

VISAKHAPATNAM BUS RAPID TRANSIT SYSTEM



11.0 Visakhapatnam Bus Rapid Transit System

11.1 Context

Visakhapatnam (Vizag) is second largest city of Andhra Pradesh with an area of 550 km². It is primarily an industrial city, apart from being a port city. It is also home to the Eastern Naval Command. Vizag is a cosmopolitan mix of people from various parts of the country. From a population of a few thousand locals during the 18th century and early 19th century the population grew steadily every decade. The city doubled its population from 1990–2000 owing to a large migrant population from surrounding areas and other parts of the country coming to the city to work in its heavy industries. As of 2001 India census, Visakhapatnam had a population of 1, 329, 472.

11.2 Situation before Implementation of the Project

Currently, about 4.5 lakh registered vehicles ply on the city roads in Vizag City, 90% of which are cars and motorized two-wheel vehicles (MTWVs). The present travel demand in the City is about 12 lakh trips per day; a significant 65% of these trips are catered by private modes. The current modal split studies indicate that only 20% favour public transport. According to the NUTP, cities with one million-plus population must target a minimum public transport mode split of 50%. The demand for travel is predicted to grow to 16 and 28 lakh trips per day by 2011 and 2021 respectively.

Therefore, a higher modal split of above 50% has been recommended for Vizag to be achieved in phases. This can be attained by giving impetus to public transport to arrest the trend of personal modes. Equally, NMT modes and pedestrian traffic management has to be accorded due priority for integration and accessibility by keeping in view the safety aspects identified by the National Urban Transport Policy (NUT). The salient features of travel demand in the city are illustrated below:

11.2.1 Problems and Needs Addressed by the Project

Similar to other UAs, in the near-future road capacity is going to be a major constraint for mobility in Visakhapatnam. Transport network in the city will not only require expansion but

widening and strengthening of the existing road network. The city's transport master plan has identified and planned a phase-wise implementation of mass public transport systems.

As a precursor to the detailed corridor design effort, a Detailed Project Report (DPR) was prepared which identified eight corridors of about 100 km for BRTS implementation. Given the rate at which the city is growing as a commercial, industry, and tourism hub set along the coastline of the Bay of Bengal, the proposal to develop and implement a comprehensive BRT system is justified.

The available travel trends from the past studies and the 'Feasibility Study of BRTS in Vizag' convened by ASCI has been studied. The trends suggest that the traffic volume on roads has been growing at the rate of about 5% p.a. It is expected that the traffic will, generally, continue to increase at the same rate for the next 20 years.

The maximum motorized vehicles volume expected in 2021 is 2800 PCU/hour/direction. The capacity for two lanes (one way) is over 4000 PCU/hour, after the buses and slow vehicles are segregated from the mixed traffic. There is provision of two lanes for motorized vehicles in each direction along the BRT corridor.

The volume capacity ratio will be less than 0.8 and therefore, we can expect 'level of service 'C' most desirable in urban conditions. The extraction / separation of buses and motorized vehicles will improve the capacity of MV lanes. The provision of 2.5 m non-motorized vehicles (NMV) lane is quite sufficient to handle 2000 bicycles per hour in both directions.

The maximum passenger loads on the bus stops along PTC and STC corridor have been found to be approximately 200 inclusive of boarding and alighting. The bus stops along PTC and STC corridor have been designed with sizes 20 X 3.4 meter (for low passenger volume) and 30 X 3.4 meter (for high passenger volume). These platforms can handle the passenger loads of 240 (4 passengers per square meter) and 360 passengers respectively.

11.2.2 Reason for Adoption of BRTS

While several mass transport options are available, BRT systems are chosen with the specific intent to balance the cost aspect with the appropriate method of delivering quality public transport services in the city. Amongst the domain of high capacity public transport systems available world-over, it has been concluded that the transport demand forecast on the major

travel corridors in Visakhapatnam can be managed by a medium capacity public transport system such as a Light Rail Transit System (LRTS) or BRTS with dedicated bus lanes. Market estimates peg LRTS costs at about Rs 200 crore per km as compared to BRT systems costing about ₹ 20 crore per km. LRTS or MRTS projects being capital intensive are considered financially unviable. BRTS has been recommended considering the following key drivers:

- i) BRT promotes high-quality transit services on a cost-effective basis and will allow the management of Vizag city to develop a high-quality mass transport with affordable infrastructure cost and ability to operate without subsidies. The internal rate of return for BRTS in Vizag is fairly high and sustainable / achievable by public funds even after considering expenses to be incurred for procurement and operation of rolling stock.
- ii) BRTS can be implemented within shorter periods (1-3 years after conception) – a significant advantage over rail based mass transport in addition to the cost effectiveness.

11.2.2 Preparation of Feasibility Study

- i) Greater Vishakhapatnam Municipal Corporation (GVMC) has all possible efforts to address the development of public transport in Vishakhapatnam. A detailed feasibility study was convened by GVMC through Administrative Staff College in India (ASCI) in 2007. This study appraised a BRTS network of 100 km consisting of 6 BRTS corridors. It was recommended to take 2 corridors between RTC complex to Pendurthi (20.00 km) and Simhachalem (18.50 km) in the 1st Phase. The study was approved by MOUD and aid was granted through JNNURM programme.
- ii) Subsequently, Srei Infrastructure Finance Limited in association with CRAPHTS Consultant (I) Private Limited and McCormick Rankin International, Canada (MRIC) were deputed as DEPR consultants to prepare detailed designs and ensure quality supervision and assurance for the project. The implementation of the project commenced in Dec 2008 and till date progress on providing fixed infrastructure has been going on with 2 separate contractors assigned with 1 corridor each.

11.3 Description of the Project

Given the rapid growth of the country and increasing urbanization of UAs, strengthening of traffic and transportation systems in the nation and especially UAs will be a key challenge. Visakhapatnam is also experiencing immense growth and is on the horizon of launching itself as a major economic and commercial centre in the state and the nation. Keenly aware of the growth aspects, GVMC have been proactively addressing the needs of the city by adopting a comprehensive approach to plan, augment and streamline transport demand and supply.

Consistent with its philosophy to develop a viable and sustainable transport system for the city, GVMC has endeavoured to augment the supply of mass transport services at an affordable cost, and provide impetus to riding on public transport thereby encouraging personalized vehicles to shift modes. The city has been actively working towards creating a sustainable inter-modal transportation system.

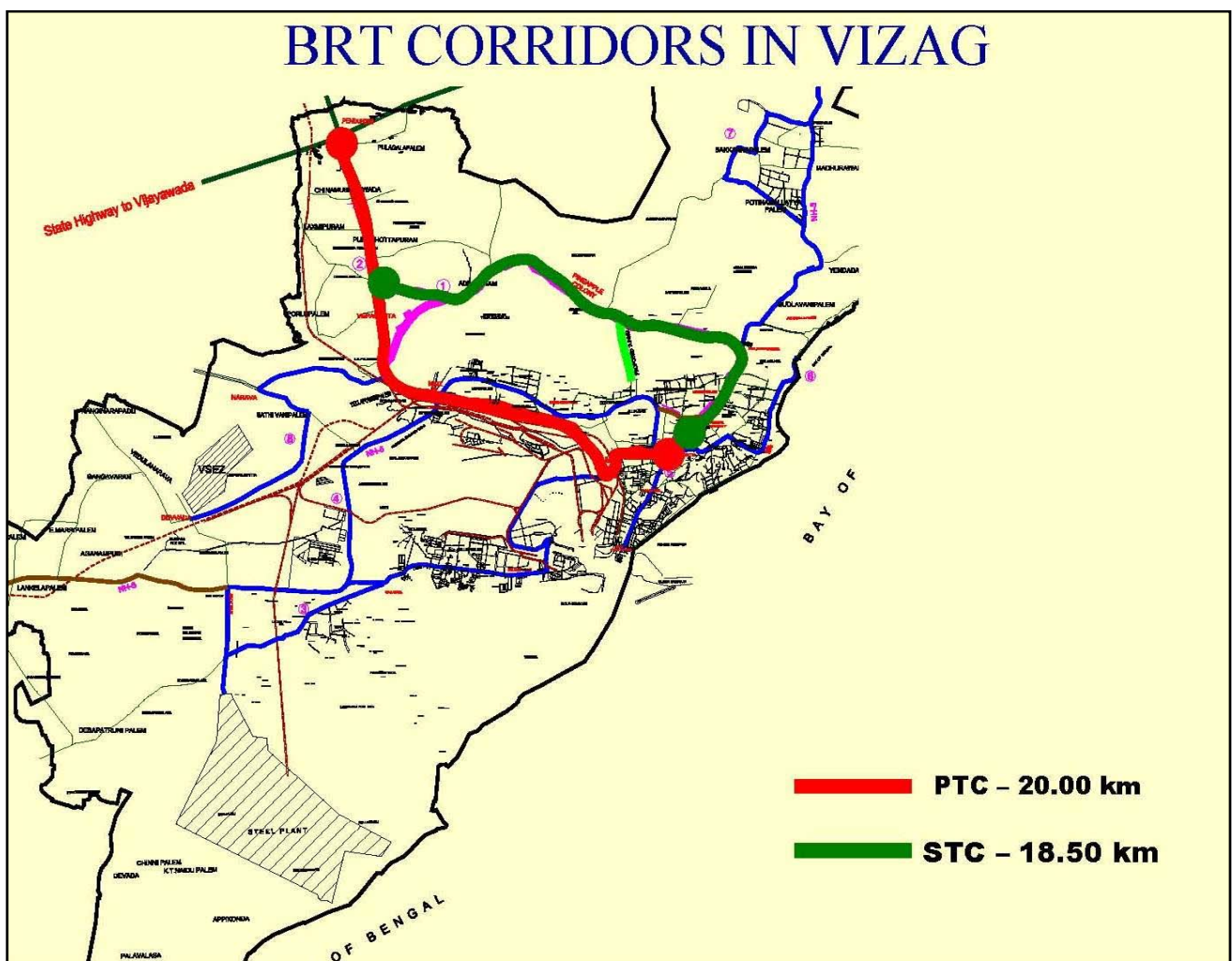


Figure 11.1: BRT Corridors in Visakhapatnam

i) Goals of the Project

- a) To provide all possible options to plan the system with the commuter's perspective a decision has been made not to compromise with space requirements for dedicated bus, MV, NMV lanes and safety aspects of pedestrian traffic.
- b) To augment transport supply at an affordable cost to the citizens.
- c) To prepare a comprehensive parking plan in place and will be implemented with control on demand and fiscal measures.

ii) Strategy Used to Achieve the Desired Goals

Project design features are detailed below:

- ❖ Min 30 m section at mid-block section;
- ❖ 36 section at stations / junctions;
- ❖ Dedicated bus lane, 7.0 m (2 x 3.5 m);
- ❖ 3.4 m. wide passenger platform with shelter;
- ❖ 2 x 3.25 m motorised vehicle lane (MV), 2 x 2.5 m non-motorised vehicle lane (NMV), minimum 2.0 m wide sidewalk on both sides;
- ❖ Placement of stations – mostly near side junctions, few at mid block sections based on demand and spaced at a distance of 500 to 700 m;
- ❖ Additional right turning (MV) lane at junctions;
- ❖ Provision of bus passing lane at some stations;
- ❖ Safe crossing facilities of bus passengers along zebra crossings and foot-over-bridges;
- ❖ Adequate depot and terminal facilities; and
- ❖ Safe dispersal and integration measures.

Cross Sections of the Corridor including Flyover

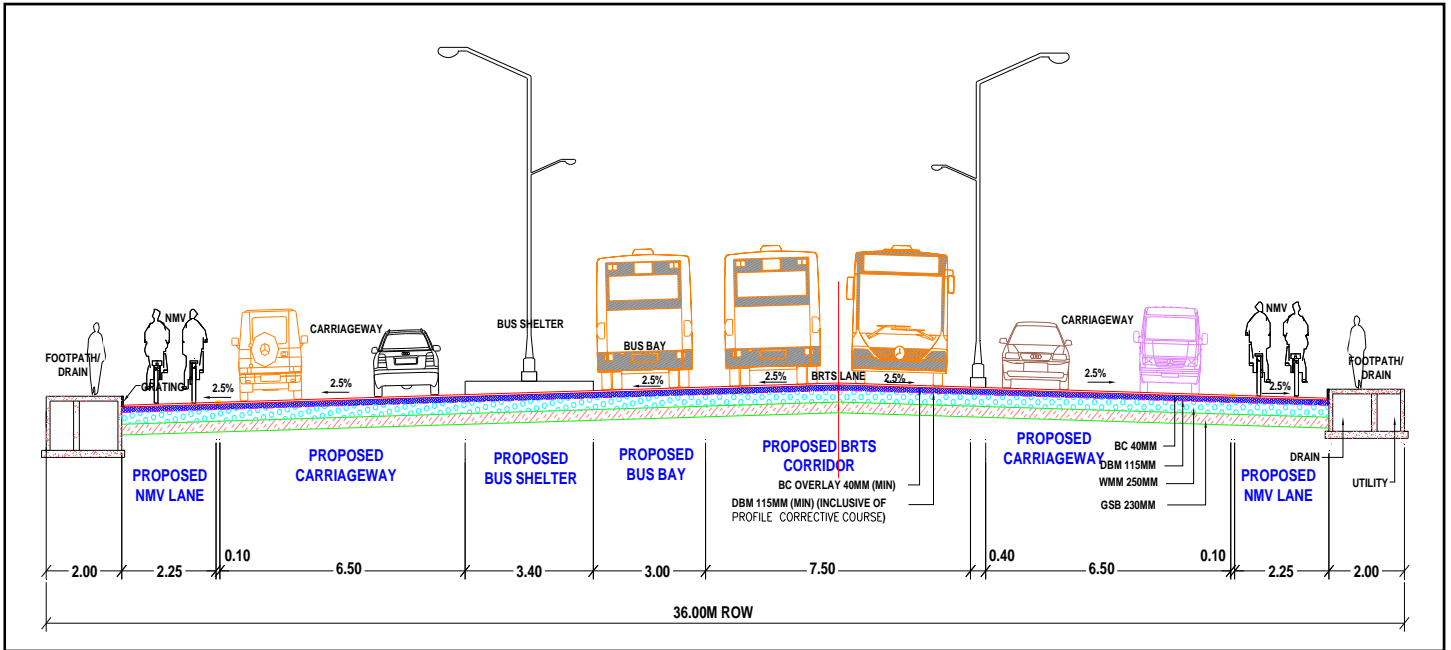


Figure 11.2: Typical Cross Section at 36.0 M Row (With Bus Bay)

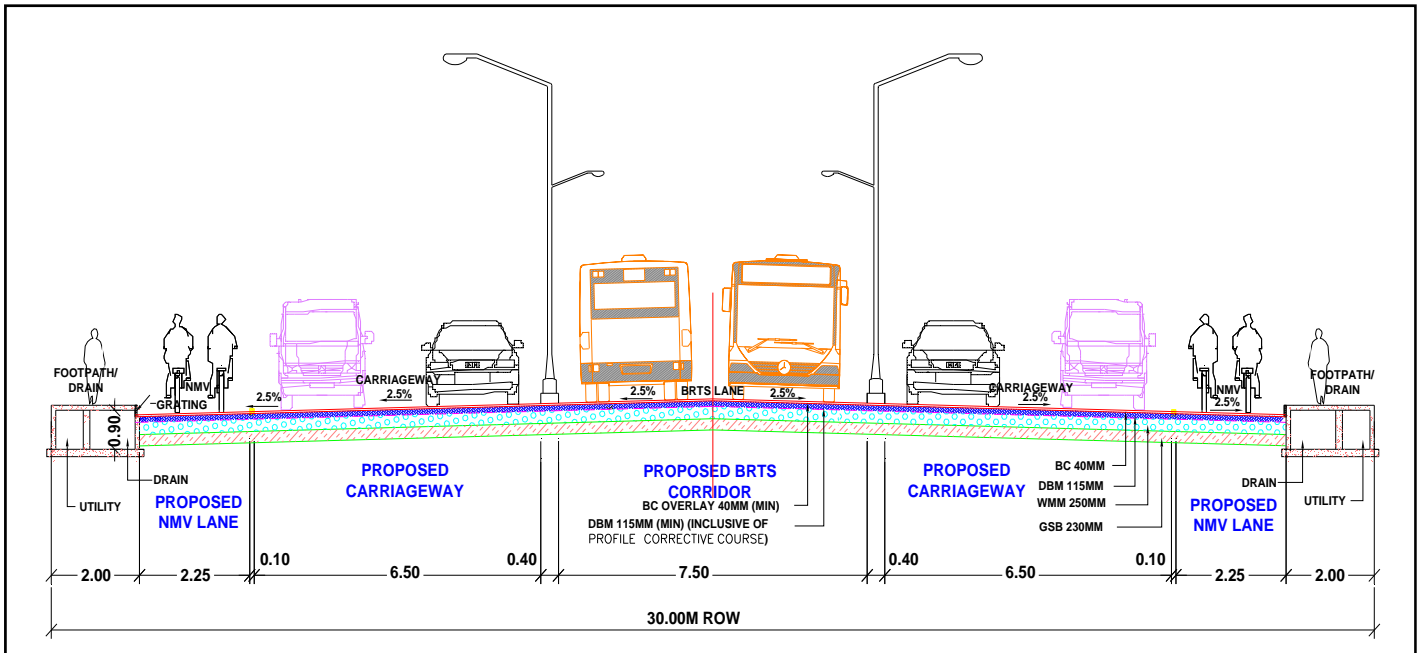


Figure 11.3: Typical Cross Section at 30.0 M Row

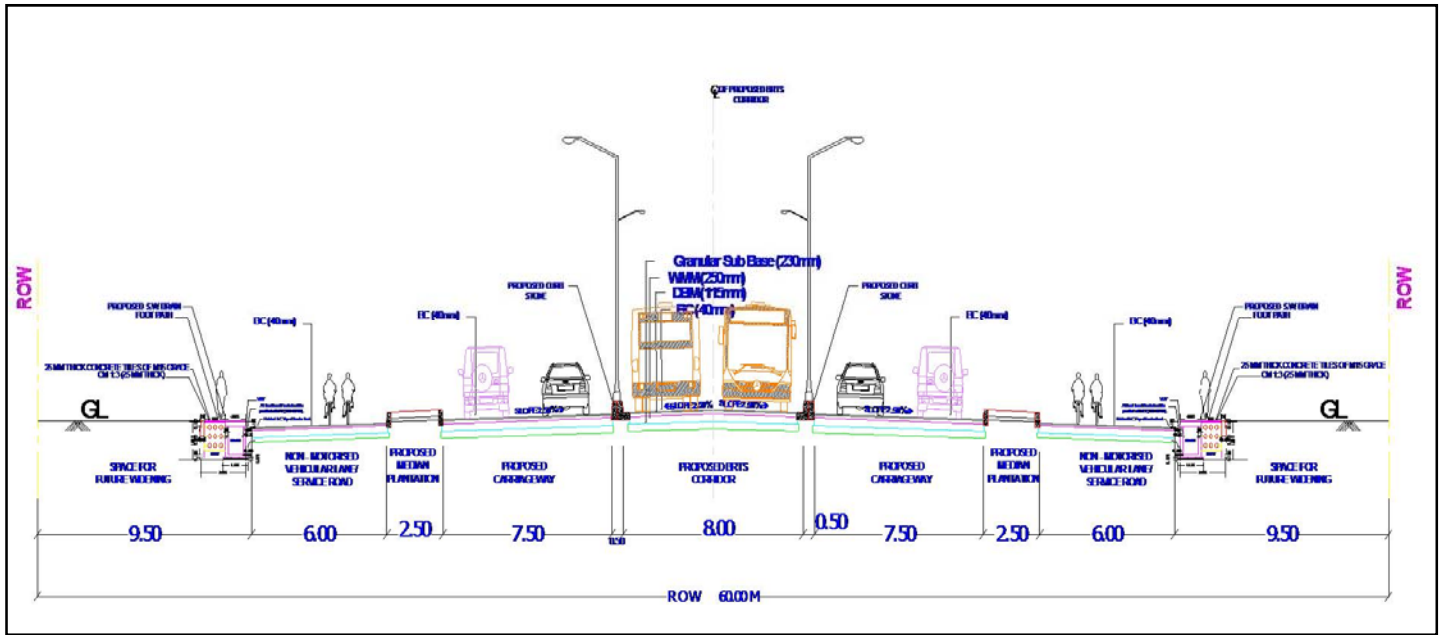


Figure 11.4: Typical Cross Section at 60.0 M Row

Flyover

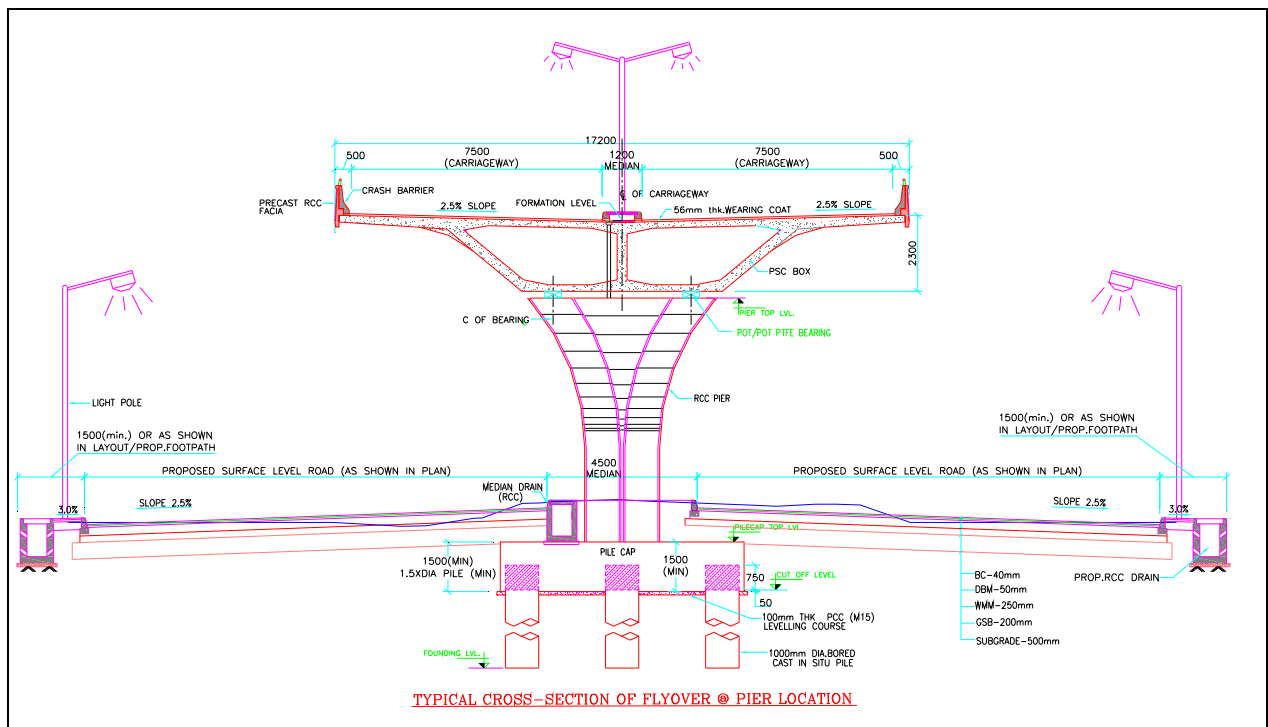


Figure 11.5: Typical Cross Section of Flyover, Pier Location

The key aspects of the bus rolling stock and technology features are outlined below:

- ❖ Standard 60 seat low floor urban bus (12 m length) is recommended to be introduced gradually and initially existing fleet of APSRTC will be utilized.
- ❖ To save cost, partial low floor buses may be introduced.
- ❖ Outline of Information Technology and Automatic Fare Collection System identified and is planned to be introduced later after sufficient trials are conducted.



Figure 11.6: Bus to be operated on BRTS corridors

First Phase, 2 corridors were prioritised i.e. PTC & STC.

- ❖ The Combined cost of prioritized 2 corridors (PTC & STC, Tunnel) is ₹ 452.93 Crores.
- ❖ The Project was approved by the Central Sanctioning and Monitoring Committee (CSMC), MoUD, GoI on 18-05-2007.
- ❖ The Detailed feasibility report was proposed as per the guidelines of NUTP, MoUD, and GoI.
- ❖ Administrative Sanction was accorded by the Govt. of AP vide G.O No: 1390 MA&UD (UBS) Dept. DT: 22-11-2007.
- ❖ GVMC invited Project Management Consultant (PMC) for BRTS exclusively in two phases in June, 2007: Phase 1: Detailed Engineering report along with the tender process i.e. bid process management; and Phase 2: Construction supervision and Quality Assurance.

- ❖ Consultancy for PMC was finalized on 29-08-07 with M/s. SREI Infrastructure Finance Limited (Lead Consultant), and LOA was issued with M/s McCormick Rankin International, Canada and M/s CRAPHTS Consultant (India) Pvt. Ltd, Haryana.
- ❖ The consultant submitted the Estimates, BOQ and Tender Documents for the prioritized corridors (PTC & STC) for getting approval of NIT from the Committee headed by the Engineer-in-Chief.
- ❖ The tenders were floated for the above corridors under EPC system with 2 years defect liability period. The tenders for the above corridors were finalized in Committee headed by the Principal Secretary MA&UD.
- ❖ PTC corridor was approved by the Govt. of AP. vide G.O.Rt.No:1384 MA&UD(UBS) Dept. dt:01-10-2008 for the M/s. Sadbhav Engineering Ltd with GKC Projects Ltd (JV) and STC Corridor was approved vide G.O. Rt.No:1397 MA&UD(K1) Dept. dt:03-10-2008 for the M/s.GVR Infra Projects Ltd, Hyderabad. Agreements were concluded with GVMC by the said firms.

Field Surveys, Investigations, Designs have been completed and construction work is in progress for 10 km segments each on PTC and STC.

iii) Activities Implemented to Achieve the Desired Goals

Right from conceptualisation and detail design of the BRTS in Vizag, GVMC has been proactively considering and promoting all important aspects for successful completion of the project. Be it the stakeholder consultations, public advisory and quality assurance – all aspects have been dealt with in detail. GVMC has BRTS cell in place and consultants, engineers, contractors all work in a healthy atmosphere to find the best possible solutions for achieving the ultimate objective of producing a world class mass transport system.

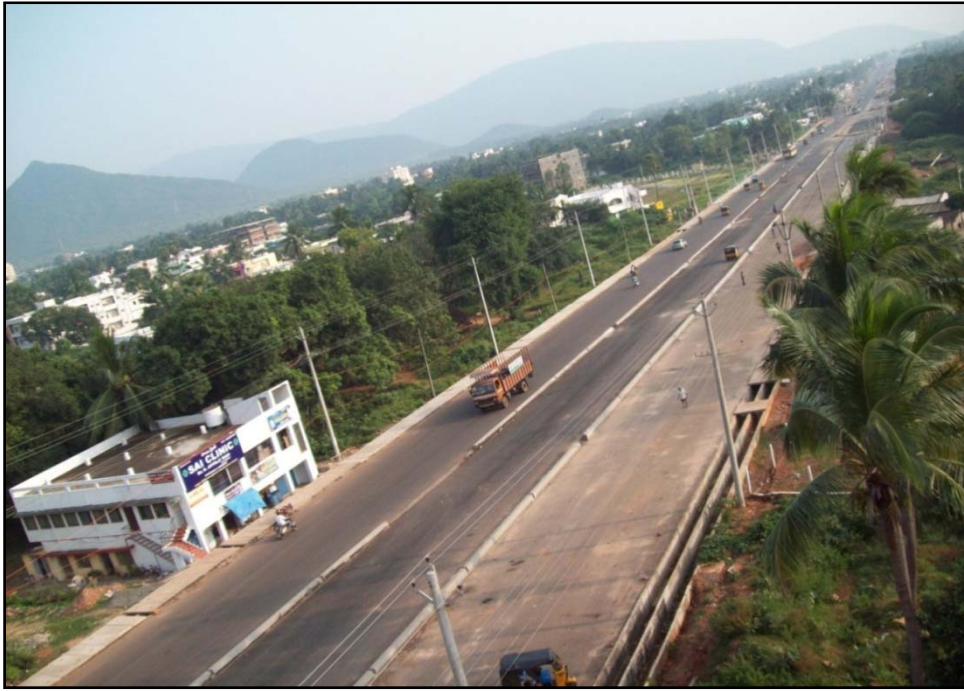


Figure 11.7: Pendurthi Transit Corridor at Visakhapatnam

The EPC contract modes has paved the way for PMC consultants to have a close look at the design offered by the contractors' and these are being debated, discussed, fine tuned to be more useful in terms of implementation, operational ease and practicality. The design process is vetted through quality assurance procedures embedded in the design and built contracts through clearly demarcated deliverables and timelines.

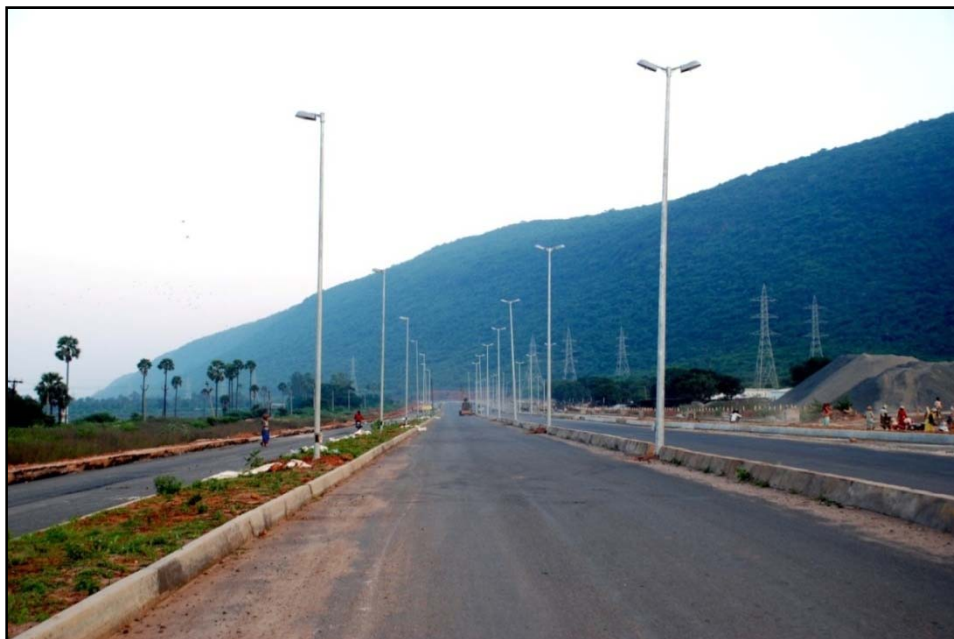


Figure 11.8: Simhachalem Transit Corridor at Visakhapatnam

The GVMC has laid emphasis on project quality and plans have been made to make the project a true success as perceived by the riding community and the general public. The city is best suited for BRTS. The services of Project Management Consultants have been taken to ensure successful implementation. Quality Assurance and Quality Control of all aspects (road design, BRT elements, construction, integration & operations) including management of project construction and execution are being perceived with great detail. A qualified team of professionals is in place to serve as GVMC's extended arm in ensuring project success.

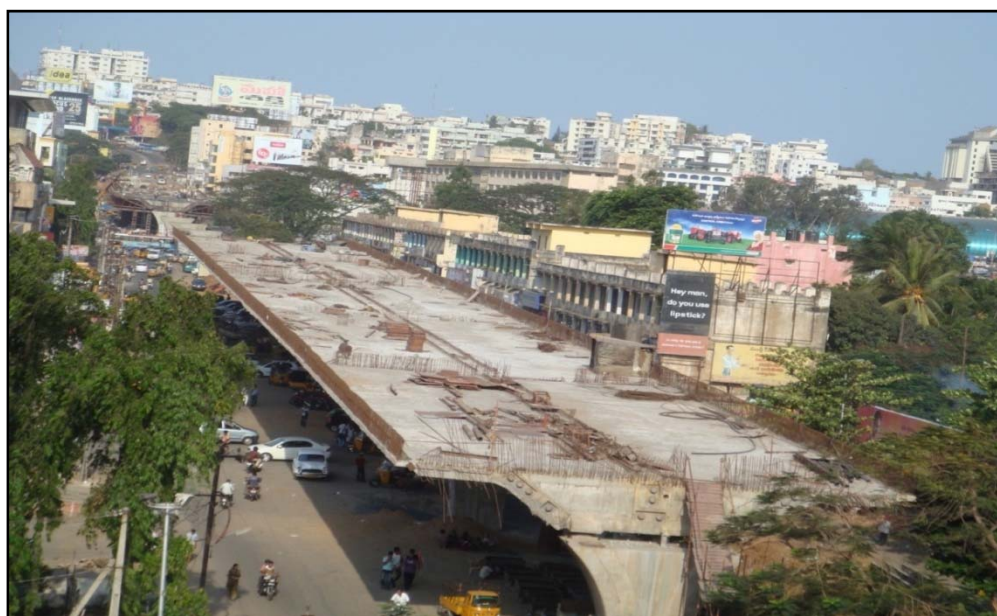


Figure 11.9: Flyover in Progress at Visakhapatnam

iii) Challenges / constraints encountered and how it was conquered:

The key concerns in the project are the land and property acquisitions required to produce a ROW of 30 m especially on PTC. At the bus stations along the PTC and STC we will require about 36 m ROW to construct bus bays. Therefore, primary issue is to availability of minimum ROW to achieve segregation of traffic on the corridors. Nature of compensation and re-settlement issues have been finalised first in consultation with affected public and their representatives. The co-ordination of various civic agencies and departments including GVMC, Vishakhapatnam Urban Development Authority (VUDA), APSRTC, BSNL, Traffic Police etc. is essential for effective implementation. The major issues to be reckoned are utility diversions and addressing the drainage. The traffic management and diversion during construction will need the services of Local Traffic Police in Vizag. The major constraints on

STC are the strategic locations of village settlements at Simhachalem, where property acquisition is rather difficult. Alternatives will need to be addressed and frozen.

These concerns have been addressed with minute's details at the ground zero level. Environmental and social issues have been addressed in the detail. Promotion of public understanding and fruitful solutions of developmental problems such as local needs and those of road users were discussed. In addition to discussing problems and prospects of resettlement, several stakeholders were consulted through focused group discussions and individual interviews.

Discussions were also held to understand their local transport needs and to achieve speedy implementation of the project with involvement of people. Nature and loss of structures, which are likely to be affected, were identified. It was this effort that took the project forward towards successful implementation. The main reason being the minimum land availability was ensured for bus lanes, MV, NMV and pedestrian sidewalks.

Experts from a wide spectrum of the society began discussing the concerns of some BRTS implementations in the country. While every new project is expected to experience some level of friction during initial stages, adequate efforts are underway to mitigate any adverse effects from the implementation of Vishakhapatnam BRT system for the following reasons:

- ❖ In a majority of instances across the world, project 'success' or 'failure' can quickly begin as a perception and soon turn into a reality. Such a perception is created due to the ability of the implementing agency to properly and adequately publicize information about on-going projects. Technically better projects have failed in many instances due to not providing adequate project information to the general public.
- ❖ It is anticipated that Vishakhapatnam, BRTS will not experience concerns because GVMC has been actively engaging the public through the social assessment study and wide publication in the news media.
- ❖ A second issue is with regard to proper planning of projects such as BRTS. Vishakhapatnam has been actively conceptualising, planning, and designing the project for over 2 years and is pursuing the implementation aspect with diligence. It is recommended that GVMC continue to brief the elected representatives and provide

information that the project had been thoroughly planned by taking into consideration the current and projected travel demand in the city.

- ❖ Projects that have ‘take-away’ lanes from the general purpose traffic, i.e., from the ‘existing’ lane geometry for BRTS dedication – mostly 7 meters – are considered an inappropriate strategy. Such an action is considered not only negative in terms of further constraining currently depleted capacity but also invites public anger. Vishakhapatnam BRTS does the opposite by not only widening the roadway for dedicating two lanes to BRTS but also improving opportunities for pedestrianisation and junction improvements. It is suggested that GVMC use this as a reason for seeking added right-of-way, thereby not taking away lanes from the general public but adding to public convenience, while removing buses out of general purpose lanes.
- ❖ Projects where the proposed BRT systems are for short lengths / short segments experience concerns. Any BRT system should be a multimodal effort with several interchange points to feeder services. Vishakhapatnam BRTS is proposed along 20km and 18km continuous stretches and therefore, provides a viable length of road segment for effective implementation. It is recommended that GVMC mention this key aspect since such a proposition is not only financially sustainable but also physically implementable.
- ❖ Systems that have developed in a very short duration may have caught the people by surprise thus adding to the syndrome ‘we did not hear or know about this problem.’ Vishakhapatnam BRTS is likely to not experience this problem because GVMC has already been informing the media and the general public about project progress; and social assessments have been educating the directly impacted citizens about project issues including seeking feedback and opinion; and above all, construction activity will invariably raise public awareness about project aspect.

iv) Expected Outcome of the Initiative / Project / Best Practice:

The progress of the implementation can be deemed satisfactory since its inception. The construction of BRTS infra commenced by Dec 2008 and since then we have been able to complete about 10 km each on PTC and STC corridor.

Development of Modern Bus Shelters and Foot Over Bridges on the BRT Corridors

As part of development essential infrastructure facilities on the corridors, GVMC proposes to develop about 25 Foot-over Bridges integrated with modern Bus Shelters (a total of 76 shelters) for the safe movement of commuters at crossings, interchanges, boarding and alighting.

Development under PPP

In order to leverage limited resource of GVMC it is proposed to develop the above Fob's and Bus Shelters on Public Private Partnership (PPP) Model dividing them in to three to four bid packages. The other advantages of the PPP model include:

- i)** The development under PPP model will provide a quality infrastructure with state of the art facilities and bring substantial saving in the capital investment of Government / GVMC.
- ii)** Construction, operation and maintenance risks will be transferred to the selected developers.
- iii)** GVMC would get the revenue share from the selected developers during concession period, in case a particular bid package works out to be commercially viable proposition.

Proposed Methodology for PPP

- i)** As per the PPP model, the scope for the selected developer(s) would include the following major project components/activities:
 - a)** Implementing (financing, designing and executing) the proposed Modern Bus Shelter and Foot Over Bridges on BRTS Corridor on BOOT model, Vishakhapatnam
 - b)** Operating and maintaining the facilities for the given Concession Period.
 - c)** Transferring the facilities to GVMC after Concession Period.
- ii)** The selected developer(s) will have advertisement rights on the project facilities they create during the entire concession period. Capital cost (debt servicing) and O&M costs would be met from the revenues they receive from the advertisement.

- iii) Based on requirement, locations of the Bus Shelters and Foot Over Bridges are finalised.
- iv) Based on the traffic intensity including pedestrian movement, the project components of the facilities (i.e. with lift or without lift) are decided.
- v) Based on advertisement potential, the facilities (locations) are grouped in to individual bid packages.
- vi) Request for Proposals (RFP) would be invited from short-listed bidders for selection on competitive basis. The bid parameter for selection would be concession period quoted.

Present Status of RFQ

- i) Request for Qualifications (RFQ) invited from the prospective leading business houses, entrepreneurs, advertising agencies, media houses, developers.
- ii) Seven firms submitted their applications and based on evaluation of their credentials vis-à-vis the stipulated financial and experiential qualification criteria, these firms would be short listed for issue of RFP documents.
- iii) Draft RFP documents are under discussion.
- iv) Typical design of Bus Shelter and FOB is being done for inclusion in the RFP document.

Roles / activities of the partners at each stage of the Initiative / Project / Best Practice:

GVMC has been very active in pursuing the goals and objectives with which the project was conceptualised. Being the main civic agency in Vizag, GVMC has discussed the project with elected representatives, multi-political party and public forums. With the formation of SPV, the final shape of the project is being formalised on operational, ITS and maintenance issues.

v) Important Stakeholders Involved and Communication / Networking Procedure for the Project

The project will be implemented by a Special Purpose Vehicles (SPV) with equity stakes through GVMC, APSRTC & VUDA. Working group has been constituted with Local Government Representatives. Government have already approved the formation of Special Purpose Vehicle (SPV) named “Visakhapatnam Urban Transport Company Limited” and company has been registered with the Registrar of Companies for registration of the SPV

under name VUTCL for implementation and operationalisation of the BRTS. As per the Government approval APSRTC will be the major stakeholder with 51% equity and the Greater Visakhapatnam Municipal Corporation with 25 % equity & VUDA with 24% equity as other stakeholders.

OBJECTIVES OF SPV

The main objectives of proposed SPV Company are as follows:

- ❖ To provide bus rapid transit system to public by way of planning, designing, financing, developing constructing, maintaining, marketing operating and enabling BRTS.
- ❖ To provide and/or facilitate provision of multi model transport services including owning, licensing and operating bus routes, passengers and other modes of transportation.
- ❖ To serve as a single agency which will facilitate, coordinate, control and monitor the activities of various public and private partners that are an integral part of the BRTS planning, implementation and operational functions.
- ❖ To engage in and/or to facilitate development and operation of mass transit system.

Status of SPV

- Formed as per G.O.Ms.No.817 of MA&UD Dated: 26th November 2008.
- VUTCL name registered with ‘Ministry of Corporate Affairs’.
- DIN (Directors Identification Number) for 6 Directors out of 7 including Chairman & CEO Obtained. DIN of ED RTC is to be obtained.
- APSRTC - 51% equity, GVMC equity -25% and VUDA equity - 24%.
- Authorized share Capital ₹ 2.50 Cr. - ₹ 10 /- per equity share.
- GVMC Body adopted by G.O. on 29-12-2008
- MoA and AoA finalised
- Co-ordination committee for implementation / execution of BRT project vides G.O. Rt. N. 1808 of MA&UD Dated: 19-12-2008.
- Revised order issued vides G.O Ms. No. 77 MA & UD (H Dept) Dt17.02.2010 forming VUTCL with 7 Board of Directors with Collector , Vsp as Chairman ,

Commissioner GVMC as CEO and Executive Director APSRTC as Managing Director.

11.4 Factors of Success

The success of public transport initiative in Vizag will result in large number benefits accruing to public directly or indirectly, when the project is made operational in about one year's time. In all cities in India supply effective public transport has been a forgone and travel and mobility needs are exclusive in the hands of private vehicles and para-transit services. We are largely unprepared to tackle severe traffic congestion, air pollution, accidents and loss of sense of community.

BRTS Vizag will create a high quality public transport to enhance the mobility pattern and demonstrate that people and community come first. It will increase the modal split in favour of public transport – being the ultimate strategy of the Government of India (MOUD) to promote public transport in the country. The other benefits can be quantified at a later date when the system is operational. BRTS will reorganise road space with the segregated MV, NMV and dedicated bus lanes and will enhance road capacity utilisation factors. Dedicated bus lanes will promote public transport & discourage use of private vehicles.

BRTS corridor will cater to all modes of road transport. Also systematic movement of traffic in dedicated lanes ensures smooth flow, frictionless travel, and savings in travel time / cost, minimise accidents & enhances safety. The provision of exclusive segregated NMV lane will promote safety to slow moving vehicles and planned & protected sidewalk facilities will guide the pedestrian safely. The key sustainability indicators will be protection of environmental conditions, energy savings, readiness of people to shift to PT, reduction in road accidents etc.

11.5 Budgetary Implications and Sustainability

i) Total Cost of the Project

The BRTS corridors PTC & STC has been planned for the various improvements / enhancements needed to construct dedicated bus lanes, segregated MV and NMV lanes including footpaths and foot over bridges at different locations. Accordingly, construction packages were devised by GVMC for various sections of the project corridors.

It is envisaged that the project would involve widening of project road, construction of new pavements for bus transit, MV lanes, NMV lanes, construction of cross and longitudinal drainage, footpaths and foot over bridges, street lighting, traffic signs and road markings etc. The detailed cost estimate has been worked out using detailed quantities of different items of works derived from the detailed design, drawings and unit rates.

- ❖ The estimated cost for providing fixed infrastructure for civil and electrical infrastructure is estimated at ₹ 339 crore which has provision of ₹ 1.5 crore as contingencies. The cost shifting of utilities has been estimated at ₹ 26.5 crore.
- ❖ The specification of Automatic Vehicle Tracking System and Passenger Information System has been outlined for the project. The cost estimate for producing ITS related facilities for 300 buses, 50 bus stops, 8 terminals, 3 depots and a Control Centre has been provisioned. The total cost is estimated at INR 6 crore. The O&M cost shall be about 15% of capital cost.

Financial partners involved:

The funding is given partly by Government of India (Funding through JNNURM initiative), partly Government of Andhra Pradesh and GVMC in the ratio of 50%, 20% and 20% respectively. GVMC is planning to achieve its share by accessing loans form FI / Bank up to 50% of its contribution in the project.

ii) Source of Finance for Sustainability of the Project

The annual operational and maintenance cost of the system per annum will be about Rs 25 crore by year 2011 and 39 crore for year 2021. The expected ridership on the PTC and STC corridor will 1.85 lakh by year 2011 & 3.15 lakh by year 2031 passengers daily. The estimated bare box revenue will be about 73 crore per annum by year 2011 and will increase to 125 crore by year 2021. In addition to this about Rs 5 crore per annum can be generated through advertisement rights. Being the Government funded capital intensive project, the operational viability is expected to be sound as the project IRR comes to healthy 41%. This implies that project is operationally quite viable and not only the rolling stock (buses), but other systems (fare collection system and intelligent transportation systems) can also be financed from the fare box revenue and even after that there will be enough in the kitty of SPV - VUTCL to maintain the fixed infrastructure efficiently.

Since an IRR of 15% is considered a reasonable proposition to attract investors for financing rolling stocks, a proportion of total revenue is enough to give this kind of return for successful rolling stock concession and maintaining the BRTS infrastructure in efficient conditions.

The profitability of the project was critically analysed based on variation in the rolling stock cost – impact of +20% and the variation in the project revenue (on account of ridership, fare level and other incomes) of the project. The operational would not be effected even with negatively side sensitivity of key variables under reasonable scenario. The project IRR will off course be very sensitive to the revenue fluctuations. GVMC has taken advance actions on implementing the part of BRT infra like bus stations; grade separated pedestrian facilities, ‘off-street’ parking on PPP mode.

11.6 Impact of the Initiatives

- ❖ The project has been discussed in the MOUD progress review meetings and seminars many times. The project was presented in the international seminar conducted by Indo-German Institute of Advance Technology (IGIAT) and Gayatri College of Engineering, Vizag - promoted and sponsored by;
- ❖ Federal Transit Administration (FTA), Washington;
- ❖ German Technology for Technology Cooperation (GTZ);

Since the venue was Vizag, the delegates visited the BRTS corridors and showed keen interest in the project. The project was discussed in many forums in the seminar and received wide publicity and attention.

11.7 Summing Up

As feasibility study, convened by GVMC, appraised a BRTS network of 100Km consisting of 6 BRTS corridors. In first phase, 2 corridors between RTC complex to Pendurthi (20.00 Km) and Simhachalem (18.50 Km) were recommended. The study was approved by MoUD and aid was granted through JNNURM programme. Visakhapatnam BRTS is also a PPP based project. ‘Public’ is represented by a SPV named ‘Visakhapatnam Urban Transport

Company Limited' (VUTCL). The project will be implemented by a Special Purpose Vehicles (SPV) with equity stakes through GVMC (25% equity), APSRTC (51 % equity) and VUDA (24 % equity).

The main objectives of SPV are to provide BRTS by way of planning, designing, financing, developing and constructing etc.; facilitate multi modal transport services including owning, licensing and operating bus routes; and serve as single agency to facilitate, coordinate, control and monitor the activities of various public and private partners.

As per PPP model, the scope for developer (private sector) would include implementing bus shelters, foot over bridge on BOOT, operating, maintaining and transferring the facilities to GVMC after concession period; having advertisement rights etc.

Challenges / constraints faced during the construction of corridors are related to land and property acquisition for RoW, utility diversions and addressing the drainage, traffic management and diversion of traffic, strategic location of village settlements, environment and social, problems and prospects of resettlements etc.

The projects are progressing as per the schedule. The construction of BRTS infrastructure had commenced by December 2008. About 10 km of BRT corridors, on PTC as well as STC, have been completed.