

A planning proposal of physical infrastructure for Tarsadi fringe area of Surat.

¹Komal K. Parmar, ²Sejal S. Bhagat

¹ M.Tech. (Town and Country Planning), ² Associate Professor,
Sarvajanik College of Engineering and Technology, Surat.

Abstract- Infrastructure plays a very important role in the growth process of an economy and improving the well-being of community. It is known to be the backbone of any economy. Infrastructure development has been on the top of priority list for governments all over the world. Physical infrastructure is a one type of infrastructure which directly supports economic growth. Due to population growth and rapid urbanization, pressure is increased on existing infrastructure. The main objective of this dissertation is to assess the existing condition of physical infrastructure in Fringe Area of Surat city, Tarsadi with respect to service level benchmarks and other parameters of URDPFI guidelines and propose physical infrastructure planning for improvement and requirement of necessary physical infrastructure services. The primary survey would be needed to be done by public opinion and secondary data would be needed to be collected from the various authorities. The gap will be identified by comparing obtained existing data with the requirement as per guidelines and accordingly a planning proposal will be prepared.

Keywords: Physical Infrastructure, Urban fringe area, Government authorities, URDPFI, Surat city.

I. INTRODUCTION

India's recent economic growth is one of the most notable trends in the global economy. One of the world's economies with the quickest growth rates has returned: India. India's expansion, notably in manufacturing and services, has improved attitudes both domestically and internationally. The investment boom and strong macroeconomic fundamentals have a positive impact on India's outlook going forward. Many observers believe that India could realise its full potential if it improved infrastructure facilities, which are now insufficient to fulfil the expanding economic demand. India's economic growth will be slowed down if infrastructure improvements are not made. As a result, the government of India has made it its top priority to invest in the infrastructure sector among others in order to meet the challenge of managing and maintaining fast growth. People have moved into urban fringe areas as a result of economic population shifts or land speculation (or areas in the periphery of the urban). Such places are changing as a result of population inflow and the creation of new enterprises, as evidenced by modifications to land use and occupational patterns, a decline in agricultural activity, and an increase in built structures. Numerous issues are a result of local governments' poor management and development of urban fringe areas.

Urban fringe: Its definition shifts depending on the global location, but typically in Europe, where urban areas are intensively managed to prevent urban sprawl and protect agricultural land, the urban fringe will be characterized by certain land uses which have either purposely moved away from the urban area, or require much larger tracts of land. As examples: Roads, especially motorways and bypasses, Waste transfer stations, recycling facilities and landfill sites, Park and ride site, large hospitals, Power, water and sewerage facilities Factories, Large out-of-town shopping facilities, e.g., large supermarkets Compact residential areas. Urban fringe development is a complicated process that encompasses numerous issues, such as a change in the pattern of landownership, the land transfer process, different types of development, regulatory measures, and their implementation. It is not just a process of converting land from its rural to urban usage. The process of periphery development is not uniform and can be carried out by rural or urban players, and it can be done formally or informally (Masum, 2009). The metropolitan centres have long been a major issue for technocrats and policy makers. This is because they contribute to the political, social, and economic growth of a nation. Numerous issues that span a variety of issues plague urban places. The problems of urban fringe in developing countries are quite often and very similar in nature. Most of the developing countries experience spontaneous development pattern rather than planned growth as they fall outside the jurisdictional boundaries of the governing bodies of the urban area. Therefore, the most daunting problem is development of land in informal way where associated land development activities take place without conforming to the state rules and regulations because the local governments and those of urban areas often act separately in terms of overall planning. This lack of an integrated advocacy group for integrated urban planning for the fringe areas is arguable the largest single hurdle to overcome (Masum 2009). Compounding the problem is that the local governments of the fringe areas often have only limited town/urban planning rules, regulations or planning capacity. As a result, their existing "urban planning" is at best incomplete and at worst non-existent. Similarly, the vastness and diversity of fringe areas and the piece-meal nature of development makes it almost impossible for local government to monitor and manage hence, a reflection of poor urban fringe management (Masum 2009).

Infrastructure: The term 'Infrastructure' seems to be of relatively recent origin. It has been derived from the French language in the 19th century, perhaps as early as 1875. The word 'Infrastructure' is a combination of two words 'infra' means below; 'structure' means form. Infrastructure is the system of public works in a country, state or region, including roads, utility lines and public buildings. Infrastructure refers to the substructure or underlying foundation or network used for providing goods and services; especially the basic installations and facilities on which the continuance and growth of a community, state, etc. depend. It can be defined as the set of interconnected structural elements that provide supporting framework of an entire structure of development. It

also depicts the physical components of interrelated systems that provide commodities and services access enable, sustain or reach up to the societal living conditions. Infrastructure is the basic facilities and services that are necessary for carrying out the economic activities and which help in the economic development of the country. The basic facilities do not produce goods and services but facilitate the production and distribution processes. Infrastructure contributes to economic development by increasing productivity and providing services which enhance the quality of life. The provision of quality and efficient infrastructure services is essential to realize the full potential of the growth impulses surging through the economy. India, while stepping up public investment in infrastructure, has been actively engaged in involving private sector to meet the growing demand. The demand for infrastructure investment during the 11th Five Year Plan (2007-2011) has been estimated to be US\$ 492.5 billion (Planning Commission, 2007). To meet this growing demand, Government of India has planned to raise the investment in infrastructure from the present 4.7 percent of GDP to around 7.5 to 8 percent of GDP in the 11th Five Year Plan. In general, efforts towards infrastructure development are continued to focus on the key areas of physical infrastructure.

II. LITERATURE REVIEW

MoUD has initiated an exercise to define Service Level Benchmarking (SLBs). Measuring service levels of civic agencies implies measuring outcomes and indirectly reflects on institutional capacity, financial performance and other parameters. The Handbook of Service level benchmarking prepared by MoUD can be referred while providing basic infrastructure facility such as water supply, sewerage, drainage and solid waste management for efficient functioning. Considering the importance of SLBs to measure the performance of abovementioned infrastructure facilities it is suggested that SLBs should be considered as benchmark for measuring, reporting and monitoring the performance and comparing inter and intra city level infrastructure. The MoUD has suggested SLBs for different utility services in an urban area, which are mentioned in table below:

Table 1 service level benchmark

Sr. No.	Indicators	Benchmark Levels
Water Supply		
1	Coverage of WS connections (Population)	100%
2	Per capita availability of WS at consumer end	135 Lpcd
3	Extent of metering of WS connections	100%
4	Extent of Non-Revenue Water	20%
5	Continuity of Water Supply	24*7
6	Efficiency of redress of Customer Complaints	80%
7	Quality of Water Supplied	100%
8	Cost recovery of in Water Supply Service	100%
9	Efficiency in collection of Water Supply Charge	90%
Sewerage		
1	Coverage of Wastewater network service	100%
2	Collection efficiency of Wastewater network	100%
3	Adequacy of Wastewater treatment capacity	100%
4	Quality of Wastewater treatment	100%
5	Extent of reuse & recycling of treated Wastewater	20%
6	Extent of cost recovery in Wastewater management	100%
7	Efficiency of redress of Customer Complaints	80%
8	Efficiency in collection of sewerage charges	90%
9	Coverage of toilets	100%
Storm Water Drainage		

1	Coverage of storm Water Drainage network	100%
2	Incidence of water logging/flooding	0
Solid Waste Management		
1	Household level Coverage of Solid Waste Management service	100%
2	Efficiency of Collection of Municipal Solid Waste	100%
3	Extent of segregation of Municipal Solid Waste	100%
4	Extent of Municipal Solid Waste recovered / recycled	80%
5	Extent of scientific disposal of Municipal Solid Waste	100%
6	Extent of cost recovery in Solid Waste managementservice	100%
7	Efficiency of redress of Customer Complaints	80%
8	Efficiency in collection of user charges	90%

Source: Advisory note on Improving Urban Water Supply and Sanitation Services, MoUD, 2012

Physical Infrastructure Facilities

Basic physical infrastructure facilities, services, and installations needed for the functioning of a community or society are water supply, sewerage, storm water lines and solid waste management, etc.

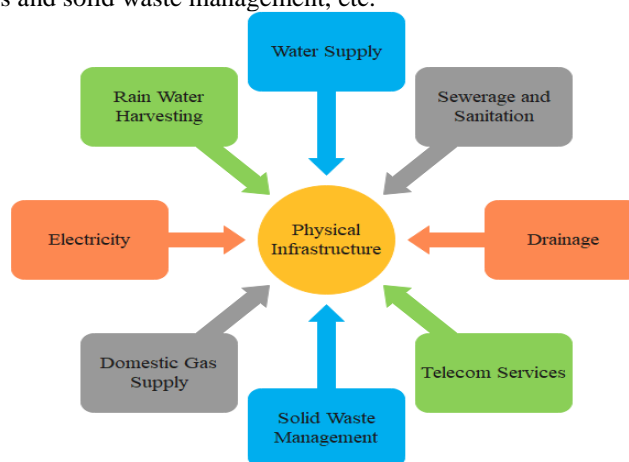


Fig. classification of physical infrastructure

Source: URDPFI GUIDLINE, 2015

Interaction of urban fringe and transportation System: Istanbul case.

Nowadays, urban sprawl is common problem of all cities. Decentralization of Housing with low density and jobs into urban fringe areas is considerable development. Sprawl is blamed a wide range of problems likewise wasteful use of land, air pollution, Dependence on car, increased traffic congestion, lengthened travel distance and time, but it is not clear explaining how urban sprawl affects travel behavior in Turkey?

The aim of the thesis is to identify the influence and importance of urban sprawl on travel behaviour in turkey. Firstly, literature survey on urban sprawl and urban fringe was examined. Geographic information system was used to define and map urban sprawl. Daily trip production in sprawl and urban core was analysed. In addition, daily travel behaviour was inquired. For this study, 2007 Istanbul master plan household survey was also used. it allows comparisons travel behaviour between sprawl and urban core area. The results confirmed that there is no much difference on socio economic situation between people living in urban sprawl area and people living in urban core area. However, using of private car is higher rate in sprawl area than urban core. In addition, sprawl population drive more time and distance than urban population. The results provide important insights into the importance of sprawl on transportation and suggest that transportation system can be adversely affected to the extent that cities continue to expand to urban sprawl areas as wanton. As a consequence, sprawl effects Istanbul transportation as negative because sprawl affects travel behaviour. This situation creates increased private car ownerships and traffic congestion. To solve this problem and many other problems in transportation related sprawl, studies on transportation and master planning should be considered sprawl fact

Physical infrastructure planning and management for sustainable development in Ramtek town.(Thakare and Sanyal, 2016)

Infrastructure is the basic physical and organizational structures needed for the operation of a society necessary for an economy to function and physical networks that support society. Socio- economic growth of a town is motivated by means of socioeconomic and more so with the physical Infrastructure development in the town. Its prerequisites the input in the form of working on land resource and physical infrastructure viz. roads, rail, water supply, drainage and solid waste management. Urban Local Agencies then become responsible for fulfilling the physical infrastructure requirements thus developing the area with every development stage. Many times, Urban Local Bodies overlook the sustainability aspect while working on physical growth of a town as they do not contemplate of the quantity and the quality of the resources available. This brings in the issues of unsustainability of physical infrastructure affecting the overall sustainable development in town. Hence, Architect planners should consider the carrying capacity of the resources available in the vicinity of the town while planning the development so that local agencies can work for sustainable development. The Ramtek town shows Development trend. The Development is positive towards sustainable growth of the town. The physical infrastructure is available for the need of the town. It observes development but not at par with the demand. Water supply: Water is available in required quantity for the population. To maintain it the conservation measures must be adapted Separate pipelines for Water supply to urban and rural areas have been made. Solid Waste management: The collection of the waste is well done by the trolley and it is disposed of in the outskirts of the town. For Sewerage collection there is no layout provision made in this region hence every house has its own septic tank. The provision of layout for sewage may reduce the construction area for the separate Septic Tanks. Roads are undergoing widening. With the growth of settlements there is observed an encroachment on the natural settings. Cleanliness of environment: To maintain the surrounding environment neat and clean the local agents are working out the ways as under:

- Encroachment Removal: To remove the encroachments if any along the streets which is creating obstruction for the public traffic. Under this the encroachments along the main cross road of Gandhi Square (Main Square near central Bazar) and the encroachments of the shop keepers and their residences on the „Ramgad“ which is a property of the private trust and the government are all removed during 2010-12.
- Tree Plantation: Under Environment protection mission the tree plantation was done by the local agencies. The targeted and completed are is 6 Sq. Kms. The total number of trees planted under this mission are 12,225 as targeted in 2010-11, and around 20,000 in this season (rainy) 2016.
- Under protection of natural forest and Wild animals the work was undertaken in Pench Reserved Forest.

III. STUDY AREA PROFILE:

Tarsadi is a town in Mangrol Taluka in Surat District of Gujarat State, India. It is located 49 KM towards East from District headquarters Surat. 239KM from State capita Gandhinagar. Tarsadi Pin code is 394120 and postal head office is Kosamba.

Tarsadi is surrounded by Valia Taluka towards East, Mandvi Taluka towards East, Ankleshwar Taluka towards North, and Kamrej Taluka towards South. Ankleshwar, Bharuch, Surat, Vyara are the nearby Cities to Tarsadi. This Place is in the border of the Surat District and Bharuch District. Bharuch District Valia is east towards this place.

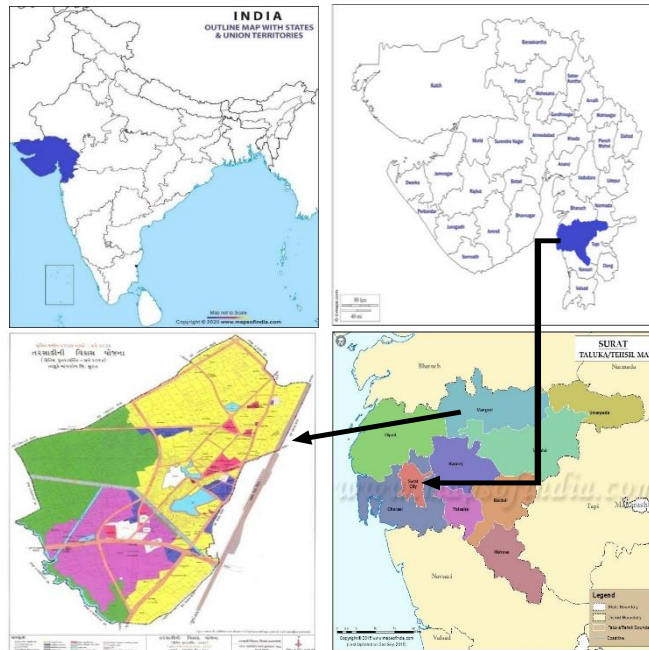
Demographic Profile of Tarsadi:

An official demographic data of Tarsadi town is taken. Total population, density, literacy rate, etc of Tarsadi town are shown in below table:

Table: Demographic Profile of Surat City

TITLE	TARSADI TOWN
Area	6.57(ha)
Population	29305
Density	4460(p/ha)
No of Election ward	7ward
Sex Ratio	894
Literacy Rate	87.9%
Male literacy rate	92.26%
Female literacy rate	83.06%

SOURCE: census of India



Location of Study Area

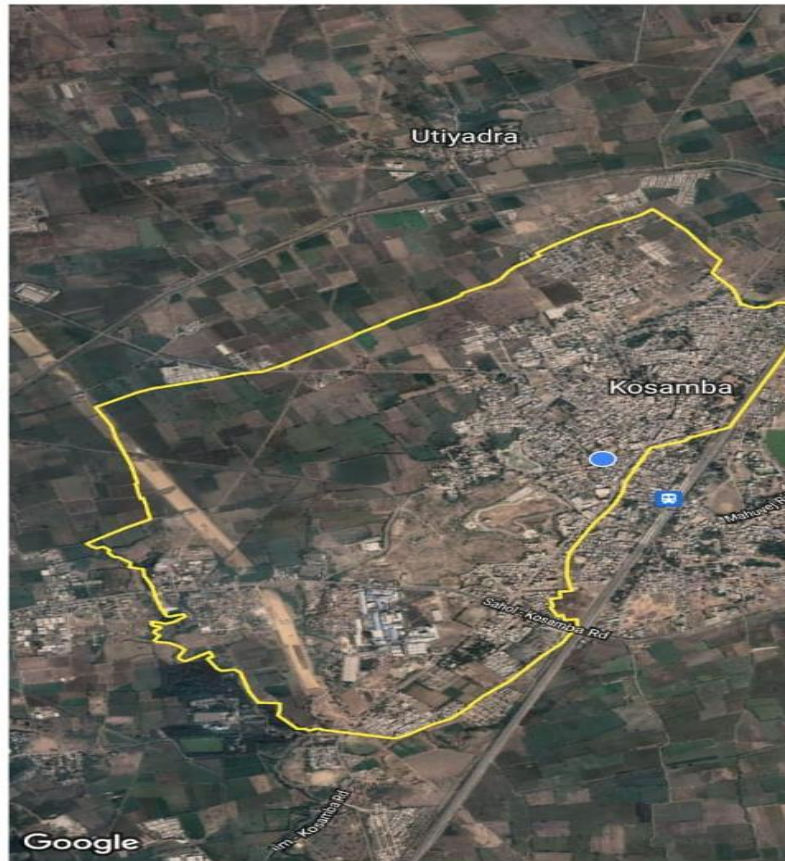
Source: Maps of India and Tarsadi Nagarpalika.

Tarsadi is a Municipality city in district of Surat, Gujarat. The Tarsadi city is divided into 7 wards for which elections are held every 5 years. Pin code of Tarsadi is 394120. A ward is a local authority area, typically used for electoral purposes Tarsadi Municipality has total administration over 6,378 houses to which it supplies basic amenities like water and sewerage. It is also authorized to build roads within Municipality limits and impose taxes on properties coming under its jurisdiction.

Table: Tarsadi Town Data

Description	Data
Town	Tarsadi
District	Surat
Tehsil	Mangrol
Sub District Head Quarter	Surat
Sub District Head Quarter Distance	50 Km
Nearest City of 1 Lakh Population	Bharuch
Nearest City of 1 Lakh Population Distance	34 Km
Nearest City of 5 Lakh Population	Surat
Nearest City of 5 Lakh Population Distance	50 Km

Source: Tarsadi City Population Census 2011 Data- Gujarat
 Fig.Map of Tarsadi Area Source: Google Maps



Population of Tarsadi Town

Description	Tarsadi - Census 2011 Data
Total Population	29305
Total Area	654.3 ha
Total No. of Households	10094
Total Male Population	15,475
Total Female Population	13,830
0-6 Age group Total Population	3551
0-6 Age group Male Population	1904
0-6 Age group Female Population	1647
Total Person Literates	22,639
Total Male Literates	12,520
Total Female Literates	10,119
Total Person Illiterates	6666
Total Male Illiterates	2955
Total Female Illiterates	3711

Source: Census India, 2011

Result and Conclusion: To determine how many amenities are lacking in any location, a gap analysis is required. It will be beneficial to provide the amenities that people require in order to improve their quality of life and to meet their fundamental necessities in order to live better. Gaps were found by taking into account the guidelines for the formulation and implementation of urban and regional development plans (URDPFI). Using survey data analysis and a comparison of the facilities now in place with URDPFI standards, the gaps in the physical infrastructure were identified. Research was carried out to determine what infrastructure and facilities the projected population would need.

REFERENCES:

1. Abdullah, R. (2016) 'Arrangement of Settlements and Infrastructures : Notes for the Urban Fringe Areas Development in the Eastern Part of Indonesia', IV(Vii), pp. 30–35.
2. Aswathi, V. and S, S.M. (2022) 'Rural-Urban Fringe Development in Kerala Context', 4(8), pp. 1664–1670. Available at: <https://doi.org/10.35629/5252-040816641670Impact>.
3. Baig Asadullah Mirza Wahab, Ravindra V. Wanjule and H. H. Shinde (2016) 'Study on Sewage Quality from Sewage Treatment Plant at Salim Ali Lake, Aurangabad (MS)', *International Journal of Engineering Research and*, V5(10), pp. 245–247. Available at: <https://doi.org/10.17577/ijertv5is100175>.
4. Banu, N. and Fazal, S. (2013) 'Development of Infrastructural Facilities in Public Sector on the Urban Fringe of Aligarh City', *Journal of Infrastructure Development*, 5(2), pp. 151–168. Available at: <https://doi.org/10.1177/0974930614527946>.
5. Bobylev, N. and Jefferson, I.F. (2014) 'INTEGRATION OF URBAN PHYSICAL INFRASTRUCTURE INTO LAND USE', (March). Available at: <https://doi.org/10.13140/2.1.1563.3603>.
6. Brody, S.D., Highfield, W.E. and Thornton, S. (2006) 'Planning at the urban fringe: An examination of the factors influencing nonconforming development patterns in southern Florida', *Environment and Planning B: Planning and Design*, 33(1), pp. 75–96. Available at: <https://doi.org/10.1068/b31093>.
7. Cantú, C. (2017) 'Defining Infrastructure and its Effect on Economic Growth', *Revista de Economía, Política y Sociedad*, 13(1), pp. 77–104.
8. Li, M.E. (2019) 'Microbiological analysis of waste water for onsite treatment : a review ABSTRACT ', 8(3), pp. 586–591.
9. Khediya, T.D. (2016) 'Study of Surface and Sub Surface Highway Drainage System', 4(3), pp. 945–949. Available at: www.ijedr.org.
10. Kumari, A. and Sharma, A.K. (2017) 'Physical & social infrastructure in India & its relationship with economic development', *World Development Perspectives*, 5, pp. 30–33. Available at: <https://doi.org/10.1016/j.wdp.2017.02.005>.
11. Mahaprashasta, J. (2010) 'Economics of urban drainage system: A case study of Cuttack city, Orissa, India', 5(1), pp. 22–28.