

SUPPORTING SUSTAINABLE MOBILITY
UNDER SMART CITY MISSION

CITY REPORT: VISA KHAPATNAM

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VISAKHAPATNAM

MESSAGE

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About Shakti Sustainable Energy Foundation

Shakti Sustainable Energy Foundation works to strengthen the energy security of India by aiding the design and implementation of policies that support renewable energy, energy efficiency and sustainable transport solutions.

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Greetings!

Urban areas in India act as catalysts of economic growth as they play a significant role in contributing towards national income, employment generation and productivity in their region of influence. Yet, city governments in urban areas continue to lag behind in capacity and have poor infrastructure, resulting in substandard quality of life for end users even today. In order to address the above challenge, Government of India identified Smart City Mission as an integral source of funding amongst its on-going flagship programs to tackle the infrastructural gaps and capacity of urban local bodies.

We are glad to provide our support in association with Sandeep Gandhi Architects in the mobility and built environment sector to four cities which are being developed as Smart Cities. This has been a unique initiative by engaging with the project cities and giving inputs to the smart city proposal, assisting in initiating specific mobility projects, carrying out assessments and studies looking at feasibility and impact of projects, citizens and community engagement based pilots that converted into tender development in line with the Smart City Proposals.

I would like to express our gratitude to Shakti Sustainable Energy Foundation for initiating the approach of assisting the city governments with regard to mobility and built environment. I would also wish to thank the mobility and built environment sector experts, government officials, members of Smart City Special Purpose Vehicle, municipal staff of the project cities for their continuous support provided towards completion of this report.

(Emani Kumar)

*Deputy Secretary General, ICLEI – Local Governments for Sustainability &
Executive Director, ICLEI South Asia*

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We acknowledge the inputs of team members of Sandeep Gandhi Architects in providing technical support to the city.

We are highly obliged and acknowledge our sincere thanks to Sri M Hari Narayanan, IAS, Municipal Commissioner, Greater Visakhapatnam Municipal Corporation for assistance, support and necessary guidance towards the successful completion of the projects under the grant program.

Our honest and deepest gratitude to Smt. R. Jyothi Vidyullatha, Chief City Planner, GVMC and Mr. B. Suresh Kumar, City Planner, GVMC for their constant guidance, valuable suggestions and criticisms during the entire project duration, without which the projects/ proposals would not have streamlined to its present form.

We would also like to acknowledge our sincere thanks to Mr G. Anand Rao, Manager Smart City for all the assistance and necessary support towards the projects under the grant program.

We also acknowledge our sincere thanks to officials from Town Planning Department, GVMC, Visakhapatnam Traffic police Department, Visakhapatnam City and Command Operations Centre, GVMC.

1 BACKGROUND

The Ministry of Urban Development's (MoUD) Smart cities initiative provided an opportunity to envision, plan and develop projects for improving the livability in 109 cities selected to be developed as Smart Cities over a period of time. Urban built environment and transport happen to be the core of this program, even though the program only focuses on an identified area for aiming improvements along with pan city initiatives including systemic changes. Currently the smart cities mission focuses mainly on Area Based Development (ABD), while the other ongoing schemes such as AMRUT (another flagship mission of GoI) focuses on the remaining city improvements where the funds are allocated for various service sectors. It is observed that the interventions planned at the area level are beneficial but scaling up to the whole city later might become an issue as the cities are continuously sprawling. Hence there is an urgent need to assist the cities in formalizing an integrated action plan in line with the defined vision for smooth implementation of the proposed mobility components of the plan and future scaling up of the same for the entire city.

Additionally, built environment is also a major component under the smart cities mission; however it is also observed that though there are numerous policies and codes notified under the building sector in India to guide the development in built environment, there is very less knowledge available to the stakeholders on the implementation of the same at the city level. Hence, most of the cities though being developed under the Smart City Mission have not been able to show improvement in the built environment sector. Therefore, there is a need to help the cities to understand the implementation of measures in order to reduce the emissions from this sector. This can be done by developing an action plan and creating awareness along with the capacity building exercises including the stakeholders from government and the private sector.

ICLEI- South Asia - Local Governments for

Sustainability, which aims to build and serve a regional network of local governments to achieve tangible improvements in regional and global sustainability through local initiatives, together with its partners SGA Architects worked and supported 4 Indian smart cities of Udaipur, Kakinada, Visakhapatnam and Jaipur during 2015-16 with the grant support from Shakti Sustainable Energy Foundation (SSEF). Successful engagements with the city and state governments during implementing this grant provided for close insights into the existing gaps and needs that require addressing as the cities proceed into implementing their smart city proposals.

After successful implementation of phase I of the grant, ICLEI – South Asia was granted the second phase of the handholding support project by Shakti Sustainable Energy Foundation (SSEF) in February 2017 to support four cities to deliver city scale action plans under transport and built environment. The cities in the second phase included three cities from the prior engagement i.e. Udaipur, Visakhapatnam and Kakinada and a new city i.e. Ludhiana from Punjab was added to the handholding support. In the process, Kakinada was dropped due to inactive engagement and Gwalior was added for the handholding support.

The proposed initiative aims to develop and showcase an integrated and comprehensive approach to address urban transport issues and promote sustainable built environment by implementing nationally recommended steps and strategies. With the background of ongoing national efforts to develop 109 smart cities with complementary funding from programs such as AMRUT, HRIDAY, Housing for all (and few other programs) and expected active involvement of state government for undertaking implementation, the proposed project was scheduled to support four city governments to understand the 'Smart' aspects of urban mobility and built environment, as relevant to their local conditions and make available existing resources for utilisation towards implementing the same for the entire city.

1.1 OBJECTIVE

The project aims to deliver city scale action plans under transport and built environment sector for four Smart Cities. The primary intended outcome of the project is to build capacity of the city level authorities for smart built environment approach thus achieving the sustainable transport targets and promoting green and efficient buildings. The project also aims to provide handholding support and build state level preparedness of the cities for implementing the Smart city program.

1.2 SMART CITY HANDHOLDING SUPPORT: ENGAGEMENT PROCESS

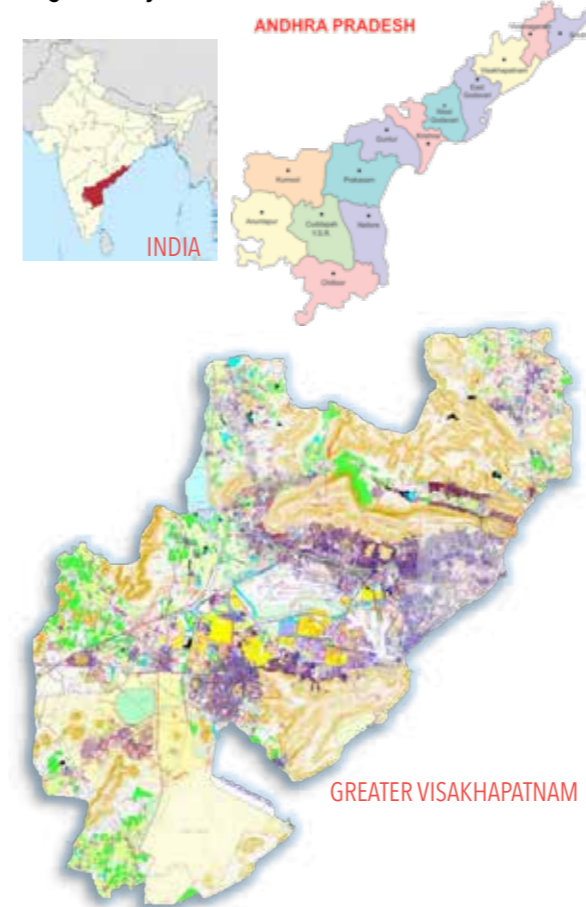
The engagement process mainly included engaging with Visakhapatnam Smart City Limited (SPV), Greater Visakhapatnam Municipal Corporation and Project Management Consultant (PMC) for the Smart City Limited on successfully implementing the proposed projects under the Smart Cities Proposal. The initial engagements with the selected cities were carried out through the state government and city governments, by the means of city specific Memorandum of Understanding (MoUs). The MoUs were signed in order to finalise the activities to be carried out under the support in consultation with Greater Visakhapatnam Municipal Corporation.

1.3 ACTIVITIES CARRIED IN THE CITIES UNDER HANDHOLDING SUPPORT

To implement the activities and provide the support as envisaged in the MoU, the project team from ICLEI-SA commenced the work by reviewing the Smart city proposal of the city. The review of Smart City Proposal emphasized on analyzing the mobility components and understanding the subcomponents and costs envisaged under the projects. The second phase of handholding support in Visakhapatnam began from February 2017 and since then various activities have been initiated within the city under this project. The subsequent chapters below describe various activities/tasks/projects which have been carried out during the engagement in the city.

2 CITY PROFILE

Figure 1 City Profile



2.1 GENERAL PROFILE

The City of Visakhapatnam, commonly known as Vizag, is Andhra Pradesh's largest city, both in terms of population and economy. Located on the southeastern part of India, it is one of the largest municipal corporations with a population of around 1.7 million, spreading across 515 square kilometers (km²) of land area. This hilly coastal city is connected by different transport modes: east coast railway, national highway, airport and sea port. Visakhapatnam Port is one of the

largest ports in the country and has the only natural harbor on the east coast. The geographical advantage coupled with a myriad of infrastructural facilities positioned the city on the international market as the financial and industrial capital. However, the high population growth is not met with the supply of efficient public transport system while the better economic situation of the population resulted in higher automobile ownership. Like in any other cities in India, Visakhapatnam faces an all too familiar problem: the increasing motorization rate resulted in traffic congestion and air pollution.

2.2 LOCATION & TOPOGRAPHY

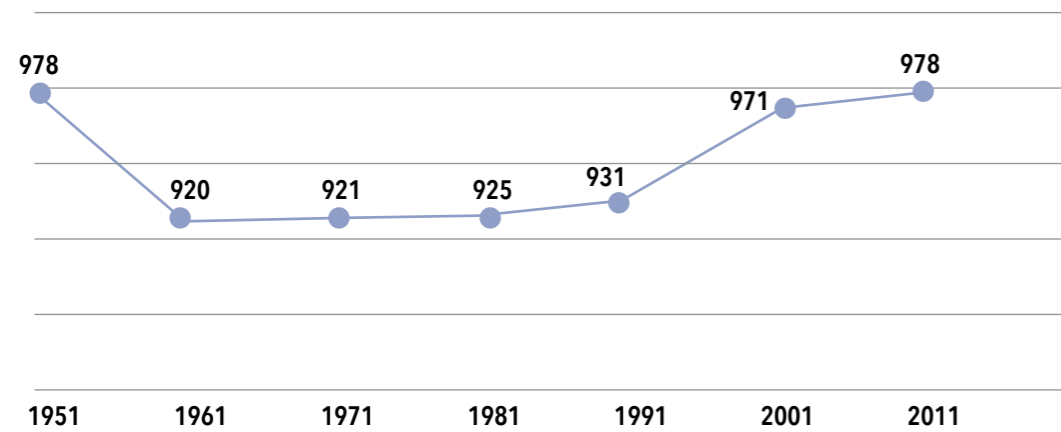
Visakhapatnam Municipality was set up as early as in 1858 and was converted into Municipal Corporation in 1979. Visakhapatnam Municipal Corporation was serving the estimated population of 12 lakhs with a total number of 4,534 officials and staff. The growth rate of the population between 1981-91 was 47.39%.

The areas of the erstwhile along with the that will now be governed by Greater Visakhapatnam Municipal Corporation (GVMC). GVMC came into existence after inclusion of Gajuwaka Municipality and 32 villages (includes few Panchayats) into Visakhapatnam Municipal Corporation. GVMC was formed after the Government of Andhra Pradesh released the Government Order (GO) on November 21, 2005. Major industries such as the Visakhapatnam Steel Plant, Bharat Heavy Plate and Vessels and the Hindustan Zinc, now a part of the Sterlite group id under the limits of Greater Visakhapatnam municipal corporation.

2.3 CLIMATE

Visakhapatnam has a tropical savanna climate with little change in temperature throughout the year. May is the hottest month with an average maximum

Figure 2 Decadal Sex ratio



temperature of about 36 °C, and January is the coolest month with an average maximum temperature of about 29 °C. The location characteristics and unique physiography (popularly known as dolphin nose) has a high influence on its weather and climatic conditions as well as the climate related hazards.

2.4 DEMOGRAPHICS

Visakhapatnam City has urban population of 21 lakh¹ (Census 2011) and a total area of 530km², the average population density of the city is around 3,995 people per square kilometre. However, since the effective built up area is only around 166km², the effective population density in the city is around 12,750 people per square kilometre.

As of 2011 census there are 978 females per 1000 male in the city. There are 944 girls under 6 years of age per 1000 boys of the same age in the city

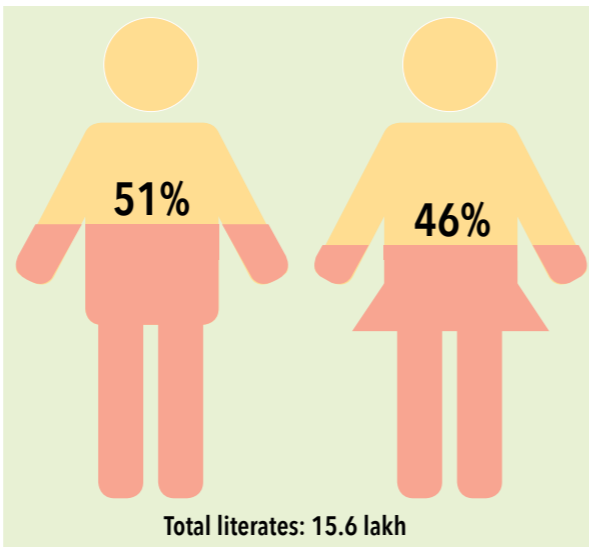
2.4.1 Literacy

Total about 15.6 lakh people in the city are literate, among them about 8.4 lakh are male and about 7.2 lakh are female. Literacy rate (children under 6 are excluded) of Greater Visakhapatnam is 74%. 54% of male and 46% of female population are literate here.

2.4.2 Population and Decadal Growth Rate

The Average Annual Growth Rate (AAGR) for the region from 2001 to 2011 is only 1.34%. Based on an AAGR of 2%, the population figure will rise to 7.56

Figure 3 Literacy among gender



million in 2030. More than half of the total regional population will still live in GVMC³.

2.5 CITY URBAN SYSTEM PROFILE

Visakhapatnam Municipality was set up as early as in 1858 and was converted into Municipal Corporation in 1979.

Visakhapatnam Municipal Corporation was serving the estimated population of 12 lakhs with a total number of 4,534 officials and staff. The growth rate of the population between 1981-91 was 47.39% and the total annual revenue of the Corporation was about Rs. 100 crores.

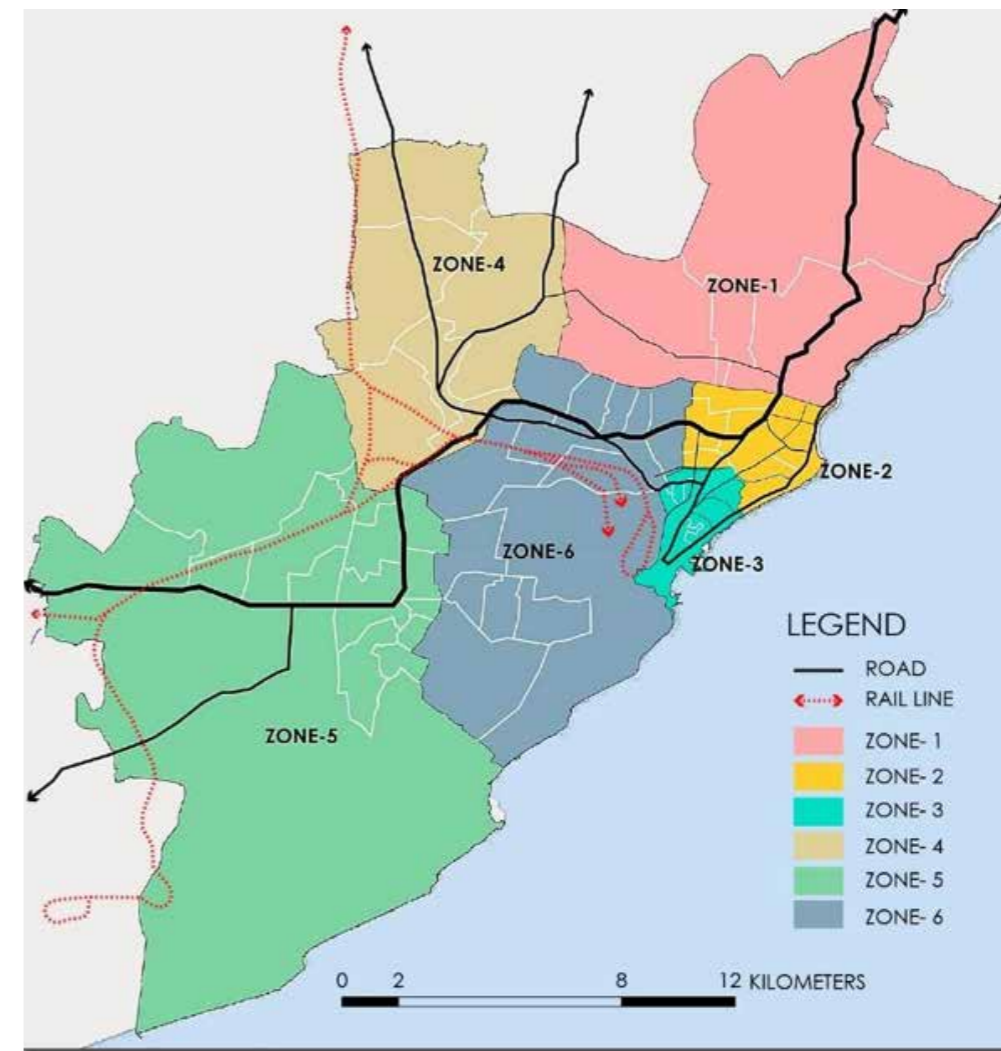
Table 1 Population Projections

Area	2001	2011	2021	2030
GVMC area	22,00,000	27,97,100	31,95,200	41,69,000
Other VMR	20,00,000	25,42,900	29,04,800	33,95,674
Total VMR	42,00,000	53,40,000	61,00,000	75,64,674

The areas of the erstwhile Visakhapatnam Municipal Corporation along with the Gajuwaka Municipality and 32 villages (includes few Panchayats) that will now be governed by Greater Visakhapatnam Municipal Corporation (GVMC). GVMC came into existence after the Government of Andhra

Pradesh released the Government Order (GO) on November 21, 2005. Major industries such as the Visakhapatnam Steel Plant, Bharat Heavy Plate and Vessels and the Hindustan Zinc, now a part of the Sterlite group will come under the limits of Greater Visakhapatnam.

Figure 4 Administrative Zones of GVMC



3 TRAFFIC AND TRANSPORT PROFILE

Multiple agencies are involved in supporting and facilitating traffic and transportation system in Visakhapatnam. While road infrastructure within municipal limits is responsibility of GVMC. VUDA is responsible for the roads outside municipal limits. The bus service is managed by APSRTC. The traffic regulation has been the responsibility of the Traffic police department. The NHAI, R&B, AP Transco. Etc., are the other agencies that facilitate transport system. No single agency is solely responsible and accountable for traffic and transport management. This is giving rise to spatial and functional fragmentation.

3.1 ROAD NETWORK

The city has radial form of road network development. The major road network in the city area extends over a length of 126 Km. The total road length is 1007 kms. The recent growth trend is more in the North /

south and west directions of the city. Two National Highways, NH5 (connecting Chennai on south and Kolkatta on East, and NH43 connecting Raipur) passes from city.

The road network of Visakhapatnam is very dense and congested due to narrow carriage ways, high pedestrian traffic and slow-moving vehicle concentration. As per the existing land use plan, the area under road and railways is about 6%.

3.2 VEHICULAR GROWTH

As per the Regional Transport Authority statistics, the total number of non-transport vehicles in Visakhapatnam city was about 2.85 lakhs during the year 2005. Of which about 2.43 lakhs (85.00%) were 2-wheelers, 0.27 lakh motor cars (9.4%), 0.14 lakh 3- wheelers (5.1%), 0.05 lakh (0.18%) buses. Commensurating with the growth in population, the number of vehicles also grew at a rapid pace within

Figure 5: City Transport Map

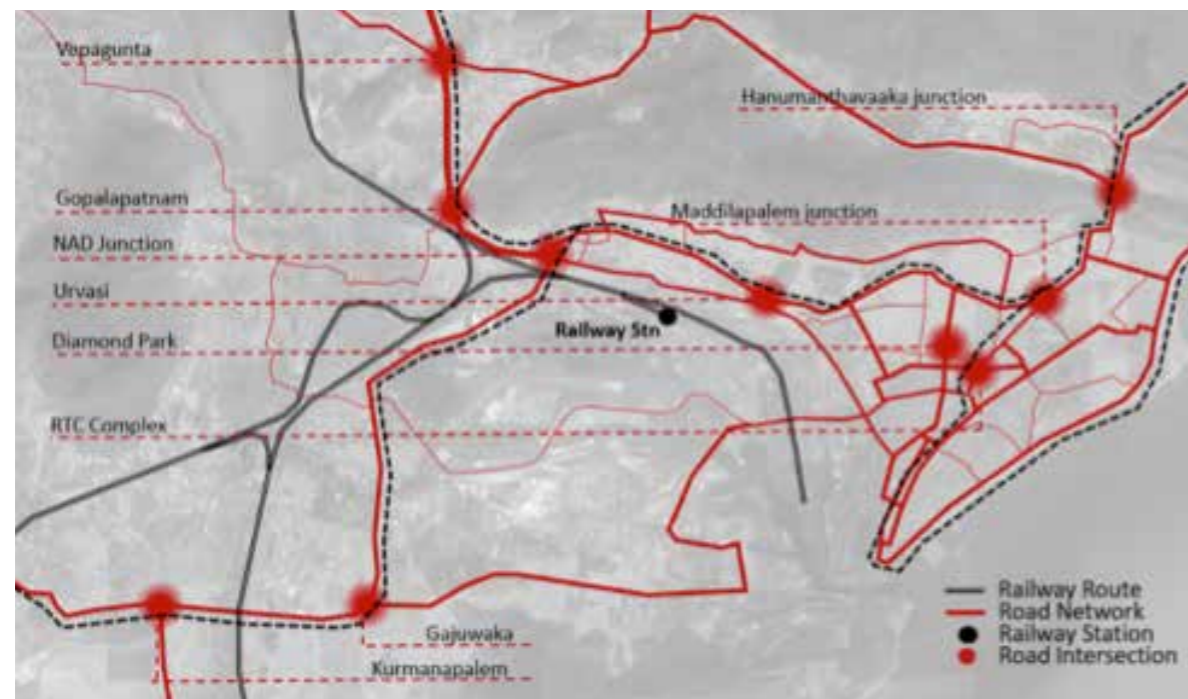
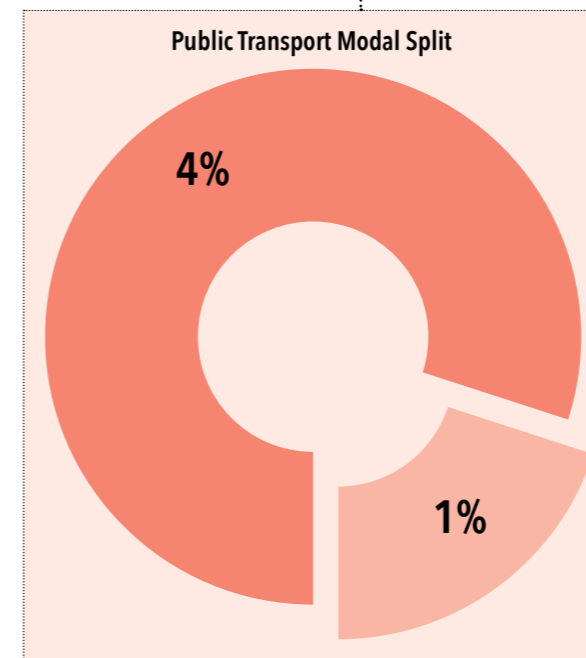
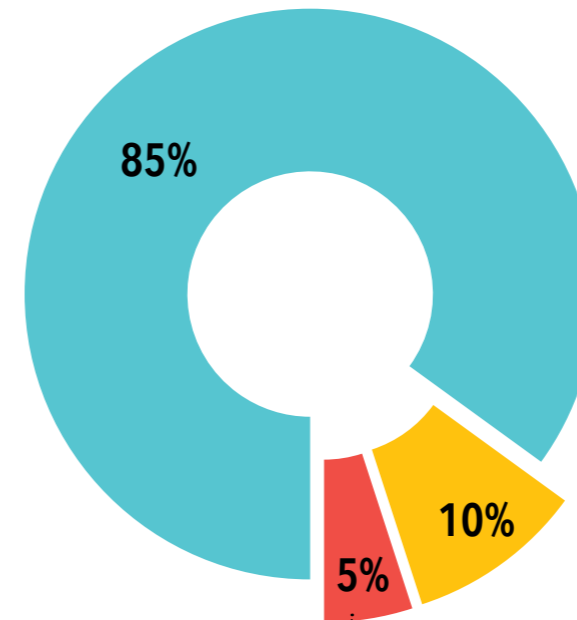


Figure 6: Vehicular Composition



■ Bike ■ Car ■ Auto/Bus ■ Auto ■ Bus

the urban area. The private transportation has also become the preferred mode of transportation in Visakhapatnam like any other cities in India. The deficiency in frequency of APSRTC buses is one of the reasons for the growth of private vehicles. Overall, there is an attitudinal shift of people to use private

Table 2: Cumulative Vehicular Registrations

Category	2002	2003	2004	2005
Motor Cycles (2 Wheelers)	1,78,143	1,97,534	2,19,158	2,43,033
Motor Cars, Jeeps (4 Wheelers)	17757	20360	23511	27065
Autos	9993	11718	13212	14771
APSRTC	503	491	495	521

vehicle rather than public transport.

3.3 MODAL SPLIT

As per Low carbon mobility plan, Non-Motorised transport constitutes 55% of city trips with average trip length of 1.92 km compared to city average of 4.1 km. Private modes share 17% & IPT shares 9% of trips leaving only 19% of trips to public transport which is a decline in benchmark of 55% public to 45% private ratio

3.4 PUBLIC TRANSPORT (PT)

Public Transport System (PTS) in Visakhapatnam is primarily road-based bus transport. APSRTC buses capture about 85% of all the trips made by public transport whereas para transit services share the balance 15% in commuting passengers. The total share of public transport is less than 20% against the minimum desired 55% share for Visakhapatnam.

Dwaraka Bus Complex is the major bus station in the city. It operates buses to major parts of the State and also operates Intercity transport (City Bus Services).

3.5 INTERMEDIATE PUBLIC TRANSPORT (IPT)

The paratransit operates, mainly in the form of auto-rickshaws (3-seater and 7-seater) have increased in the recent years to capture the peak hour demand and are emerging as competitors to the APSRTC

4 SECTOR SPECIFIC PROJECTS/ PLANS

4.1 PARKING

Majority of the parking in the city is found on-street causing inefficiency of the carriage way and traffic movement due to un-organized parking and encroachment on the roads. Although few No-parking sign boards are installed on few major roads such as Beach road, Jagadamba area, ramatalkies road, etc. and parking rules are hardly enforced.

Greater Visakhapatnam Municipal Corporation (GVMC) & Visakhapatnam Urban Development Authority (VUDA) are involved in parking management. Although there are few parking lots in the city, due to lack of strict enforcement and monitoring, these lots are hardly utilized to full potential. Also few commercial spaces in the city have off-street basement parking facilities with variable parking prices.

One of the major concerns in the city is parking for short term or long term at major junctions like Asillmetta, NAD, Goapalapatnam, Jagadamba junction, etc. Parking at junctions reduces the throughput of vehicle flow causing increase in travel time, multiple signal cycles, high emissions at junctions, etc. Presently short-term parking of Auto rickshaws is identified at these junctions creating bunching of traffic following behind. It is important to understand that IPT stands are supposed to be located at least 15m away from junction after turning circle with recessed space allotted for drop off and pick up. This helps in increasing both the vehicular and passenger through put at junction. Additionally, it is important to formalize and organize the road edge treatment in more disciplined manner which is presently unorganized.



Existing on-street parking in front public building



Visakhapatnam City Bus (APSRTC)

buses. A total of 15,000 auto-rickshaws ply on the city roads and cater to an estimated 10% trips each day. While a proper integration of para-transit can actually complement the bus system, this has not happened due to the much unorganised nature of the sector with too many independent owners of auto- rickshaws. The high degree of maneuverability of the auto rickshaws and frequent stopping on the carriageway to serve the passengers has resulted in severe problems in the free flow of road traffic in the city.

3.6 PEDESTRIAN AND NON-MOTORIZED TRANSPORT (NMT INFRASTRUCTURE)

The road inventory survey reveals that the entire city has approximately 77km of footpaths that either exist or are being constructed. Out of this, 40km are part of the two BRT corridors in the city. None of these footpaths have been provided with disabled-friendly access. The table no 3 gives the summary of footpath infrastructure in the city.

It is observed that 50 per cent of the footpaths in the city are discontinuous, due to various reasons like the presence of electric poles and trees on the footpath, entry to properties along the road, and breaks in footpaths at crossings and on-street parking. 20 per cent of the footpaths are mostly encroached by parking and shopkeepers along the road extending their shops to the footpaths. Only 30 per cent of the footpaths are without any encroachments. However, even these

Table 3: Footpath Widths City wide

Width of Footpath (in m)	Length(Km)
1.5	67
2.0	6
3.0	4
Total	77

footpaths are not completely pedestrian-friendly because they are mostly concrete blocks placed as a cover to the sewer lines below. They are 180-200mm above the road surface and have occasional gaps between concrete blocks making them uncomfortable to the users.

3.7 PARKING FACILITIES

Roads in Visakhapatnam have enough carriage way and shoulder width to cater the PCU's at peak hours. However, majority of roads witness congestion due to poor usage of carriage way. Unorganized and stationary vehicles on carriageway are becoming threat to other vehicles. At major junctions like Asillmetta, Jagadamba, NAD, Gopalapatnam, etc. and important landmarks like CMR central Jagadamba theatre etc., auto rickshaws are occupying more than 70% of road space for passenger drop off and pick up's which leads to bunching and delay of traffic.

CHITRALAYANA MALL	
DURATION	CHARGES
0 to 1 hrs	₹ 10/-
1 to 3 hrs	₹ 20/-
ADDITIONAL HOUR	₹ 5/-
9 to 12 hrs	₹ 70/-
12 to 24 hrs	₹ 110/-
LOSS OF TICKET	₹ 50/-

DURATION	CHARGES
0 to 2 hrs	₹ 30/-
ADDITIONAL HOUR	₹ 10/-
9 to 12 hrs	₹ 100/-
12 to 24 hrs	₹ 220/-
LOSS OF TICKET	₹ 100/-

Top: Variable parking prices of both 2W and 4W at a private Retail mall
 Bottom: IPT parked at Asillmetta junction to accommodate the passengers



4.1.1 Initiative by city authorities

GVMC has demarcated parking area which are proposed to be supplemented with parking fee structure to improve parking turnover. A proper parking policy, which looks at users-pay principle, is imperative. Off street parking complexes for private vehicles at 20 important nodal points (identified

by GVMC) in the city are required to ease traffic congestion by releasing precious carriage way. Besides there is an urgent need to streamline the para-transit vehicles by provision of suitably designed para-transit hubs. As many as 25 locations have been identified to implement this scheme. Similarly, there is a need for providing parking spaces for private bus operators.

10 such locations, on all major arterial roads are identified for this purpose.

4.1.2 Initiative under smart city projects

Based on the need to tackle parking issues in the city, GVMC is constructing multi-level car parking facility (MLCP), under the Vizag Smart City initiative. The MLCP is planned on a 367.8 square meters land pocket next to Jagadabama junction.

MLCP will provide facility for 100 ECS through a five-level structure of puzzle parking system. It will be integrated with mobile app for real-time tracking of vacant parking slots in the facility. The initiative is proposed as part of Smart cities Mission.

Similarly, Visakhapatnam Urban Development Authority (VUDA) has proposed an underground parking facility to accommodate nearly 800 cars on the RK beach road. The underground parking facility is part of the proposed 60-crore Integrated Museum Project. The Greater Visakhapatnam Smart City Corporation Limited is expected to provide funding for this parking facility as part of a convergence under the Smart City initiative.

4.1.3 Need for new Approach

To overcome parking challenges, a detail parking policy and guidelines needs to be developed and enforced at city level. This policy will assist city in controlling and reducing the parking demand. Also, the policy focuses on the parking management that includes road edge treatment, on-street and off-street parking spaces, various parking price strategies, ITS integration etc., The policy will assist GVMC to introduce effective enforcement mechanisms. There is also a need of setting up an institutional framework which provides details on responsibilities of each concerned authority and introduction of funding mechanisms to maintain the parking structures. The approach to be followed while dealing with parking management is mentioned below:

Develop a fair understanding of parking demand and supply - divide entire city into three zones i.e. CBD, major corridors and rest of the city. The initial zones should have restrictive parking availability with high pricing and for rest of the city different parking zones should be created.

Subdivide city into multiple parking districts

- parking district shall be the main unit for administering parking regulations and management. Each parking district shall comprise the entire street network - including streets with no parking and paid parking, as well as off-street parking in the vicinity. The management of on-street as well as off-street parking in any particular district shall be managed by a single operator.

Calculate parking demand - parking should be provided separately for different modes and establishments of the particular area mode wise.

Introduce Parking charges - separately for both on-street and off-street parking spaces, and the parking charges shall be reflective of rentals of the zone, parking demand and Equivalent car space (ECS) of the vehicle.

Encourage private sector's investment - for creating multi story parking structures. Cost of land, construction of built space, operation and maintenance shall be recovered from the users using such facility. The authority shall not give any form of subsidy for development of such parking structures.

Implementation - successful implementation of parking management system with cooperation between multiple stakeholders (such as urban local bodies, traffic police, planning agencies, operators and others). "Parking Management Committee should be created; committee shall have competent professionals, representatives from traffic police, municipal corporations, along with city engineers who are capable of managing and overseeing these complex and highly technical tasks.

Enforcement - traffic police to declare a "no tolerance zone" for illegal parking on any public place in the project area not designated as parking and penalise for illegal parking and remove any impediments from the road.

Evaluate - conduct regular surveys to evaluate the satisfaction levels of the customers as well as regulate the parking rates. By knowing the public willingness towards a service, helps to maintain the awareness of the competitive environment.

4.1.4 Activities suggested/ carried out under the suggested approach.

As part of Handholding support, Project implementing team in consultation with GVMC, Town Planning department and other relevant stakeholders developed

draft parking policy framework and Parking action plan for beach road. The Parking Action Plan is strongly linked with overarching different transport policies, various plans and documents, parking objectives and travel characteristics of Visakhapatnam.

The core objective of the proposed parking action plan is to assist GVMC for preparation of Parking Management Plan in the city. The plan consists of following measures

1. Arterial and Sub-arterial Roads with on-Street parking provision in the city
2. No-parking zones in the city with demarcated boundaries and relevant graphics.
3. Various pricing methods and strategies that are briefed in the policy in relevance to the location, time, topography and various other physical elements with detail parking and traffic surveys.
4. About the operation and maintenance of the plan as briefed in the policy.
5. Enforcement of parking policy in short term, medium term and long-term phasing within 9-12 months of timeline based on the strategy implemented.

4.1.5 Key challenges, broad level findings in formulation of parking policy for the city

During the formulation of draft policy framework in consultation with municipal staff, Project team was directed to prepare a plan for implementation of parking policy. Project team has taken up the inference and has surveyed suitable locations along the Beach road as suggested. Along the beach road stretch parking count survey was performed taking visual information, project team has identified nine locations along the stretch for implementing parking.

Based on the survey data appropriate locations along the beach road have been identified for parking spaces and plans have been prepared.

Table 4: Weekend Parking demand (ECS) along Beach Road

Sl.No	Location		PCU Demand in Weekends
1	Coastal Battery	Hawah-mahal	35
2	Hawah-mahal	Novotel	67
3	NTR Statue	CCD	135
4	CCD	Aqua Sports Complex	92.5
5	Aqua Sports Complex	Submarine	134.5
6	Submarine	Park Hotel	75.5
7	Park Hotel	Bell park	107
8	Bell park	Kurpam Circle	8
9	Kurpam Circle	Pedha Waltair	33.5

4.1.6 Current Status

A draft parking policy has been made and submitted at GVMC where a Stakeholder meeting is to be held for further approval of the policy document. Once approved the city will officially implement the interventions proposed.

4.1.7 Way forward

Based on the parking policy framework and parking action plan, the GVMC needs to develop detailed parking management plan which focuses on:

- Formalising the existing unorganized and informal parking.
- Introduction of parking prices for on-street and off-street parking.
- Discouraging the growing private transportation.

Figure 7: Vehicular composition along beach road

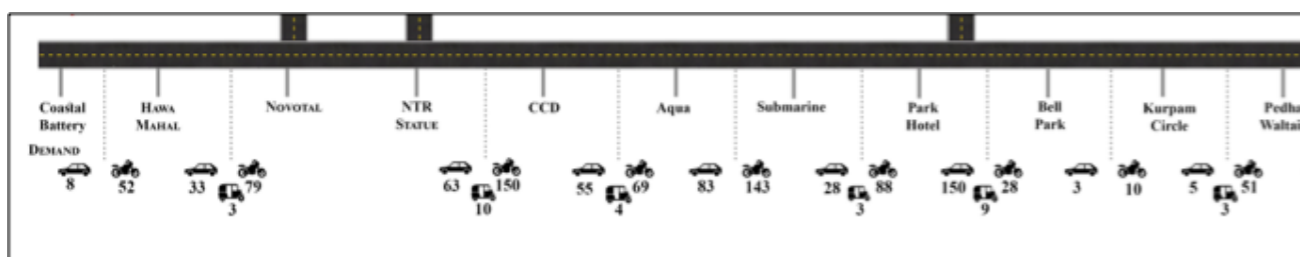


Figure 8 Parking provision at Submarine Museum (LOC-5)

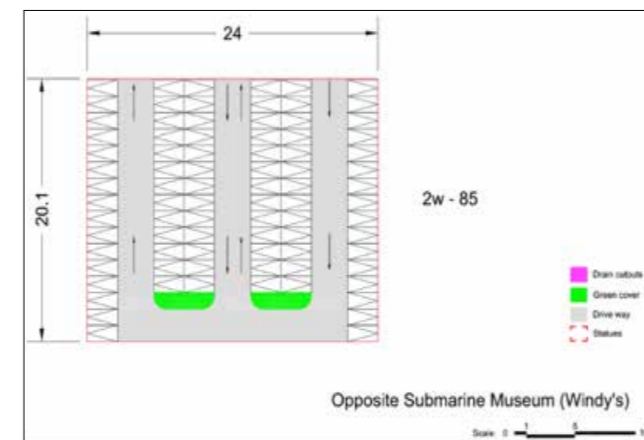
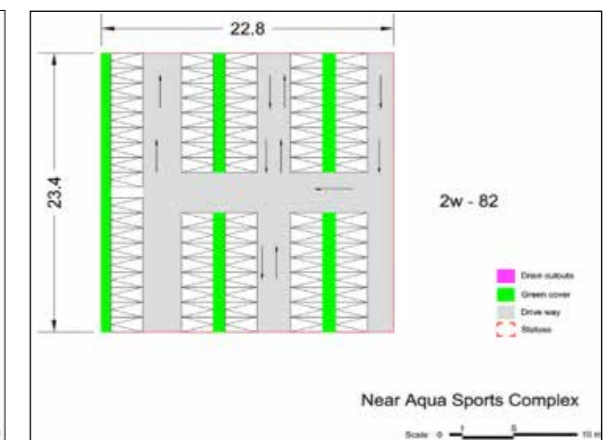


Figure 9 Parking Provision at Aqua Sports Complex (LOC-4)



- Encouraging the Multimodal integration by providing parking facilities at transit stops.
- Formalizing and treating the road edge beyond shoulder line space with good streetscape designs
- Appropriate use of land with promotion of environment friendly measures
- Promoting Non-Motorized transportation and reduce private vehicles.
- Developing Streets with Universal Access friendly through strict enforcement and discipline.

4.2.2 Need for new Approach

Intersection improvement of these junctions is intended to accommodate an infrastructure which ensures a safe and reserved right of way for all road users and space for accommodating infrastructure which supports context relevant activities currently observed on the street (such as pedestrian, vending and landscaping space to support shopping and religious activity on the street along with spaces for parking of IPT, bus stops, etc.). The junction improvement needs to meet local objectives of reducing traffic queues during peak hour along with reducing delays and improving safety. Additionally, the traffic 'congestion' at these junctions is not a result of capacity constraint but caused by friction between motor vehicles and slow-moving traffic (such as pedestrians and cyclists) as well static activities such as street vending, all of which share the right of way with motorized modes. These requirements can be met by Modern Roundabout development at this intersection. Modern roundabouts work best with junction traffic volume, less than 6000 PCU, and they ensure minimal conflicts and offer maximum safety as well efficiency. The salient features which were followed in the junction re designing exercise are as follows:

- Pedestrian Friendly environment.
- Integrated barrier free infrastructure (mandated by disability act of 1995)
- Organized Traffic circulation, through improved geometric design in order to improve junction efficiency, minimize congestion
- Equity in road space allocation, ensure designed

4.2 JUNCTION IMPROVEMENTS

Due to conflict of various activities, encroachment, and roadside parking, Junctions in Visakhapatnam remain the bottleneck of congestion. This not only restrict the smooth vehicular flow, but also creates issues for safe pedestrian movement. Therefore, junction improvement is one of the priority actions for city authorities.

4.2.1 Initiative by city authorities

Adaptive Traffic Management System (ATM) are adopted by Vizag over the regular IC based traffic signals. At present 50 junctions have been taken up for upgrading to ATM's with a cost of 8.90 Crores. Adaptive Traffic Management System (ATM) uses high resolution cameras to sense the changing traffic patterns around the traffic signal and manipulates the signal timer accordingly by triggering the signals to the timer control system.

space is integrated for activities for all road users such as provision footpaths.

- Improve safety and security through active and passive means such as traffic calming (speed control).

4.2.3 Activities suggested/ carried out under the suggested approach

Project team in consultation of GVMC identified critical junctions to be resolved through passive design solutions. Project team has identified ten junctions which are to be prioritised for which conceptual designs were provided.

4.2.4 Current Status

Based on discussion with Commissioner, GVMC and detailed assessment of identified junctions, Project team has identified two priority junctions (Diamond and Gajuwaka Junction) for detailed designs. Based on discussion on designs, GVMC was communicated about need of total station survey for junctions for effective junction solutions. However, considering the delay from GVMC to undertake Total Station Survey, Project team has appointed surveyor to undertake TSS.

S.No	Junction	Type of Junction	No of Arms	PCU	Encroachment & other issues	Bus Stop (within 25mts)	Signal	BRTS	Predominant Landuse
1	Kurmannapalem	T shape	3	6249	Parking, Geometry	--	Yes	No	Industrial
2	Gajuwaka	Y shape, 4 arm	3	5763	Parking, hawkers, geometry, Rickshaw	Yes	Yes	No	Commercial
3	Urvasi	Y shape	3	4044	Geometry, signal	Yes	Yes	No	Residential
4	Maddilapalem	Y shape, 4 arm	3	7522	Geometry, hawkers, Auto rickshaws	Yes	Yes	Yes	Commercial, Institutional
5	Isakhathota	T shape	3	3717	Hawkers, parking	Yes	Yes	No	Residential
6	Hanumanthavaaka	T shape, 4 arm	3	5664	Parking, geometry	Yes	Yes	Yes	Residential
7	Gopalapatnam	Y shape	3	4445	Auto Rickshaw, hawkers, parking	Yes	Yes	Yes	Commercial
8	Vepagunta	4 arm	4	4757	Geometry, hawkers, parking	Yes	No	Yes	Residential
9	Diamond Park	4 arm	4	2488	Parking, Hawkers, geometry, Rickshaw	--	No	No	Commercial
10	RTC Complex	4 arm	4		Auto Rickshaw, Parking, Hawkens	--	Yes	Yes	Commercial

Figure 10: Existing scenario and Activity survey



Figure 11: Existing peak hour Arm-wise Traffic (in PCU) and Pedestrian Count



Figure 12: Proposed Junction Improvement Plan (Option-I)



Figure 13: Proposed Junction Improvement Plan (Option-II)



4.2.5 Way forward

Upon completion of the total station survey drawings project team will be finalizing the proposal and appropriate implementation plan will be given to the municipal staff on the same, which is taken on to ground. The passive design solution in Vizag will focus to:

- Make Junctions more Pedestrian Friendly & Disabled Friendly
- Support captive use and bicycle sharing efforts
- Provide Organised Traffic circulation - through improved geometric design
- Improve junction efficiency, minimize congestion
- Equity in road space allocation
- Designated spaces for parking, which can be charged as per parking policy
- Generation of space for “city space” treatment through landscaping, lighting, street furniture and signage
- Enhancement of heritage appeal and attractiveness through better experience, connectivity and access
- Improve safety through active and passive means

such as traffic calming (speed control)

4.3 SMART STREETS (NMT INITIATIVE)

4.3.1 Initiative under smart city projects

As part of NMT improvement, GVMC plans to redevelop its major roads with focus on pedestrian friendly infrastructure. The 6-km pilot project for this program is currently being designed under Vizag’s Smart City. The pilot would be phased over a 4-8-year period, to eventually include all of the major arterial roads in Vizag’s city center.

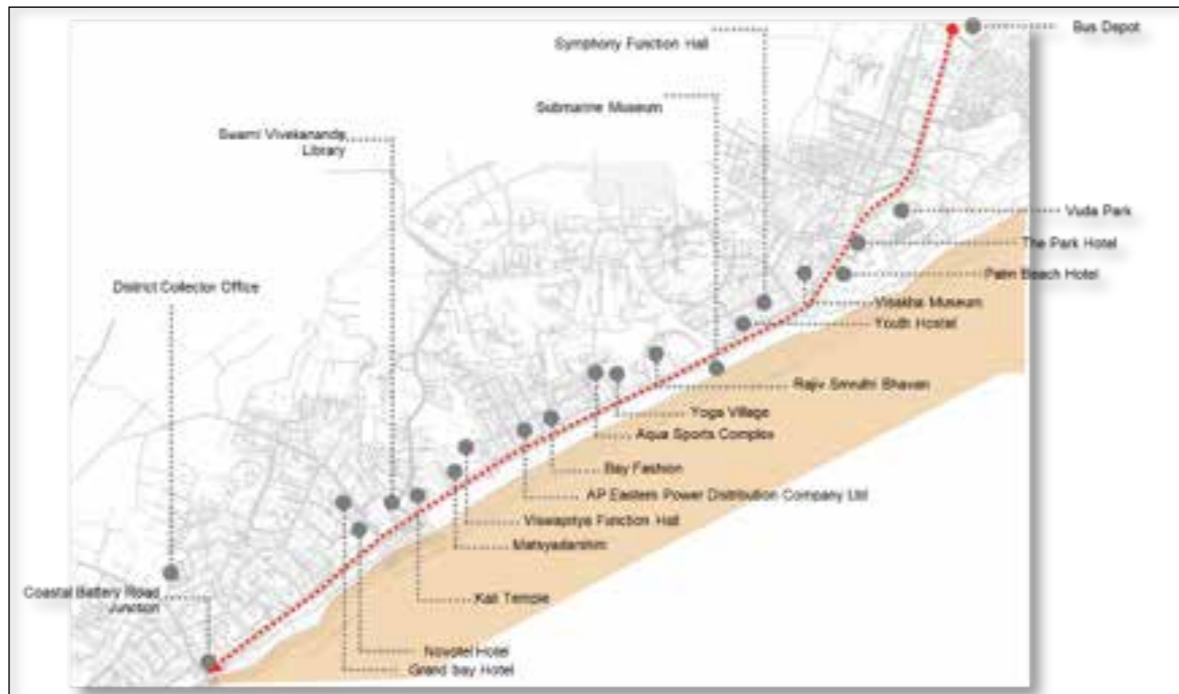
4.3.2 Need for new Approach

It is worthwhile, to note that even though Smart Cities Mission envisage to create walkable communities through re-design of pedestrian space, the pedestrian infrastructure projects has been clubbed with road network improvement to ease vehicle movement. The road network improvement includes utility duct and footpath, however due to lack of comprehensive design, the usability of such walkway in improving

Figure 14: Proposed Smart Street Enhancement to arterial road



Figure 15: Activity identification along Beach Road



walkability needs serious discussions. In the above context the redesigning principles to be adopted should include:

- Rationalized sidewalk widths, based on anticipated pedestrian flows;
- Geometric changes at intersections to improve pedestrian safety, including safety islands for wider street crossings, high visibility marking of pedestrian crossings, and pedestrian signals;
- Urban design solutions to prevent vehicles from using sidewalks for parking, while maintaining safe sight distances for vehicles along the roadways and at intersections;
- Parallel on-street parking at key commercial locations;
- Planting areas to buffer pedestrian paths, where space permits;

4.3.3 Activities suggested/ carried out under the suggested approach and its outcomes-plans, discussions, pricing, pilot etc.

Based on the stakeholder consultations, Commissioner GVMC has shown interest in inclusion of NMT along the beach road stretch which adds to tourism and recreational activities along beach side. Project

Table 5 Modal split along beach road

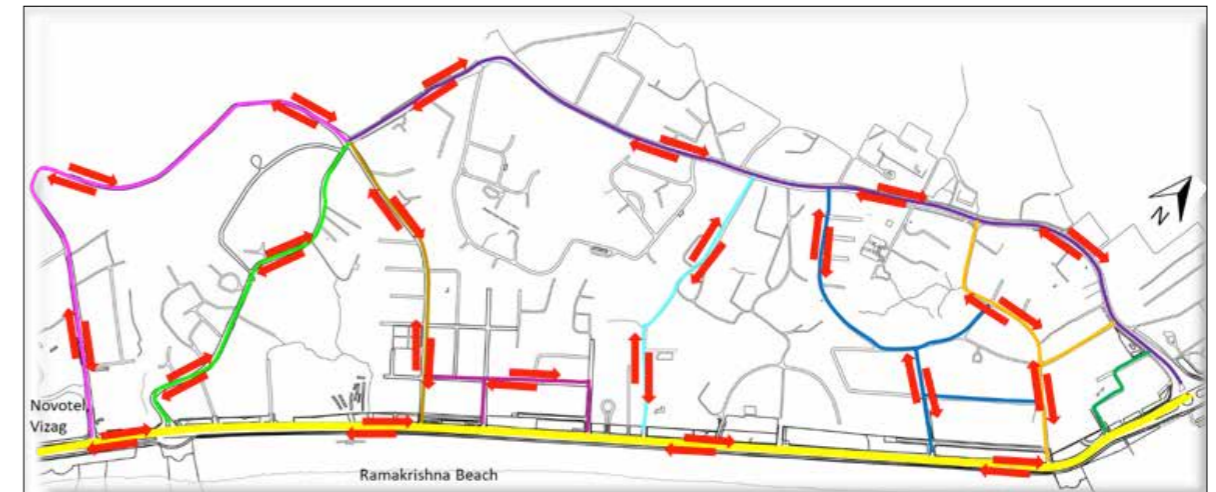
	From A to B		From B to C	
Left Side	Cars	84	Cars	132
	Bikes	395	Bikes	256
	Auto Rickshaw	3	Auto Rickshaw	21
	From A to B		From B to C	
Right Side	Cars	28	Cars	12
	Bikes	225	Bikes	162
	Auto Rickshaw	0	Auto Rickshaw	21

	From C to D		From D to E	
Left Side	Cars	75	Cars	81
	Bikes	91	Bikes	202
	Auto Rickshaw	2	Auto Rickshaw	5
	From C to D		From D to E	
Right Side	Cars	8	Cars	9
	Bikes	164	Bikes	234
	Auto Rickshaw	0	Auto Rickshaw	0

Figure 16: Activity mapping along beach road



Figure 17: Existing Circulation Network along Beach Road



team has taken up the input and worked on ground for a better management plan. Project team has identified the hotspots along the beach front where footfall is high.

The activity survey has been carried out and carriage way utilisation has been analysed, road inventory surveys have been carried out and carriage way widths within the circulation network suggested have been taken for draft proposals.

A robust circulation network was prepared. Salient Features of submitted proposal include parking spaces to cater for rising PCU demands, wide foot paths for pedestrians with dedicated bicycle lanes which not only serve for pedestrians but will be catering even for activities for other public. Also, informal kiosks have been included as a part of inclusive planning aspect

Name of Road	ROW	
Beach Road	35.50 Mt	
Chinna Waltair main Road	31.00 Mt	
Nowroji Road	13.70 Mt	
Harbour Park Road	12.70 Mt	
Yoga Village of Andhra University Road	12.50 Mt	
Kirlampudi Main Road	11.50 Mt	
Ambica Sea Green Road	11.00 Mt	
Beach View & Aqua Sports Complex Road	8.50 Mt	
Pandu Ranga Swamy Temple Road	7.00 Mt	
Swagraha Sapphire Apartments Road	6.50 Mt	

and greens have been introduced to separate carriage way with activity zone which sums up to beautification of streets.

Figure 18: Proposed Circulation Pattern



Figure 19: Proposal options for Beach Road stretch

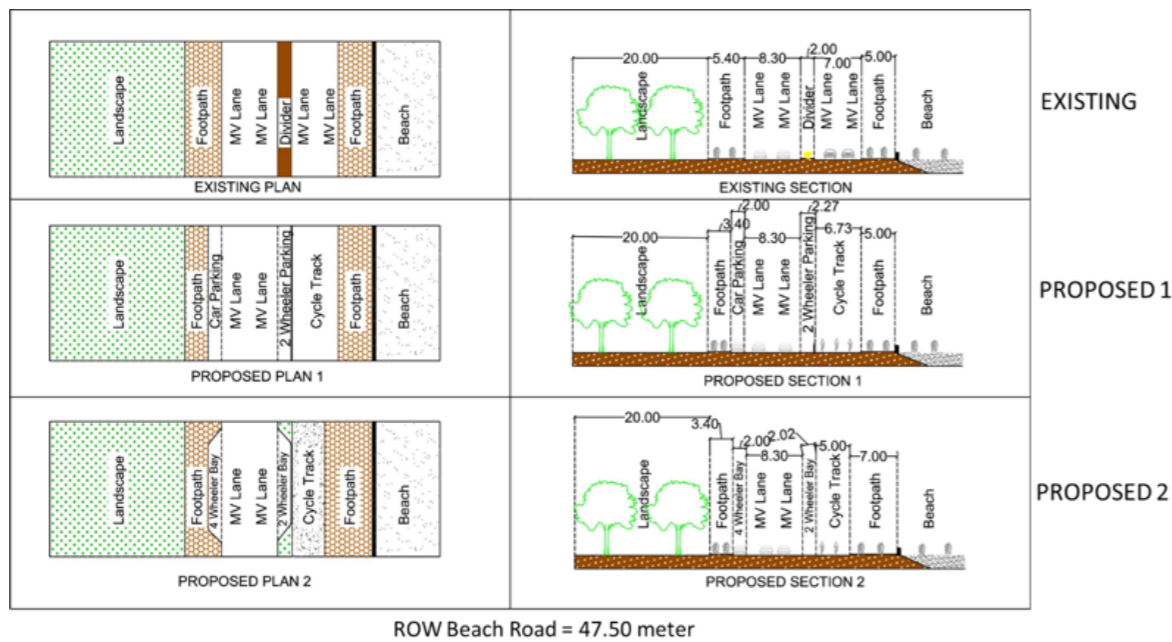


Figure 20: Proposed Cross Section of Beach Road

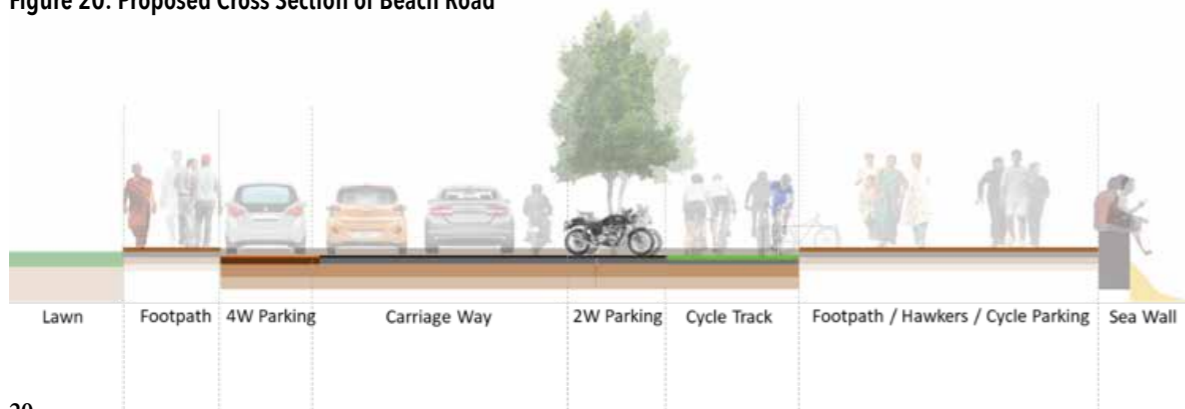


Figure 21: Visual Illustration of Proposed Cross Section



4.3.4 Current Status

GVMC has included the redesign of beach road with larger project funded by World bank to improve 35 kms of coastal roads along Vizag. However, engineering team has requested world bank appointed urban designer to take input from City Associate regarding beach road planning.

4.4 E-RICKSHAW FOR LAST MILE CONNECTIVITY

In addition to above, the City Associate also assisted city officials with technical specification of E-rickshaw which can be used to improve the last mile connectivity. The Specification includes the E-loaders to be used for collection and transportation of solid waste in the city.

5 SECTOR SPECIFIC ANTICIPATED IMPACTS AND OUTCOMES

5.1 SECTOR OVERVIEW

As a part of hand holding support under smart city program, the project team worked in consultation with the Municipal Corporation, SPV Smart Cities and the PMC for Smart Cities Visakhapatnam to showcase the impact of sustainable mobility interventions. City associate was stationed within GVMC to provide the local support in conducting various traffic surveys, for initiating involvement of other stakeholders in ongoing projects and assisting in managing and conducting junction trails

Project team assisted the city in the following tasks

- Development of draft Parking Policy and Parking Action plan
- Provided technical specification for E-carts.
- Assisting in Non-Motorized Transport (NMT) with focus on junction improvement of Diamond Junction and Gajuaka Junction
- Assistance in developing proposal for Beach road improvement with focus on pedestrian movement and off street parking.

Apart from providing the support in various ongoing smart city proposals, project team also assisted GVMC in various mobility initiatives in the city.

5.2 ANTICIPATED IMPACT AND OUTCOMES (IN CASE IT WOULD HAPPEN)

City has very well accepted the views and proposals which project team provided for parking management along the beach road and junction

improvements. The draft parking policy submitted to city has been acknowledged by chief town planner and it will be discussed with government stakeholders for adoption. Proposal for beach road improvement which was provided by the project team has been submitted by local authority to the World Bank. City officials have advised the project team to demonstrate the on-ground implementation of junction improvement proposal. Discussions are going on with the authority for topo survey for Diamond junction. The GIS drawing provided by the authority is not enough to exactly map the existing activities which are required for creating barricading plan for the trial run. To promote E-rickshaws in the city, technical specifications for E-Loaders linked to waste collection were also developed.

5.3 WAY FORWARD

Since the support to Greater Visakhapatnam Municipal Corporation under the grant has come to an end after the successful completion of the project. It is expected that the city along with the Smart Cities team would continue to work on the remaining junctions which need immediate interventions along with other sub sectors such as parking, IPT and public transport based upon the learnings gained during the project duration.

6 OVERALL LEARNING FROM THE CURRENT ENGAGEMENT

Urban mobility is the important topic of discussion among the city stakeholders and is one of the primary components of SCPs. While the city has been able to seek assistance from the project team ICLEI SA successfully, at the same time it has been a great learning experience for the project team in dealing with various govt. agencies and departments, its officials, and political representatives as well on day to day basis. The challenges, limitations, learning's from the engagement are listed below.

■ Learn from pilot projects

It is important to conduct pilots for all the projects (if the conditions permit), irrespective of the scale and size of the projects. Pilot demonstrations provides an opportunity to make necessary modification(s) in the proposals, based on the actual ground condition, which might have been missed or gone unnoticed while drawing the proposal. The learning from E-rickshaw pilot will be helpful for city to scale up the service at larger area more effectively.

■ Advance resource planning while executing projects

It is important to plan and put in place all the project requirements and resources (infrastructure, man, machinery etc.) beforehand to avoid last minute hassles on ground as more often than not the inadequate provisions will not allow the project implementation in a way it was envisaged, leading to possibility of the project failure because of poor resource planning.

■ Involvement of all the concerned stakeholders

For success of any project, it is imperative to have inclusive and participatory planning that includes dissemination of project information/ proposals to all the related stakeholders- governmental and non-governmental. The level of information which needs to disseminate to different groups depends on the complexity of the project/ activity and on the level of understanding of each group. For eg. decision makers along with execution, monitoring and enforcement team should know the proposed interventions in detail while media, electric media, and general public may be briefed on the overall proposal to avoid any last minute surprises/ chaos and also for their acceptance to gain necessary support and cooperation.

■ Adopt process driven project and not person driven project

As the shuffling of officials is common and sometimes frequent across government offices, it is important to have process driven projects, the progress of which is free of inter and intra department transfers of officials, hence will not see any delays in project progress.

■ Communication and Outreach Activities

Communication & Outreach (C&O) activities before and during the implementation of any project is one of the most important factors in success of the project. The C&O activities should be treated as serious and important factor by the city authorities for greater success and desired outcomes of the project and not just a resource draining exercise. Users should be told and made aware about any new initiative and its benefits via right channel

