

Critical Study of Infrastructure Facilities in Walled city area for Smart city Vadodara

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Abstract

This paper focuses on regeneration of the Walled city area of Vadodara city. Cities in developing countries are growing at speedy rates, often compressing into decades the organization process that has taken centuries, and it is more so in the case of Walled city area of Indian metropolitan city. This core is the cultural, administrative and economic heart of the city. For the economic growth and technological development of any country urbanization is inevitable but it needs proper monitoring and closes observations. Any city of India the urban area consist of Walled city area, inner ring road, outer ring, sub urban, fringe area and etc. For any city the core part and value is link with its walled city area from which the development of city is initiated. Government of India is also form in rejuvenated of the heritage on walled city area. The scheme like HRIDAY, AMRUT, and JnnuRm are the first step for the same. The effort should be made towards betterment of infrastructure facilities of walled city. In this paper, Walled city area of vadodara has been selected for study and analysis of infrastructure facility.

Keywords: Infrastructure facility; population; traffic congestion; urbanization; vadodara; walled city.

INTRODUCTION

A **Walled city area** is the commercial and business centre of a city with a heritage impression. The cities are growing horizontally & vertically because of population growth. For the economic growth and technological development of any country, urbanization is expected but it needs proper monitoring and close observation. Urbanization occurs because people move from rural areas to urban areas as well as urban area to walled city area, for business/job, migration etc. This usually occurs when a country is still developing. There is an increasing competition for facilities due to the high standard of living in urban areas, which has triggered several negative effects Slums and its penalty of overcrowding, Lack of sanitation, Poverty, illiteracy, Unemployment and Crime is the worst impact of urbanization. The Global warming, air pollution, water scarcity, noise pollution and loss of heritage impression. Infrastructure sector is highly responsible for driving India's overall development.

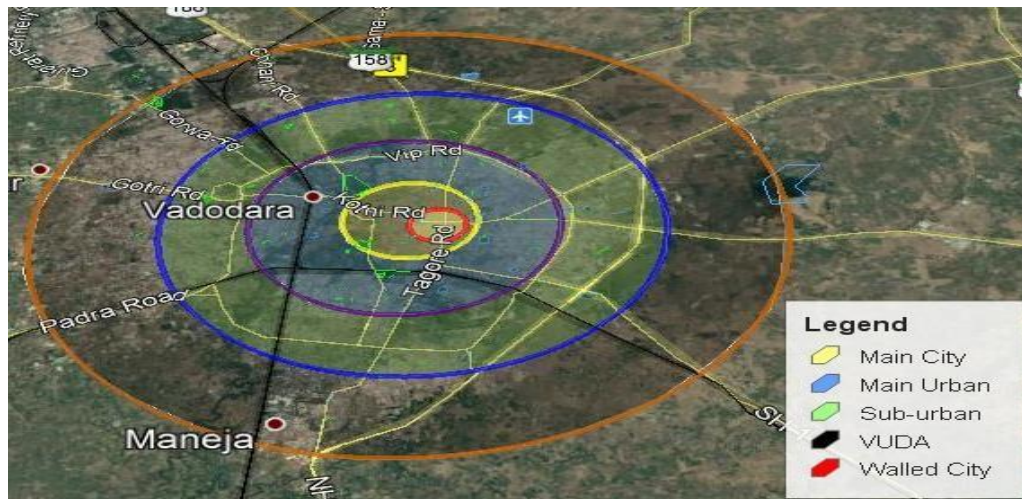


Figure 1 CBD Model of vadodara city

Eventually these centers became the modern urban centers and attraction of these urban areas pulled people from the surrounding rural areas and has significant impact, however major impact has been on city core or inner area. It is walled city area which is under significant pressure. It is the case of Vadodara city as shown in fig. 1.

In association with rapid motorization, it affects the road infrastructure adversely. Out of various infrastructures problem parking is considered to be one at the major problem for walled city area. Due to continuous increase in vehicle, congestion in urban area continuous to rise and it becomes increasingly difficult for drivers to find convenient location of parking space [2]. The role at parking space in transportation system is vital. Each vehicle making trips need parking space at its origin and destination regardless of parameters defining trips [2]. Today, all states of India are facing this crucial problem of parking and the most is effective mean of solving parking problem is efficient parking policy. Rapid urbanization now a day often resulted into high density population, traffic congestions, environmental degradation, losing importance and beauty of the city and lack of infrastructure facility. Vadodara, a metropolitan city, especially the walled city is located almost in the geographical centre of Vadodara city, the concentration of activities and growing urbanization in the walled city of Vadodara over the year has been subjected to several problem such as very old system and unplanned development, poor infrastructure facilities, traffic congestion, pollution, poor municipal services. The walled city is dying because of these unsolved and unplanned problems. The walled city is losing its popularity and city image amongst the people living within the walled city as well as other part of the city.

OBJECTIVES OF STUDY

- To study existing infrastructure facility in walled city area of Vadodara.
- To identify problems and issues in the walled city of Vadodara.

STUDY AREA

Vadodara is the third largest city of Gujarat in terms of population as well as in area. As per census 2011, the population of the city is 16.70 lac. It is estimated that by 2041, it will be reaching around 37.12 lac. It Vadodara has also been selected as one of the sixty Indian cities (in the Second round of selection) to be developed as a smart city under Smart Cities Mission.

The Walled city of Vadodara is located almost in the geographical centre of Vadodara city. Like any other Walled city it has a rich, vibrant and intense land use as in fig. 1. The Inner City and its periphery also house many important administrative educational and other

institutions. However the concentration of activities and growing urbanization in the Inner City over the years has also given rise to several problems such as unplanned & haphazard development, lack of open spaces, poor infrastructure facilities, congestion, pollution, imbalanced land use, poor municipal services. There is a gradual yet steady change of land use in the Inner city. The residential areas along major traffic arteries are getting converted into commercial or mixed land uses.

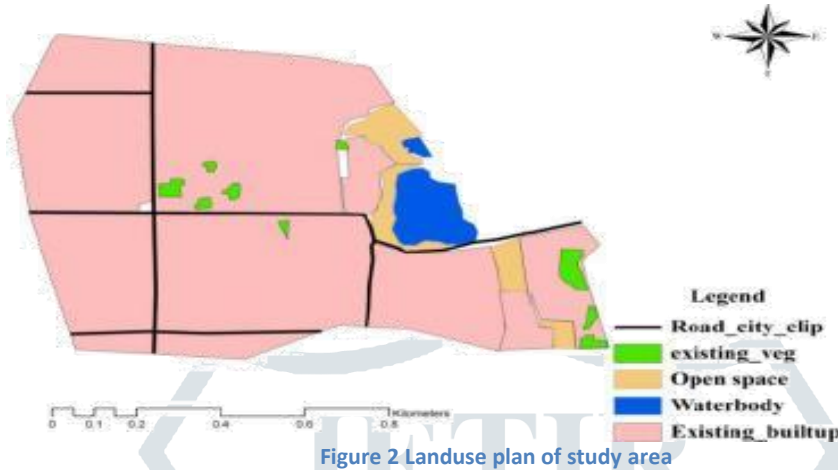


Figure 2 Landuse plan of study area

The change in population density of different wards of vadodara city exhibited that the Walled city area (ward no:-1) was having the highest density. This ward has become congested due to higher residential building density affecting environment condition of this ward as shown in fig no.2. Increasing vehicular traffic has made the situation worse due to heavy pollution load. The current water supply line and water drainage line is in poor situation because of it's over usage and age. The walled city has poor parking facilities because the walled city is congested due to residential as well as commercial infrastructure. The walled city area has also inadequate solid waste management system. It is necessary to control the level of noise pollution, air pollution, encroachment by hawkers, illegal construction. The demographic profile of walled city Vadodara is given in table no.1.

Table 1 Demographic profile of ward no.1

Total properties.	Total house holds	Total population	Male	Female
20707	9274	43555	22388	21167

SPECIAL FEATURES

The old city around the main street gates has mixed land use with commercial uses acting deep inside. However, commercial activities are concentrated in the western part of the old town and confined within two squares developments, flanking the street connecting the Laheripura gate and Mandavi; the eastern part of the town caters to middle and lower middle class residential needs. Vadodara was a walled city with four gates as shown in fig. 3, 4,5,6,7. These gates were used to enter the city. On the West, there was the Laheripura Gate, on the South the Champaner Gate, on the East the Pani Gate and to the South the Gendi Gate. The centre of the city had the pavilion called the Mandavi.

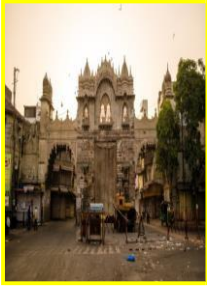


Figure 3 Laheripura Gate

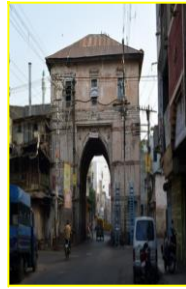


Figure 4 Champaner Gate

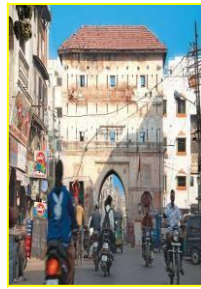


Figure 5 Gendi Gate

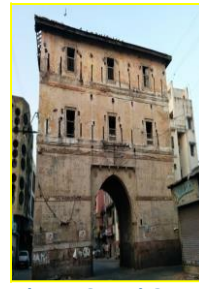


Figure 6 pani Gate



Figure 7 Mandavi Gate

EXISTING CONDITION OF WALLED CITY AREA OF VADODARA CITY

Major Problem Character of Walled city area of city changed over period of time. The water supply lines were laid in the year 1990 and underground drainage was laid in the year 1923. Wall to walls roads are constructed in this area. Storm water drainage system is also equally old. Solid waste management system is also crucial for Walled city area due to narrow roads.

Infrastructure conditions have been analyzed by doing primary survey. Questionnaire has covered for all the core infrastructure facilities of walled city area of vadodara.

Water Supply problem

The current water supply line and is in poor situation because of its over usage and age. After conducting a survey, I get to know that there is an inefficient water supply system. Time duration of water supply is 45 minutes which is less. Which CPHEEO manual, the distribution lines are designed for supply of 8 hours at 8 mt. tail and head. Quality of water is poor for 5-10 minutes in the beginning of water supply duration. Most of the people are facing low pressure problem and impure water.

Drainage system

The water drainage line is in poor situation because of it's over usage and age. The design population is calculated for 30 years as per CPHEEO manual, while around 100 years are completed of its laying down. All the households in this area have drainage connection, but these connections are not updated since 1923, so repaired and new connection is needed. More than 200 complaints of chock up and over flow per month in this area are registered by VMC authority. Problem of chock up and overflow occurs in every rainy season as in fig. 8.



Figure 8 Condition of Overflow in rainy season

Parking and Traffic problem

Walled city was planned and developed decades ago, which is unable to handle the present vehicular rush. In Walled city area maximum number of vehicle are being parked in peak hours. The walled city has very poor in parking problems because the walled city is congested due to residential as well as commercial. Insufficient road width with the space of footpath is using by hawkers. As shown in fig.

Increasing no. of vehicle and insufficient road width has resulted into massive traffic problem. Stray dogs & Cows can be obstacles in the road causing a blockage.



Figure 9 Parking and Traffic problem

The walled city area has also inadequate solid waste management system. There are necessary to control level of noise pollution, air pollution, encroachment by hawkers, illegal construction.

FINDINGS AND SUGGESTIONS

The major factors that need to be catered are;

- A. Water supply
- B. Drainage system
- C. Traffic and Parking

Water supply

- New leakage can be identified earlier, which will reduce awareness time,
- New, augmentation and rehabilitation of water supply system,
- Rejuvenation of water bodies for water supply and recharge of ground water,
- Special arrangements for difficult areas, like walled city area.
- Water meter to be installed in the low lying area where the water pressure is high, so that unnecessary wastage of water can be mitigated.

Drainage system

- There is poor and old Water drainage system, so it needs to improve and update the system.
- New augmentation and rehabilitation of sewerage systems and treatment plants.
- New strategies & techniques need to be introduced for the recycling of waste water.
- Chock up problem should be minimized by checking at regular interval.

Traffic and Parking

- Road widening in walled city areas not only changes the character of individual building but also changes the entire street character.
- Relocating all the informal activities automatically reduces the traffic in the zone.
- The city bus stands to be re-designed, and few bus stops to be introduced.
- Full length buses should be restricted to major road of the cities and the desired minor buses should be integrated with it to act as a feeder service.
- Existing parking space should be converted to multi-storey parking.
- Mangal bazaar and all business market to be no private vehicular zone, only pedestrian area and proper bus stand facility.
- Loading and unloading in the market area like Mangal bazaar should be restricted to timing.
- One way system can be planned during pick hours.

- No parking zones should be implemented forcefully.
- Parking charges to be imposed for regulatory parking.
- Hawking zones to be planned enforcement strictly.
- The strict enforcement of bylaws provisions for parking.
- Mass transportation with appropriate size of vehicle to be promoted.
- Parking lots are required to redeveloped, for increasing its capacity.

CONCLUSION

Walled city area is the core part of the city or heart of the city, from where the city vibrancy takes place. Inherits the various infrastructure development occurred decades ago, along with time which has become outdated or can't meet the present demand. It has been analyzed by questionnaire survey of stake holders & concerned authority. The primary infrastructure facility mainly water supply, drainage system, transport facility i.e. traffic congestion and insufficient parking facility has been identified to be major issues and which requires to be replaced immediately to mitigate the present as well as future issues. In this paper attempt have been made for suitable recommendation & suggestion, which is required to be integrated with the government initiatives such as HRIDAY, AMRUT, and JnnuRm.

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