

Obstacles in Creating and Governing Pedestrian Inclusive Streets in India: Insights from the Streets in Vadodara

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Abstract

With increasing awareness about the importance and need of walking for health and environmental benefits, it is crucial to enhance accessibility to pedestrian friendly environments. Yet, cities continue to adopt an auto-centric approach to planning and designing the streets ignoring the needs of pedestrians. Although there is no dearth of literature discussing the design and quality requirements of good pedestrian facilities, the ground reality depicts otherwise. Thus, this study examines the process of making footpaths from provision to implementation and maintenance with the involvement of various agencies.

This study explores the pedestrian environment along three streets located within the Vadodara Municipal Corporation limits, using qualitative research methods. It employs observations and mapping, semi-structured interviews with the officials and examination of the governance structure of the agencies involved. These were followed by content analysis of existing policies and programs implemented to identify the gaps that act as barriers to implementing pedestrian inclusive environments effectively.

The study concludes that there is little to no consideration of pedestrian linkages and dedicated space allocations for services in Vadodara, when planning for mobility. There are also discrepancies in the administrative setup ranging from coordination gaps within the agencies to fragmented budget allocations. Furthermore, the policies, legislative provisions and guidelines are complex, leading to severe difficulties in promoting walkability. The study points out that pedestrian inclusivity cannot be achieved only with design and needs the backing of a strong governance system in terms of both administrative setup as well as good policies and provisions.

Keywords: Governance System, Pedestrian Facility, Pedestrian Provision, Transport Policies, Walkability

Introduction

A city comprises of many entities such as buildings, road networks, service infrastructure, parks, gardens and open spaces. However, it is the people, who through their myriad activities, give a city its soul (Maulsharif, 2023). The spaces within the cities that truly belong to its citizens, are its streets (Jacobs, 1995).

However, despite the fact that walking was the first form of mobility known to Man as well as the increasing awareness of health and environmental benefits of walking, our streets

are being planned for the automobiles rather than the people. The pedestrian facilities, on the other hand, remain just a tick mark on the list of requirements, in planning proposals.

The issue is that in reality, even though the streets belong to people, they are provided for by local governments and what they choose to emphasize on depends on their ideologies (Jacobs, 1995). Currently, there is very little emphasis on improving pedestrian infrastructure in most parts of the world. Instead, the focus is on road widening and flyover construction for the automobiles (Askarov, 2014).

Furthermore, even though the National Urban Transport Policy (NUTP) 2014 of India recognizes the need to move people but not vehicles, between 2014 and 2018, 1627 kms. of roadworks and 86 National Highway Projects have been awarded in Gujarat (Ministry of Road Transport and Highways, 2018). In 2020 alone, Vadodara has sought approval for 14 road projects including new roads and road widening projects (Times News Network, 2020).

Interestingly however, there is no lack of literature focusing on the importance of pedestrianization or the design and quality parameters required as well as the role of the governance systems for the provision of pedestrian infrastructure. Nevertheless, there is very little research carried out in India and more so in Vadodara. In this context, this research focuses on identifying the issues in providing, implementing and maintaining pedestrian infrastructure from the governance systems perspective particularly in India. With footpaths being the most widely used pedestrian infrastructure, the research examines the making of footpaths dictated by the existing governance systems.

Its objectives are:

1. To identify fixed physical obstructions, present on footpaths and agencies responsible for the same.
2. To understand and examine the existing process of providing, implementing and maintaining pedestrian infrastructure.
3. To analyse existing policies and legislative provisions for gaps and restrictions that adversely affect the provision, implementation and maintenance of pedestrian infrastructure.

Literature Review

People spend a considerable amount of time on streets, commuting for work or for leisure. An average Indian spends 90 minutes daily for commuting to work, which equals 18 days in a year just for work commute (Nangial, 2008). The Census 2011 data indicates the same that walking is the preferred mode of commute for one fourth of the Indian population for commuting to work. These numbers don't include people walking for recreational purposes. With one fourth of the population relying on walking as a mode of commuting, improving pedestrian infrastructure becomes vital.

Researchers have been studying the concept of walkability since 1960's where Jane Jacobs through her book, *The Death and Life of Great American Cities*, highlighted the importance of streets and walkability (Jacobs, 2011). Moreover, numerous studies have highlighted the benefits of walking as well as pedestrian inclusive communities and cities. Todd A. Litman in 2003 and Susan Claris with her peers in 2016 argue that walkable communities are more liveable (Litman, 2003; Claris, 2016). Litman and Bill Ryan in 2003 said that walkable communities display improved economy and Soongbong Lee and others in 2021 also mention the improved economy of walkable communities (Litman, 2003; Ryan, 2003; Lee, 2021). Improved health, as an advantage of walkability is being advocated at great lengths by numerous authors (Litman, 2003; Muhlbach, 2012; Zhu, 2013). Social Inclusivity is another aspect of walkable communities that has been advocated by Litman in 2003, Susan and her peers in 2016 as well as Lee and others in 2021 (Litman, 2003; Claris, 2016; Lee, 2021). Muhlbach in 2012 as well as Claris in 2016 also advocate that walkability brings sustainability within communities and cities (Muhlbach, 2012; Claris, 2016). According to Tiziana Campisi, walkability allows for pollution and congestion abatement (Campisi, 2020).

As Abdulla Baobeid and his peers from 2021 say,

“... walkability has been shown to be a reconciling solution that can serve long-term sustainability, short-term livability goals, and health of individuals. Improving walkability not only contributes to more efficient use of energy but also adds vibrancy by improving resident, tourist, and visitor access.”

Abdulla Baobeid, 2021:13

Despite the numerous studies, highlighting the benefits of walkability, today when the traffic congestion increases on the streets and the streets become more chaotic, an immediate response is to widen the streets and / or build new fly-overs resulting in streets carpeted from plot line to plot line and the pedestrian facilities getting compromised.

The issue is that in reality, there is very less emphasis on improving of the pedestrian infrastructure. The streets and the built urban environment that need to define and include pedestrian and space for pedestrians more often than not, concentrate on automobiles and their movement.

“When implementing city projects more emphasis is placed on the impact to vehicles than on pedestrians.”

Amy Child and Ryan Falconer, 2015:2

Even though achieving walkability remains a challenge for most cities, it has not prevented the researchers or policy makers to look at the concept of walkability and explore ways of achieving it. However, researchers and policy makers fail to derive a single definition for walkability as the definition of walkability evolves with the theme or focus that is being studied. For instance, Eunyoung Choi in his thesis in 2012 defines walkability as walking in urban environments (Choi, 2012). While, Maren Reyer and others defined walkability as the extent to which the built environment is walking-friendly in 2014 (Reyer, 2014). Lorenzo, with his peers, in 2016 defined walkability as the safety, security, economy, and convenience of travelling by foot (Ros-McDonnell, 2016).

However, despite a lacking comprehensive definition for walkability, researchers and policy makers have a certain clarity and consensus towards how it can be achieved through provision of quality pedestrian infrastructure. Galingan and others in 2009 state that an appropriate and adequate pedestrian friendly infrastructure is one that is accessible and permeable, safe and inviting, comfortable for users to walk and well maintained (Galingan, 2009).

Barman and Daftardar argue that to achieve an easy movement for pedestrians, the built environment needs to be planned and designed for safety from falls, injuries and accidents. Apart from this, to achieve pedestrian convenience, the pedestrian infrastructure should be accessible, and have adequate design in terms of footpath heights as well as the footpaths should be free from any obstructions (Barman, 2010).

There are multiple studies in place highlighting such design requirements of pedestrian infrastructure. However, a more comprehensive definition is given by Rahman and his peers in 2015 that suggests that a pedestrian friendly built environment should include continuous footpaths on both the main roads as well as internal streets, well designed pedestrian crossings, footpaths free of encroachments – movable, built and equipment encroachment and finally facilitate movement of disabled people (Rahman, 2015).

These studies highlight the fact that the design and built quality of the pedestrian infrastructure have a direct relation with the pedestrian movement (Wijesundara, 2021; Kumari, 2021). Thus, it is important to pay close attention to different design parameters from the conceptualization stage itself. These parameters include:

- Continuity of footpaths (Rahman, 2015)
- Obstruction free movement (Barman, 2010; Rahman, 2015; Ros-McDonnell, 2016; Subramanyam, 2017)
- Quality surface for pedestrian safety (Barman, 2010; Rahman, 2015)
- Provision for disabled (Hodgson, 2004; Rahman, 2015; Ros-McDonnell, 2016)

- Good design and accessibility (Galingan, 2009; Barman, 2010; Rahman, 2015)

With the abundance of studies available, discussing the concept of walkability, highlighting various benefits of walkable communities and discussing the design requirements of pedestrian infrastructure in such great depth, the streets in most cities remain automobile centric. The few efforts being made to provide some form of walkability in our cities are not achieving desired results. Thus, there arises a need to study the concept with a new paradigm that looks at the issue on grassroot level – where it all begins, with the conceptualization, designing and provisioning of pedestrian infrastructure by the governing authorities.

Research Methods

With an aim to examine the existing governance systems for improved pedestrian inclusivity, this study takes the form of an exploratory research. It employs qualitative methods. The research was carried out in the Vadodara city in three successive phases (Fig. 1).

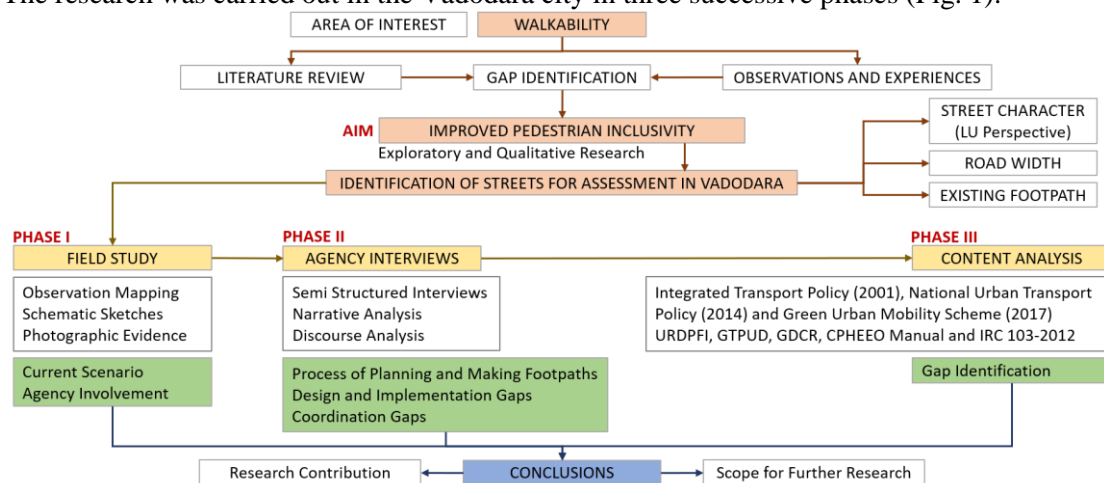


Fig. 1: Research Methodology

Source: Authors

In the first phase, three streets within the municipal corporation limits with different characters were identified. These streets were then mapped for fixed services and objects present on the footpaths creating obstructions. During observation mapping, pedestrian behaviour along with quality of footpath surface were also noted. As an added outcome, the identification of fixed services and objects helped identify the agencies involved in the making of footpaths. Each of the street was observed and mapped on a different week-day between 11:30 a.m. and 1:30 p.m. - the time slot was selected keeping in mind the pedestrian footfall in the selected time slot. Photographic evidences were collected along with schematic mapping to locate the fixed services and objects present on the footpaths.

In the second phase, officials from identified agencies were interviewed to understand the process, issues in the process as well as governance structure. A total of 11 officials were interviewed from six different agencies identified based on the presence of fixed services and objects present on the footpaths observed. The department heads for each of the agency were approached and referrals from them led to the officer selection for interviews. They were interviewed using a semi-structured interview and 3 different sets of interview schedules were prepared based on the role of each agency (Appendix I). The responses received were represented in tabulated manner (Appendix II) which was then analysed using narrative analysis methods to derive the process of making of footpaths as well as identify key issues and gaps in the process and within the system.

Finally, in the third phase, existing policies and legislative provisions were analysed to understand the gaps and restrictions that adversely affect effective provision, implementation and maintenance of the footpaths. Firstly, National Urban Transport Policy was studied to understand place of walkability in the larger scheme of transportation planning. Apart from

that, five different guidelines and Acts were studied viz. Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, Gujarat Town Planning and Urban Development (GTPUD) Act, Gujarat Development Control Regulations (GDCR), Central Public Health & Environmental Engineering Organisation (CPHEEO) and IRC 103:2012. Out of these five documents, URDPFI and GTPUD Act are related to overall planning of cities. The GDCR is an implementation tool for architectural interventions, however, it has some separate provisions for street abutting plots. CPHEEO was studied to understand the service provision requirements as well as their placement on streets. Lastly, IRC 103:2012 was studied as the only guideline specifically for the pedestrian facilities.

Findings and the Discussion

Based on the understanding of the concept of walkability and what it entails in terms of the design requirements for the pedestrian infrastructure, a basic ideal stretch of footpath was envisioned (Fig. 2) which was then used as the base for the assessment of the 3 streets selected.

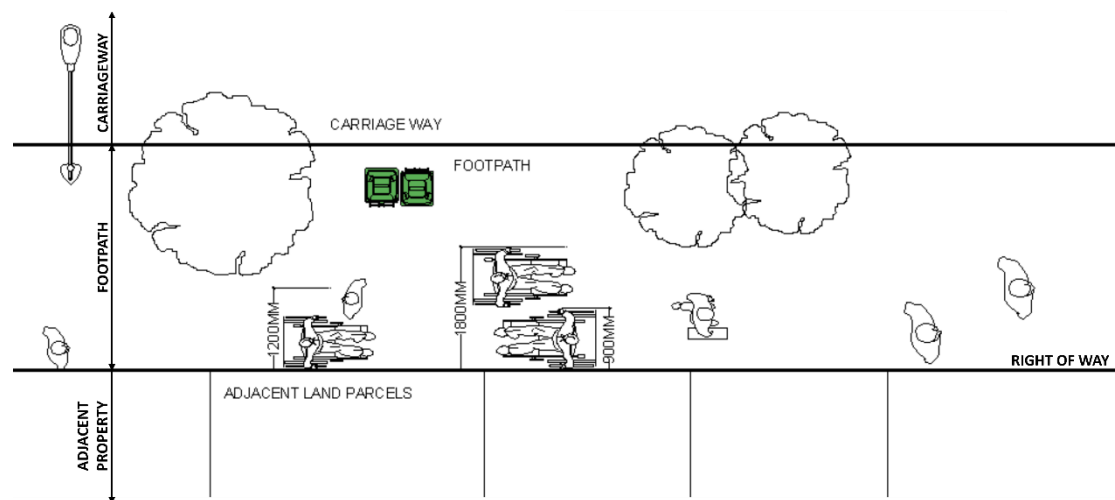


Fig. 2: Ideal Footpath Stretch
Source: Authors

RC Dutt road is a commercial road, 30 meters wide with 1.2-meter-wide footpath on one side of the road. Being a commercial street, it sees a lot of pedestrian movement. The street originally had footpaths on both sides. However, with increasing numbers of shoppers arriving in private vehicles leading to increased parking requirement, footpath on one side was compromised and given up for parking, leaving the street with footpath only on one side. The side having the footpath was the side which has government housing for senior officials leaving the side with commercial complexes and shopping avenues devoid of any pedestrian infrastructure forcing the shoppers to walk on the carriageway. Furthermore, the footpath itself was poorly made and maintained (Fig. 3). The footpath was dotted with fixed services and objects with inconsistencies in the walking surface as well as discontinuity in the footpath itself leaving the pedestrian to meander his way through it all. Eventually, the pedestrian ditched the footpath and once again preferred to walk on the carriageway compromising the safety by increasing the chances of conflict with the vehicular traffic.

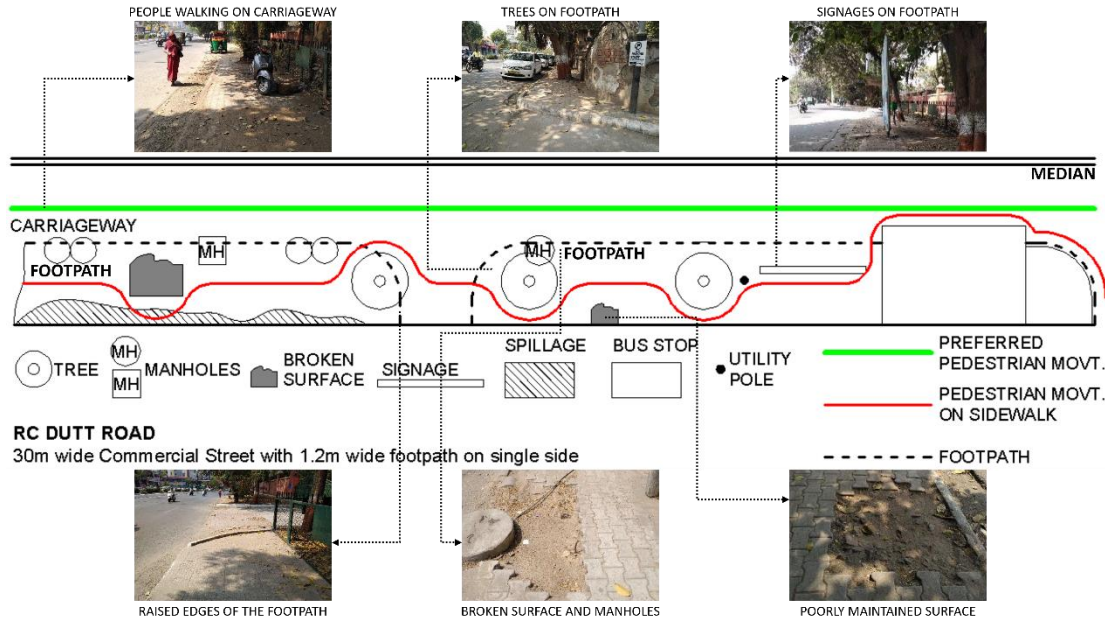


Fig. 3: RC Dutt Road Section

Source: Authors

Moving on to the second street, Dabhoi road is an industrial road, 24 meters wide with 1.2-meter-wide footpath on both sides of the road. Apart from being dotted with various fixed services, discontinuity in the footpaths presents a larger issue. To make way for heavy commercial vehicles to turn and move in and out of the property, large stretches of road are devoid of footpaths, leaving no option for the pedestrians but to walk on the carriageway. Furthermore, the street being industrial in nature, sees a lot of pedestrian movement, who mainly belong to labour class. Seeing this as an economic opportunity, tea and snack stalls are in abundance. The issue arises as they extend and encroach the space on footpath creating built encroachments leaving no space for pedestrians to walk on (Fig. 4). Additionally, the footpath is designed poorly and not maintained.

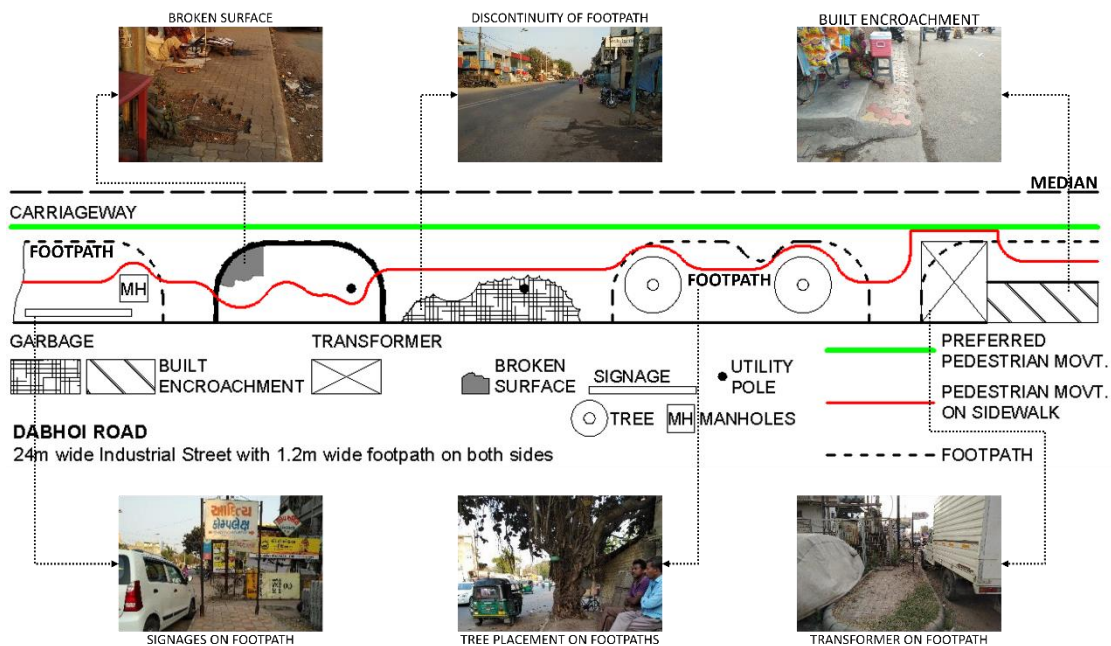


Fig. 4: Dabhoi Road Section

Source: Authors

Finally, Kubereshwar Marg is a residential street, 18 meters wide with 0.6-meter-wide footpath on both sides. Even though, this residential street has a footpath on both sides of the road, they are rendered useless owing to narrow width, and dilapidated state of walking surface and presence of fixed services and objects on the footpath (Fig. 5). Apart from fixed service-related obstructions, most of the adjacent properties have their entry ramps built upon the footpaths. This form of built encroachment, made the footpaths unmaneuverable and deteriorate the pedestrian experience once again forcing the pedestrian to opt for walking on the carriageway instead of using the footpath.

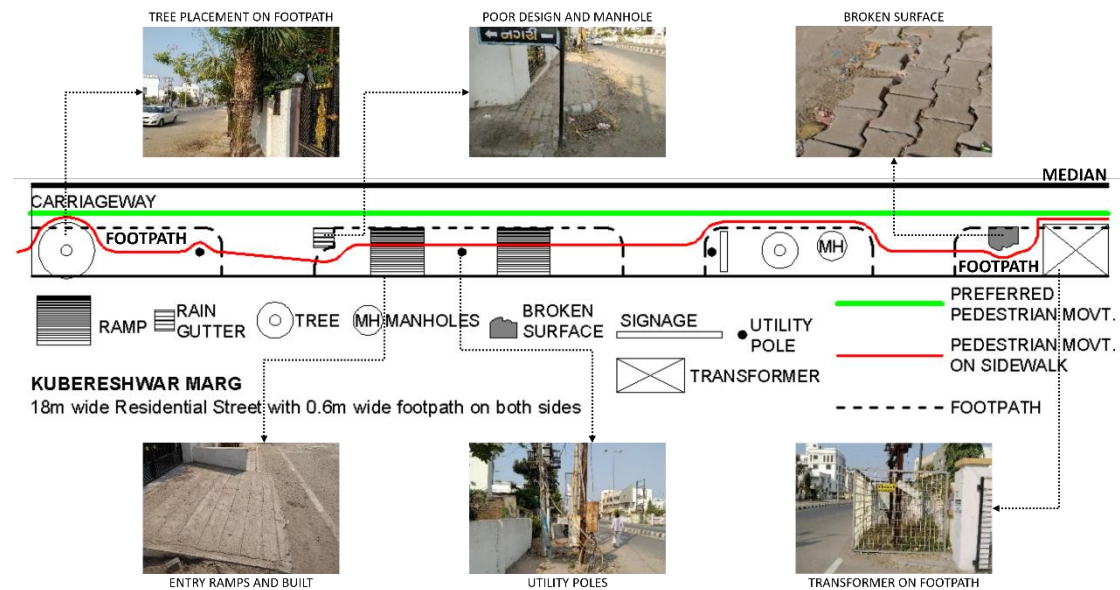


Fig. 5: Kubereshwar Marg
Source: Authors

Observation mapping reveals that the obstructions present on the footpath, whether it is the fixed service elements or built encroachment, are non-conductive to walking. Additionally, the poor design quality in terms of uneven walking surface and level differences, creating balance issues on footpaths and their subsequent poor maintenance forces the pedestrians to walk on the carriageway (represented by green movement line in above sections) avoiding the footpath. Walking on the footpath results in a poor pedestrian experience with meandering path, lacking quality walking surface, discontinuity and movement hampered by built encroachments (represented by red movement line in above sections).

Based on the findings of the observation mapping, in terms of the fixed services and objects present on the footpath, various agencies involved directly or indirectly in the process of making and maintaining footpaths were identified as can be seen in the Fig. 6. On interviewing the officials from the agencies, the process of planning and making of footpaths was mapped (Fig. 7).

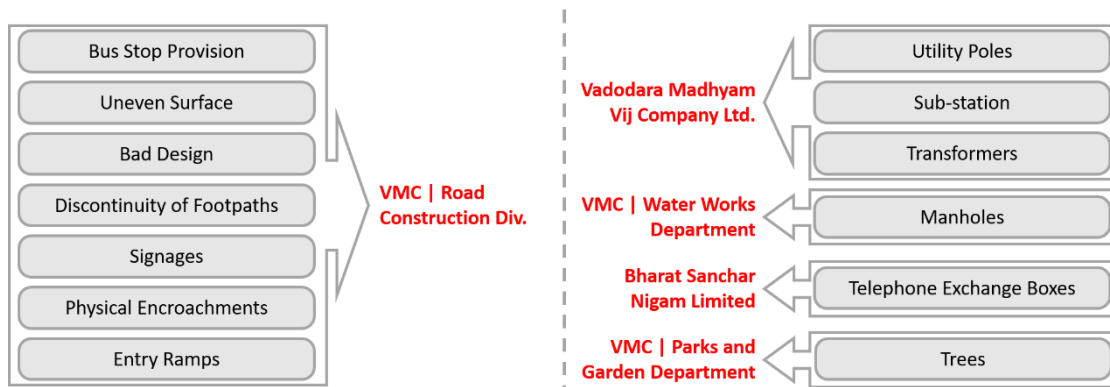


Fig. 6: Agencies Involved in Making of Footpaths

Source: Authors

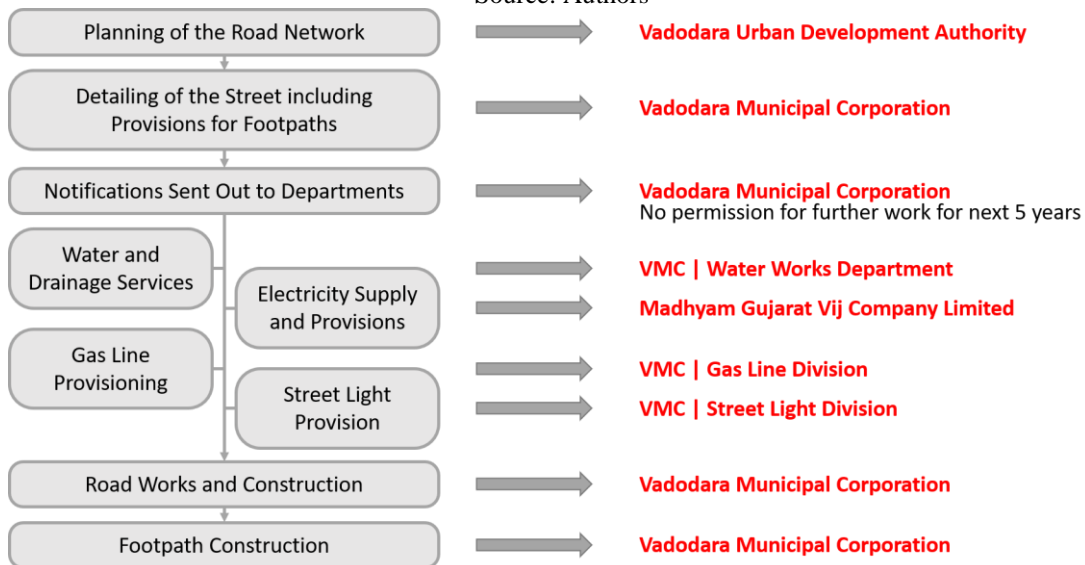


Fig. 7: Process of Making of Footpaths

Source: Authors

At present, the Vadodara Urban Development Authority (VUDA) is responsible for planning the road networks as part of the development plan. However, VUDA only takes on the responsibility of deciding where the new roads will come up as well as the road widths. The authorities don't take into consideration pedestrian footfall, space requirements for various activities and services, which then results in haphazard placement of services as those areas start developing.

Once those streets come under the jurisdiction of the Vadodara Municipal Corporation (VMC), the Road Construction Division of the VMC takes up the job of designing the cross-section of streets. However, at this stage, most of the services are already in place and its realignment is disruptive and costly. Thus, they are incorporated as they are and footpaths are designed around them. The Road Construction Division designs the streets as per road width requirements stated in the Indian Road Congress (IRC) Guidelines 103-2012 with existing services interfering with the quality of footpaths. Furthermore, the designs do not take into account the adjacent land-uses or the activities taking place on the street side as this impact how the footpath area is used (Tewari, 2022)**Error! Reference source not found.** At this stage, the Road Construction Division sends out a notice to all the concerned agencies to finish their pending work before the road carpeting is implemented.

However, more often than not, other departments and agencies do not take any work citing the fact that there is no funding available at the time. When funds become available, they take up the repair works breaking the hierarchy of the process. Considering that any repairs would fall under the category of public works, cannot be denied despite the clause not allowing

any work for 5 years once the road work has been implemented. This results in further degradation of the quality of the footpath as each agency takes up the work as and when the funds become available and even though a part of their contract is to carry on the repair works of the road and the footpath in case of any damage to either. Invariably, the work gets done in a patch work manner. Furthermore, unlike the Road Construction Division, other agencies don't try to coordinate with the other agencies before starting the work and this results in more repair work needing to be done as other services get damaged or hampered. Additionally, there is no specific provision for carrying out the maintenance work of the footpaths and it may or may not be covered under road maintenance depending on the budget allocated resulting in further degraded condition of the footpaths. This keeps getting ignored and with time getting lost as more and more road widening projects are taken up.

The process analysis and interviews with officials from all the agencies (Appendix I and II), helped highlight the gaps in the design and implementation process as well as the coordination gaps within the different agencies (Table 1) that prevents the smooth functioning of the process.

Table 1: Coordination Gaps Within the Agencies

Source: Authors

	VUDA	VMC Road Construction Division	VMC Water Works	VMC Street Light Division	VMC Gas Line Division	MGVCL / GEB	BSNL
VUDA	---	X	X	X	X	X	X
VMC Road Construction Division (Design Stage)	X	---	X	X	X	X	X
VMC Road Construction Division (Implementation Stage)	X	---	■	■	■	■	■
VMC Water Works (Implementation Stage)	X	X	---	■	■	■	X
VMC Street Light Division (Implementation Stage)	X	X	■	---	■	■	X
MGVCL / GEB (Implementation Stage)	X	X	■	X	■	---	X
BSNL (Implementation Stage)	X	X	■	X	■	■	---

Following the mapping of the process and involvement of agencies, the study examined existing policies and provisions. Currently, no policy exists specifically for improving walkability. However, the Integrated Transport Policy of 2001 addresses a multi-modal approach which included pedestrian and Non-Motorised Transport (NMT). The NUTP 2014 specifically points out that the focus needs to be on the pedestrians rather than the automobiles. However, there are hardly any provisions to implement these policies on the ground.

For planning purposes, Urban and Regional Development Plans Formulation and Implementation (URDPFI) 2014, acts as a guideline which addresses specific requirements including the needs of the pedestrians. However, for the implementation instructions or guidelines, the URDPFI recommends referring to the IRC Guidelines 103-2012.

In Gujarat, the Gujarat Town Planning and Urban Development (GTPUD) Act is the enabling legislation for planning of the neighbourhoods with the Town Planning Scheme (TP Scheme) as an implementation tool to do so. The Act regulates the percentage of land that needs to be utilised for planning of roads and transport infrastructure. There is no mention of pedestrian or pedestrian infrastructure specifically.

The Gujarat Development Control Regulations (GDCR) is a planning implementation regulation, it does talk about the allowed land-uses based on the road width as well as how to deal with plot abutting roads that includes instructions on projections as well as ramp designs for connecting plots with reference to footpath facility.

Central Public Health & Environmental Engineering Organisation (CPHEEO) Manuals provide detailed instructions of different types of service infrastructure required for water distribution, sewage & sewerage and solid waste management. However, they remain silent on specific placement requirements for the same beyond the distance between two units of each type of service infrastructure.

Ultimately, it falls onto the purview of IRC 103-2012 to give a detailed guideline on provisioning and designing of the pedestrian infrastructure. However, IRC 103-2012 fails as a guideline, to take into account the other legislative provisions but only guides the road sections based on road widths. The guidelines do discuss in depth, about the quality of the pedestrian infrastructure and specifically the footpaths. However, they fail to take into consideration the adjacent land-uses, activities and the transitional spaces to streets and their impact on the usage of footpaths.

Observations and interactions reveal that the poor condition of footpaths can be attributed to multiple services which are usually provided on the road side that prevent the effective implementation of desired design requirements for the footpaths. Also, lacking maintenance policy and coordination among various agencies further worsens the situation. And so, achieving walkability remains a challenge for most cities as is evident from the ground realities of pedestrian infrastructure (Fig. 8).

R C Dutt Road (30m wide *Commercial Street*, 1.2m wide footpath on single side)



BROKEN SURFACE



FIXED INFRASTRUCTURE ELEMENTS



PEOPLE WALKING ON CARRIAGEWAY



BUS STOP PLACEMENT

Dabhoi Road (24m wide *Industrial Street*, 1.2m wide footpath on both sides)



TREES ON FOOTPATH



TRANSFORMERS



BROKEN SURFACE



DISCONTINUITY IN FOOTPATH

Kubereshwar Marg Road (18m wide *Residential Street*, 0.6m wide footpath on both sides)



INADEQUATE WALKING SURFACE



TREES ON FOOTPATH



SIGNAGES AND PARKING



BUILT ENCROACHMENT

Fig. 8: Existing Scenario of Pedestrian Infrastructure in Vadodara

Source: Authors

Conclusions

This study concludes the following.

1. There is no conceptualization of pedestrian infrastructure when the road networks of a city are planned in Gujarat nor are there any considerations towards providing dedicated spaces for services that run along the road networks.
2. The current government system fails in every aspect - be it in terms of existing governance structure, their coordination or process or policies and legislative provisions.

These findings contribute to the enhancement of pedestrian infrastructure of Vadodara by highlighting the gaps and issues in the existing government system. It also highlights the strong need to streamline the government mechanisms in terms of human and financial resources, planning, design and implementation regulations keeping in mind the temporal nature of all their interconnected activities.

It is proposed that detailed studies should be carried out to understand the fund allocation system within the different government agencies so as to streamline the functioning of the existing systems. There is also, not only a need to update the policies and provisions, but a need to regulate the guidelines so as to ensure that they are rigorously followed.

This research was focused on Vadodara, and therefore the findings may be limited in generalising to other locations. However similar studies can be conducted in other cities to evolve a contextualized process to streamline the pedestrian infrastructure.

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