes down towards the north and, the northern areas have a downward slope towards south. Apart from the river Krishna three major irrigation canals namely Eluru canal, Ryves canal and Bandar canal, all originating from Prakasam barrage, flow across the town. A major water course, Budameru channel, also flows north-east in the northern part of the city. All these water channels contribute in draining the surface run off from the city and hence have been referred as the major drainage areas of the city.

In most part of the city, there are no separate systems to carry the sewage, sullage and storm water separately. Except for 390 km length of the roads, where UGD exists, the rest of the road side drains also serve as sewers round the year. In fact, except during the monsoon months spread over July-September, the rest of the year, the drains carry only the sewage. Also during the monsoons, the wastewater from the kitchen and toilets get diluted with the storm water. But in the rest of the year, the sewage with high BOD necessitates treatment.

Traffic and Transportation

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-motorized 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.

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 centers 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.

Traffic Flows on Major Arterials

Sl. No.	Name of the Road	Traffic Flow		Direction 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 - Railaway Stn.)	44164	33630	46/54	47/53
15	KBN Col. Road (Kothapet - Chttinagar)		39662	45/55	47/53
16	Pinnamaneni Road (P.Road - N.Convent)	35620	25547	49/51	48/5
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

Traffic Flows at Internal Cordon Points

Sl. 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

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*

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

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.* 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.

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

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:

Road infrastructure

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

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*; 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.

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

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.

Share of Public Transport

Sl. No.	**City population (in millions)**	**Desired share of public transport (%)**
1	0.5-1.0	25
2	Above 1.0 and up to 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

CHAPTER-4

ABSTRACT OF COMPREHENSIVE TRAFFIC & TRANSPORT SYSTEM

The Vijayawada Municipal Corporation (VMC) have initiated preparation of an Integrated Transport System Plan for Vijayawada, the fast growing, third large city of Andhra Pradesh. The study has been carried out by M/s. Consulting Engineering Services (India) Private Limited, New Delhi.

The overall objective of the study is to prepare a Comprehensive Traffic and Transport Plan for Vijayawada city. The study are covers the VMC area extending over 61.88 Sq.km. It is identified into 3 circles, 26 Revenue Wards and 59 Electoral Wards.

The study methodology was extensive and comprehensive. It included: appreciation of study area physical, demographical and transport system characteristics; conduct of extensive traffic and household interview surveys; application of traffic and travel characteristics of the city; construction of transport models; forecast of transport demand, by modes, by 2021; conceptualization of alternate transport network patterns and systems, evaluation and selection; detailed of the selected transport system and preparation of an Integrated Transport System Plan; identification of programmes, cost estimates and phasing.

Extensive traffic studies have been carried out. They include; Road Network Inventory; Traffic Volume Counts; Origin & Destination Surveys; Parking Surveys; Public Transport user surveys; and Household Interview surveys.

Inception Report, Interim Report and report on Bus Rapid Transit System, Draft Final Report, apart from monthly progress reports, have been submitted. This report is the fifth and final deliverable of the study.

Vijayawada is a fast growing city. It is an important trade and transport center. It has rich agricultural belt. There is a spurt in industrial development. The transport system of the city is essentially a road network and road based bus system. With 3 hills, a major river, 4 canals and 4 rail lines, the physical pattern is a major constraint for efficient movement of traffic. The city from is radial. Orbital corridors are missing. The activities are heavily concentrated in the Central Area.

Vijayawada – Guntur – Tenali – Mangalagiri Urban Development Authority (VGTM UDA) have taken up preparation of Zonal Development Plans (ZDP). Vijayawada city forms one of the zones. The city ZDP (Final Draft) has analyzed the physical, socio-economic, land use and other characteristics of the city and has prepared the ZDP. It has forecast the population size of Vijayawada, by 2021, to be 16.4 Lakhs. Of this, it has proposed to accommodate 12.1 Lakhs within the present VMC by re-densification. The balance 4.3 Lakhs is proposed to be distributed amongst the adjacent zones of Nunna, Gollapudi, Kanuru, Tadepally and Nidamanuru.

Intensity of traffic within, to, from and through the city is high. Nearly 1,97,784 vehicles enter / exist the city on an average day. Goods vehicles, is 48.6%. The intensity of traffic on the road network within the city is high. Mahatma Gandhi (Bandar) Road carries an ADT of 52,781 vehicles. Karl Marx road carries 24,941 vehicles. The peak hours flows account for 7 to 8% of ADT. Passenger modes predominate. 2- Wheelers account for a large share of 27 to 45%.

The socio-economic characteristics of the households of Vijayawada have been assessed by the Household Interview Survey (HIS). The average household size is 4.31. gender ratio at 968 is better than All India (933) but lower than Andhra Pradesh (978). Vijayawada is a city of young people with 50% of the population below 25 years of age. It is highly literate city(88.5%; India – 65%; Andhra Pradesh – 61%). Students (32.0%) and housewives (28%) account for a major share of the population. The average household monthly income is Rs. 5,347/- only. Low income Group Category predominates (57.71%). Expenditure on “Transport” is reasonable high (12.74% of monthly expenditure.

Travel characteristics make interesting reading. A total of 12,61,026 person trips were generated on an average working day. The overall mobility (per capita trip) rate was high at 1.49 including "walk" trips and 1.11 excluding "walk" trips. "Walk" mode accounts for 25% of all person trips. The share of "bus" mode was low at 22.32%. "Auto rickshaw" accounts for 12.66%. "Work" was the predominant trip purpose at 39.60%. "Education" purpose has a high share (31.04%). There is inequity amongst genders in terms of mobility rate (males – 1.51; females – 1.21). The share of "walk" trips by "females" was more (54.78%). The share of "work" trips by females was low (20.48%). The movement pattern within the city is complex with intense flows into and put of the Central Area. The degree of "self containment", by spatial units in Vijayawada, is poor.

Vijayawada Transport Model (VTM) has been conceptualized, constructed, calibrated and validated using TRIPS Software. Four-Stage sequential model has been adopted. Regression model for trip generation, gravity model for trip distribution, logit model for modal share and capacity restraint technique for assignment have been calibrated. Population size, Resident Workers and resident Students for trip production modeling and Employment Space and Student Enrolment for trip attraction modeling have been selected as independent variables. Their values for Base year (BY) (2006) and Horizon Year (Y) (2021) have been derived based on Census data, VZDP and HIS and other surveys carried out. The VTM forecasts the travel demand. By 2021, to be 24.95 Lakhs person trips on an average working day. The inter-city travel demand has been estimates, by growth rate method, to be 2,39,396 vehicle trips per day. The comparative picture between BY and HY is as under.

Sl. No.	Item	By (2006)	HY (2020)
1	Study Area	61.88 Sq.Km	Increased to include 5 zones of Nunna, Gollapudi, Kanuru, Tadepally and Nidamanuru.
2	Population	9,27,711	16,40,600
3	WFPR	32.71%	35%
4	PCI	Rs. 1240	Rs. 2480

Sl. No.	Item	By (2006)	HY (2020)
5	Travel Demand • Intra-city(Person trips per day) • Inter-city (No. of Vehicle trips per day) • Intra-City (commercial trips per day)	 12,61,026 1,17,072 5,352	 24,95,688 2,39,396 29,454
6	Modal Share (%) (of intra-city person trips) Walk Cycle / Cycle Rickshaw 2-wheelers Car IPT Bus	 25.05 16.25 22.17 1.12 12.72 22.68	 17.9 6.9 22.6 2.5 10.0 40.0

To sere the future travel demand, 9 alternative network and transport systems have been conceptualized. They include.

N-1 : Do Nothing

N-2 : Improved Road Network & Bus System in Mixed Traffic

N-3 : N-2 + BRTS along M.G.Road (Pink Corridor)

N-4 : N-2 + BRTS along Karl Marx Road (Red Corridor)

N-5 : N-2 + BRTS along G S Raju Road (Blue Corridor)

N-6 : N-2 + BRTS along Satyanarayanapuram Road (Orange Corridor)

N-7 : N-2 + BRTS along all the four corridors

N-8 : N-2 + BRTS along Circular Route (Green Corridor)

N-9 : N-2 + BRTS along all corridors including Circular Route.

The alternatives have been evaluated by traffic assignment and selection made based on a set of criteria comprising LOS on road network, vehicle-kms, passenger-kms vehicular-hours and passenger-hours.

On consideration of all factors, N-9 has been selected for further detailing. The selected transport system involves 240 km of city level road network and 38.8 km of BRTS corridors.

The Vijayawada Transport Plan Includes

- Policy Framework
- Road Network System
- Public Mass Transport System
- Parking Policy
- Terminals (Passenger & Goods)
- Plan for Goods Movement
- Plan for Pedestrian Facilities
- Safety & Environment
- Resource Mobilization
- Institutional Framework

The Vijayawada Transport vision has been stated as "**Affordable Transport**, **enhanced access and mobility".** The city Transport Policy is identified in the framework of National Urban Transport Policy. It gives importance to integrated transport plan with a high priority for public mass transport system. It facilitates private sector participation and includes institutional reforms.

A short Term improvements Plan (STIP), to be implemented in a period of 5 years, has been formulated. It includes re-organization of traffic circulation pattern in the Central Area, upgrading of road capacity, improvement to intersections including control systems, improved pedestrian facilities, street lighting, traffic signs and lane markings. The STIP is estimated to cost Rs. 57.0 Crores.

The proposed city level road network extends over 240km. the new roads proposed are: ring road system to act as bypass system, city peripheral ring road, new links within the city and river bank roads. Two major bridges across River Krishna and capacity augmentation of Prakasam Barrage road have been recommended. A large number of intersections are identified for improvement of geometrics and control system. A comprehensive parking policy has been framed. 6 new passenger terminals have been proposed.

Integrated both at residential and activity end, is becoming a critical problem in our cities. A comprehensive parking policy has been formulated. It includes parking norms, space standards, development of off-street parking facilities, parking pricing, technology and private sector participation. Off-street parking for 1500 ECS needs to be developed during the plan period (2007-2021).

Public Mass Transport System Development, Operation and management of public mass transport system (PMTS) are the critical component of the Transport Plan. The technology selected includes the conventional bus system in mixed traffic along with Bus Rapid Transit System (BRTS), of high capacity high technology buses, operating on exclusive bus ways.

The total cost of Transport System Development has been estimated to be Rs. 5,445.00 Cr. A development programme in 3 phase period (2007-12, 2012-17 and 2017-21) has been formulated.

Transport system development requires large and lumpy investments. They have long gestation periods. It is necessary to mobilize resources from all possible sources to maintain the sustainability of the plan. A large number of potential sources have been identified for tapping. Private sector participation through public-Private-Participation route is important.

Institutional re-organization and restricting are important for the effective implementation and long term sustainability of the plan and programmes. Establishment of a Vijayawada Metropolitan Transport Authority (VMTA) is important for sustained policy formulation, planning and co-ordination. A structure of VMTA has been recommended. To attend to the day-to-day work, a Traffic Engineering and Management Unit (TEMU) within VMC, with due authority and logistics support, has been proposed. Logistics support to traffic police for traffic management has also been recommended.

The plan is as good as it is implemented. It calls for concerted actions by many agencies – State Government, VGTM UDA, VMC, Traffic Police, APSRTC, Private Sector and the Public. An Agenda for Action has been listed to enable follow-up action.

CHAPTER-5

PROPOSED PROJECTS

Review of previous studies

M/s. CES Consultants had prepared City Traffic & Transport study in the year 2008-09. In this connection the consultant had conducted all traffic studies, Surveys and analyzed the data the outcome of the CTTS indicates so many short term medium term and long term projects. In this report traffic management, Parking facilities, Pedestrian facilities etc., had been studied and analyzed vividly to suggest suitable projects based on the field conditions. The study indicates Vijayawada requires better public transport system and good connectivity from north direction to south direction. Based on the outcomes of the mobility plan the following projects have been identified as per field conditions.

Providing BRTS corridors

Providing BRTS corridors in the city as envisaged in the mobility plan including extension for the ongoing BRTS corridor. These BRTS corridors will enhance mobility of public in east west north south directions duly covering peripheral rural population. Further one extension corridor for the ongoing BRTS corridor is also proposed connecting Gollapudi Gannavaram with linkage to Airport and so many business and educational establishments. This corridor will give a better connectivity between 1 town & 2 town of the city and linkage between NH-5 & NH-9. For all the corridors widening of roads establishment of BRTS elements etc., is required. However in the extension corridor 1 flyover bridge across railway tracks and tunnel for Indrakiladri hill is to be provided. All these civil engineering activities will facilitate better connectivity and improvements in mobility based on the origin and destination studies after implementation of this project which will cost around Rs. 1000 Crores will be beneficial to the city and there will be a streamlined traffic flow in the city. Details of the corridor and cost estimates are furnished in the subsequent chapters.

Development of Road Network

As per detailed study on Road Densities, Traffic Densities some of the major master plan roads had been identified for widening and alternative routing. These roads will enhance traffic plan enhancement in the city and creates alternatives. The details of roads are as follows:

- Cost estimates for these roads are furnished in the appendix. In this road widening proposals widening of roads strendgthening of roads as per field conditions soil duly preparing necessary payment designs.

Construction of Bridges And Flyovers

Vijayawada city is having 3 canals, 1 rivulet, 1 river and major railway tracks. These barriers always dividing the city and becoming hindrance for free flow of traffic. Therefore bridges and flyovers are essential to cross the barriers and to establish the best connectivity of national highways and other commercial zones with central business distract. All these proposals are technically feasible as suggested by the consultant. The details of proposals are furnished below. The cost of proposals furnished in the subsequent chapters.

Providing Pedestranization Parking Lots and Cycle Tracks & Pedestranization of Besent Road:

Besent road is located in the central business distract of Vijayawada this is very important and significant road in the city having maximum business establishments. 1000's of floating population are being visiting this area for shopping, recreation and entrainment etc., this road stretches from M.G.Road to Karlmarx Road connecting Bandar canal and Ryves canal. On the banks of both the water bodies we have recreation centers entertainment zones and parks. These facilities needs up gradation on par with the present needs and demands. Therefore this beasent road requires modernization with sufficient facilities for pedestranization with parking facilities following are the key elements proposed in this project.

- Providing duct in the road to embed all the services.
- Providing beautification and ornamental units in the road for better recreation.
- Providing pedestrian paths with suitable materials.
- Providing modern street lighting, seating area etc.,
- Creation of facilitating and vendor zones.
- Constructing of multi level parking etc.,
- Providing parking facilities @ various locations in the city as proposed by the consultant. The details of cost estimates are furnished in the subsequent chapters.

Navigation and Beautification Along Canals

It is to mention that the following irrigation canals are bifurcating Vijayawada city and the details are as follows:

1) Eluru Canal, Length 7.60 K.M
2) Ryves Canal, Length 7.20 K.M
3) Bandar Canal, Length 5.30 K.M
4) Main Canal, Length 0.90 K.M

Further, the Vijayawada Municipal Corporation is taking care of sanitation in the entire city in addition to maintenance of public toilets at various places in the city on PPP Mode. Some of the Canal berm is developed as parks of its own and some of them are given to the Residential Welfare Association for maintenance. It is observed that, lot of vegetation is grown up all along canal berms breeding grounds for mosquitoes, open defecation, letting of sullage water and washing of cloths at certain locations in the canals by the public in the city. Moreover, dumping of garbage at berms margins of road bridges causing environmental pollution and creating unhygienic conditions of the residents of Vijayawada city and also en-route villages and towns who are consuming the canal water for drinking purpose. The said activities are continuing for the past decades causing environmental pollution.

The Budameru is also a one of prime factor for a Malaria menace in the Vijayawada city, the Budameru river let of Krishna river, it touches no. of habitation and 12 major slums as Rajarajeswaripet, Ramakrishnapuram, Devinagar, Ayodhyanagar, Kanakadurga Nagar, Rajivnagar, Ajithsinghnagar, Payakapuram and Santhinagar etc., and these are high incidence zone for Malaria positive cases, as a part of special drives through my Biologist and Chief Medical Officer has organized cleaning process of green vegetation in the Budameru by boat operation and anti-larval operations are also on to prevent and destroy the breeding grounds of mosquitoes.

Therefore, it is desirable to keep the canal berms clean and neat by removing unnecessary vegetation, cutting of branches of large trees wherever required, reconstruction of damaged walls all along the canal berms to avoid open defecation and avoiding dumping of garbage in the canal berms by the residents and shop keepers so as to avoid unhygienic conditions in canal berms passing through Vijayawada city for this work, V.M.C is planning to take up sanitation work by Self Help Groups (S.H.Gs) on pair with main roads of Vijayawada city, it is necessary to arrest the public defecation and open urination, garbage dropping into the canal, by the nearby residents and shop owners. These public interventions can be stopped by putting wall fencing and security wards and watch besiders regular maintenance of parks all along the canals.

In addition to the above, benefits will definitely add to the beatification, illumination and water sports such as canal rafting activities creating recreation to the residents of Vijayawada in collaboration with Tourism, Vijayawada Municipal Corporation, Irrigation Department and District Sports authority. For the above task I earnestly request to your support and guidance from the District administration, particularly from the Irrigation Department for getting clearance, and suitable instructions may be issued to the concerned.

CHAPTER-6

COST ESTIMATES

General:

This chapter presents the details of cost estimate of deferent proposals based on prevailing unit rates in Vijayawada. The overall investment costs for planning and implementation of various improvement measures for transport system in Vijayawada is estimated to be Rs.52,600 millions.

Detail of items:

Following items have been included in cost estimation

Sl. No.	Item
1	Short Term Improvement
2	Improvement of Existing Roads (as recommended in VZDP)
3	Road Network System Development
	• Bypass/Ring Road System & Regional Roads
	• Improvement of City Road Corridors
4	Intersection Improvements
5	Interchanges
6	Flyovers
7	Bridges across Krishna River (new & improvements)
8	Bridges across Canals (new & improvements)
9	Off-Street Parking facilities
10	Pedestrian facilities
11	Terminals
	• Integrated Freight Complex
	• Passenger Terminals
12	Traffic Management
13	Logistics Support to Traffic Police
14	BRTS Road Infrastructure
15	Bus System
	• General
	• BRTS
16	Surveys and Studies

Phasing:

The development is proposed in 3 phase periods as under:

- Phase I : 2007-2012
- Phase II : 2012-2017
- Phase III : 2017-2021

Costing:

The cost estimate has been worked out for all the development and improvements proposals based on unit costs, which have been compiled from various sources/projects implemented by Vijayawada. The total investment for proposals is estimated to be Rs. 54,450 millions. Item wise quantities and cost estimation for each component are presented in **Annexure.**

Summary of Cost Estimate

Sl. No.	Item	Cost Estimate (Rs. Millions)			
		Phase I	**Phase II**	**Phase III**	**Total**
A	**Road Network Development**				
1	Short term Improvement Plan	570.00			570.00
2	Improvement of Existing Road (as recommended in VZDP)	222.50			222.50
3	Improvement of City Road Corridors	1093.50	1004.56		2098.05
	TOTAL				**3765.55**
B	**Bridges & Flyovers**				
4	Intersection Improvements	437.50	218.75	218.75	875.00
5	Interchanges	1170.00	1170.00	585.00	2925.00
6	Flyovers	1023.75	1023.75		2047.50
7	Bridges across Canals (new & improvements)	2043.30	971.55		3014.85
	TOTAL				**8862.35**
C	**Pedestrian & Parking Facilities**				
8	Off Street Parking Complex	250.00	250.00	250.00	750.00
9	Pedestrian Facilities				
	Subways	8.50	8.50		17.00
	Pedestrian Bridges	42.10	42.10	42.10	126.30
10	Traffic Management	100.00	100.00	100.00	300.00
	TOTAL				**1193.3**
Total (Say)		**6961.15 6962.00**	**4789.21 4790.00**	**1195.85 1200.00**	**13821.2 13822.00**

Note: Land and O & M costs not included

The above estimate is an indicative sixe of total investment. Some of the programmes can be developed by private sector.

Finance and Investment Plan:

Financial performance

This chapter details the Municipal finances of the Municipal Corporation and other following entities involved in the provision of services and outline the receipts and expenditure over the last five years.

- Vijayawada Municipal Corporation
- Mangalagiri Municipality
- Vijayawada Guntur Tenali Mangalagiri Urban Development Authority (VGTMUDA)

CHAPTER-7

VMC REVENUE PERFORMANCE

Municipal finances of VMC have been reviewed for the last five years, commencing from the financial year 2000-01. Municipal finances of VMC have been consistent for the last five years. VMC getting finance from the various sources and the revenue inflow is dominated by the property tax. For the purpose of analysis, the items of account have been categorized under the following major heads:

Revenue Account:

All recurring items of income and expenditure are included under this head. These include taxes, charges, salaries, maintenance expenditure, etc.

Capital Account:

Income and expenditure items under this account are primarily nonrecurring in nature. Income items include loans, contributions by GoAP, other agencies and capital grants under various State and Central Government programmes. Expenditure items include expenses booked under developmental works and purchase of capital assets.

Deposits and Advances:

Under the cash system of accounting, certain items are compiled under advances and deposits. These items are temporary in nature and are essentially adjustments for the purpose of recoveries and payments. Items under this head include library cess, income tax deductions, pension payments, provident fund, payment and recoveries of advances to employees and contractors, etc.

Financial Status

Revenue income of VMC has grown to a level of INR 1210.46 million in the FY 2000-2001 from INR 627.20 million in FY 2003-20004, at consistent annual growth of Revenue expenditure increased from INR 622.32 in the year 2000-2001 to 1281.640 in the year 2003- 2004. During this period, VMC consistently maintained a revenue surplus. Capital income of VMC comprises of loans, grants and contribution in the form of sale

proceeds of assets and contribution (donations for water supply, sewerage connections and deposits works, etc.) A major share of capital income is in the form of grants. The capital account has witnessed a deficit – implying utilization of revenue surpluses to fund capital works. However, during FY 1994-95 the capital account witnessed a surplus – resulting from British Overseas Development Assistance (ODA) grant allocations towards slum improvement. Envisaged under the aforesaid assistance program were undertaken in the following year. It is observed that capital expenditure has been inconsistent during the review period. During FY 1997-98, capital expenditure had risen to INR 350 million from INR 150 million in the previous FY. This rise was primarily attributed to higher allocation for road works, ODA works and the ongoing UGD project. The following sections provide an in-depth review of the revenue and capital account, primarily aimed at assessing the municipal fiscal status and to provide a base for determining the ability of VMC to sustain planned investments.

Revenue Account:

The revenue account comprises of two components – revenue income and revenue expenditure. Revenue income comprises of internal resources in the form of tax and non-tax items. External resources are in the form of shared taxes / transfers and revenue grants from the State Government. Revenue expenditure comprises of expenditure incurred on salaries, operation & maintenance expenditure and debt servicing.

Revenue Income:

The revenue sources of VMC can be broadly categorized as own sources, assigned revenues and grants. The source-wise income generated during the last four years period is presented. The base and basis of each income source has been further elaborated in the following section.

Own Sources:

Own source income includes income from resource mobilization activities of VMC in the form of taxes, charges for water and sewer and fees for building permission, trade licenses, etc. The own revenue sources are further classified as tax revenue and non-tax revenue sources that are generated by various sections of the VMC. The salient features of this revenue head is detailed below:

Tax sources:

The sections contributing tax income include – General Taxation, General Administration, Communication and Engineering, Education, Town Planning, Public Health, Remunerative Enterprises, Water Supply and Underground Drainage. The General Taxation section is the largest revenue generating section and collects among other taxes, property tax and advertisement tax. Other sections collect charges and fees, as per the rules, towards services rendered by VMC.

Non Tax Sources:

Non-Tax sources include all non-tax revenues such as fees and charges levied as per the Municipal Act. Such revenue sources include income from special services, etc. The major sections/departments contributing non-tax income include: General Administration, Income from Town Planning Section, Dangerous & Offensive Trade License Fee, Births and Death Certificate, Income from Remunerative Enterprises, Water Supply and Under Ground Drainage.

General Administration:

Income from general administration is in the form of Magisterial fines; warrant & distraint fees; lapsed deposits and other sundry income. It also includes income through interest on investment and realization of past investment during the financial year.

Property tax:

Income through property tax is based on the Annual Rental Value (ARV) of the property and is the single largest and most elastic source of revenue. VMC has witnessed an increase in number of assessments (greater than the number of building permission sanctioned), a clear indication that efforts are being made to include unassessed properties into the demand net.

Advertisement Tax:

Another major tax source – advertisement tax, contributes about one percent of the revenue income. This tax is levied on hoarding, slides in cinema halls, advertisements on buses, and bus shelters. This source has grown considerably over the assessment period.

Town Planning:

The income from town planning section includes layout fees, building permission fee, compounding fees, betterment charges, development charges, change of land use and impact fee. The income from town planning section, excluding building regularization fee, accounts for about 5 percent of the revenue income. Due to the implementation of the Building Regularization Scheme (BRS) for all unauthorized constructions, VMC realized INR 456 Lakhs and INR 630 Lakh during FY 1998-99 and FY 1999-00, respectively – this was a major initiative undertaken by VMC to increase the revenue.

Public Health:

The Public Health section of VMC generates income by way of dangerous and offensive (D&O) trades license fee, birth & death certificates. Income under this head contributes over two percent to the revenue income.

Remunerative Enterprises:

Income from remunerative enterprises is in the form of rental income from assets like shopping complexes, market fees, parking fee and income from other real assets owned by the Corporation.

Assigned Revenue:

Assigned Revenues include revenues transferred to VMC by the State Government (Govt. of A.P.) under special Acts. Transfers are in the form of VMC's share of taxes levied and collected by GoAP from establishments/operations within municipal limits. Surcharge on transfer of immovable properties, entertainment tax, and professional taxes are items under which these revenues are realized by VMC.

Income through assigned revenues contributes 51 percent of revenue income for the year 2004-05 and has increased at an average rate of 41 percent per annum. Professional tax is a fixed transfer amount per annum and other transfers are as per actual realization. Income through assigned revenue heads that contribute substantially towards revenue income include:

Entertainment Tax:

The Commercial Tax (CT) Department collects entertainment tax from all Cinema Halls functioning within VMC limits. The CT Department transfers 90 percent of the total tax collection to VMC, and retains 10 percent towards management charges.

Professional Tax:

The Commercial Tax Department also collects Professional Tax.

Stamp Duty:

Surcharge on stamp duty is a major assigned revenue source. It is levied in the form of a surcharge on stamp duty applicable on all properties registered or transferred within VMC limits. The Registration Department had been collecting this tax since 1986 and the collections made were transferred to VMC.

Revenue expenditure

Revenue expenditure of VMC has been analyzed based on expenditure heads broadly classified under the following department/sections of VMC. General Administration, Street Lighting, Revenue Section, Education, His Worshipful Mayors Office, Public Health – Preventive Medicine, Pension Contribution, Public Health – Conservancy, Communication, Engineering Section, Remunerative Enterprises, Town Planning & Urban Community Development (UCD). Revenue expenditure is further classified under establishment and contingencies (O&M). Besides the above items of expenditure, pension contribution and debt servicing constitute a substantial proportion of revenue expenditure. The revenue expenditure of VMC is as follows:

Establishment expenditure alone accounts for 42 percent of revenue expenditure. In comparison with revenue income, over 32.5 percent is utilized for payment of salaries and pensions. Debt servicing accounts for a major share of about 2.8 percent of the revenue expenditure. For the assessment period, revenue expenditure grew at an average rate of 30 percent, while the corresponding growth in revenue income was 21.3 percent. Further, while expenditure on establishment increased at annual average rate of 3.20 per cent, expenditure on O&M grew at an average rate of 64 percent per annum. Analysis of heads under revenue expenditure has been carried out with regard to establishment, operation & maintenance, and debt servicing. The following sections detail the same.

Establishment Expenditure

Establishment expenditure of all sections accounts for over 45 per cent of total revenue expenditure (include debt servicing). The salary bill alone of MCH, during financial year 2004- 05, was INR 41.38 Crores. Details of establishment expenditure have been indicated.

Operation and Maintenance Expenditure

Operation and maintenance expenditure of all section together accounts for 40 percent of revenue expenditure. The total O&M expenditure during financial year 2004-05 was INR 39.09 Crores *Table 7.3*. O&M expenditure registered an average growth of 64 percent during the assessment period, with a maximum of 77 percent during financial year 2003-04. The increase in O&M expenditure is attributed to high allocations towards road maintenance.

Debt Servicing

A review of the loan statement of VMC reveals that as on 31st March 2005 VMC HAS 2747 Lakhs as loans from state government and has paid Rs.275 Lakhs as interest payment on the loans.

Capital account

Capital Receipts

Capital income comprises loans, grants and own contributions. The detailed components of capital income are enumerated in *Table 7.4.* An analysis of this account indicates that 17 percent of capital income is in the form grants and 83 percent by way of loans from state government. It also reveals that during the review period capital income was inconsistent due to irregular flow of scheme specific grants.

Capital Expenditure

Capital expenditure **(Table 8.1.10 – ref. Annexure)** has been directed towards roads, special works and other grant works for improvement of slums. The overall status of the capital account indicates a net deficit. Which is positive sign that revenue surplus have been transferred to capital account Analysis of capital income and capital expenditure indicates regular transfer of funds from the revenue account to the capital account. This transfer, towards capital investments, constitutes 38 percent of capital expenditure.

Analysis of VMC Finances

Revenue income

VMC has generated over 66 percent of revenue income through its own sources, which is a commendable feat. Dependency on grants is only to the extent of 1 percent. The balance 33 percent is by way of assignments or transfers from GoAP, which is an indirect form of own source revenues. However, realization of these amounts is dependent on timely transfers from GoAP. Though property tax is the single largest own-source revenue income, in comparison with other major cities, there is scope for improvement by expanding the base by way of covering unassessed properties.

Revenue expenditure

It is observed that about 45 percent of revenue income is spent on salaries, which is well above the average when compared to other local bodies-the range being 30-40 percent of revenue income.

Capital account status

While the capital account has consistently indicated a deficit, indicating revenue surplus has been utilized to fund the capital works.

The total Revenue income of Mangalgiri Municipality has grown to Rs. 585.72 Lakhs in the financial year 2003-04 from Rs. 171.3 Lakhs in financial year 2001-02, at a high average annual growth of 86 percent. Revenue expenditure increased at an average annual rate of 76 percent from Rs. 544.75 Lakhs in 2001-02 to Rs. 128.47 Lakhs during 2003-04. The revenue account maintains surplus during the entire assessment period.

Capital Account

Capital income comprises of loans, grants and contribution in the form of initial deposit for water supply connections and sale proceeds of assets. The capital account has witnessed deficit during the entire assessment period, implying revenue surplus is being used for asset creation.

Financial performance of Mangalagiri municipality over the last three years

Receipts for the year 2000-2001 to 2003 - 2004 (Rs. In Lakhs)				
Sl. No	**Particulars**	**Years**		
		2001-2002	**2002-2003**	**2003-2004**
1	Total Taxes	40.07	62.1	70.48
2	Total Non-Taxes	64.86	138.28	117.28
3	Total Assigned Revenues	43.75	135.22	72.53
4	Total Plan Grants	22.62	25.95	325.43
5	Loans		0.6	
Expenditure for the Years 2001-2002 to 2003-2004 (Rs. In Lakhs)				
Sl. No	**Particulars**	**Years**		
		2001-2002	**2002-2003**	**2003-2004**
1	Establishment	85.61	109.84	92.11
2	Maintenance of Services	25.43	147.13	59.02
3	Capital Works		9.66	141.66
4	Office Maintenance	17.43	80.12	251.96
	TOTAL	**128.47**	**337.09**	**544.75**

Source-Wise Revenue Income

Items	**2001-02**	**2002-03**	**2003-04**
Own Sources	104.93	200.38	187.76
Assigned Revenue	43.75	135.22	72.53
Grants	22.62	25.95	325.43
TOTAL	**171.3**	**361.55**	**585.72**

Own Sources

Own-source income includes income from resource mobilization activities of Mangalagiri Municipality in the form of taxes, user fees, fee for building permission, trade licenses, etc. Own revenue sources are further classified as tax and non-tax sources that are generated by various sections of the Mangalagiri Municipality and are presented.

Tax Sources:

The sections contributing tax income include General Taxation, General Administration, Communication and Engineering, Education, Town Planning, Public Health and Estate Department. The General Taxation section is the largest revenue generating section and collects among other taxes, property tax and advertisement tax. Other sections collect charges and fees, as per the rules, towards services rendered by Mangalagiri Municipality.

Non-Tax Sources:

Non-tax sources include all non-tax revenues such as fees and charges levied as per the Municipal Act. Such revenue sources include income from special services, etc. The major sections/departments contributing non-tax income include General Administration, Income from Town Planning Section, Dangerous & Offensive Trade License Fee, Births and Death Certificate and Income from Remunerative Enterprises.

Base case scenario - Income considerations

- In "do nothing "scenario following assumption was made;
- No revision in taxation from financial year 06-07;
- Maintaining the same collection efficiency over the forecast period:
- Growth in other revenue income items based on past performance and or likely growth of 15% in tax and non tax revenues.

Base case scenario - Expenditure considerations

- Establishment expenditure assumed to increase at rate of 15% per annum for VMC and Mangalagiri Municipality.
- O& M to grow based on past performance and/or likely growth;
- Additional O&M due to the new investment was considered;

With Reforms scenario - Income considerations

- Property tax revision (Rationalization) by 10% in financial year 2006-07 and Revision of property tax current valuation method to Unit Area method from FINANCIAL YEAR 2006-07 and there on every year 10% increase is assumed;
- Improving the tax collection efficiency from the current level to the minimum of 85 % of current demand and 50% of arrear demand;
- Growth in other revenue income items based on past performance and/or likely growth;
- Introduction of conservancy fee in addition to the bulk garbage collection charges to households to a minimum of Rs. 10 per month per households;
- Identifying more areas for parking and increasing the parking fee.

With Reforms scenario - Expenditure considerations

- Establishment expenditure assumed to increase at rate of 15% per annum for VMC AND Mangalagiri Municipality
- O& M to grow based on past performance and/or likely growth;
- Repayment commitments of all outstanding debt liabilities like bonds etc.

Assumptions for projected income

Particulars	Assumption for Future	Current Average	Unit
Projection of Revenue Income (with Reforms)			
Property Tax			
Tax Revision - 2006-07 (Rationalization)	10.00		%
Tax Revision - Every year	10.00		%
Growth in Assessment	2.50	2.33	%
Collection Performance			
Arrear Collection	50.00	50.00	%
Current Collection	85.00	76.00	%

REVENUE INCOME PROJECTIONS OF VMC										
Description	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**TOTAL**
Tax	3722	42.803	49.22345	56.6069675	65.309801263	74.8627145	86.0921217	99.00594	113.856831	**544.746037**
Non Tax	5430	62.445	71.81175	82.5835125	94.97103938	109.216695	125.5992	144.43908	166.104941	**794.726218**
Transfers / Other grants	6543	75.2445	86.531175	99.5108513	114.4374789	131.603101	151.343566	174.045101	200.151866	**957.623139**
TOTAL	15695	180.4925	207.566375	238.701331	274.5065309	315.682511	363.034887	417.49012	480.113638	**2297.09539**

REVENUE EXPENDITURE PROJECTIONS OF VMC										
Description	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**TOTAL**
Establishment (Wages and Salaries)	4138	47.587	54.72505	62.9338075	72.37387563	83.2299604	95.7144545	110.071623	126.582366	**605.63114**
O & M	3909	44.9535	51.696525	59.4510038	6836865431	78.6239525	90.4175453	103.980177	119.577204	**572.115062**
Interest Payment	275	3.1625	3.636875	4.18240625	4.809767188	5.53123227	6.36091711	7.31505467	8.41231287	**40.2485654**
Others	1460	16.79	19.3085	22.204775	25.53549125	29.3658149	33.7706872	38.8362903	44.6617338	**213.683292**
TOTAL	9782	112.493	129.36695	148.771993	171.0877914	196.75096	226.263604	260.203145	299.233616	**1431.67806**
Surplus / Deficit		67.9995	78.199425	89.9293388	103.4187396	118.93155	136.771283	157.2869863	180.880022	**865.417334**

GENERAL ABSTRACT

Sl. No.	Description	Amount (Rs. in Cr)
1	Development of BRT Corridors	756.00
2	Road Network Development	376.00
3	Bridges & Flyovers	798.00
4	Traffic Management, Pedestrian Facilities & Parking Facilities.	150.00
5	Besent Road Pedestrianization	25.00
6	Canal Navigation & Beautification	340.00
	TOTAL	**2445.00**
Add for escalation @ 20%		489.00
Add 10% towards Tender Premium		244.50
Add 5% towards contingencies & administrative charges		122.25
	Grand Total	**3300.75**
	Say	**3300.00**

Annexure-1

VMC FINANCES

Receipt during last 4 years in Rs. Lakhs

Tax receipt during last four years for Vijayawada Municipal Corporation

Head	Actual			Projected
I-Taxes	**2001-02**	**2002-03**	**2003-04**	**2004-05**
Property Tax & VLT	1872.00	2952.2	3031.6	3183.1
Advertisement tax	65.99	95.02	166.0	174.3
Other taxes	0.95	0	0	0
Total Taxes*	1938.9	3047.2	3197.6	3357.5

* The sharp increase in PT receipts over the last three years is explained by the massive drive undertaken to collect long pending dues and also the survey done to detect all un-assessed and under assessed properties. The advertisement tax was assigned to a single agency from 2003-04, by tenders, and this explains the spurt in revenues.

Non–Tax receipts during last four years for Vijayawada Municipal Corporation

Head	Actual			Projected
II-Non Taxes	**2001-02**	**2002-03**	**2003-04**	**2004-05**
Water Charges*	402.00	398.2	761.7	776.9
D & O Traders	94.4	82.7	59.3	64.1
Encroachment fee	0.85	2.4	3.2	3.5
Betterment charges	81.0	92.7	53.5	55.7
Building permission fee**	87.5	208.4	221.0	236.5
Water supply Donations	75.6	92.2	168.4	170.1
Other receipts***	15.9	507.8	877.1	920.9
Miscellaneous receipts****	322.8	568.5	1111.6	1133.85
Total Non-Taxes	10801.1	1952.9	3255.8	3361.5

1. The water charges have gone up from 2003-04 due to tariff revision from Rs. 60/- to Rs.80/- for domestic consumers and also due to a massive drive carried out to detect illegal connections.
2. The building permission fees grew in 2003-04 and 2004-05 due to the combined effect of the one-time Building Regularization Scheme (BRS) initiated by the Government and better enforcement of existing regulations. The Government has recently issued guidelines on revised building permission process, which gives considerable powers to the Commissioners to regularize minor deviations. This is expected to significantly increase revenues in the coming years.
3. The sharp rise in other receipts in 2002-03 is due to Grants from the Government to set-up Projects like the modern slaughter house, the bio-methanization plant etc., and assistance to conduct the Krishna Pushkaram in 2004-05.
4. The spurt in miscellaneous receipts is due to the increased income from three big new commercial complexes, and also a drive carried out to clear all old arrears from various commercial establishments under the Corporation. Further, under PPP some parks and other assets were outsourced for maintenance, which have been fetching significant revenues.

Assigned revenues during last four years for Vijayawada Municipal Corporation

Head	**Actual**			**Projected**
III-Assigned Revenues	**2001-02**	**2002-03**	**2003-04**	**2004-05**
Entertainment tax	476.17	352.69	506.43	531.75
Surcharges on stamp duty	748.353	873.76	1246.71	1346.45
Profession tax compensation	489.99	1276.65	1012.95	1063.60
Per capita grant.	56.04	41.06	41.23	42.05
M.V.tax compensation	3.57	15.53	6.75	7.43
Total Assigned revenues	**1774.3**	**2559.72**	**2814.07**	**2991.28**

Total planned grants during last four years for Vijayawada Municipal Corporation

Head	**Actual**			**Projected**
IV-Total Planned Grants	**2001-02**	**2002-03**	**2003-04**	**2004-05**
State Govt. Programmes	132.43	152.02	145	140
Teaching Grants	791.04	791.04	400.00	858.82
Other Grants	0.00	0.00	0.00	308.67
N.R.Y / SJSRY	127.69	39.39	1.85	250.00
Total Compensation (octroi)	1680.91	1718.26	2518.66	2772.84
NSDP	25.00	211.54	57.60	200.00
ILCS	0.00	0.00	0.00	175.00
Property Tax Compensation	14.81	14.81	55.68	25.53
Road Grant	0.00	0.00	33.06	0.00
School Building Grant	8.80	8.80	7.30	7.373
Other Grants	7.14	2.25	11.75	18.60
Total Plan Grants	**2787.82**	**2938.11**	**3230.9**	**4756.83**

Abstract of total receipts during last four years for VMC

Head	**Actual**			**Projected**
Abstract	**2001-02**	**2002-03**	**2003-04**	**2004-05**
Total Taxes	1938.94	3047.21	3197.64	3357.52
Total Non-Taxes	1080.11	1952.88	3255.82	3361.50
Total Assigned Revenues	1774.3	2559.72	2814.07	2991.27
Total Plan Grants	2938.11	3230.9	4756.833	5035.30
Loans	0.00	0.00	1000.00	0.00
Grand Total	**7731.46**	**10790.71**	**15024.6**	**14745.6**

Establishment and Maintenance expenses during last four years for Vijayawada Municipal Corporation

	Actual			Predicted
Maintenance Expenditure	**2001-02**	**2002-03**	**2003-04**	**2004-05**
Staff Salaries*	3300.50	3384	3763.22	3951.38
Management, Engineering etc.,	150.00	132.00	212.46	233.70
Public Health	6.18	28.87	115.50	127.05
Pension Payment	450.75	420	480	542.4
Other expenditure	143.23	238.42	520.39	572.43
Water Supply**	530.45	570.20	650.57	683.09
Sanitation***	39.44	149.72	320.10	352.11
Remuneration enterprises	10.42	0.00	41.78	45.95
Roads	151.69	294.00	568.93	597.37
Drains and culverts	46.90	140.00	54.24	59.66
Street Lighting	83.65	77.06	574.77	580.51
Buildings	19.16	72.42	36.72	40.39
Total expenditure Maintenance	**4932.37**	**5508.69**	**7338.68**	**7786.08**

1. The major portions of staff are Public Health workers, who are involved in sanitation. The utilities – water, sewerage, street lighting, vehicles etc – are run mainly with contract labour through labour contracts.
2. The expenditure on water supply includes electricity charges, consumables, and repairs.
3. Sanitation cost has increased thanks to the sharp in purchase and use of dumper placers etc.

Capital expenses during last four years for Vijayawada Municipal Corporation

	Actual			Predicted
Capital Expenditure	**2001-02**	**2002-03**	**2003-04**	**2004-05**
Roads & Bridges*	391.40	792.00	2074.79	2178.53
Drains & Culverts	94.59	12.00	793.42	801.35
Remuneration enterprises	30.94	24.02	102.15	103.17
Lighting	200.82	67.02	279.44	293.41
Water Supply**	73.78	606.89	767.93	844.73
Buildings	69.84	80.92	51.83	57.01
Sanitation	0.00	25.02	37.07	40.78
Land Acquisition	2.51	4.21	152.69	153.91
Law Charges	7.00	8.43	10.73	11.80
Loan Repayment	0.00	661.00	1208.00	1220.08
Total Capital expenses	**870.88**	**2281.51**	**5477.75**	**5704.77**

1. The sharp rise in roads and bridges expenditure from 2002-03 is due to the HUDCO loan available.
2. The sharp increase in capital expenditure in water supply from 2002-03 can be attributed to the spending on additional treatment capacity and its attendant works (10 MGD Plant), which is ongoing. These works are being done through HUCO loans.

Abstract of total expenses during last four years for VMC

Head	Actual			Projected
	2001-02	**2002-03**	**2003-04**	**2004-05**
Total Management Expenditure	4932.37	5508.69	73387.68	7786.083
Total Capital Expenditure	870.88	2281.51	5477.75	5704.777
Total	**5803.25**	**7790.2**	**12816.43**	**13490.86**

The total capital expenditure grew sharply from 2002-03 due to utilization of the Rs.70 Cr. HUDCO loan. The projects under the loan are still under implementation.

Annual Growth rates of the receipts and expenditure under different heads

Head	Growth Rates			Projected
Receipts	**2002-03**	**2003-04**	**2004-05**	**Growth Rate**
Total Taxes	57.16	4.94	5.00	14.33
Total Non-Taxes	80.80	66.72	3.25	5.44
Total assigned revenues	44.27	9.94	6.30	7.24
Total planned grants	9.97	47.23	5.85	8.04
Expenditure				
Total expenditure Maintenance	**6.75**	**31.63**	**9.82**	**3.76**
Total Capital expenditure	**161.98**	**140.09**	**4.14**	**11.20**

CASE SCENARIO MATRIX OF VIJAYAWADA MUNICIPAL CORPORATION FOR THE YEAR 2005-06

	Base case scenario	Optimistic scenario	Pessimistic scenario
REVENUE RECEIPTS (1)	15511.5	17062.7	13960.4
REVENUE EXPENDITURE (2)	8267.1	8267.1	8267.1
SURPLUS / DEFICIT (3) = (1-2)	7244.4	7244.4	7244.4
SURPLUS / DEFICIT AFTER ANNUITY (5) = (3-4)	6749.3	6749.3	6749.3
TF / TR (7) = (2/1)	0.5	0.5	0.5
CAPITAL EXPENDITURE (11)	5209.4	5209.4	5209.4
To get DS / TR of 30%, borrowing is (A)	4188.1	5118.8	4188.1
TE / TR	0.53	0.5	0.6
To get TE /TR of 1.00, total TE should be	15511.5	17062.7	13960.4
Existing Revenue Exps. (Other than ann.)	8267.1	8267.1	8267.1
Annuity at TE / TR = 1, is (B)	7244.4	8795.5	5693.2
40% of Operating Surplus©	2897.8	3518.2	2277.3
(A), (B) or (C) whichever is less	2897.8	3518.2	2277.3
Additional Sustainable Annuity	2402.7	3518.2	2277.3
Borrowing Capacity	19293.3	28251.3	18286.7
Investments	32155.6	47.85.5	30477.8

ANNEXURE-2

Vijayawada BRTS – Cost Estimate

Sl. No	Item	Amount (Rs. Lakhs)
1	Corridor Physical Infrastructure	
	• Green Corridor	9,512
	• Red Corridor	5,768
	• Blue Corridor	12,700
	• Orange Corridor	5,565
	• Yellow Corridor	3,062
	• Airport Corridor	30,000
2	Terminals	
	• Central Bus Terminal	1000
	• Kanuru Nodal Bus Terminal	500
	• Ramavarapadu Nodal Bus Terminal	500
	• Nunna Nodal Bus Terminal	500
3	BRT Buses (100 no's @ 40 Lakhs per bus)	4,000
4	Intelligent Transport System (ITS) (LS)	2,500
	TOTAL AMOUNT	**75,607**

Note: Land and O&M costs not included

Green Corridor: Mahatma Gandhi Road

(Bus Terminal to Kanuru)

Cost Estimate

Sl. No	Item	Unit	Length/ Number	Lump sum / Unit Rate (Rs. Lakhs)	Amount (Rs. Lakhs)
1	Road Pavement including Footpaths	Lane km	96	60	5760
2	Bridges / ROBs / Flyovers	-	-	-	-
3	Geometric Improvements of Intersections and Signal Control System	Junction	8	100	800
	• Police Control Room Junction • Government Junction • Vangaveeti Ranga Statue Junction • IGM Stadium Junction • Police Control Room Junction • Benz Circle Junction • NTR Statue Junction • Autonagar Junction				
4	Improvement of other Minor Junctions	LS	-	-	500
5	Provision of Median Railing	Km	24	10	240
6	Street Furniture	Km	12	1	12.0
7	Street Lighting	Km	12	5	60
8	Traffic Management	Km	12	5	60
9	Provision of Bus Stops / Shelters	Shelter	16	5	80
10	Provision of Parking Facilities	ECS	2000	1	2,000
Total =					**9,512**

Red Corridor: Eluru Road

(Bus Terminal to Ramavarapadu Junction)

Cost Estimate

Sl. No	Item	Unit	Length/ Number	Lump sum / Unit Rate (Rs. Lakhs)	Amount (Rs. Lakhs)
1	Road Pavement including Footpaths	Lane km	54.4	60	3264
2	Bridges / ROBs / Flyovers	-	-	-	-
3	Geometric Improvements of Intersections and Signal Control System	Junction	6	100	600
	• Swarna Palace Hotel Junction • Vijaya Talkies Junction • Seetarampuram Junction • Chuttagunta Junction • Machavaram Hanuman Temple Junction • Ramavarapadu Junction				
4	Improvement of other Minor Junctions	LS	-	-	500
5	Provision of Median Railing	Km	13.6	10	136
6	Street Furniture	Km	6.8	1	6.8
7	Street Lighting	Km	6.8	5	34
8	Traffic Management	Km	6.8	5	34
9	Provision of Bus Stops / Shelters	Shelter	12	5	60
10	Provision of Parking Facilities	ECS	1133	1	1133
Total =					**5,768**

Note: Land and O&M costs not included

Blue Corridor: G.S.Raju Road

(Bus Terminal to Payakapuram - Nunna)

Cost Estimate

Sl. No	Item	Unit	Length/ Number	Lump sum / Unit Rate (Rs. Lakhs)	Amount (Rs. Lakhs)
1	Road Pavement including Footpaths	Lane km	96	60	5760
2	Bridges / ROBs / Flyovers - Eluru & Budameru Bridges @ Govt. Press Junction - Widening ROB @ Devinagar	 Sq.m Sq.m	 3000 9750	 0.02 0.25	 750 2438
3	Geometric Improvements of Intersections and Signal Control System	Junction	8	100	800
	• Govt. Hospital Junction • Gandhi Center Junction • Intersection with Corridor No-4 • Cement Factory Bridge Junction • Govt. Press Junction • Ajithsinghnagar Junction • Pipula Road Junction • Pumping Drainage Junction (Kandrika)				
4	Improvement of other Minor Junctions	LS	-	-	500
5	Provision of Median Railing	Km	24	10	240
6	Street Furniture	Km	12	1	12.0
7	Street Lighting	Km	12	5	60
8	Traffic Management	Km	12	5	60
9	Provision of Bus Stops / Shelters	Shelter	16	5	80
10	Provision of Parking Facilities	ECS	16	1	2000
Total =					**12,700**

Orange Corridor: S.N.Puram Road

(Bus Terminal to Machavaram Hanuman Temple)

Cost Estimate

Sl. No	Item	Unit	Length/ Number	Lump sum / Unit Rate (Rs. Lakhs)	Amount (Rs. Lakhs)
1	Road Pavement including Footpaths	Lane km	44	60	2640
2	Bridges / ROBs / Flyovers - Machavaram Bridge (across Ryves canal) - Near Gymkhana Ground (across Eluru Canal)	Sq.m Sq.m	1500 1650	0.25 0.25	375 413
3	Geometric Improvements of Intersections and Signal Control System	Junction	5	100	500
	• Goods Shed Junction • Vijayawada Railway Station • Pezzonipet Junction • Old S N Puram Railway Station Junction • Madhuranagar Road				
4	Improvement of other Minor Junctions	LS	-	-	500
5	Provision of Median Railing	Km	11	10	110
6	Street Furniture	Km	505	1	5.5
7	Street Lighting	Km	505	5	28
8	Traffic Management	Km	5.5	5	28
9	Provision of Bus Stops / Shelters	Shelter	8	5	50
10	Provision of Parking Facilities	ECS	917	1	917
Total =					**5,565**

Note: Land and O&M costs not included

Yellow Corridor: Route No.5 Road

(Eluru Road Junction – Executive Club Junction – Auto Nagar)

Cost Estimate

Sl. No	Item	Unit	Length/ Number	Lump sum / Unit Rate (Rs. Lakhs)	Amount (Rs. Lakhs)
1	Road Pavement including Footpaths	Lane km	12.30	30	369
2	Bridges / ROBs / Flyovers	-	-	-	-
3	Geometric Improvements of Intersections and Signal Control System	Junction	10	100	1000
	• Eluru Road Junction • Swarna Palace Hotel Junction • Besant Road Junction • Dornakal Road Junction • Madhu Kalyanamandapam Junction • Siddhartha Arts College Junction • Sunnam Battilu Junction • Executive Club Junction • Gurunanak Colony Road Junction • Auto Nagar Junction				
4	Improvement of other Minor Junctions	LS	-	-	500
5	Provision of Median Railing	Km	-	-	-
6	Street Furniture	Km	6.15	5	31
7	Street Lighting	Km	6.15	5	31
8	Traffic Management	Km	6.15	5	31
9	Provision of Bus Stops / Shelters	Shelter	20	5	100
10	Provision of Parking Facilities	ECS	1025	1	1025
Total =					**3,062**

Note: Land and O&M costs not included

Brown Corridor: Loop Road

(City Bus Terminal – Goods Shed junction – VMC Junction – City Bus Terminal)

Cost Estimate

Sl. No.	Item	Unit	Length/ Number	Lump sum / Unit Rate (Rs. Lakhs)	Amount (Rs. Lakhs)
1	Road Pavement including Footpaths	Lane km	21	60	1260
2	Bridges / ROBs / Flyovers - Widening of VMC Bridge. - City Bus Terminal Bridge.	 Sq.m Sq.m	 3750 3750	 0.25 0.25	 938 938
3	Geometric Improvements of Intersections and Signal Control System.	Junction	1	100	100
	• VMC Junction on NH-9 Road.				
4	Improvement of other Minor Junctions.	LS	-	-	500
5	Provision of Median Railing	Km	5.24	10	5.24
6	Street Furniture	Km	2.62	1	2.6
7	Street Lighting	Km	2.62	5	13
8	Traffic Management	Km	2.62	5	13
9	Provision of Bus Stops / Shelters	-	-	-	-
10	Provision of Parking Facilities	-	-	-	-
Total =					**3,816**

Note: Land and O&M costs not included

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Area (sqm)	Unit Cost (Rs. In Lakh) / sqm	Total Cost (Rs. in millions)
D	**New Construction of Grade Separators / Flyovers**			
	Grade Separators			
1	Intersection of Northern Ring Road – Western Ring Road (along Hyderabad – Kolkata Road)	9750	0.3	292.5
2	Gollapudi Intersection (along Northern Ring Road)	9750	0.3	292.5
3	Ambapuram Road Intersection (along Northern Ring Road)	9750	0.3	292.5
4	Kandrika Road Intersection (along Northern Ring Road)	9750	0.3	292.5
5	Nuzevidu Road Intersection (along Northern Ring Road)	9750	0.3	292.5
6	China Avatapalli Intersection (along Northern Ring Road)	9750	0.3	292.5
7	Gudavalli inter section (along Eastern Bypass / Ring Road)	9750	0.3	292.5
8	Near Penamaluru Intersection (along South Eastern Loop Ring Road)	9750	0.3	292.5
9	Mangalagiri Bypass Intersection (along South Eastern Loop Ring Road)	9750	0.3	292.5
10	China Kakani Intersection (along South Eastern Loop Ring Road)	9750	0.3	292.5
	Flyovers			
1	Police Control Room Intersection	68250	0.3	2047.5
2	Governer pet Intersection			
3	Benz Circle Intersection (along NH-5 Road)			
4	NTR Intersection			
5	Executive Club Intersection			
6	Fire Station Intersection			
7	Ramavarapupadu Intersection			

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Area (sqm)	Unit Cost (Rs. In Lakh) / sqm	Total Cost (Rs. in millions)
E	**Improvement / New construction of ROB / RUB for Railway Crossings**			
1	Vijayawada – Machilipatnam Railway Line at Ramavarapupadu.	9750	0.3	292.50
2	Vijayawada – Machilipatnam Railway Line at Gunadala.	4875	0.3	146.25
3	Vijayawada – Machilipatnam Railway Line at Madhuranagar.	4875	0.3	146.25
4	Vijayawada – Kolkata Railway Line at Gunadala – Payakapuram Road.	4875	0.3	146.25
5	Vijayawada – Kolkata Railway Line at Devi Nagar.	4875	0.3	146.25
6	Vijayawada – Kolkata and Vijayawada – Hyderabad Railway Line at K.L Rao Nagar.	4875	0.3	146.25
7	Vijayawada – Hyderabad Railway Line at Milk Project	4875	0.3	146.25
8	Vijayawada – Hyderabad Railway Line at Urmilasubbarao Nagar.	4875	0.3	146.25
9	Vijayawada – Hyderabad Railway Line at Northern Ring Road.	9750	0.3	292.50
10	Vijayawada – Kolkata Railway Line at Northern Ring Road.	9750	0.3	292.50
11	Vijayawada – Machilipatnam Railway Line at Gudavalli.	9750	0.3	292.50
12	Vijayawada – Guntur Railway Line at Mangalagiri town.	9750	0.3	292.50
13	Vijayawada – Tenali Railway Line at Mangalagiri Bypass.	9750		292.50

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No	Description	Length (km)	Existing features (m)			Proposed Features (m)				Unit Cost (Rs. in Lakhs) (Lane km)	Total Cost (Rs. in millions)
			Classification	ROW (m)	CW (m)	Classification	Improvement Measures	ROW (m)	CW (m)		
A	**Development of Bypass System & Regional Roads**										
1	Northern Bypass / Ring Road	27.6	-	-	-	Arterial	New Construction of 4 lane divided carriageway	100	15	125.00	1380
2	Eastern Bypass / Ring Road	5.8	-	-	-	Arterial	New Construction of 4 lane divided carriageway	100	15	125.00	290
3	South Eastern Loop Ring Road	14.2	-	-	-	Arterial	New Construction of 4 lane divided carriageway	100	15	125.00	710
4	South Western Loop Ring Road	15.9	-	-	-	Arterial	New Construction of 4 lane divided carriageway	100	15	125.00	795
5	Northern River Bank Road	4.1	-	-	-	Arterial	New Construction of 4 lane divided carriageway	60	15	125.00	205
6		11.6	-	-	-	Arterial	New Construction of 4 lane divided carriageway	80	15	125.00	580
7	Southern River Bank road (western Leg)	12.45	-	-	-	Arterial	New Construction of 4 lane divided carriageway	80	15	125.00	623
8	Middle Ring Road (Peripheral Ring)	24.1	-	-	-	Arterial	New Construction of 4 lane divided carriageway	60	15	125.00	1205
9	Inner Ring Road	3.82	Sub-Arterial			Arterial	Widening to 4 lane divided carriageway	40	15	80.00	61
10	Chennai – Kolkata Road	26.51	Arterial	65	15.5	Arterial	Widening to 4 lane divided carriageway	80	22	80.00	424
11	Nainavaram Road	3.1	Sub-Arterial		3.2	Arterial	Widening to 4 lane divided carriageway	60	15	80.00	50
12	Nunna Road	5.7	Sub-Arterial		7.5	Arterial	Widening to 4 lane divided carriageway	60	15	80.00	91
13	Mangalagiri Road	7.6	Sub-Arterial		7.5	Arterial	Widening to 4 lane divided carriageway	60	15	80.00	122
14	Kummaripalem Jn. – Varadhi Jn	4.8	Arterial	22	7.5	Arterial	Widening to 4 lane divided carriageway	60	15	80.00	77

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No	Description	Length (km)	Existing features (m)			Proposed Features (m)				Unit Cost (Rs. in Lakhs) (Lane km)	Total Cost (Rs. in millions)
			Classification	ROW (m)	CW (m)	Classification	Improvement Measures	ROW (m)	CW (m)		
B	**Improvement of City Road Corridors**										
1	Urmila Subbarao Nagar Road – Kabela	1.36	-	-	-	Sub-Arterial	New Construction of 2 lane carriageway	30	9.5	112.5	31
2	Milk Project – KL Rao Nagar	1.70	-	-	-	Collector Street	New Construction of 2 lane carriageway	30	9.5	112.5	38
3	Rajarajeshwari Peta Road	2.57	-	-	-	Collector Street	New Construction of 2 lane carriageway	30	9.5	112.5	58
4	Disney Land Road	1.00	-	-	-	Arterial	New Construction of 4 lane Divide carriageway	30	15	125	50
5	Gunadala Hill Tunnel Road	1.00	-	-	-	Sub-Arterial	New Construction of 4 lane Divide carriageway	30	15	1500	600
6		1.79	-	-	-	Sub-Arterial	New Construction of 2 lane carriageway with Paved Shoulders	30	9.5	112.5	40
						Sub-Arterial	Widening to 4 lane divided carriageway		15	80	29
7	Satyanarayanapuram Road	5.30	-	-	-	Arterial	New Construction of 4 lane Divide carriageway	30	15	125	265
8	Gunadala-Payakapuram Road	3.43	-	-	-	Sub-Arterial	New Construction of 4 lane Divide carriageway	30	15	125	172
9	Bandar Road	6.60	Sub-Arterial	34	16	Arterial	Widening to 6 lane divided carriageway	30	22	80	106
10	Siri Labs-Kanuru	5.34	Sub-Arterial	30	7.5	Arterial	Widening to 4 lane divided carriageway	30	15	80	82
							Widening to 6 lane divided carriageway		22	80	82
11	Eluru Road	6.80	Sub-Arterial	28	16	Arterial	Widening to 6 lane divided carriageway	30	22	80	109
12	C K Reddy Road	2.90	Sub-Arterial	33	18	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	46

Sl. No	Description	Length (km)	Existing features (m)			Proposed Features (m)				Unit Cost (Rs. in Lakhs) (Lane km)	Total Cost (Rs. in millions)
			Classification	ROW (m)	CW (m)	Classification	Improvement Measures	ROW (m)	CW (m)		
B	**Improvement of City Road Corridors**										
13	Gandhi Center-Alankar Center	0.45	Sub-Arterial	17	7.5	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	7
14	Convent Road	0.45	Collector Street	22	7.5	Collector Street	Widening to 4 lane divided carriageway	30	15	80	7
15	Ramalingeshwarnagar Road	0.80	Collector Street	8	3	Collector Street	Widening to 2 lane carriageway with Cycle Track	30	9.5	80	7
16	Enamalakoduru Road	1.10	Collector Street		3.2	Sub-Arterial	Widening to 4 lane carriageway	30	9.5	80	35
17	Gurunanak Road	1.50	Collector Street		7.3	Collector Street	Widening to 4 lane divided carriageway	30	15	80	24
18	IGM Stadium Road	0.60	Collector Street	18	7.5	Collector Street	Widening to 4 lane divided carriageway	30	15	80	10
19	Sunnampattilu Road	2.75	Collector Street	14	7	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	44
20	GS Raju Road	2.90	Collector Street			Sub-Arterial	Widening to 6 lane divided carriageway	30	15	80	46
21	Ajitsingh Road	3.90	Collector Street			Sub-Arterial	Widening to 6 lane divided carriageway	30	15	80	62
22	Loyala College Road	0.87	Collector Street	14	7	Collector Street	Widening to 4 lane divided carriageway	30	15	80	14
23	Gandhi Hill Road	1.20	Collector Street	15	3.2	Collector Street	Widening to 2 lane carriageway with Cycle Track	30	9.5	80	11
24	Cement Factory Road (CK Reddy Road-GS Raju Road)	0.10	Sub-Arterial		7	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	2
25	Chittinagar-Kedareshwaripet Road	1.36	Collector Street	10.7	7.3	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	22
26	Sitara Jn-Milk Project Road	1.60	Sub-Arterial	10	3.3	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	26
27	Old NG-9 Road	1.40	Sub-Arterial	18.7	6.2	Sub-Arterial	Widening to 4 lane divided carriageway	40	15	80	22
28	Govt. Press-Madhuranagar Road	0.75	Collector Street	6	3	Collector Street	Widening to 2 lane carriageway with Cycle Track	30	9.5	80	7
29	YV Rao Hospital Road	1.50	Collector Street		3.2	Collector Street	Widening to 2 lane carriageway with Cycle Track	30	9.5	80	13
30	Vidyadharapuram Road	1.60	Collector Street	19	10	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	26

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Proposed Measures	Total Cost (Rs. in Lakhs)
C	**Intersection Improvements**		
1	Police Control Room Intersection (Redesign)	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
2	Vangaveeti Ranga Statue Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
3	IGM Stadium Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
4	Veterinary Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
5	D.V.Manore Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
6		Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
7	NTR Statue Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
8	Autonagar Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
9	Enamalakodudu Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
10	Kamayyatopu Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
11	Governerpet Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
12	Swarnapalace Hotel Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
13	Seetaramapuram Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
14	Chuttugunta Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
15	Machavaram Down Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
16	Gunadala Center Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
17	Ramavarapupadu Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00

18	Asoka Pillar Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
19	Potti Sree Ramulu Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
20	VMC Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
21	Prakasham barrage Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
22	Kummaripalem Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
23	Chittinagar Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
24	Sitara Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
25	Pipula Road Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
26	Fire Station Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
27	Alankar Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
28	Lenin Center Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
29	Vastralatha Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
30	Executive Club Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
31	NTR Health University Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
32	Gunadala Hill Tunnel Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
33	Convent Road Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
34	Madhu Kalyana Mandapam Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
35	Zymkhana Club Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Improvement Measures	Area (Sqm.)	Unit Cost (Rs. in Lakh) / Sqm.	Total cost (Rs. in millions)
H	**Bridges New Construction / Widening**				
	Across Krishna River:				
1	Across Western Ring Road at Venkatapalem	New Construction of 4 lane Divide Carriageway			5000
2	Across Eastern Bypass/Ring Road at Penamaluru	New Construction of 4 lane Divide Carriageway			5000
3	On Kanakadurga Varadhi Bridge	Widening to extra 2 Lane Carriageway			3000
4	On Prakasam Barrage, Mangalariri Road	Widening to extra 2 Lane Carriageway			3000
	Across Canals:				
1		Widening to 4 lane divided carriageway	5775	0.30	173.25
2	Across Eluru-Bodameru Canals at Madhura Nagar	New Construction of 2 lane Carriageway	12075	0.30	362.25
		New Construction of 4 lane Carriageway	12075	0.30	362.25
3	Across Ryves canal at Padavalarevu	New Construction of 4 lane Divide Carriageway	11025	0.30	330.75
4	Across Budameru Canal at Rajarajeshwari Peta	New Construction of 2 lane Carriageway	4200	0.30	126.00
5	Across Bandar Canal at Ramalingeshwara Nagar	New Construction of 2 lane Carriageway	5250	0.30	157.50
6	Across Bandar Canal at Y.V Rao Hospital Road	New Construction of 2 lane Carriageway	6510	0.30	195.30
7	Across Ryves Canal at Hanumanpet	Widening to 4 lane divided carriageway	6300	0.30	189.00
8	Across Ryves Canal at Kottavanthena	Widening to 4 lane divided carriageway	4935	0.30	148.05
9	Across Ryves Canal at Durgapuram	Widening to 4 lane divided carriageway	6300	0.30	189.00
10	Across Bandar Canal at Labbipeta	Widening to 4 lane divided carriageway	5250	0.30	157.50
11	Across Budameru Canal on Mylavaram Road	Widening to 2 lane carriageway	2600	0.30	78.00
12	Across Budameru Canal at Urmilasubbaraonagar.	New Construction of 4 lane Divide Carriageway	7000	0.30	210.00
13	Across Eluru Canal at Cement Factor	Widening to 4 lane divide carriageway	4200	0.30	126.00
14	Across Eluru Canal at Zymkhana Club	New Construction of 4 lane Divide Carriageway	7000	0.30	210.00

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Total Cost (Rs. in millions)
F	**Pedestrian Subways**	
	Fire Station intersection	8.5
	Kanaka Durga Temple	8.5
	Pedestrian Bridges (3.0 m wide)	
	On Bandar Canal (3 Nos.)	45.0
	On Ryves Canal (3 Nos.)	49.5
	On Eluru Canal (2 Nos.)	19.8
		12.0
G	**Traffic Management Measures**	
	Parking regulation, circulation system, enforcement, logistics etc. (Lum sum)	100
		100
		100

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

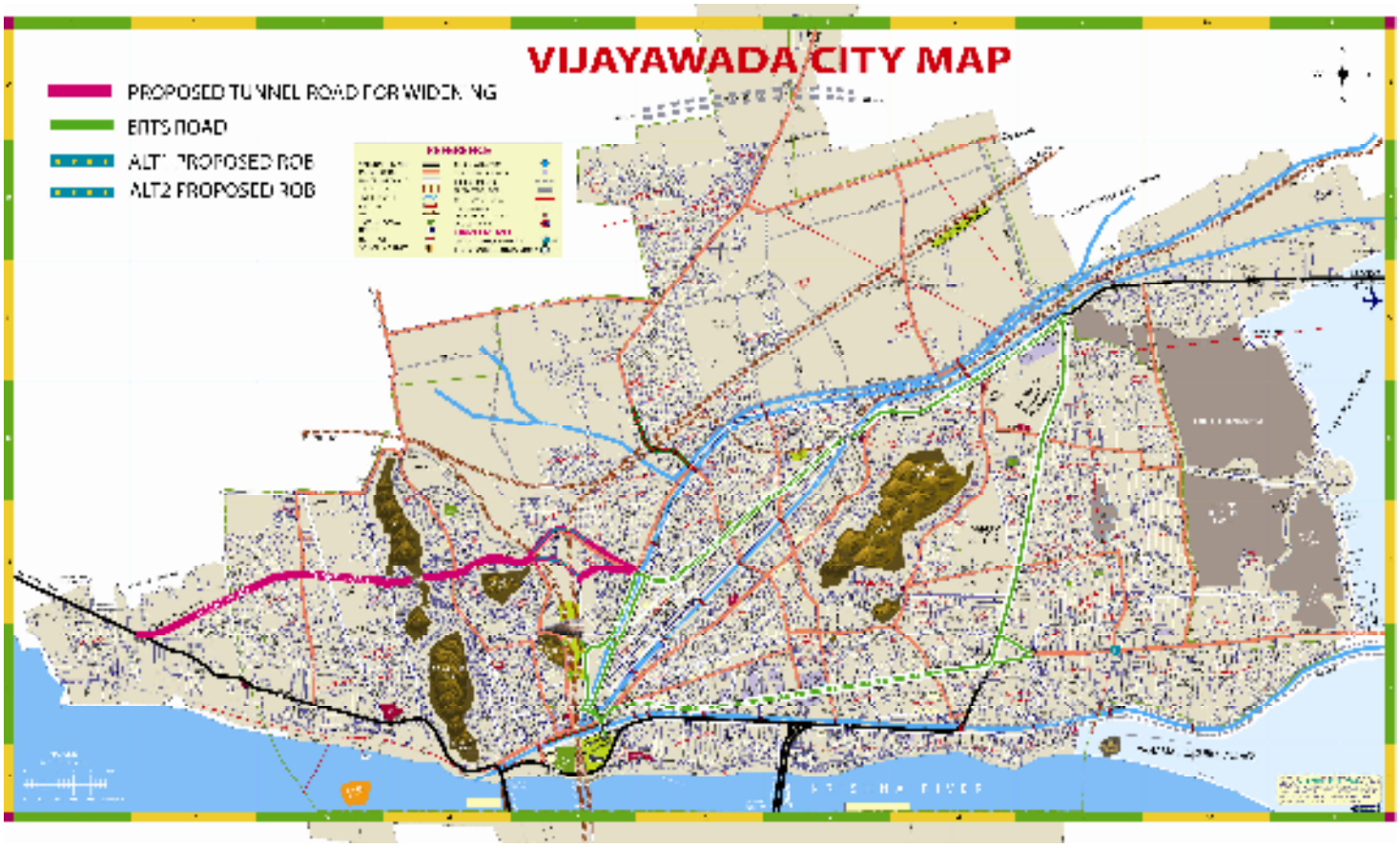
Sl. No.	Description	Area (sqm)	Total Cost (Rs. in millions)
I	**Terminal Development**		
a)	**Freight**		
	Construction of Integrated Freight Terminals (IFC)		
	1. IFC at Gollapudi	1000000	3000
	2. IFC at Gudavalli	1000000	3000
	3. IFC at Mangalagiri Bypass	1000000	3000
b)	**Passenger Terminals**		
	1. At Gollapudi along Hyderabad Road	20000	500
	2. At Nainavaram along Mylavaram Road	20000	500
	3.At Nunna along Nuzevedu Road	20000	500
	4. At Ramavarapupadu along Kolkata Road	20000	500
	5. At Kanuru along Machilipatnam Road	20000	500
	6. At Tadepalli along Chennai Road	20000	500

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Total Cost (Rs. in millions)
J	Vijayawada Public Mass Transport System (VPMTS)	
	Bus Rapid Transit System (BRTs)	
1	*Green + Pink (Part) + Red (Part) + Blue Corridor	
	Green + Pink (Part) + Red (Part)	2094
	Blue Corridor	926

*** BRTS Infrastructure Cost only**

CITY MAP


VIJAYAWADA CITY MAP
PROPOSED TUNNEL ROAD FOR WIDENING
BRTS ROAD
ALT1 PROPOSED ROB
ALT2 PROPOSED ROB

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Area (sqm)	Unit Cost (Rs. In Lakh) / sqm	Total Cost (Rs. in millions)
D	**New Construction of Grade Separators / Flyovers**			
	Grade Separators			
1	Intersection of Northern Ring Road – Western Ring Road (along Hyderabad – Kolkata Road)	9750	0.3	292.5
2	Gollapudi Intersection (along Northern Ring Road)	9750	0.3	292.5
3	Ambapuram Road Intersection (along Northern Ring Road)	9750	0.3	292.5
4	Kandrika Road Intersection (along Northern Ring Road)	9750	0.3	292.5
5	Nuzevidu Road Intersection (along Northern Ring Road)	9750	0.3	292.5
6	China Avatapalli Intersection (along Northern Ring Road)	9750	0.3	292.5
7	Gudavalli inter section (along Eastern Bypass / Ring Road)	9750	0.3	292.5
8	Near Penamaluru Intersection (along South Eastern Loop Ring Road)	9750	0.3	292.5
9	Mangalagiri Bypass Intersection (along South Eastern Loop Ring Road)	9750	0.3	292.5
10	China Kakani Intersection (along South Eastern Loop Ring Road)	9750	0.3	292.5
	Flyovers			
1	Police Control Room Intersection	68250	0.3	2047.5
2	Governer pet Intersection			
3	Benz Circle Intersection (along NH-5 Road)			
4	NTR Intersection			
5	Executive Club Intersection			
6	Fire Station Intersection			
7	Ramavarapupadu Intersection			

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Area (sqm)	Unit Cost (Rs. In Lakh) / sqm	Total Cost (Rs. in millions)
E	**Improvement / New construction of ROB / RUB for Railway Crossings**			
1	Vijayawada – Machilipatnam Railway Line at Ramavarapupadu.	9750	0.3	292.50
2	Vijayawada – Machilipatnam Railway Line at Gunadala.	4875	0.3	146.25
3	Vijayawada – Machilipatnam Railway Line at Madhuranagar.	4875	0.3	146.25
4	Vijayawada – Kolkata Railway Line at Gunadala – Payakapuram Road.	4875	0.3	146.25
5	Vijayawada – Kolkata Railway Line at Devi Nagar.	4875	0.3	146.25
6	Vijayawada – Kolkata and Vijayawada – Hyderabad Railway Line at K.L Rao Nagar.	4875	0.3	146.25
7	Vijayawada – Hyderabad Railway Line at Milk Project	4875	0.3	146.25
8	Vijayawada – Hyderabad Railway Line at Urmilasubbarao Nagar.	4875	0.3	146.25
9	Vijayawada – Hyderabad Railway Line at Northern Ring Road.	9750	0.3	292.50
10	Vijayawada – Kolkata Railway Line at Northern Ring Road.	9750	0.3	292.50
11	Vijayawada – Machilipatnam Railway Line at Gudavalli.	9750	0.3	292.50
12	Vijayawada – Guntur Railway Line at Mangalagiri town.	9750	0.3	292.50
13	Vijayawada – Tenali Railway Line at Mangalagiri Bypass.	9750		292.50

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No	Description	Length (km)	Existing features (m)			Proposed Features (m)				Unit Cost (Rs. in Lakhs) (Lane km)	Total Cost (Rs. in millions)
			Classification	ROW (m)	CW (m)	Classification	Improvement Measures	ROW (m)	CW (m)		
A	**Development of Bypass System & Regional Roads**										
1	Northern Bypass / Ring Road	27.6	-	-	-	Arterial	New Construction of 4 lane divided carriageway	100	15	125.00	1380
2	Eastern Bypass / Ring Road	5.8	-	-	-	Arterial	New Construction of 4 lane divided carriageway	100	15	125.00	290
3	South Eastern Loop Ring Road	14.2	-	-	-	Arterial	New Construction of 4 lane divided carriageway	100	15	125.00	710
4	South Western Loop Ring Road	15.9	-	-	-	Arterial	New Construction of 4 lane divided carriageway	100	15	125.00	795
5	Northern River Bank Road	4.1	-	-	-	Arterial	New Construction of 4 lane divided carriageway	60	15	125.00	205
6		11.6	-	-	-	Arterial	New Construction of 4 lane divided carriageway	80	15	125.00	580
7	Southern River Bank road (western Leg)	12.45	-	-	-	Arterial	New Construction of 4 lane divided carriageway	80	15	125.00	623
8	Middle Ring Road (Peripheral Ring)	24.1	-	-	-	Arterial	New Construction of 4 lane divided carriageway	60	15	125.00	1205
9	Inner Ring Road	3.82	Sub-Arterial			Arterial	Widening to 4 lane divided carriageway	40	15	80.00	61
10	Chennai – Kolkata Road	26.51	Arterial	65	15.5	Arterial	Widening to 4 lane divided carriageway	80	22	80.00	424
11	Nainavaram Road	3.1	Sub-Arterial		3.2	Arterial	Widening to 4 lane divided carriageway	60	15	80.00	50
12	Nunna Road	5.7	Sub-Arterial		7.5	Arterial	Widening to 4 lane divided carriageway	60	15	80.00	91
13	Mangalagiri Road	7.6	Sub-Arterial		7.5	Arterial	Widening to 4 lane divided carriageway	60	15	80.00	122
14	Kummaripalem Jn. – Varadhi Jn	4.8	Arterial	22	7.5	Arterial	Widening to 4 lane divided carriageway	60	15	80.00	77

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No	Description	Length (km)	Existing features (m)			Proposed Features (m)				Unit Cost (Rs. in Lakhs) (Lane km)	Total Cost (Rs. in millions)
			Classification	ROW (m)	CW (m)	Classification	Improvement Measures	ROW (m)	CW (m)		
B	**Improvement of City Road Corridors**										
1	Urmila Subbarao Nagar Road – Kabela	1.36	-	-	-	Sub-Arterial	New Construction of 2 lane carriageway	30	9.5	112.5	31
2	Milk Project – KL Rao Nagar	1.70	-	-	-	Collector Street	New Construction of 2 lane carriageway	30	9.5	112.5	38
3	Rajarajeshwari Peta Road	2.57	-	-	-	Collector Street	New Construction of 2 lane carriageway	30	9.5	112.5	58
4	Disney Land Road	1.00	-	-	-	Arterial	New Construction of 4 lane Divide carriageway	30	15	125	50
5	Gunadala Hill Tunnel Road	1.00	-	-	-	Sub-Arterial	New Construction of 4 lane Divide carriageway	30	15	1500	600
6		1.79	-	-	-	Sub-Arterial	New Construction of 2 lane carriageway with Paved Shoulders	30	9.5	112.5	40
						Sub-Arterial	Widening to 4 lane divided carriageway		15	80	29
7	Satyanarayanapuram Road	5.30	-	-	-	Arterial	New Construction of 4 lane Divide carriageway	30	15	125	265
8	Gunadala-Payakapuram Road	3.43	-	-	-	Sub-Arterial	New Construction of 4 lane Divide carriageway	30	15	125	172
9	Bandar Road	6.60	Sub-Arterial	34	16	Arterial	Widening to 6 lane divided carriageway	30	22	80	106
10	Siri Labs-Kanuru	5.34	Sub-Arterial	30	7.5	Arterial	Widening to 4 lane divided carriageway	30	15	80	82
							Widening to 6 lane divided carriageway		22	80	82
11	Eluru Road	6.80	Sub-Arterial	28	16	Arterial	Widening to 6 lane divided carriageway	30	22	80	109
12	C K Reddy Road	2.90	Sub-Arterial	33	18	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	46

Sl. No	Description	Length (km)	Existing features (m)			Proposed Features (m)				Unit Cost (Rs. in Lakhs) (Lane km)	Total Cost (Rs. in millions)
			Classification	ROW (m)	CW (m)	Classification	Improvement Measures	ROW (m)	CW (m)		
B	**Improvement of City Road Corridors**										
13	Gandhi Center-Alankar Center	0.45	Sub-Arterial	17	7.5	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	7
14	Convent Road	0.45	Collector Street	22	7.5	Collector Street	Widening to 4 lane divided carriageway	30	15	80	7
15	Ramalingeshwarnagar Road	0.80	Collector Street	8	3	Collector Street	Widening to 2 lane carriageway with Cycle Track	30	9.5	80	7
16	Enamalakoduru Road	1.10	Collector Street		3.2	Sub-Arterial	Widening to 4 lane carriageway	30	9.5	80	35
17	Gurunanak Road	1.50	Collector Street		7.3	Collector Street	Widening to 4 lane divided carriageway	30	15	80	24
18	IGM Stadium Road	0.60	Collector Street	18	7.5	Collector Street	Widening to 4 lane divided carriageway	30	15	80	10
19	Sunnampattilu Road	2.75	Collector Street	14	7	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	44
20	GS Raju Road	2.90	Collector Street			Sub-Arterial	Widening to 6 lane divided carriageway	30	15	80	46
21	Ajitsingh Road	3.90	Collector Street			Sub-Arterial	Widening to 6 lane divided carriageway	30	15	80	62
22	Loyala College Road	0.87	Collector Street	14	7	Collector Street	Widening to 4 lane divided carriageway	30	15	80	14
23	Gandhi Hill Road	1.20	Collector Street	15	3.2	Collector Street	Widening to 2 lane carriageway with Cycle Track	30	9.5	80	11
24	Cement Factory Road (CK Reddy Road-GS Raju Road)	0.10	Sub-Arterial		7	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	2
25	Chittinagar-Kedareshwaripet Road	1.36	Collector Street	10.7	7.3	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	22
26	Sitara Jn-Milk Project Road	1.60	Sub-Arterial	10	3.3	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	26
27	Old NG-9 Road	1.40	Sub-Arterial	18.7	6.2	Sub-Arterial	Widening to 4 lane divided carriageway	40	15	80	22
28	Govt. Press-Madhuranagar Road	0.75	Collector Street	6	3	Collector Street	Widening to 2 lane carriageway with Cycle Track	30	9.5	80	7
29	YV Rao Hospital Road	1.50	Collector Street		3.2	Collector Street	Widening to 2 lane carriageway with Cycle Track	30	9.5	80	13
30	Vidyadharapuram Road	1.60	Collector Street	19	10	Sub-Arterial	Widening to 4 lane divided carriageway	30	15	80	26

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Proposed Measures	Total Cost (Rs. in Lakhs)
C	**Intersection Improvements**		
1	Police Control Room Intersection (Redesign)	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
2	Vangaveeti Ranga Statue Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
3	IGM Stadium Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
4	Veterinary Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
5	D.V.Manore Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
6		Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
7	NTR Statue Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
8	Autonagar Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
9	Enamalakodudu Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
10	Kamayyatopu Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
11	Governerpet Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
12	Swarnapalace Hotel Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
13	Seetaramapuram Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
14	Chuttugunta Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
15	Machavaram Down Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
16	Gunadala Center Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
17	Ramavarapupadu Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00

18	Asoka Pillar Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
19	Potti Sree Ramulu Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
20	VMC Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
21	Prakasham barrage Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
22	Kummaripalem Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
23	Chittinagar Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
24	Sitara Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
25	Pipula Road Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
26	Fire Station Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
27	Alankar Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
28	Lenin Center Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
29	Vastralatha Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
30	Executive Club Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
31	NTR Health University Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
32	Gunadala Hill Tunnel Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
33	Convent Road Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
34	Madhu Kalyana Mandapam Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00
35	Zymkhana Club Intersection	Road Widening, provision median, rotary, foot path, railing, laying and painting of kerb stones to footpath, median rotary & islands, road markings, Signage's, relocation of electric poles & telephone poles street lighting etc.,	25.00

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Improvement Measures	Area (Sqm.)	Unit Cost (Rs. in Lakh) / Sqm.	Total cost (Rs. in millions)
H	**Bridges New Construction / Widening**				
	Across Krishna River:				
1	Across Western Ring Road at Venkatapalem	New Construction of 4 lane Divide Carriageway			5000
2	Across Eastern Bypass/Ring Road at Penamaluru	New Construction of 4 lane Divide Carriageway			5000
3	On Kanakadurga Varadhi Bridge	Widening to extra 2 Lane Carriageway			3000
4	On Prakasam Barrage, Mangalariri Road	Widening to extra 2 Lane Carriageway			3000
	Across Canals:				
1		Widening to 4 lane divided carriageway	5775	0.30	173.25
2	Across Eluru-Bodameru Canals at Madhura Nagar	New Construction of 2 lane Carriageway	12075	0.30	362.25
		New Construction of 4 lane Carriageway	12075	0.30	362.25
3	Across Ryves canal at Padavalarevu	New Construction of 4 lane Divide Carriageway	11025	0.30	330.75
4	Across Budameru Canal at Rajarajeshwari Peta	New Construction of 2 lane Carriageway	4200	0.30	126.00
5	Across Bandar Canal at Ramalingeshwara Nagar	New Construction of 2 lane Carriageway	5250	0.30	157.50
6	Across Bandar Canal at Y.V Rao Hospital Road	New Construction of 2 lane Carriageway	6510	0.30	195.30
7	Across Ryves Canal at Hanumanpet	Widening to 4 lane divided carriageway	6300	0.30	189.00
8	Across Ryves Canal at Kottavanthena	Widening to 4 lane divided carriageway	4935	0.30	148.05
9	Across Ryves Canal at Durgapuram	Widening to 4 lane divided carriageway	6300	0.30	189.00
10	Across Bandar Canal at Labbipeta	Widening to 4 lane divided carriageway	5250	0.30	157.50
11	Across Budameru Canal on Mylavaram Road	Widening to 2 lane carriageway	2600	0.30	78.00
12	Across Budameru Canal at Urmilasubbaraonagar.	New Construction of 4 lane Divide Carriageway	7000	0.30	210.00
13	Across Eluru Canal at Cement Factor	Widening to 4 lane divide carriageway	4200	0.30	126.00
14	Across Eluru Canal at Zymkhana Club	New Construction of 4 lane Divide Carriageway	7000	0.30	210.00

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Total Cost (Rs. in millions)
F	**Pedestrian Subways**	
	Fire Station intersection	8.5
	Kanaka Durga Temple	8.5
	Pedestrian Bridges (3.0 m wide)	
	On Bandar Canal (3 Nos.)	45.0
	On Ryves Canal (3 Nos.)	49.5
	On Eluru Canal (2 Nos.)	19.8
		12.0
G	**Traffic Management Measures**	
	Parking regulation, circulation system, enforcement, logistics etc. (Lum sum)	100
		100
		100

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Area (sqm)	Total Cost (Rs. in millions)
I	**Terminal Development**		
a)	**Freight**		
	Construction of Integrated Freight Terminals (IFC)		
	1. IFC at Gollapudi	1000000	3000
	2. IFC at Gudavalli	1000000	3000
	3. IFC at Mangalagiri Bypass	1000000	3000
b)	**Passenger Terminals**		
	1. At Gollapudi along Hyderabad Road	20000	500
	2. At Nainavaram along Mylavaram Road	20000	500
	3.At Nunna along Nuzevedu Road	20000	500
	4. At Ramavarapupadu along Kolkata Road	20000	500
	5. At Kanuru along Machilipatnam Road	20000	500
	6. At Tadepalli along Chennai Road	20000	500

Planning and Implementation of Various Improvement Measures for Transport system in Vijayawada

Sl. No.	Description	Total Cost (Rs. in millions)
J	Vijayawada Public Mass Transport System (VPMTS)	
	Bus Rapid Transit System (BRTs)	
1	*Green + Pink (Part) + Red (Part) + Blue Corridor	
	Green + Pink (Part) + Red (Part)	2094
	Blue Corridor	926

*** BRTS Infrastructure Cost only**