Defining Road Widths in Neighborhoods – An Important Characteristic for Planning Sustainable Communities

Ar. Nishant Saxena, Ar. Neha Saxena

Abstract

Determining road widths while developing contemporary neighborhoods is a critical concern for planners. Though regulatory bodies have determined several standards and norms for road widths of residential communities, their suitability could be interrogated in the context of sustainable developments.

A Sustainable road could be one which is not overly broad or narrow; which not only caters the traffic needs of the present day lifestyles but of the future generations too, have efficient drainage system, have potential to cater to street parking, encourage pedestrian usage and other significant features. This paper aims to discuss planning considerations that are important while deciding on suitable road widths in a residential neighbourhood.

Keywords: Sustainable; neighborhood; residential; drainage; parking; pedestrian

1. Introduction

Today streets occupy approximately 20 percent of land area in a city & are an essential element of urban life, but it is not a recent phenomenon; streets have played their role right from the beginning of towns and cities.

The history of town planning in India starts right from Indus valley civilisation (3000BC) which was considered to be highly urbane & exemplary system of that period. It had very well organised street system with road widths varying from 9ft to 34ft. All the community streets were 9ft wide boosting circulation of bullock carts. The evident underground drainage system in the street too was a key feature. However, due to the decline of civilisation, the functioning of these streets could not be adjudicated in contemporary state.

During medieval period Mughal Monarch developed their capital in Shahjanabad (formally known as Purani Dilli), now suffering from congestion, massive traffic jams, and dark, narrow alleyways. The City was planned with an organic street pattern with varying widths (10’ft-15ft) emphasising pedestrian and animal driven movements. Today these narrow streets are falling inadequate hence city has been suffering from massive traffic mobbing, inadequate infrastructure services, unplanned commercial activities leading to the weak living environment.

Recently the streets have been reduced to more restricted use of serving movement of automobiles; the situation is getting worse as the growth of vehicles is growing exponentially this already leading to diluted quality of public spaces & life. There is indeed a strict requirement to look at the streets as public spaces where people can walk, talk, cycle & socialize.
1.1. Methodology

This research paper shall be carried out with the following methodology:

- **Study of road widths in the neighbourhood of the historic walled city of Jaipur with objectives of identifying the characteristics which made those streets sustained for centuries; though being observed as not functioning appropriately in the present environment.**
- **Study of various planning norms (at state & national level); recognising the minimum road widths imposed as per them, analysing their suitability.**
- **Analyzing how contemporary lifestyle has influenced the road widths;**
- **Provisioning infrastructure services (such as sewerage, water supply, drainage, LT/HT electrical & communication services) within a neighbourhood to have a significant impact over planning a residential street; the study shall discuss this as well.**
- **The case studying of existing streets in neighborhoods of Delhi.**
- **Studying the importance of elements of street architecture & furniture which often gets ignored while planning, gauging their impact concerning road widths.**

2. Streets in Jaipur Walled City

Many Urbanists still considered the Old walled city of Jaipur is to be one of the best-planned cities in the world. Arguably, the City developed in 18th Century has served inhabitants well till the mid of 20th century; it is the current context or maybe the past three decades when the questions on the longevity of the ‘sustainability of the development’ are being raised.

The city was planned in 1727 BC to serve the needs of growing population and scarcity of water; based on the principles of ‘Prastara’ having an emphasis on cardinal directions & a strong grid layout formed with street system. For the first instance, the concept of ‘Mohalla’ was observed in urban development. The streets have clear hierarchy evident in layouts interconnecting to each other at right angles. The main roads are 108’0”, while secondary streets 54’0” wide, which are then, intersected internal streets of 27’0” wide & local streets of 13’0” wide.

In today’s scenario following glitches can easily be noticed on the internal roads of walled city:-

- The unplanned excessive, uncontrolled & unchecked growth of commercial activities is evident leading to massive congestion & traffic.
- The rapid increase in the population; the ‘havelis’ which were designed to cater up to 10 inhabitants are now serving a range of 40 to 50 persons at least; this has augmented heavy traffic load on the narrow streets.
- Further quantum of automobiles too has increased exponentially, some four-wheelers per family have amplified highly as well; while these streets designed to emphasise on pedestrians & animal driven movement resulting in blockage every other minute.
- Unplanned infrastructure provisioning too created chaos; placements of transformers, overhanging thick electric cables have resulted in streets appear narrower apparently.

3. Planning norms

Some of the prevailing rules in India regarding planning of streets and roads in a plotted development and neighbourhoods are enlisted as follows:-

- **As per draft URDPFI guidelines 2014 prepared for Ministry Of Urban Development, Government of India: No plot shall be permitted on roads having width less than 6.0m, other higher widths could be 7.5m, 9.0m, 12.0m & 24.0m to be opted as per length of the street (Ref Sec 9.3.1, table 9.2: width and length of means of access for residential buildings). Other controls include provisioning of the paved pathway of minimum 1.5m width within the street.**
- **As per Rajasthan township policy 2012 prepared by Urban and housing department of Government of Rajasthan: Minimum width of internal road specified is 9.0m for residential developments, applicability of which is relative to its length (Ref Sec 4.4.2 Roads and circulation, table 10).**
- **Guidelines for Mega Township planning by Punjab urban development authority 2006 - No internal roads shall be less than of 12.0m width comprising at least 5.0m carriageway.**
Revision in standard road widths as per notice from Chief town planner, Haryana urban development authority in 2006: Minimum road widths in residential sectors shall be no less than 12.0m.

As per draft city planning regulations (2017), Pune approved by urban development department of Maharashtra: Minimum road width could be 6.0 up to the small length of 75m but for above it & up to 150m length the road has to be at least 9.0m wide. These streets to include a pathway of 1.50m on both the sides.

As per KTCP act Bangalore; road widths should be not less than 9.0m & every fourth road in the layout has to be 12.0m.

Furthermore, listed below are street widths norms in neighbourhoods of other countries

- In Singapore; as per ‘Singapore transport policy and regulations,’ the minimum road widths in a neighbourhood has to be 15.0m with 2.50m wide pathways on both the sides.
- In San Diego; as per ‘Street design, Manual 2002’; the minimum road width for low volume local residential street has to be 15.2m.

The above details show that while we, in India, are still developing neighbourhood with streets of narrow widths of 9.0m; overseas, in developed countries the street widths are wide up to 15.0m. Here a critical aspect is that the planning commissions in those countries are also focusing on detailing the streets with sidewalks, parking lanes, curbs & green strips.

4. Impact of Modern lifestyles

Some cars, buses & trucks have become a necessity on a residential street in our modern lifestyles; but these streets also have a limitation on accommodating continually increasing traffic volumes. The exponentially increasing traffic on neighbourhood streets in today’s era are impacting on quality of life & treating the public safety.

Total numbers of 30 million cars were registered in India as on 31.03.2015, which is now expected to reach close to 60 million in last four years. This is a clear indication that car buying capacity of people is increasing day by day & hence these contemporary streets more commonly shall witness traffic comprised of four-wheelers only in future. The comfortable buying capacity has altered the numbers of cars requirement per family too. Today most of the nuclear families have at least two cars. Furthermore, visitors coming to the street needs space to park their cars as well. The commonly perceived residential street is mostly occupied by stationed cars either of the plot owners or the visitors & hence reducing the sufficient width of the carriageway.

Moreover; the pedestrian walks too cannot be ignored on the street. People these days prefer to walk for shorter distance travel primarily as prices of fuel are increasing rapidly & it keeps them physically fit as well. On the contrary, we need to ensure in our planning that these sidewalks should not get encroached by the plot owners which is a very common propensity among the public. It is an entirely well-known phenomenon that people tend to park their cars as well on the street; to maximise the construction on the ground floor usually on mid-sized plots people omit provision of parking within their plot & depends on the street for the same in turn leading to encroachment & further reducing the effective road width.

Likewise the entrance to the plots is also a dangerous aspect; high plinth construction leading to more extended plot entry ramps covers considerable road widths; this is primarily due to three reasons firstly nowadays people do not ignore the construction of basements so as to get maximum profitability from the land, secondly the strong desires of having grand appearance of their residence roots of more extended ramps & thirdly residents are always afraid of poor drainage systems being established by the developers thus they raise the plinth & driveway levels of their homes to access which they need the more extended ramps.

5. Impact of Infrastructure Services

To function a neighbourhood provisioning of all infrastructure services is a must & streets are those spinal cords which take the load of carrying them. These services primarily can be categorised into two; ‘Electrical & Public health Services’. Discussed next in the table are the elementary planning requirements of these services in a residential settlement.
Table 1: Requirements of infrastructure services in a neighborhood

| S.No | Type of Services     | Details                                                                                                                                 |
|------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Electrical           | Includes power distribution (LT & HT) which requires appropriate positioning of transformers, substations, feeder pillars with electrical cables running overhead on poles or underground cable corridor with operable chambers at regular distances. |
| 2    | Communication        | Distribution panels appropriately spaced, separate corridor carrying cables for Internet & telephone or an OFC with operable chambers located at regular distances. |
| 3    | Water Supply         | Overhead tanks, underground water supply lines with valve chambers                                                                        |
| 4    | Sewerage             | Underground sewer lines with utility holes                                                                                               |
| 5    | Stormwater drainage  | Continuous drain channels with catch basins appropriately located. Rainwater harvesting pits etc.                                         |

Here vital point is that all these elements occupy road surfaces only & sometimes the actual width of main carriage way gets reduced. Thus in this perspective trailing are the few key considerations while developing the roads:-

- The top levels of various chambers or manholes should be properly flushed with the road level to ensure obstruction free carriage way.
- The Light poles, electric poles, feeder pillars & other elements should ideally be placed in the sidewalks so as at least parking lanes & central driveway on road remains clear for traffic purpose.
- While locating Electric transformers or substations it is advisable now to carve out additional open spaces instead of putting them up on right of way.
- The street architecture of any neighborhood street preferably should have neat appearance planned appropriately with underground services, strategically located manholes (so as street remain unaffected while maintenance) & properly defined driveway, parking lanes & sidewalks.

6. Case Studies

It can be generally stated that width of typical neighborhood streets in India varies from 6.0m to 9.0m.

6.1. Street in Sadiq Nagar, New Delhi

One of the densely populated neighborhood of Delhi. Following points were observed:-

- Typical road section is of 6.0m
- Separate lanes for two & four lane parking’s.
- Common road strip left for vehicular & pedestrian movements of residents.
- Abruptly laid infrastructure services; electrical pole, transformers etc.

6.2. Street in East Greater Kailash Colony, New Delhi

One of the superior residential neighborhoods in South Delhi. Following points were observed:-

- Typical road section is of 9.0m.
- Parking occupied most of the road width.
- High Plot plinths have led to access ramps that are extended on road.
- Unauthorized encroachments done by the plot owners have reduced the effective street widths.
- No separate clear walkways/footpath apparent on the street.

6.3. Street in Pansheel Park, New Delhi

Another affluent colony of India’s Capital. Following points were observed:-

- Typical road section is of 12.0m
- Dedicated parking lane on one side of the street
- Existing foot paths however are inaccessible on account of haphazardly laid services, tree guards etc.
- No Clear walkways on footpaths.
7. Street Elements & Furniture

It is needless to say that the image of a neighborhood is primarily established by designing the streets & likewise street furniture could aid to brand streets more attractive & comfortable in use. However typical streets of neighborhoods in Indian cities usually contain infrastructure elements that are provisioned for specific utility but are definitely not placed or located with intent of having an aesthetically pleasing street architecture.

Street light poles are most common such type of element or furniture but developing authorities or municipal organization never thoughtfully locate them in residential colonies. Though emphasis on illumination is given & they are placed uniformly too but on cross section they are either placed close to the plot or sometimes near to the center of road. The idea of developing the street character through well-laid light poles is hardly given a thought.

All the elements as mentioned under the section of 'Impact of Infrastructure services’ have in fact are only found furniture on streets such as electrical transformer or substation, feeder pillars, chambers, manholes etc.

Waste bins too are very inappropriately placed; they also contribute in eating up the sidewalks; & are least considered furniture on streets.

Plantation of Trees is encouraged but no design coordination with light poles or other elements is stressed upon. In addition to non-uniform plot entries & ramps; absence of signage’s & place markers further subsidizes on lack of street character in Indian neighborhoods.

It is very important to understand that well-coordinated & designed street furniture not only add aesthetical value to the street but also impress upon discipline in the users & makes street more comfortable in usage.

8. Conclusions

1. Historically widths of the neighborhoods streets have evolved distinctly in different eras, mode of commutation has extensive impact on the street widths; streets designed in 17th century are struggling in the present scenario. Rapid growth of population & exponential use of automobiles (that too four wheelers in every household) are crucial factor in defining the road widths.

2. For development of sustainable communities & neighborhoods it becomes very crucial to decide upon the appropriate widths of the streets.

3. For effective operation of entire neighborhood; streets should be adequately sized.

4. Streets of neighborhoods are multifunctional spaces; apart from acting as spine for transportation they also cater space for carrying the infrastructure services & sometimes also deeds as community spaces for the development.

5. Changing lifestyle has led to increase in number of cars owned by per family, huge increase in traffic is evident thus apart from the suitably wide carriage ways; provisioning of parking lanes on streets are also important.

6. It is recommended to have sufficiently wide parking lanes on the edges of the carriage way to avoid cluttering of improperly parked vehicles and also helpful in accommodating extra vehicles of the plot owners.

7. Local streets should be planned & designed such that they encourage walking & cycling for shorter travel trips.

8. Sidewalks & paved shoulders are very important element of local streets; they not only offer a safe pedestrian movement but also help in evolving healthier communities. Planning & developing authorities should ensure that every local street contains adequately sized sidewalks.

9. It becomes indispensable to decide upon the fitting street width so as various spatial requirements of infrastructure services such as transformers, electric substations, chambers, recharge pits; street lighting etc. can be provisioned. Edges of sidewalks could be used to place light poles at regular intervals; further more laying of underground services should be fortified; for which parking lanes & sidewalks could be cast off.

10. Planners/Designers should ensure that the layout of street must contains different strips/zones of sidewalks & parking lanes apart from the main carriageway.

11. Developing agency should not evade earmarking & developing the proper sidewalks & parking lanes on these streets.

12. Most of the recently developed planning norms in India by different states have also emphasized upon the road widths of not less than 9.0m.

13. In no case; a street with plots on both the sides in communities having plot owners of MIG category should be less than 12.0m. It is also advisable to have a 5.5m wide carriageway along with defined 1.2m sidewalks & 2.1m parking lanes on both the sides of the street.
14. Design & development of streets must be given due importance; well-coordinated infrastructure services with landscape, street lighting & signage scheme should be done to establish the urban character of the community that is aesthetically pleasing.

15. Local authorities should come up with strong guidelines & vigilance scheme to control the usually apparent encroachments through plot entrances & high plinths.

References

[1] Naveed, M. B. 2014, ‘Harappa : An Overview of Harappan Architecture and Town Planning’, World History Encyclopedia, accessed 2 October 2020, <www.ancienteu/article/695>

[2] Garg, D. 2015, ‘City Planning & Organization of Indus valley civilization’, iSchools, accessed 7 October 2020, <www.ischools.org/resources/documents/discipline/casestudies/IndusValley-Garg2015>

[3] Delhi Urban Arts Commission. (2017). City Level Projects - Rejuvenation of Shahjahanabad. Available at: https://www.duac.org/site_content/attachments/05%20Final%20Shahjahanabad%20November%202017%20156pp_L.pdf (Accessed: 19 October 2020)

[4] Jawaid, Md. Fuzail & Pipralia, Satish & Kumar, Ashwani. (2014). Exploring the Imageability of Walled City Jaipur. Journal of Engineering Technology, 4. 46 - 52. 10.5176/2251-3701_4.1.171.

[5] URDPFI Guidelines (Vol. I). Available at: http://tcpo.gov.in/sites/default/files/TCPO/schemes/URDPFI.pdf (Accessed: 3 November 2020)

[6] Rajasthan State Township policy 2010 (Above 10.0 Hectares). Available at: https://jda.rajasthan.gov.in/content/dam/raj/udh/development-authority/jda-jaipur/pdf/Others/Township2010.pdf (Accessed: 3 November 2020)

[7] Punjab Urban & Development Authority. (2006). Guidelines for Mega Residential Township. Available at: https://www.puda.gov.in/sites/default/files/Mega_Projects%28Guidelines_for_Mega_Residential_Township%29C_Dated_201206%29%2C41.pdf (Accessed: 3 November 2020)

[8] Pune Municipal Corporation. (2017). Development Control & Promotion Regulations for Pune Municipal Corporation (DCPR-2017). Available at: https://pmc.gov.in/sites/default/files/DC%20Rule%202017.PDF (Accessed: 3 November 2020)

[9] State Town Planning Board, Karnataka. (1961). Karnataka Town & Country Planning act of 1961. Available at: http://dpl.kar.nic.in/pdf_files/11%20of%201963%20(E).pdf (Accessed: 3 November 2020)

[10] Development Services, City of San Diego. (2017). Street design Manual for City of San Diego. Available at: https://www.sandiego.gov/sites/default/files/street_design_manual_march_2017-final.pdf (Accessed: 5 November 2020)

[11] Institute for Transportation and Development Policy and Environmental Planning Collaborative. (2010). Better Streets, Better Cities - A Guide to Street Design in Urban India. Available at: https://www.scribd.com/document/120652225/A-guide-to-street-design-in-urban-India-Better-Streets-Better-Cities-2012#download. (Accessed: 5 November 2020)

[12] Shah,V. (1982). Street Developments: Case of Ahmedabad, India. Master of City Planning and Master of Science in Architecture Studies Thesis. Massachusets Institute of Technology. Available at: https://fddocuments.in/document/street-developments-case-of-ahmedabad-india-by-.html. (Accessed: 15 November 2020)

[13] San Francisco Planning Department. (2010). Better Street Plan - Policies & Guidelines for the Pedestrian Realm. Available at: https://sfplanning.org/sites/default/files/archives/BetterStreets/docs/Better-Streets-Plan_Final-Adopted-10-7-2010.pdf (Accessed: 15 November 2020)

[14] Bhatt, A 2018, ‘Intelligent Street Design Critical to Independence Movement’, Hindustan Times, 23 August, accessed 3 October 2020, <https://www.hindustantimes.com/opinion/intelligent-street-design-critical-to-independence-of-movement/story-qYZ5o1LO0koFbBggkrYM.html>

[15] Pune Municipal Corporation and Institute for Transportation and Development Policy. (2016). Urban Street Guidelines Version I. Available at: https://www.itdp.in/wp-content/uploads/2016/07/Urban-street-design-guidelines.pdf (Accessed: 1 December 2020)
[16] Tak, R and Hirands, L. 2020, ‘Design Elements to Rejuvenate Indian Streets: A Case of Bellasis Road, Mumbai.’ WRI India, 21 April, <wri-india.org/blog/design-elements-rejuvenate-indian-streets-case-bellasis-road-mumbai/>