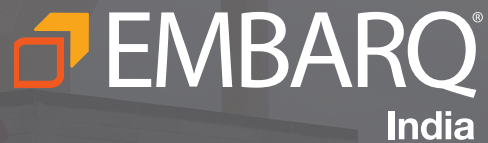




NEIGHBOURHOOD IMPROVEMENT PLAN

Case: HSR Layout, Bengaluru

Executive Report



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CONTENTS



Introduction	1
Pilot Project:HSR Layout	3
Project Definition	5
Neighbourhood Development Trends	7
Formation of Project	9
Overall Proposal	11
Wayfinding & Orientation	
Signage	13
Cognitive Mapping	14
Analysis	15
Safe Access Networks	17
Pedestrian Safe Access.	
Proposal	19
Analysis	21
NMT Safe Access	
Proposal	23
Vehicular Access & Carriageway Design	
Proposal	25
Analysis	27
Details	28
Public Open Space Network	
Proposal	29
Analysis	31
Urban Green Habitat	
Proposal	33
Analysis	35
Green Pockets	37
Green Series	38
Drain Series	39
Lakes	40
Transport Networks.	
Proposal	41
Analysis	43
Design Details	
5th Main	45
14th Main	47
27th Main	49

GLOSSARY OF TERMS

Chicanes-

A traffic calming measure. Curb extensions that alternate from one side of the street to the other forming S-shaped curves

Bulb outs-

A traffic calming measure, primarily used to extend the sidewalk, reducing the crossing distance and allowing pedestrians about to cross and approaching vehicle drivers to see each other

Speed tables-

Flat topped speed humps that are often constructed with thick or textured materials and are usually long enough for the wheel-base of a standard car to rest entirely on the flat surface

Collectors (Collector roads)-

A collector road or distributor road is a low-to-moderate-capacity road which serves to move traffic from local streets to arterial roads. Collector roads are designed to provide access to residential properties.

ABBREVIATIONS

HSR	- Hosur-Sarjapur Road
NMT	- Non - Motorised Transport
BDA	- Bangalore Development Authority
ORR	- Outer Ring Road
NIP	- Neighbourhood Improvement Plan
KUIDFC	- Karnataka Urban Infrastructure Development and Finance Corporation
BBMP	- Bruhat Bengaluru Mahanagar Palike
DCR	- Development Control Regulations





Message from the Corporator of HSR ward

My vision is to make HSR ward, one of the best places to live in Bengaluru. To achieve this, I would like to introduce the “Namma HSR Namma Neighbourhood” (Our HSR, Our neighbourhood) program, which will essentially be a neighbourhood improvement plan (NIP) for the HSR layout. This project has been under development for some time and once completed, will stand as an exercise and a program that probably will be the first of its kind in this city.

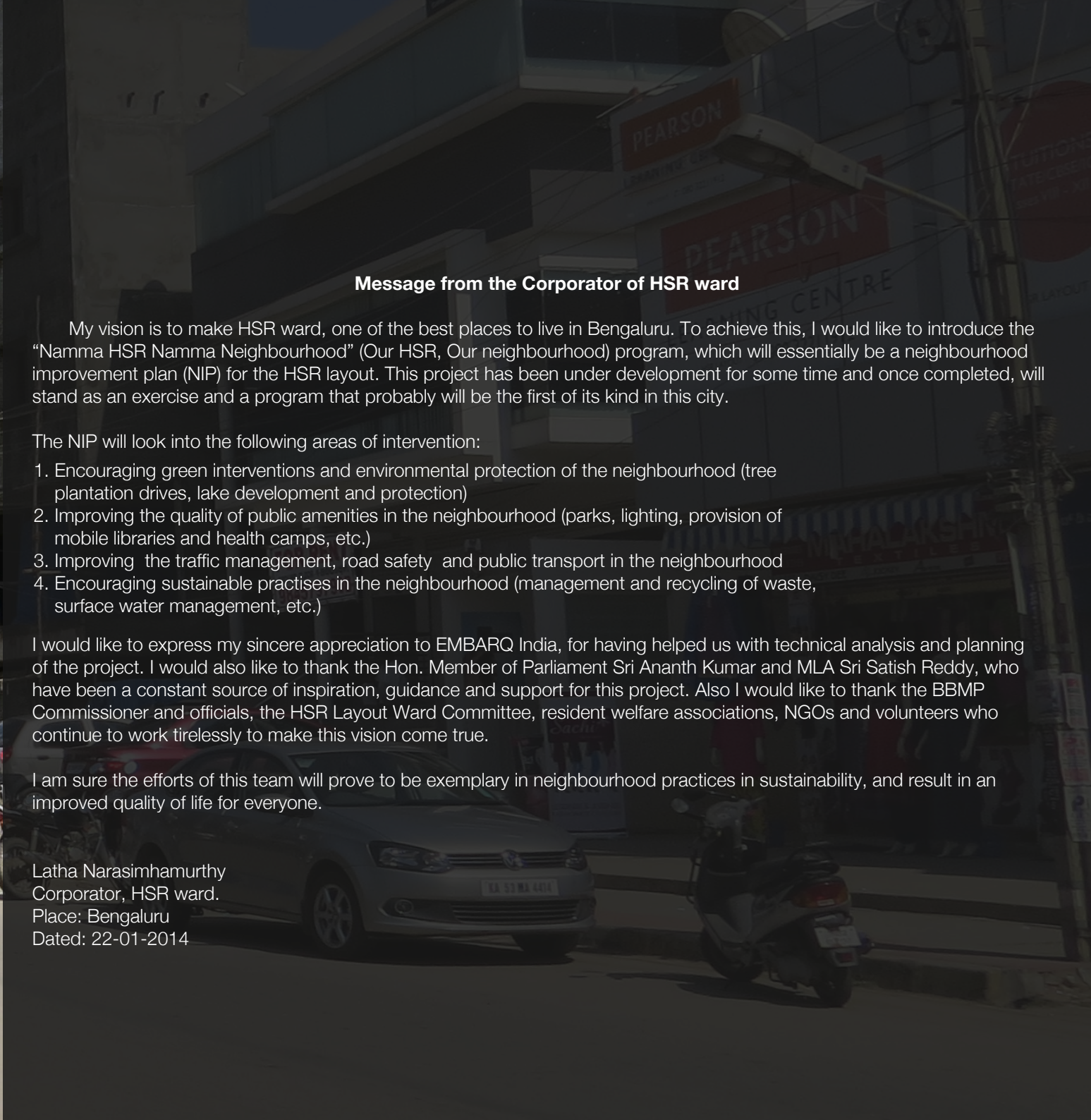
The NIP will look into the following areas of intervention:

1. Encouraging green interventions and environmental protection of the neighbourhood (tree plantation drives, lake development and protection)
2. Improving the quality of public amenities in the neighbourhood (parks, lighting, provision of mobile libraries and health camps, etc.)
3. Improving the traffic management, road safety and public transport in the neighbourhood
4. Encouraging sustainable practises in the neighbourhood (management and recycling of waste, surface water management, etc.)

I would like to express my sincere appreciation to EMBARQ India, for having helped us with technical analysis and planning of the project. I would also like to thank the Hon. Member of Parliament Sri Ananth Kumar and MLA Sri Satish Reddy, who have been a constant source of inspiration, guidance and support for this project. Also I would like to thank the BBMP Commissioner and officials, the HSR Layout Ward Committee, resident welfare associations, NGOs and volunteers who continue to work tirelessly to make this vision come true.

I am sure the efforts of this team will prove to be exemplary in neighbourhood practices in sustainability, and result in an improved quality of life for everyone.

Latha Narasimhamurthy
Corporator, HSR ward.
Place: Bengaluru
Dated: 22-01-2014



INTRODUCTION

The Need for Local Area Planning

The approach to urban planning and development over the past century or so, has typically been top-down; governed and driven by a few -politicians, bureaucrats, technicians or 'experts' - rather than being bottom-up and participatory. In India, this has been done through different forms of centralised control be it schemes like JnNURM or the creation of 'specialised agencies' like the Bangalore Development Authority, various 'Task Forces' in the city, etc. There have been few if any meaningful opportunities for the public at large to provide inputs, or to influence these city building processes. Though the Karnataka Town and Country Planning Act of 1961 had some progressive features like including 'public participation', this is hardly ever carried out in the right spirit and manner. The city's Master Plan, prepared once in about two decades is cursorily displayed to the public inviting 'objections and suggestions', though ultimately, discretion lies with the executives, requiring no explanation (for what is accepted/rejected) or accountability to the public. The Master Plan level is too broad-brush and removed from specific local contexts to be able to cogently define planning/ development agendas at that scale.

This historically top-down and high-level master planning approach for cities is typically disconnected from desired outcomes and often stops short of implementation. There is a wide gap between Master Plan proposals on paper and translation on the ground. But more fundamentally, the gap is perhaps even wider between what gets planned, and real needs at the neighbourhood level. Contributing to these issues in no small measure is the convoluted and ineffective structure of city governance. A mish-mash of authorities that don't interact or co-ordinate with each other, who are not accountable to a single authority or to the public, have led to the sorry state affairs on the ground and citizens feeling lost, helpless or apathetic about the situation.

How can we make our city planning/building processes responsive to local contexts and communities? How can we empower citizens to have a voice in these processes and make city governments 'people facing'? How can we get city governments to effectively govern our cities?

It is ironic that the solution has not only been thought about extensively, it has also been legislated as an amendment in our Constitution.

Noting that local bodies had become weak and ineffective in governance and finance, instead of 'vibrant democratic units of self-government', the Parliament enacted the **74th Amendment Act** way back in 1992. Empowering local self-government in cities, the Amendment called for devolution of powers, and an effective municipal body to run the city. The structure of city governance was redefined, such that the functions of planning, provision of utilities, regulation and monitoring etc. fall under the urban local (municipal) body, which is an elected, fully representative body. This is to be done by instating Metropolitan and District Planning Committees, Ward Committees and Area Sabhas at the lowest level, to have the government working in each neighbourhood. The law states that Ward Committees should work towards creating a 5-year Ward Vision Plan. Municipal budgets can then align with the plans and proposals outlined in it. In this way, creating a more streamlined, effective and accountable structure of city governance. This is also in line with the concept of a tiered planning process, with 'local area plans' - that are meaningfully informed by or co-created with public/stakeholder participation - being fundamental blocks in the process. It is only in this way that city building processes can be directly connected to and responsive to ground realities, citizen needs; and result in more sustainable, equitable and liveable urban environments.

As such a city's planning processes necessarily need a bottom-up component as well, with the lower tiers (ward or local area plans), able to inform the upper tiers (district or city master plans) and the upper tiers being flexible enough to accommodate the suggestions.

However unfortunately even after two decades, the 74th Constitutional Amendment Act remains merely on paper. Even though State governments have ratified the Act they have done precious little to devolve actual authority, decision-making and financial power to these bodies. Many theories do the rounds as to why, State Governments have not truly decentralized and empowered their local city governments.

For the Ward Committees to function effectively, there need to be some Rules. Draft Rules were prepared in Feb 2013 and 10,000 tenders were sent out inviting comments and suggestions; however the response was abysmal with only 25-30 people participating.

Embodying the spirit of the 74th Amendment, the **Neighbourhood Improvement Plan**, is an effort towards its realisation in actuality. This case explores a framework for instituting an inclusive, ground-up process to envisioning and planning our cities, operationalising good governance practices.

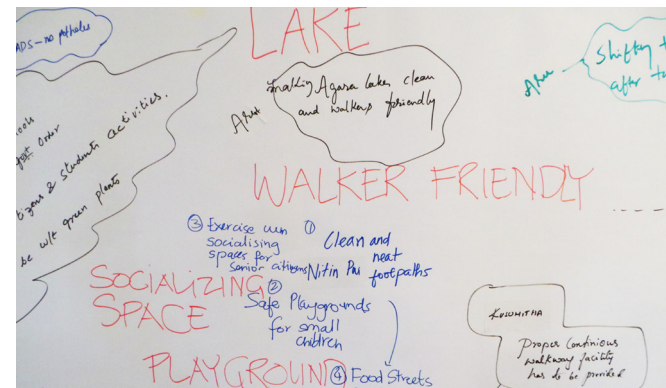


Image from Stakeholder workshops conducted.2013

Creating a Neighbourhood Improvement Plan (NIP): Essential Steps

1. IDENTIFY STAKEHOLDERS

- Identify a stakeholder group in the project who can take ownership of the project and can be associated with the project from beginning to end (implementation stage). This may be a political representative or stakeholder who will act as a go between various stakeholders. This is the **primary stakeholder**.
- Identify other key stakeholders.

2. IDENTIFY ISSUES

- List and understand the nature of the concerns identified by the stakeholders and possible root causes for the issues.
- Analyse and evaluate all of the listed concerns and research further to get a panoramic understanding of the same. The research and back ground study sources could be:
 - o Ground surveys
 - o Existing available information online/reports, mandates, newspapers
 - o Any data/ numbers that might be available with the local authorities (accident data in instances of flooding, etc.)
- Derive an understanding of where the existing governing frame work has fallen short to address said issues (try and understand where the existing system circuit is broken and how the NIP can complete the loop, thereby plugging back into the

system).

- Roughly define the scope and limitations of the project with the help of the **primary stakeholder** group.
- Identify the boundaries of study and implementation of the NIP.

3. MOBILIZE STAKEHOLDERS

- Organize a visioning exercise bringing all stakeholders to one table to develop a common vision for the NIP, and for the scope and limitations of the project.
- Use the stake holder meeting to list additional concerns of the project, to collate them, revise and rewrite the scope of the project.
- Identify key contributions that can be brought in from the stakeholders: there might be some expertise on waste management and some in traffic safety already amongst the stake holders which can be used later for reviews.
- Organize all the stakeholders into a Working Group and Review Group to allow for equal representation and contribution to the project. (Working Group will work on the key ideas and implementation plans, while the Review Group will give feedback on how favourable/doable the idea is and/or how it should be modified)

4. CREATE A PLAN

- Establish a rough master plan of possibilities,

possible implementation strategies and mechanisms based on ground studies and identify phases of implementation.

- Allow the Working Group, followed by the Review Group, to evaluate the master plan for recommendations/modifications.
- Use this evaluation to segregate easily doable facets of the master plan from the more difficult ones.
- Organize the easily doable facets into

mini-projects. These are temporary projects that can be implemented in short periods of time while the detailed master plan is being prepared. These can be used for the testing of many key ideas

5. TEST THE PLAN

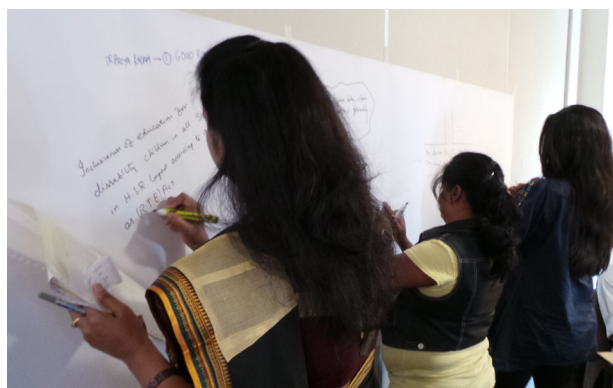
- Implement these **mini-projects** projects to get feedback from stakeholders.
- Modify master plan recommendations from the learnings gained by testing smaller projects.

6. CREATE AWARENESS FOR THE PLAN

- Create branding for the project. This creates identification of the initiatives and ownership of the project and its benefits.
- Conduct awareness exercises/strategies for varied stakeholders which can then be used as a platform for display of project ideas.
- Compile recommendations into a document which can be utilized to create pitches/presentations for potential financiers.



Images from Stakeholder workshops conducted.2013



PILOT PROJECT:HSR LAYOUT



Images from Stakeholder workshops conducted.2013



Figure 1.1: Location of India
Source: Wikimedia Commons

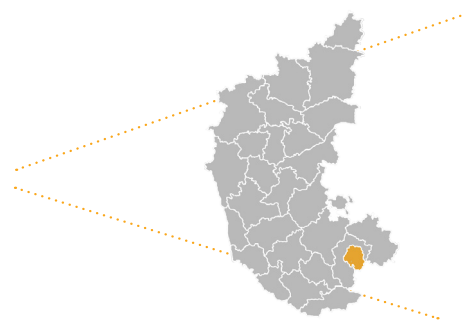


Figure 1.2: Location of Bengaluru
Source: Wikimedia Commons

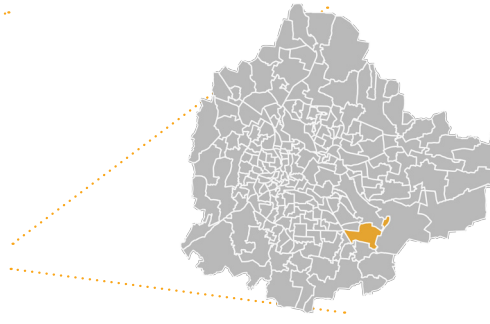


Figure 1.3: Location of Ward 174

Working with various stakeholders, EMBARQ India has been engaged with a pilot demonstration exercise of creating a Neighbourhood Improvement Plan (NIP) for HSR Layout in Bangalore. Driven by the local leadership (BBMP Corporator) and community of that ward (no. 174), the initiative aims to improve sustainability and quality of life in the neighbourhood. The layers addressed here include mobility, ecology, infrastructure, public spaces and local economy. The study and analysis methodology developed and adopted here can in turn be applied across the city, while ensuring context-responsiveness. This case study looks at the process of conceptualisation, planning and implementation of the pilot project, scale-up and expected impacts, challenges encountered, lessons learned, etc.

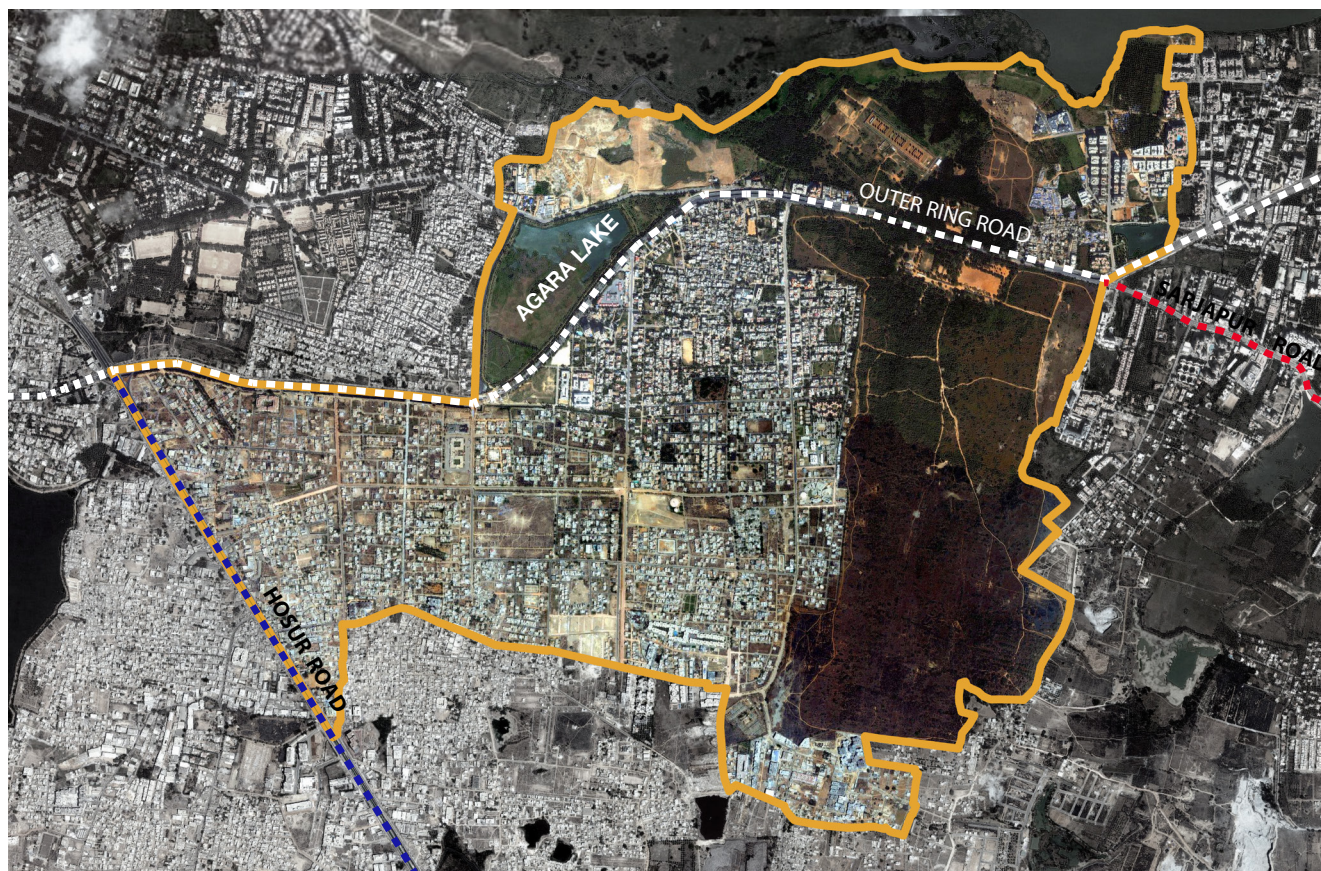


Figure 1.4: Satellite Imagery of ward no. 174, HSR Layout
Source: Google Earth. June 2013

BACKGROUND:HSR LAYOUT AND AGARA



Agara Lake

Source: Anisha Nair for bangalore.citizenmatters.in



Lord Hanuman's idol beside Puri Jagannath's temple at Agara,

Source:Veera.Sj for Wikimedia Commons

The Hosur Sarjapur Road Layout was developed by the Bangalore Development Authority (BDA) as a residential area for senior civil servants of the Government of India. The location of the layout is critical in terms of connectivity since major city level corridors i.e. Outer Ring Road (ORR) and Hosur Road (radial road connecting the city centre with the town of Hosur, Tamil Nadu) demarcate the edges of this layout. A study of the history of HSR and the village around Agara lake (an important geographical feature in the area) reveals some of the issues that the residents have.

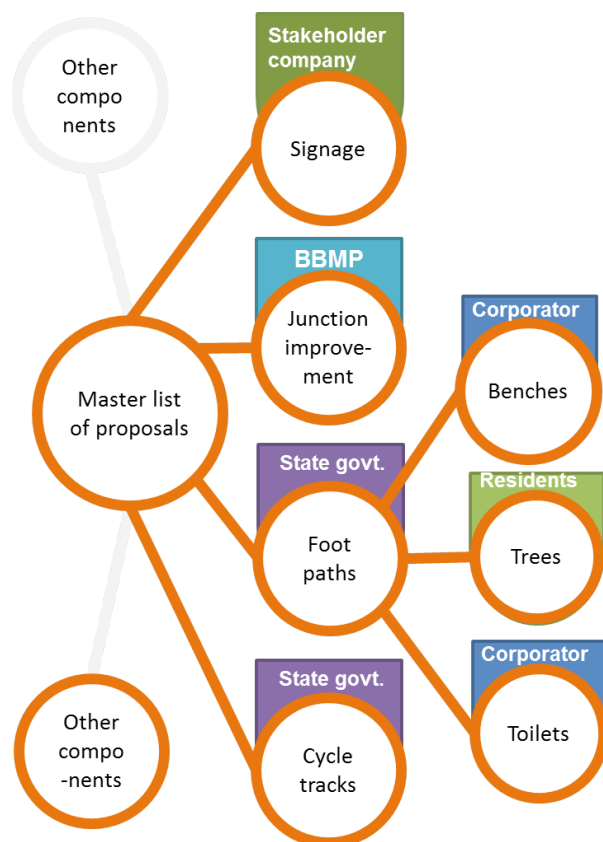
Agara Village previously 'Doddagara', meaning 'Big Agara' used to be a settlement of 300-400 houses built close to the Agara Lake comprising of farmers, landlords, washer men, barbers and scavengers. The presence of many castes was seen here, including Brahmans and Muslims. The residents of the village were primarily agriculturists with their fields in the surrounding areas, most of which have now been converted into HSR Layout. When the British came to the city, they settled just outside the village. They are thought to have begun the survey of Bangalore with the Agara village. The settlement has an old temple dedicated to the Hindu deity- Vishnu, built on the lines of the temple in Tirupati. This temple is believed to be about 200 years old, and is of the time of Chamaraja Wodeyar. The 6th generation of his family now manages the temple. Along with the renovation of the temple, a community hall was built alongside to provide food and shelter to pilgrims and visitors to the temple.

The annual temple fair was started by the same family in 1955 (by Peddanna Reddy) It is meant to coincide with the events in Tirupati temple. It includes a fair for 14 nights in the month of April, during which the village sees a large number of visitors from the surrounding settlements with a floating population of about 2000 on most days and 5000 on the final day. Many chariots are taken out for processions every night along the streets of the village. The Agara lake used to extend up to the edge of the village where most of these celebrations, including the boat festival, were originally celebrated. With encroachment on to the lake, and the Ring road cutting off the access between the village and the lake, the people are forced to follow the customs merely symbolically within the village.

The community hall was used as government school and a police station before being converted back into a dining hall for festive occasions. The flower garden of the temple had been taken up by the British to build one of the earliest theatres in Bangalore, which has since been converted into a brick factory. Some of the features that have been lost over the years besides the connection to the lake are the community wells. Many of the wells still exist but are dry or covered up.

Some of the issues brought up by the residents are the lack of open spaces in the village, absence of space/ facilities for visitors to stay during the annual fairs, loss of access to the lake, deterioration of the condition of the lake, and insufficient bus facilities.

PROJECT DEFINITION



This project aims to develop a plan to improve the quality of life and sustainability of the Hosur Sarjapur Road (HSR) Ward, Bengaluru. The methodology adopted addresses the layers of mobility, ecology, infrastructure, public spaces and local economy.

Why?

Neighbourhoods like the HSR Ward are highly auto-centric with high rates of car ownership and wide roads which dominate the landscape, lowering the spaces available for community life. The lack of connected and meaningful public spaces results in a compromised quality of community life. The absence of pedestrian and cycling infrastructure results in more accidents and reduced

safety for the elderly, children and differently-abled, thereby increasing issues of safety and security for the neighbourhood as a whole.

How?

The provision of a safe access network within the neighbourhood and to public transport corridors will facilitate access and connectivity to the parks, play grounds and lake areas within the neighbourhood. The interventions aim at fostering a sense of community and pride among the residents.

Significance

The current urban planning discourse in India that shapes cities and neighbourhoods is very automobile-centric, resulting in sprawl. The idea of a compact city promoted by EMBARQ India begins at its smallest building block, i.e. the neighbourhood. The Neighbourhood Improvement Plan (NIP) therefore becomes a key opportunity to demonstrate creation of compact cities in the Indian context.

Where and When

HSR Layout, Bengaluru.

This neighbourhood was developed by the Bengaluru Development Authority (BDA) as residential plots for senior civil servants of the Government of India. Two major city level corridors i.e. Outer Ring Road (ORR) and the Hosur Road (radial road connecting the city centre with the town of Hosur, Tamil Nadu) demarcate the edges of this neighbourhood.

What is our plan?

To use this project as a demonstration, and leverage development of a similar nature in other neighbourhoods across the city. To exhibit the improvement in the quality of lives of the neighbourhood residents through reduction in carbon emissions, travel time saved, people served and investment leveraged.

PROJECT TIMELINE

April 2013

Meetings with the concerned government agencies and the residents conducted to introduce the idea of the NIP and bring forward their concerns and aspirations

May 2013

Conceptualisation of the first draft of proposal

June 2013

Meetings with the working group of government agencies conducted to evaluate the conceptual proposal

July 2013

Implementation of the first, small-scale intervention: junction improvement plan for Gyan Shristi Junction, and Data Collection

August 2013

Junction Designs for at least 5 more locations

September 2013

The demonstration area proposal presented to the corporator of HSR and the BBMP (a stretch of 0.5 km approximately)

November 2013

Presented proposal for the 27th main to the corporator and other government agencies

December 2013

Final proposals submitted

February 2014

Proposals presented to key stakeholders for review and feedback

(Project development in progress)

SCALING UP THE NIP

The idea of the compact city promoted by EMBARQ begins at its smallest building block, which is the neighbourhood. A Neighbourhood Improvement Plan (NIP) therefore becomes a key opportunity to demonstrate the concepts of a compact city. A typical neighbourhood planning approach in a city like Bengaluru today encourages car ownership over cycling and walking, effecting the safety, security and quality of community life of the neighbourhood. EMBARQ India, in collaboration with the BBMP and the local area corporator and the RWAs, has helped in developing strategies for a neighbourhood improvement plan for the HSR ward in Bangalore. The strategies have essentially addressed the issues of signage and orientation, road safety, public transport, non-motorised transport, urban greens, quality of public space and accessibility at a neighborhoods level.

These networks improve safe access to public transport corridors and various destinations within the neighbourhood, particularly parks, playgrounds and lake areas. The interventions aim to foster a sense of community and pride in the residential area.

The study and analysis undertaken to develop this NIP is formalized into a methodology which can be applied to neighbourhoods across the city. In each application of the methodology the specific context (ecological features, historic elements, development zones) of neighbourhoods can be addressed to create a unique NIP which references the locale and its characteristics.

The success of this project will be measured in terms of the number of other neighbourhoods in Bengaluru adopting this NIP methodology based on recommendations of EMBARQ India.



Images from Stakeholder workshop conducted.2014

NEIGHBOURHOOD DEVELOPMENT TRENDS

Developed as a typical BDA single unit per plot layout, HSR layout has seen a surge of development activities in the last decade, particularly in the past five years. Once seen as neighbourhood at the periphery of the city, HSR layout today falls well within the city limit.

Today, HSR layout is seen as one of the more desirable areas to live in the city with many schools, parks and other government amenities located within the layout.

Designed based on typical town planning principles, the layout has a centralized BDA Complex, which houses the city administrative offices. It also has a number of small parks in various parts of the layout. Several renowned educational institutions have also become established in the area in recent years, like JSS Public School, the Oxford College (and the National Institute of Fashion Technology (NIFT).

Located between the Electronic City IT Hub and the main Central Business District (CBD) of Bengaluru with good connectivity to both, it has become a highly desirable location for both retail and office spaces.

The development of the neighbourhood today is in stark contrast to what was seen in its first decade; when most of the development was concentrated around Agara village with the exception of a few government buildings or allotted housing units. Today, the single unit per plot development is giving way to multi-family and multi-storeyed units and in some cases, multi-storeyed residential apartments. The increased demand for housing coupled with the increasing land prices of the area make these multi-storeyed, multi-family high density housing a prime example of the expected trajectory of development.



Image 2.1 - Junctions: 17th Cross Road



Image 2.2 - Streets: 14th Main Road



Image 2.3 - Residential: Bungalow Typology



Image 2.4 - Commercial Activity: 9th Main Road and Hosapalya Road

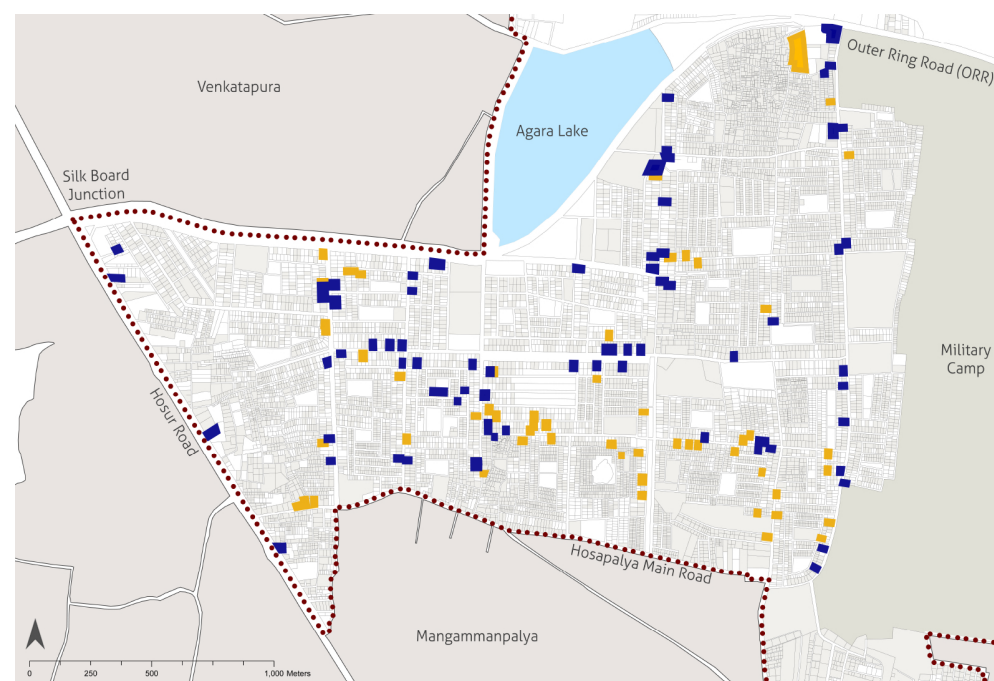


Figure 2.5: Key Map of ward No 174

Commercialization is also increasing with many buildings along the major neighbourhood roads being developed as retail and office spaces. A quick ground survey of all the buildings under construction shows that commercial building types outnumber residential developments; a clear indicator of the changes currently underway (refer fig 2.6 & 2.7).

Surveys indicate that 30% of the plots in HSR are yet to be developed. With the rate and kind of transformation this neighbourhood has seen in the last few years, HSR layout stands to become one of the most commercialised localities of the city.

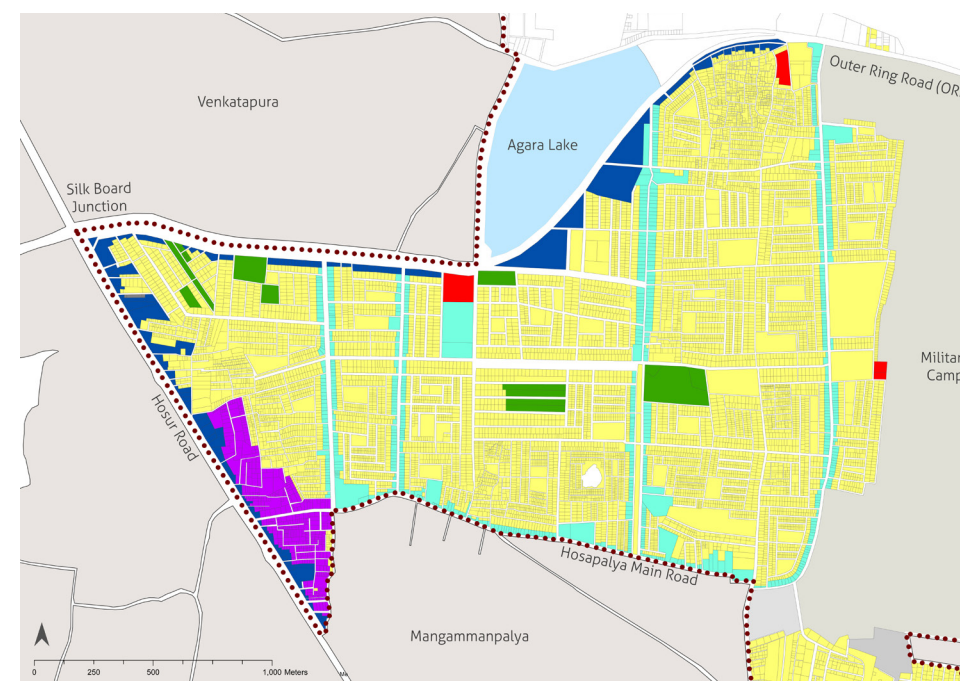
Though commercialization may not necessarily have a negative impact on this area, this quiet neighbourhood will definitely see an increase in the level of activities, through movement of people and significantly higher vehicle numbers. An upgradation of its pedestrian networks along with increased safety, better quality of open spaces and public transport infrastructure will give the neighbourhood a chance to adapt to the new changes while still maintaining its neighbourhood quality.



LEGEND

■ Residential Buildings
■ Commercial Buildings

Figure 2.6: Map showing Buildings under Construction in 2013



LEGEND

■ Institutions
■ Commercial Buildings
■ Green Spaces
■ Industrial Buildings
■ Residential Buildings

Figure 2.7: Proposed Land Use Map
Source: DULT

FORMATION OF PROJECT

The Corporator's interest in improving the safety and security of the residents and in making HSR a green ward led to the initiation of the Neighbourhood Improvement Plan .

The first step, then was to identify the concerns of stakeholders with a series of workshops and discussions. Presentations were made to the BBMP corporator, representatives of various government agencies and to the members of the ward committee allowing them the opportunity to offer their feedback. This stakeholder input provided key directives in the formulation of the vision for the project. All inputs and concerns were compiled into an exhaustive list which acted as the starting point of the project. (Refer Figure 3.1)

The next step involved a deeper study of the identified issues and drawing possible relations between them. This process finally concluded in the identification of core areas where strategic interventions were to be made.

These **Areas of Intervention** are:

1. Wayfinding and Orientation
2. Biodiversity
3. Safe Access Networks
4. Transport Networks
5. Public Space Design

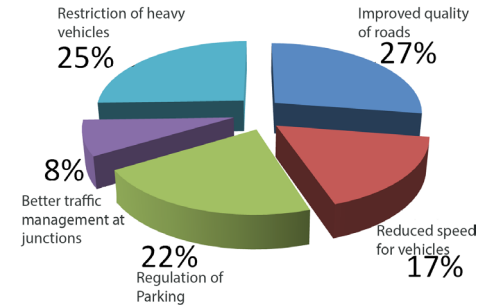


Image 3.1 - Workshop with Residents' Welfare Association conducted by EMBARQ India.2014

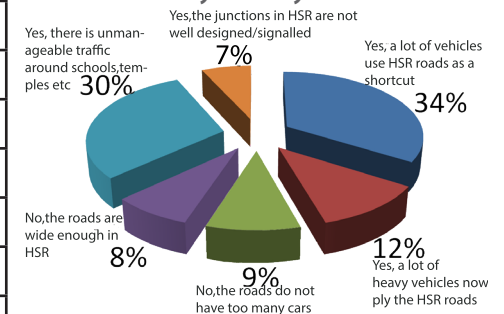
No.	Issues Discussed	1	2	3	4	5	6
1	Public Transport (Feeder Service within HSR)						
2	Access to Public Transport (City Level)						
3	Safety and Security						
4	Waste Management						
5	Infrastructure Upgrade						
6	Water Management						
7	Traffic Management						
8	Parks						
9	Trees						
10	Lake Development						
11	Safe Access to all (Barrier-free)						
12	Walking zones						
13	Safe NMT						
14	Good Roads/ Road Design						
15	Pavements						
16	Junction Design						
17	Parking Management						
18	Community/ Cultural Space						
19	Street Lighting						
20	High Street Creation						
21	Informal Sector						
22	Training and Capacity of Garbage Collectors						
23	Enforcement of rules						

Figure 3.1 - Input from workshop conducted by EMBARQ India

What are the improvements required for the roads of HSR?



Do you think vehicular traffic is a growing concern in HSR Layout? Why?



What are the improvements needed in pedestrian walkways of HSR?

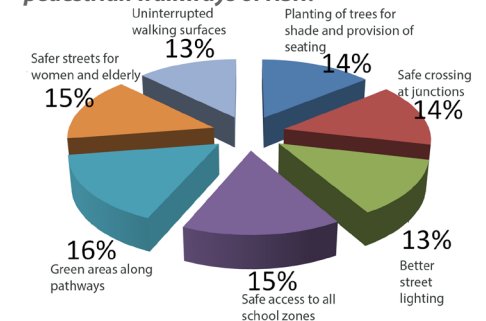


Figure 3.3 - Input from workshop conducted by EMBARQ India.2014

Identified Intervention Areas

**Way finding
and
orientation**

- Way finding maps
- Pedestrian signage
- Vehicular signage
- Creating easily identifiable land marks
- Creating identifiable entry and exit points

**Bio-diversity
interventions**

- Lake development
- Better quality of plants and vegetation
- Making public spaces more sustainable and nature friendly
- Creating more recreational spaces

**Safe access
networks**

- Safety and security
- Traffic management
- Barrier free access
- Safe NMT
- Good quality pavements
- Junction design
- Parking management
- Street lighting

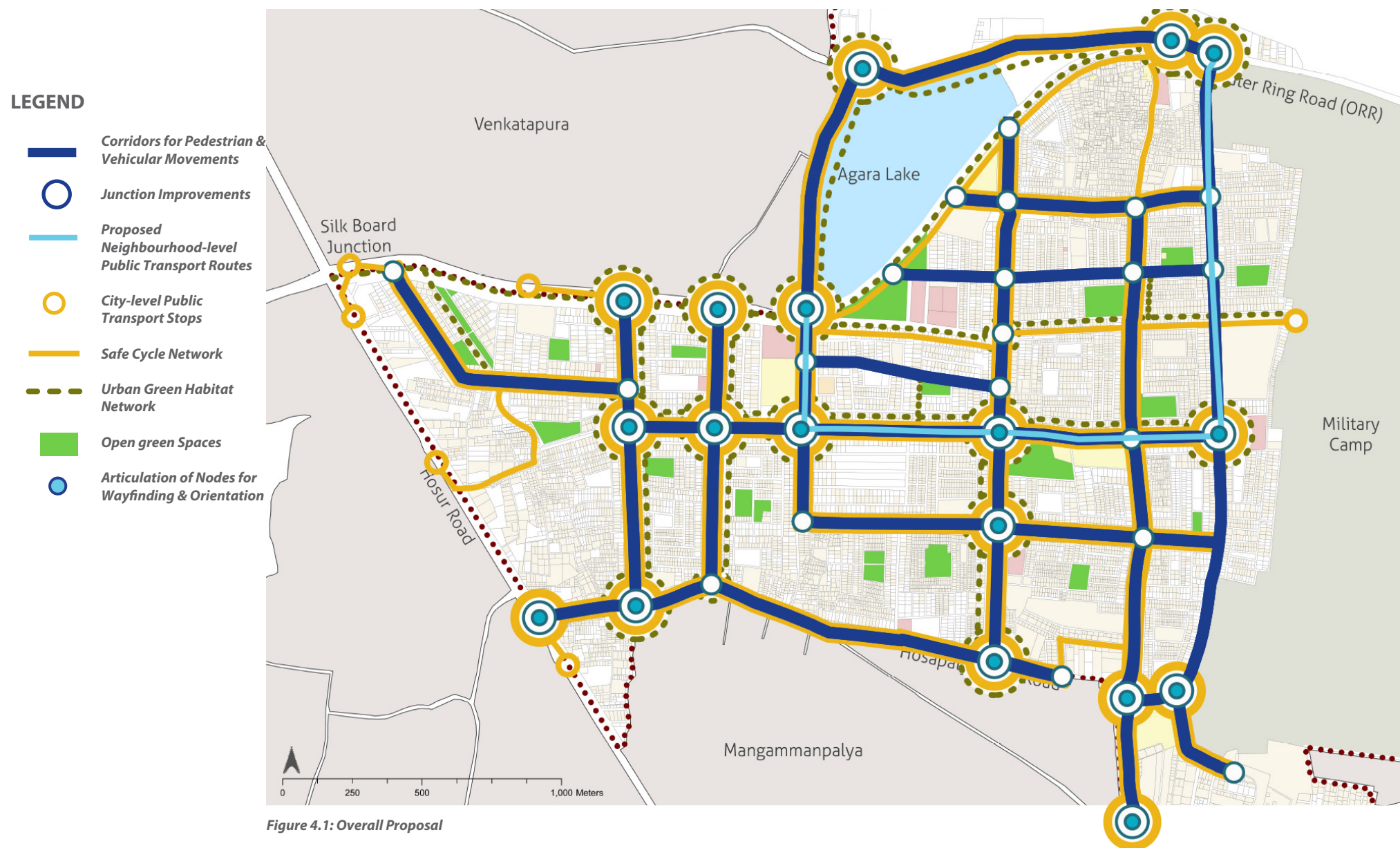
**Transport
networks**

- Better access to public transport
- Feeder services within HSR
- Better information on bus routes
- Integration of major bus routes with feeder routes
- Better bus stop infrastructure

**Public space
design**

- Creation of a high street
- Better quality of parks
- Lake development
- Community and cultural space development

OVERALL PROPOSAL



COMPONENT LAYERS

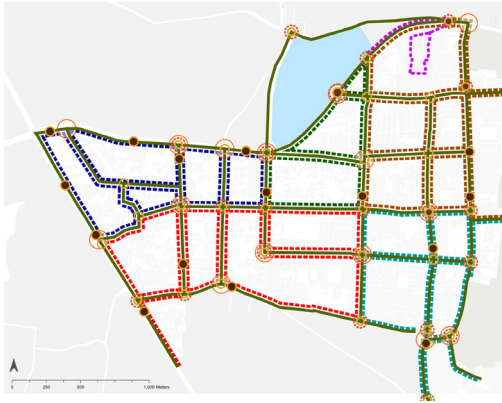


Figure 4.2: Wayfinding & Orientation

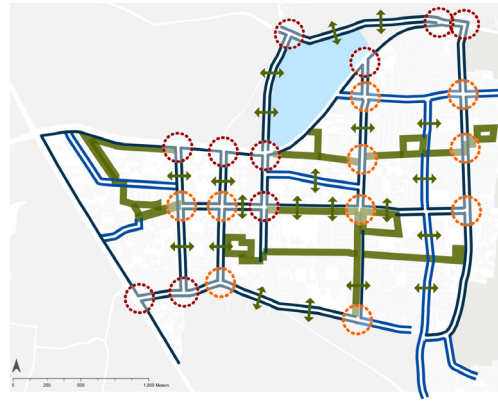


Figure 4.3: Pedestrian Safe Access

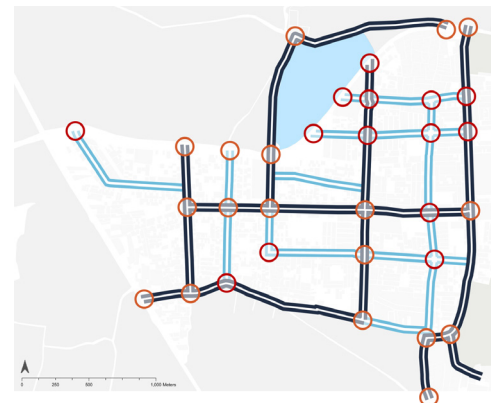


Figure 4.4: Vehicular Safe Access

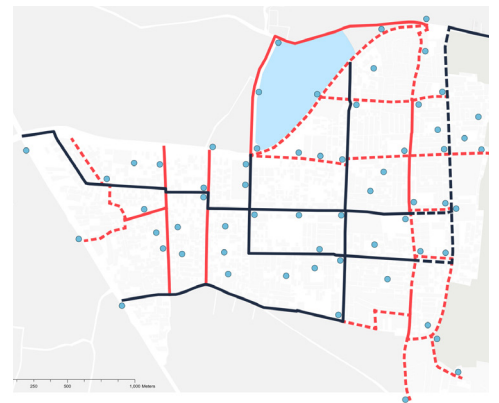


Figure 4.5: NMT Safe Access



Figure 4.6: Public Space Design



Figure 4.7: Urban Green Habitat Design

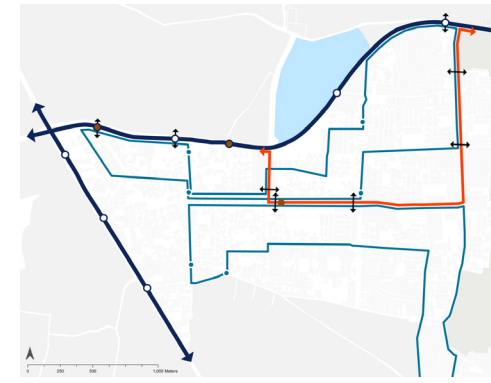


Figure 4.8: Transport Networks

WAYFINDING AND ORIENTATION

SIGNAGE

Principles

This set of design principles is concerned with making a neighbourhood efficiently navigable. Navigability means that the navigator can successfully move in the space from his/her present location to a destination, even if the location of the destination is not precisely known.

Three criteria determine the navigability of a space:

1. Whether the navigator can discover or infer his/her present location
2. Whether a route to the destination can be found
3. How well the navigator can accumulate wayfinding experience in the space.

Objectives*

- Create a unique identity at each location.
- Use landmarks to provide orientation cues and memorable locations.
- Create well-structured paths.
- Create regions of differing visual character.
- Use survey views (give navigators a vista or map).
- Provide signs at decision points to help wayfinding decisions.
- Use sight lines to show what is ahead.

*Source: : <http://www.ai.mit.edu/projects/infoarch/publications/mfoltz-thesis/node8.html>



Figure 5.1: Place-making & Orientation Proposal

LEGEND

- Existing Bus stops
- Pedestrian (Major) Signages
- Major Vehicular Signages
- Proposed Pedestrian infrastructure Network

COGNITIVE MAPPING

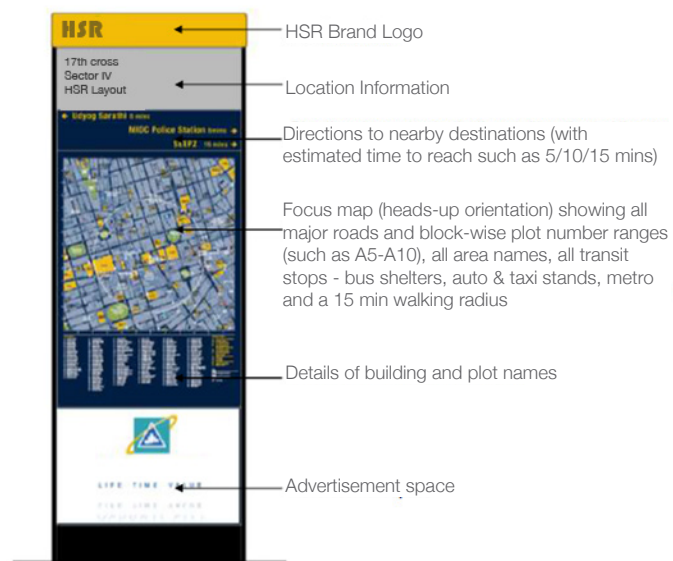


Figure 5.2: An example of Ideal Pedestrian Signage



Figure 5.3: Vehicular Signage
Source: EMBARQ India

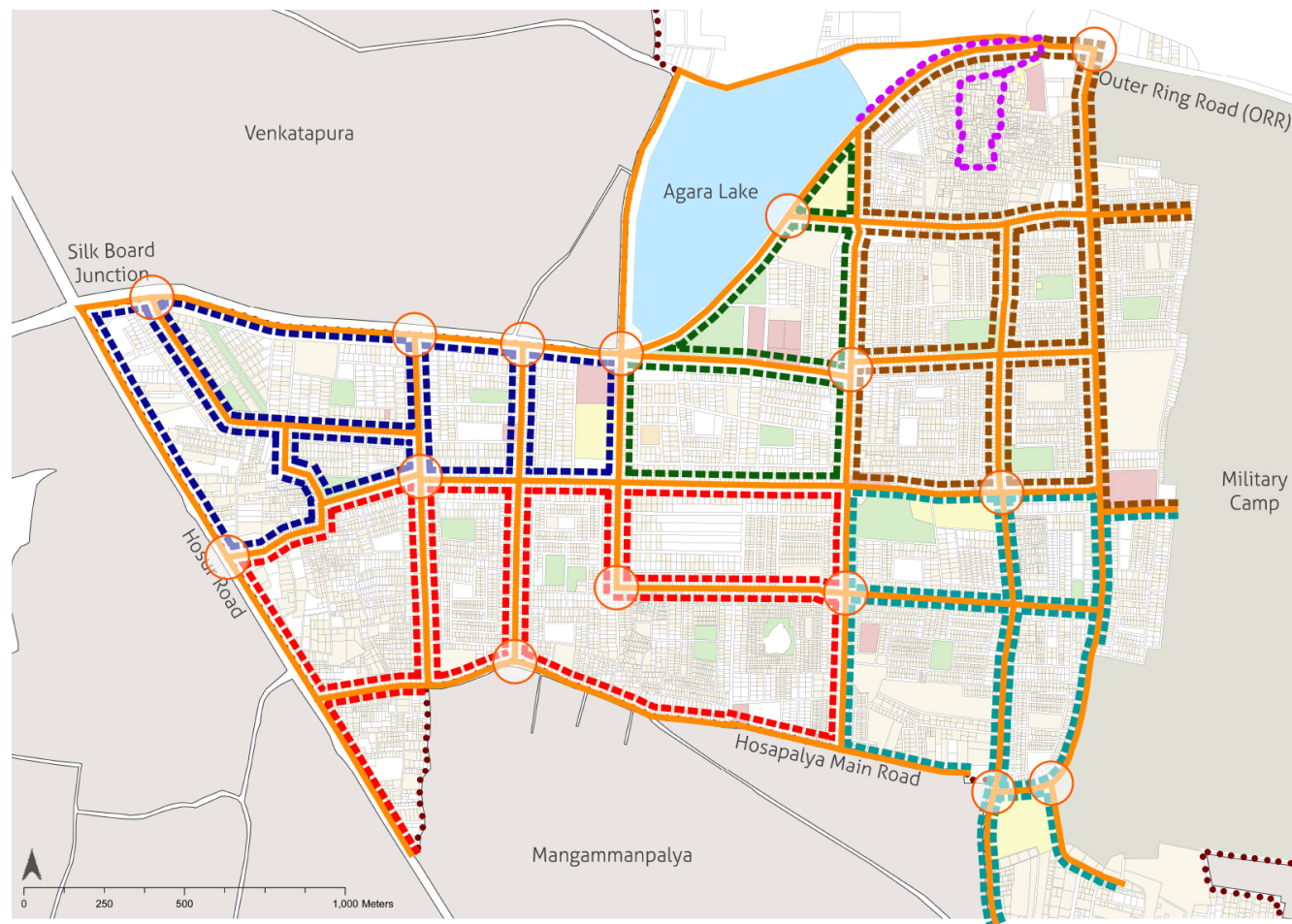


Figure 5.4: Place-making & Orientation Proposal, Part 2

LEGEND

-  Locations for installation of visually identifiable landmarks
-  Proposed Pedestrian Infrastructure Network
-  Repaving of Agara Village Procession Route
-  Repaving of sector edges to demarcate sector extents

ANALYSIS

Existing Pedestrian Signage

Though HSR already has a signage system in place, it currently lacks consistency, structure and does not show the location of the individual in relation to the neighbourhood.

There are mainly two systems of signage in place:

1. Street level signage

This is usually located at the corner of every street indicating the street name and the plot numbers

2. Sector level signage

These are large maps which show a small part of the layout only, and do not contain indications of the closest landmarks or information regarding where the individual stands in relation to the map.

Signage infrastructure already exists at some of the key decision points of the neighbourhood and can be integrated into the overall way finding plan by reorganizing the information displayed on them (Refer Images 5.2, 5.6 & 5.8)

Other locational considerations to be addressed while revamping existing signage infrastructure are

1. Visibility from carriageway and footpaths and
2. Clear line of sight at junctions with no obstructions.

Street Level Signage



Image 5.5: Existing Pedestrian Signage



Image 5.6: Proposal of Modified Existing Pedestrian Signage

Sector Level Signage



Image 5.7: Existing Sector Level Signage



Image 5.8: Proposal of Modified Sector Level Signage

Enhancing Elements for Cognitive Mapping

While landmarks and signage may form the major elements of wayfinding, places can be defined as entities of visual, auditory or other stimuli without direct recourse to object recognition. An effective system of wayfinding uses a series of elements ranging from the formal system, to a more cognitive system. The elements chosen to characterize different parts of the ward draw upon existing identities and accepted systems of differentiation and place recognition.

Some existing systems of recognition upon which place-character can further be developed to create more identifiable neighbourhoods are:

- Cultural and historical features such as Agara village and its temple procession route (see Figs. 5.4 and 5.09)
- Natural features such as Agara lake
- The sector classification of the neighbourhood used as an element of organization and identity. It characterises the address system and also defines the local welfare associations.

The recommendations are:

- Repaving of the Agara procession route, with specific materials and patterns to demarcate the route, with pedestrian furniture and public spaces carved out for seating
- Planting of specific species of plants along major roads that allow easy recognition in different seasons.
- Public art installations at key decision point areas.
- Repaving of sector edges with unique paving material to demarcate its extents.

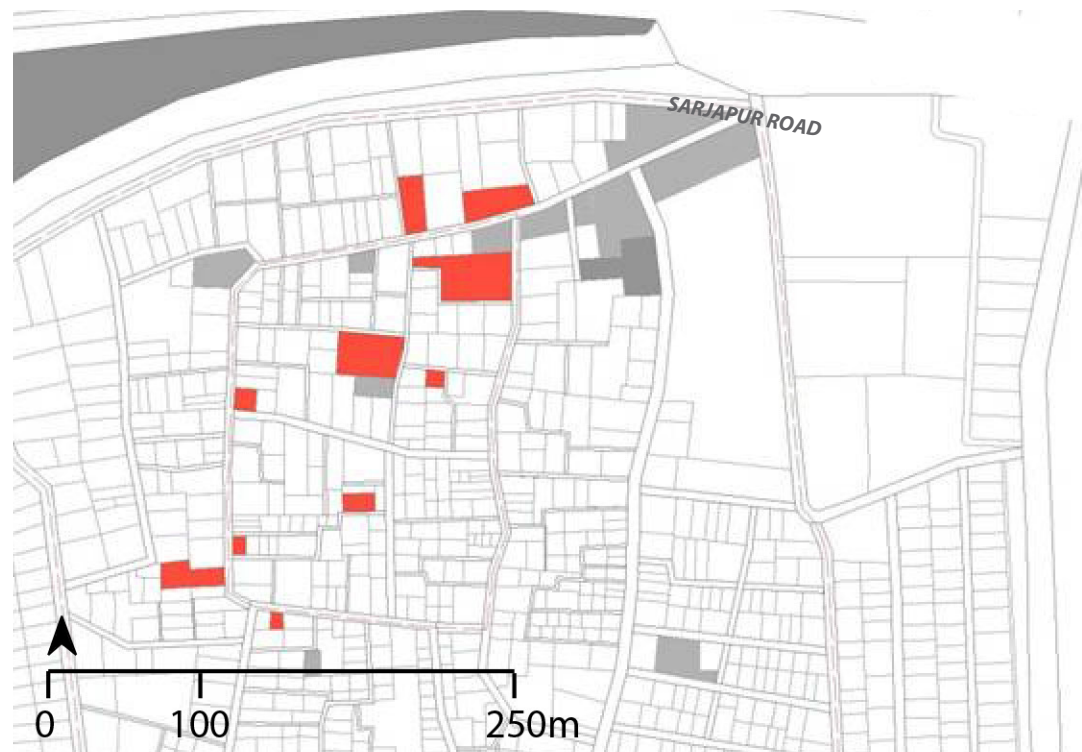


Figure 5.09: Agara Village

LEGEND

■ Temples



Image 5.10: Agara Village



Image 5.11: Agara Village



Image 5.12: Agara Village

SAFE ACCESS NETWORKS




Being a fairly new ward, HSR layout has good road infrastructure as compared to many other wards in Bangalore city, with sufficient widths allocated to both pedestrian and vehicular traffic on many of its roads. However, the existing design conditions still make walking and cycling a difficult ordeal.

An analysis of the walking conditions show that provision of amenities that promote walking and ensure pedestrian safety, are sorely missing at a network level, thus effectively reducing the walkability of the neighborhood. Current design conditions give a higher priority to, and are more conducive for vehicular movement, even for neighbourhood level trips such as to schools or markets. Also while the neighborhood exhibits a good cycling culture, the lack of safe cycling provisions discourages the use of cycles as an option for short trips within it.


The safe access network proposal made here, looks at creating a balance in the provision of amenities for access by all modes of transport. The aim of this proposal is to provide good road design that ensures the safety of pedestrians and cyclists, while at the same time ensuring a smooth movement of vehicular traffic. This can be achieved by reducing conflict areas between cars and people, ensuring safe speeds for movement of vehicles and good environmental conditions. Ensuring conducive walking and cycling conditions along with the existing vehicular infrastructure holds the potential to start changing the way people travel in the neighborhood.

LEGEND

Pedestrian Safe Access

-  Improvements at Junctions for Pedestrian Safety
-  Provision of Walkways with Tree Cover and Pedestrian Lighting
-  Provision of recreational route with green buffer and seating areas

Vehicular Access and Carriageway Design

-  Road Design & Safety Improvements at Junctions
-  Major Roads with consistent carriageway widths

NMT (Cycle) Safe Access

-  Cycle Stands
-  Safe Cycle Network



Figure 6.1: Safe Access Networks Proposal

COMPONENT LAYERS

Pedestrian Safe Access

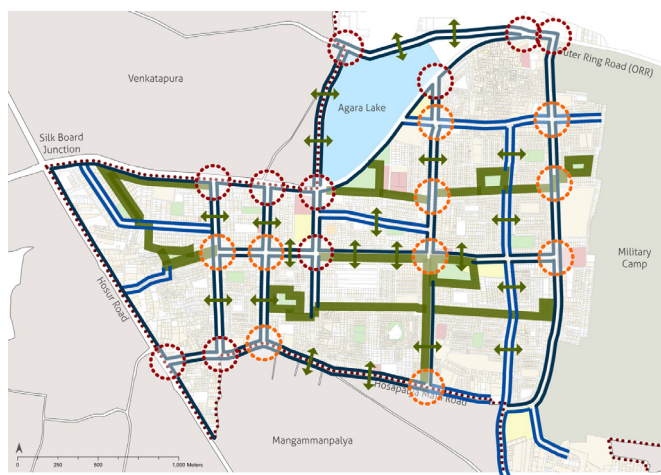


Figure 6.2:

The proposed pedestrian network (refer Fig 6.5) aims to create safe access to all major activity generators of the neighbourhood such as bus stops, schools, parks and market areas. The network looks to incorporate pedestrian safety features along with elements that improve the pedestrian walking experience.

NMT (Cycle) Safe Access

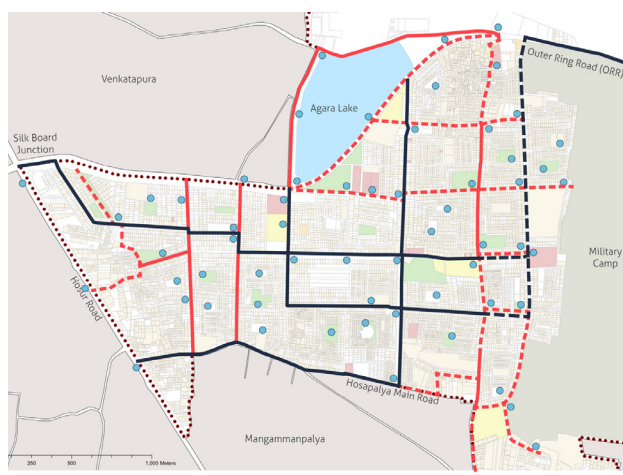


Figure 6.3:

The recommendations made for the cycle track network proposed by DULT (refer Fig 6.36) aim to completely integrate the neighbourhood network with other modes and express services operating along the arterial roads (mainly bus and rickshaws).

Vehicular Access and Carriageway Design

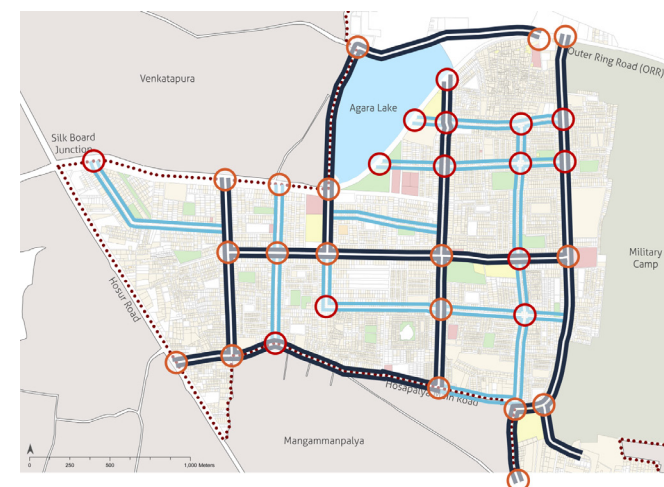


Figure 6.4:

The vehicular safe access network (refer Fig 6.21) aims to develop safe vehicular movement within the ward. The lack of traffic discipline, and irregular carriageway widths creates conflict between different vehicles, reducing pedestrian safety.

PEDESTRIAN SAFE ACCESS

PROPOSAL

Elements of Design

The proposed pedestrian network (refer Fig 6.5) aims to create safe access to all major activity generators of the neighbourhood such as bus stops, schools, parks and market areas. The network looks to incorporate pedestrian safety features along with elements that improve the pedestrian walking experience.

The three network elements are:

- Primary pedestrian corridors
- Secondary pedestrian corridors
- Recreational/ Pedestrian prioritised routes

Primary Pedestrian Corridors:

Primary pedestrian corridors are designed to be pedestrian walkways with high quality of pedestrian infrastructure. These are aligned along those stretches of the neighbourhood that have been identified by the city master plan to accommodate commercial activity. Ground studies have identified these zones as areas undergoing the most transformation in the neighbourhood and are associated with heavy pedestrian activities.

The elements of these corridors include:

- 3m minimum walkway width on either side of the road
- Mid-block table crossings at every 100m-150m
- Traffic calming at minor junctions with table crossing
- Walkway bulb-outs with tactile paving at junctions
- Landscape features, shade and pedestrian lighting
- Drinking water and toilet facilities at key points
- Street furniture at every 200m

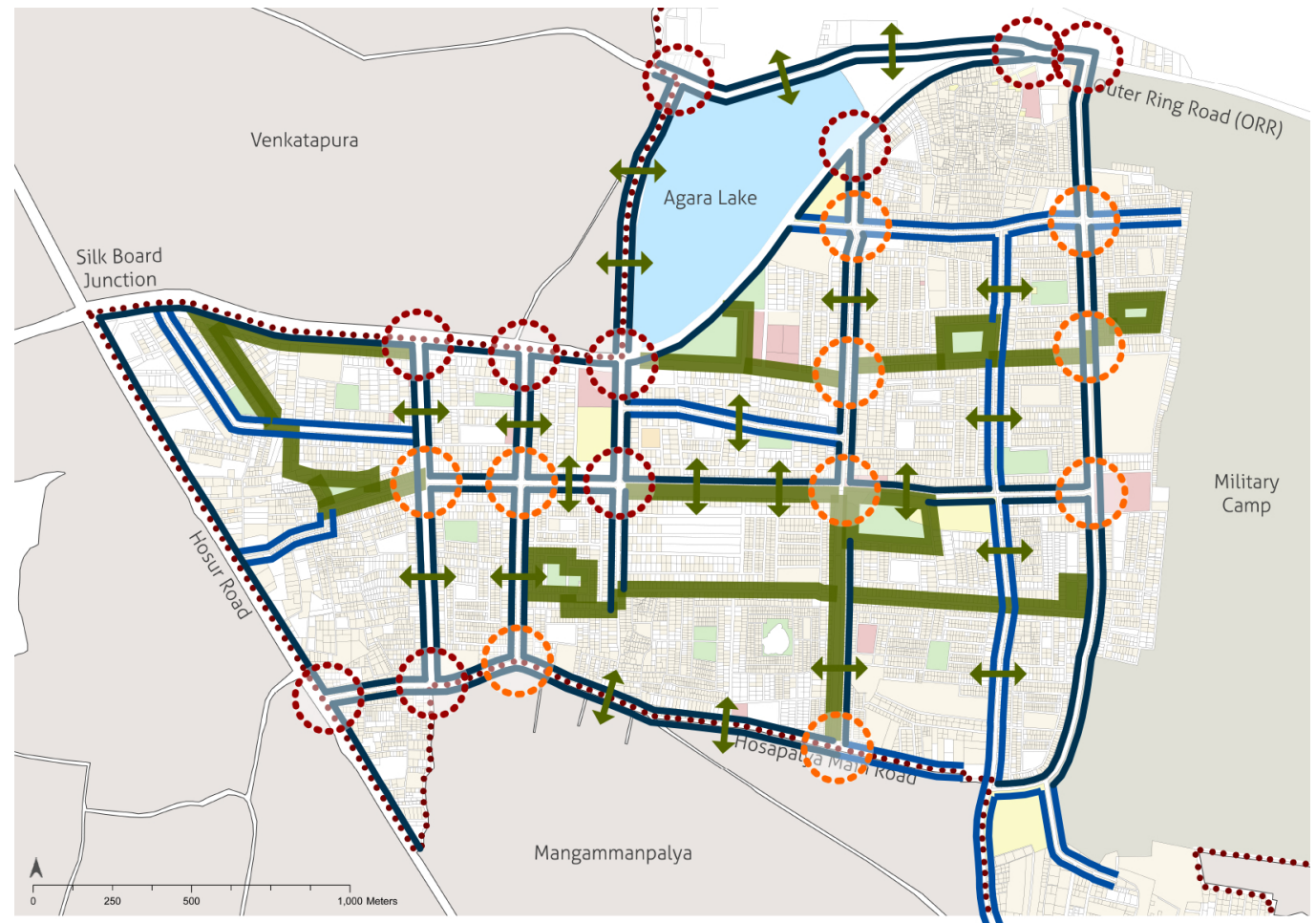


Figure 6.5: Safe Access Pedestrian Networks Proposal

LEGEND

Provision of signalised pedestrian crossings

Provision of walkway bulb-outs and designated crossing zones with traffic calming

Primary Pedestrian Corridors

Secondary Pedestrian Corridors

Recreational /Pedestrian Prioritised routes

Raised Mid-Block Crossings

Secondary pedestrian corridors:

Secondary corridors are major neighbourhood level streets that connect primary street networks. These function as extensions of the primary network into the neighbourhood.

The elements of these corridors include:

- 2m minimum walkway width on either side of the road
- Traffic calming and table crossing at minor junctions
- Walkway bulb-outs with tactile paving at junctions
- Landscape features, shade and pedestrian lighting



Left Fig 6.6: Bulb-outs
Source: metrolinx.com

Right Fig 6.7: Table-crossings
Source: techtransfer.berkeley.edu

Recreational/ Pedestrian prioritised routes:

Recreational routes aim to take advantage of the existing and proposed green spaces in the neighbourhood to create spaces for recreational walking activities.

The elements of these corridors include:

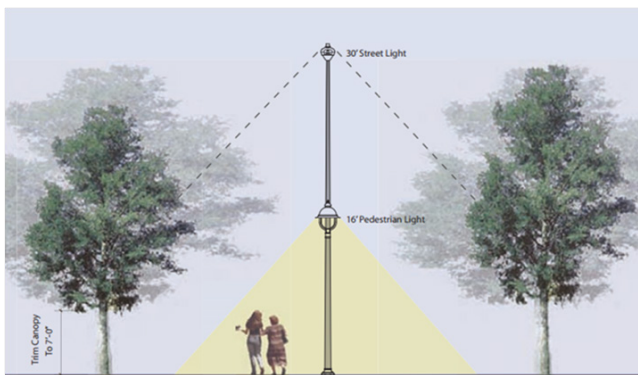
- Clear walking routes of minimum 1.5m width
- Landscape buffer from vehicular movement
- Landscape features, shade and pedestrian lighting
- Seating and street furniture at 100m intervals
- Kiosks supporting pedestrian activity
- Public facilities such as drinking water fountains and public toilets

Pedestrian prioritised routes are an extension of recreational routes thus creating a network of routes along streets with low traffic volumes and landscape buffering.



Left Figure 6.8: Pedestrian seating areas
Source: blog.oregonlive.com

Right Figure 6.9: Pedestrian seating areas
Source: sf.streetsblog.org



Left Figure 6.10: Street lighting v/s pedestrian lighting heights
Source: rallystl.org

Right Figure 6.11: Pedestrian lighting
Source: seattle.gov

PEDESTRIAN SAFE ACCESS | ANALYSIS

Parameters for Evaluation of Existing Pedestrian Environment (PEQI ANALYSIS)

The Pedestrian Environmental Quality Index (PEQI) was developed in 2008 by the San Francisco Department of Public Health to assess the quality and safety of physical pedestrian environments and inform pedestrian planning needs. It evaluates the pedestrian environment under five categories, namely:

Intersection Safety

- Crosswalks, Countdown Signal, Traffic Signal (existence of)
- Crossing Speed
- No Turn on Red (No free left turn)
- Traffic Calming Features (existence of)
- Pedestrian Signs

Traffic

- The Number of Lanes
- Two-Way Traffic
- Vehicular Speeds
- Traffic Volumes
- Traffic Calming Features

Street Design

- Sidewalk Width
- Sidewalk Surface
- Sidewalk Obstructions
- Presence of Curb
- Driveway Cuts
- Trees, Gardens
- Public Seating
- Buffers

Perceived Safety

- Illegal Graffiti
- Litter
- Pedestrian-Scale Light
- Construction Sites
- Abandoned Buildings

Land Use

- Public Art
- Historic Site



Figure 6.12: Map scoring HSR layout as per PEQI parameters

LEGEND

- Environment extremely unsuitable for pedestrians (0-10)
- Environment unsuitable for pedestrians (11-20)

- Very poor pedestrian conditions exist (21-30)
- Poor pedestrian conditions exist (31-40)
- Basic pedestrian conditions exist (41-60)
- Reasonable pedestrian conditions exist (61-80)



Image 6.13- 5th Main Road



Image 6.14 - 5th Main Road



6.15 - 9th Main Road



Image 6.16 - Bus Stop, 5th Main Road



Image 6.17 - 5th Main Road



Image 6.18- 9th Main Road



Figure 6.19: PEQI ratings on Existing Pavements



Figure 6.20: PEQI ratings on Existing Tree Cover

NMT SAFE ACCESS

PROPOSAL

Elements of Design

The recommendations made for the cycle track network proposed by DULT (refer Fig 6.36) aim to completely integrate the neighbourhood network with other modes and express services operating along the arterial roads (mainly bus and rickshaws).

While the ward has good service along bus routes, these bus routes are concentrated along specific corridors. Thus several areas within the ward are not within easy walking distance (500m) to bus services, and inefficient pedestrian amenities further reduce the number of commuters who will walk to access transit. The only modes available for intra-ward circulation and access to trunk services of the city are motorized transport. The proposed cycle network and its infrastructure extends to the peripheral roads and bus stops, as well other key activity generators of the neighbourhood to make them accessible by NMT (primarily cycles).

The main types of recommendations include:

- Dedicated cycle lanes
- Cycle prioritised routes
- Recreational routes



Image 6.37: Segregated Cycle Lanes
Source: blog.ciltsl.com



Image 6.38: Cycle Prioritised Lanes
Source: halfthefun.net

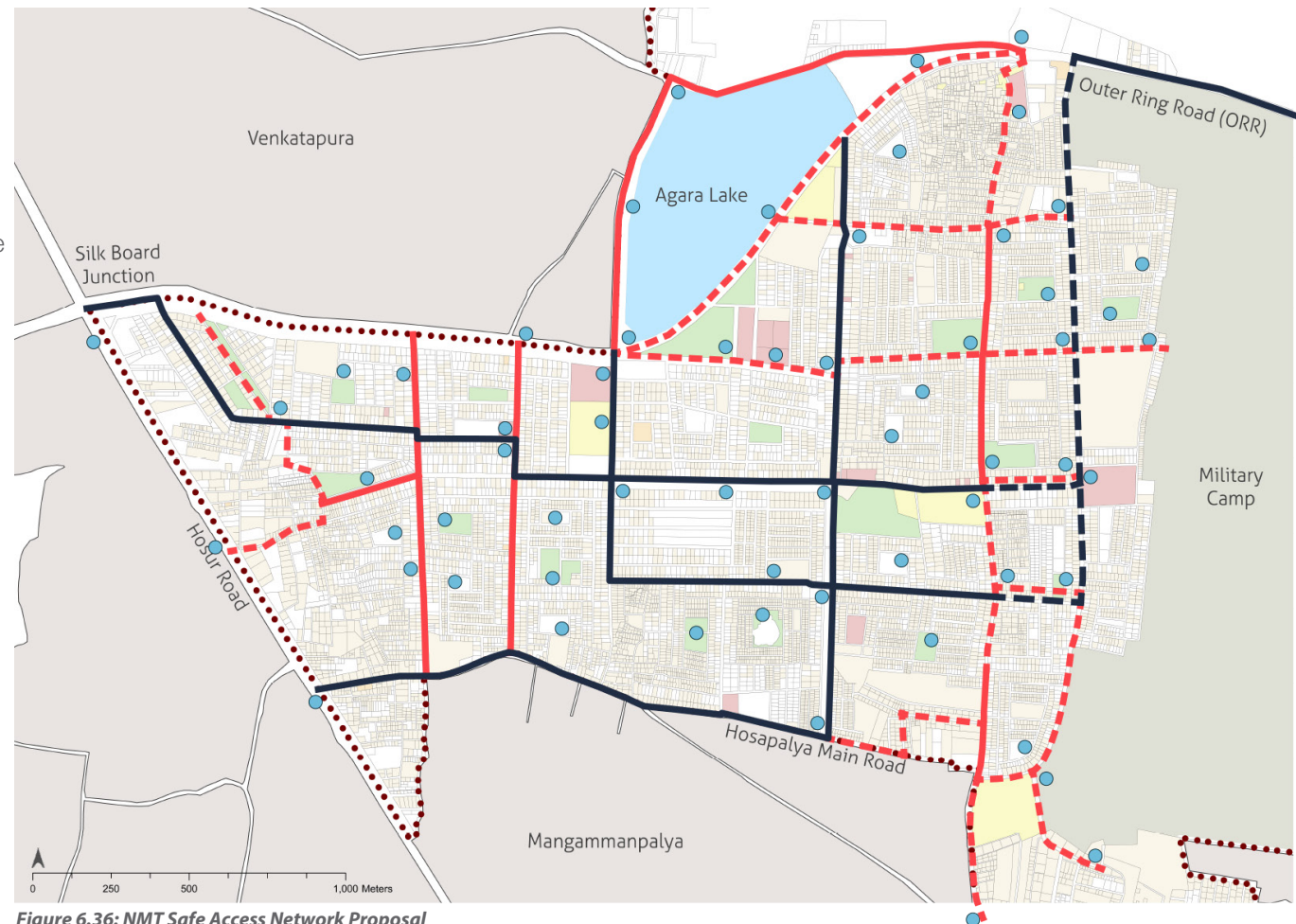


Figure 6.36: NMT Safe Access Network Proposal

LEGEND

- Proposed Cycle Stands
- Dedicated+Prioritised Cycle tracks proposed by DULT
- Proposed change in route
- Proposed dedicated cycle track extension
- - Proposed prioritised cycle track extension



Image 6.39: Two-way cycle lanes, as proposed by DULT
Source: Google

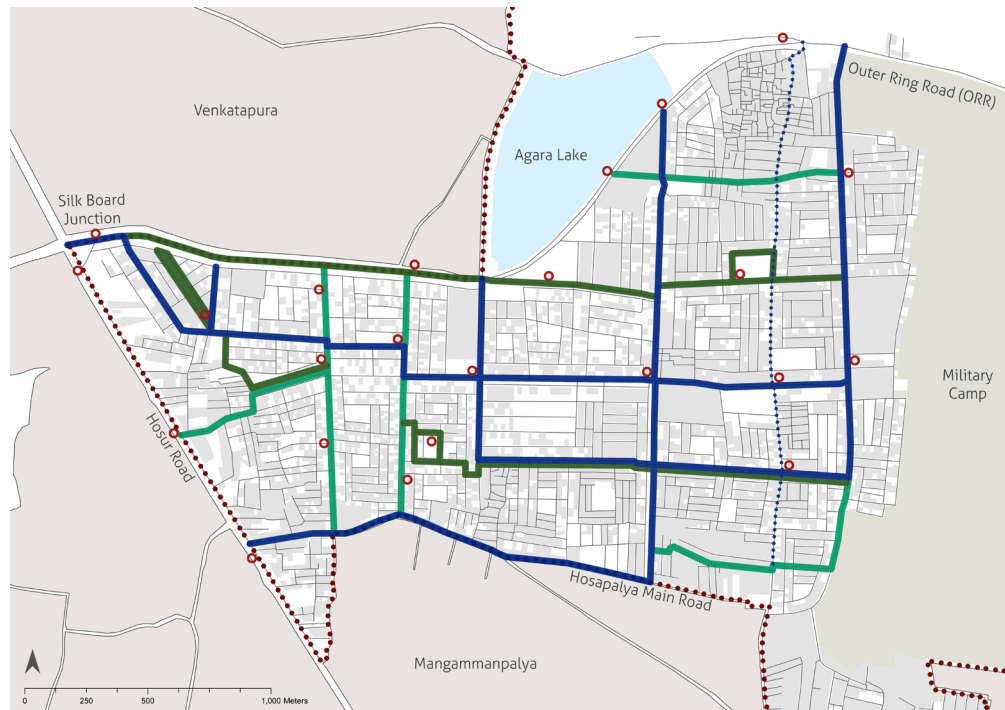


Figure 6.40: DULT Proposed Cycle Network



Figure 6.41: Integration of Networks

LEGEND

- Cycle Stands
- Cycle routes proposed by DULT
- Dedicated cycle routes suggested by EMBARQ
- Recreational NMT routes suggested by EMBARQ
- ⋯ Alternate route for 27th Main suggested by EMBARQ
- Dedicated Cycle Track
- - - Prioritised Cycle Track
- ● ● Cycle Track along Recreational Route

Dedicated cycle lanes

Segregated cycle lane networks are located along major roads that exhibit heavy traffic flows. The segregation ensures the safety of cyclists on these road sections.

The recommendations for these sections include:

- Permanent designation of lane width for the cycle track
- Segregation of lane with the use of paint & curbstones
- Docking/ parking racks at different locations on route
- Signage and demarcation of lanes at junctions.

Cycle prioritised routes

Cycle prioritised routes are along neighbourhood local streets which have lower traffic volumes.

The recommendations for such routes are as follows:

- Lane space to be shared with vehicles
- Segregation of lane with the use of paint & road reflectors.
- Docking/ parking racks at different locations on route.
- Signage and demarcation of lanes at junctions

Recreational routes

The recreational routes are more along the periphery of parks and other designated green areas for recreational riding .

VEHICULAR ACCESS & CARRIAGEWAY DESIGN PROPOSAL

Elements of Design

The vehicular safe access network (refer Fig 6.21) aims to develop safe vehicular movement within the ward. The neighbourhood roads are wide, and are located close to two major city arterials, hence they are used to bypass the usually congested Silk Board junction. The lack of traffic discipline, and irregular carriageway widths creates conflict between different vehicles, reducing pedestrian safety.

The elements of the vehicular safe access network include:

- Recommendations for the major neighbourhood roads (mainly for the collectors)
- Junction improvement plans
- Recommendations for minor intersections





Recommendations for the identified neighbourhood collectors

- Maintaining 4 (2+2) constant lanes with 3m lane widths for the entire network
- Prioritising movement of traffic on these roads over all other lanes
- Clear sight lines of minimum 25m at all junctions and pedestrian crossings
- Creating bus bays and auto rickshaw bays in this network
- Medians for lane discipline and avoiding haphazard turning
- Speed calming elements such as speed tables and chicanes that allow a maximum speed of 40km/h
- Designated parking bays for on street parking



Figure 6.21: Vehicular Access and Carriageway Design Proposal

LEGEND

-  Lane Discipline & Speed Control Measures
-  Junction improvement Plans
-  Neighbourhood Collector Roads - Consistent Carriageway Width 6m in Each Direction
-  Major Local Roads - Consistent Carriageway Width of 4.5m in Each Direction

Recommendations for the major neighbourhood roads

- Maintaining 2 (1+1) constant lanes of 4.5m width for the entire network
- Prioritising movement of traffic on these roads over all other lanes
- Clear sight lines of minimum 35m at all junctions and pedestrian crossings
- Medians for providing refuge for pedestrians
- Speed calming elements such as speed tables and chicanes that allow a maximum speed of 20 km/h

Junction improvement plans

- No obstruction of 15 m on either side of junction for clear visibility
- Bulb-outs to improve motorists' visibility of pedestrians
- Table Top crossings for junctions without traffic signals
- No speed humps at signals for greater throughput of vehicles at signalised junctions
- Medians for turning discipline
- Positioning of signals for clear visibility

Recommendations for minor intersections

- Speed tables at the mouth of the neighbourhood roads before joining the neighbourhood collectors
- Clear sight lines for motorists and pedestrians

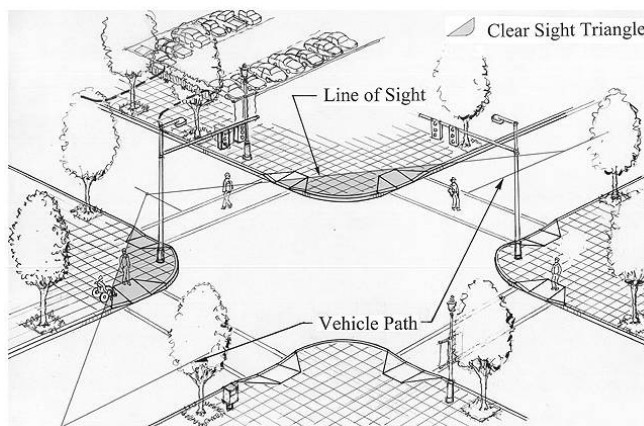


Image 6.22: Clear Sight Lines
Source: www.bicyclinginfo.org

Metric			
Design Speed (km/h)	Brake ¹ Reaction Distance (m)	Braking ² Distance On Level (m)	Design Stopping Sight Distance (m)
30	20.9	10.3	35
40	27.8	18.4	50
50	34.8	28.7	65
60	41.7	41.3	85
70	48.7	56.2	105
80	55.6	73.4	130
90	62.6	92.9	160
100	69.5	114.7	185

Image 6.24: Table showing standards for road design
Source: Bureau of local roads and streets manual



Image 6.23: Median
Source: agourard.blogspot.com

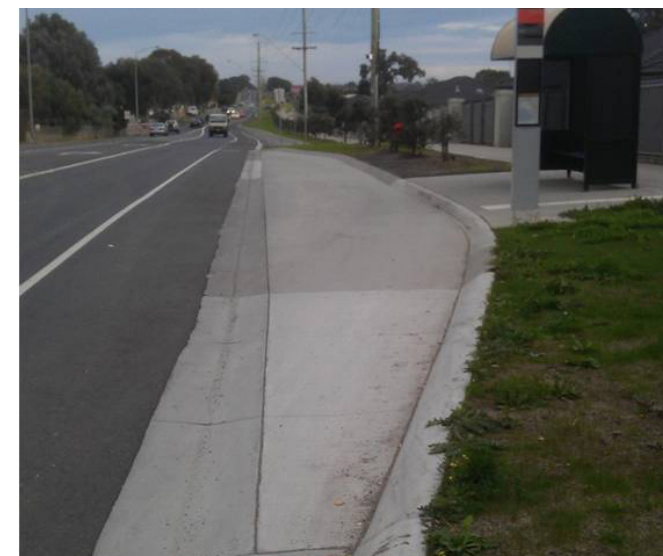


Image 6.25: Dedicated bus bay
Source: lgam.info

VEHICULAR ACCESS & CARRIAGEWAY DESIGN | ANALYSIS

A study of the existing vehicular movements and the peak and off peak volumes show that a large part of the vehicular movement in this neighbourhood is composed of city traffic bypassing the Silk Board Junction. The streets used more often are those that allow exits onto the ORR and Hosur Road. There also have been incidences of vehicular movement along smaller neighbourhood local roads during peak hours (refer Figures 6.26 & 6.27).

Vehicular congestion is mainly observed during peak hours and is mainly at the intersections of these (above mentioned) major neighbourhood collectors. Reasons contributing to this congestion are the different carrying capacities of these roads, due to varying carriage widths or unregulated parking at different locations.

The peaks of vehicular volumes are essentially office hour peaks (8am-11am and 5pm-7pm) with a small peak in the late afternoon due to school pick-up and drop-off activities. Though the straight, wide roads (refer Figures 6.28 & 6.29) serve peak hour capacities well, they create opportunities for speeding of vehicles during off peak hours. This is a major concern for pedestrian safety in the neighbourhood.

Consistent carriageways, designated parking bays and traffic calming measures will help maintain a consistent throughput on these streets while maintaining pedestrian safety.



Figure 6.26: Morning Peak Pattern

LEGEND

- Major movement of Traffic
- - - Minor movement of Traffic

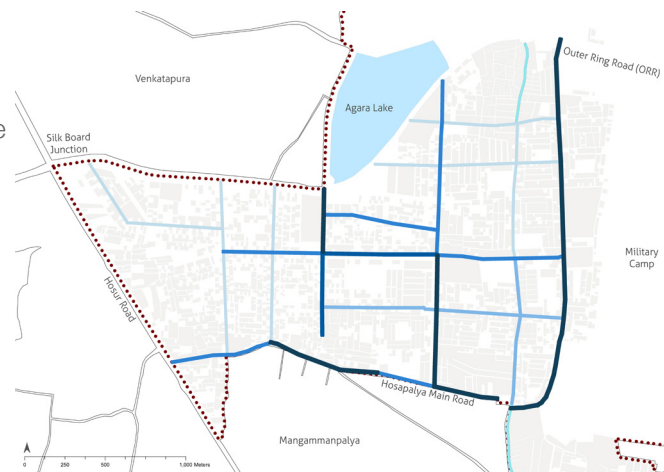


Figure 6.28: Existing Carriageway Widths

LEGEND

- 18m-19m
- 15m-17m
- 14m-15m
- 11m-13m
- 9m-11m
- <8m



Figure 6.27: Evening Peak Pattern

Source: EMBARQ India

LEGEND

- Major movement of Traffic
- - - Minor movement of Traffic

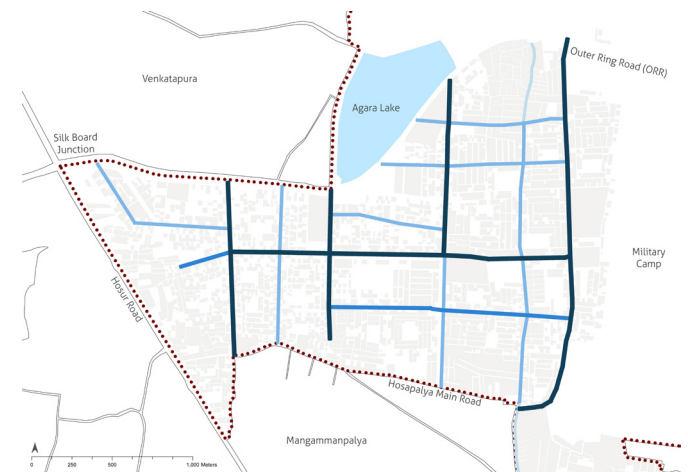


Figure 6.29: Existing ROWs

Source: EMBARQ India

LEGEND

- 20m-25m, Collector
- 16m-20m, Collector
- 11m-5m, Local
- 8m-10m, Local

VEHICULAR ACCESS & CARRIAGEWAY DESIGN | DETAILS

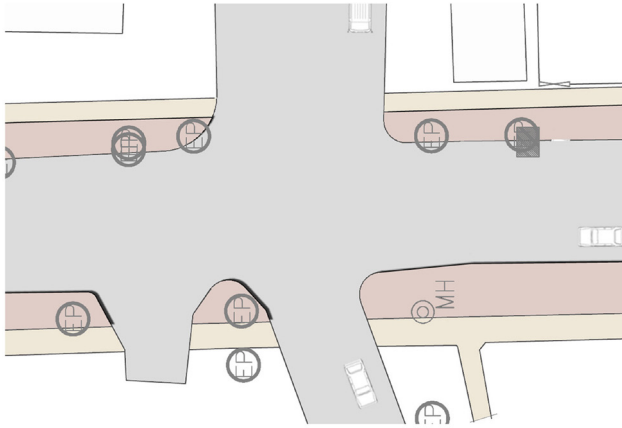


Figure 6.30: Existing 5th Main & 17th Cross Junction

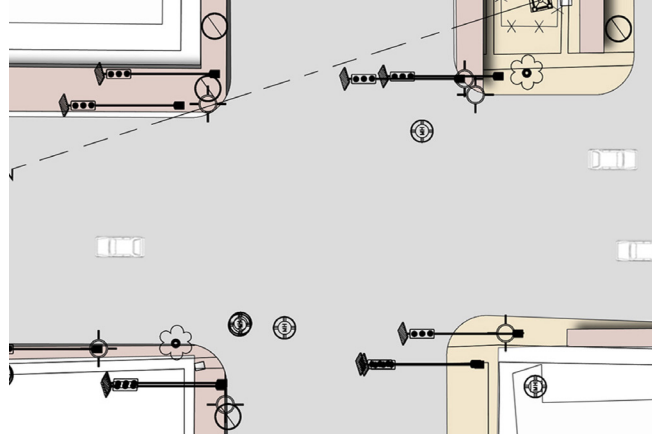


Figure 6.32: Existing Junction between 14th Main and 17th Cross

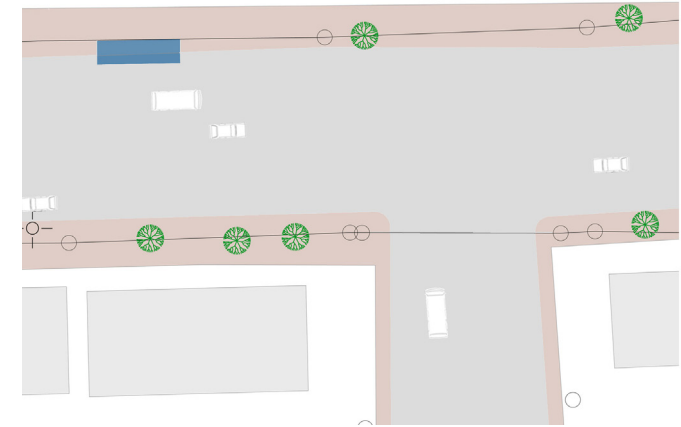


Figure 6.34: Existing Junction between 27th Main and 17th Cross



At grade pedestrian crossings to maintain vehicular throughput

Tabletop crossings to provide pedestrian refuge while crossing the streets as well as to regulate lane discipline while turning

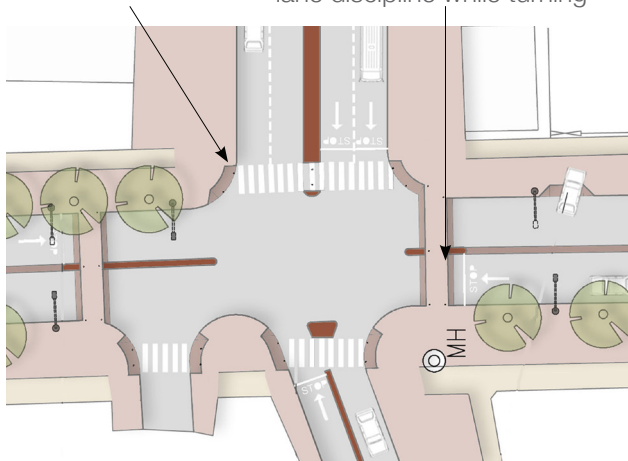


Figure 6.31: Proposed 5th Main & 17th Cross Junction



Bollards for pedestrian safety

Dedicated two-way cycle track

Streamlined carriageway widths and consistent road medians to maintain traffic discipline

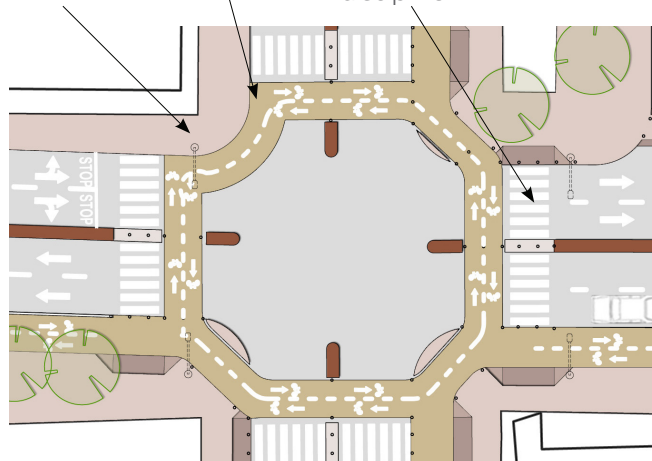


Figure 6.33: Proposed Junction between 14th Main and 17th Cross



Dedicated bus bay

At-grade pedestrian crossings

Curbs cuts in pavement

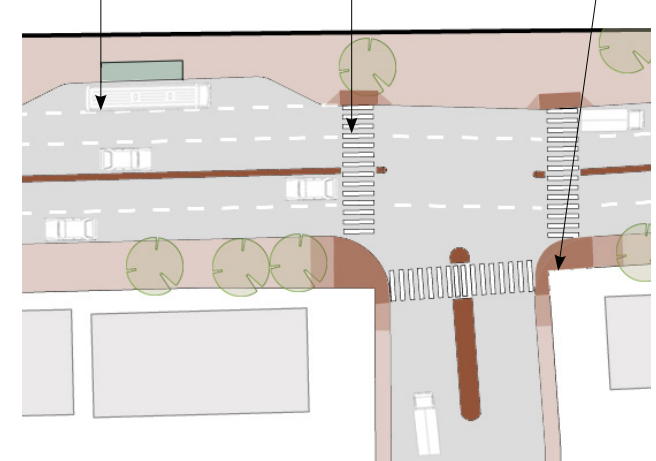


Figure 6.35: Proposed Junction between 27th Main and 17th Cross

PUBLIC OPEN SPACE NETWORK

PROPOSAL

Elements of Design

As a planned neighbourhood, HSR has several small pockets of open spaces in every sector. Open spaces can be categorized by scale:

- Local level open spaces which are smaller spaces used by residents of the sector.
- Ward level open spaces which are larger open spaces used by everyone in the neighbourhood
- City level open spaces which attract people from all over the city.

These spaces can also be categorized by the nature of the space itself.

- **Recreational Spaces** : which provide a setting for informal play and physical activity, relaxation and social interaction - gardens and open parklands, community gardens, corridor links, amenity spaces, community use facilities, civic commons or squares.)
- **Sport Spaces** : which provide a setting for formal structured sporting activities - maidans with appropriate infrastructure, space for spectators etc)
- **'Nature' Spaces** : which provide a setting where people can use, enjoy , and thereby protect natural settings and local urban green habitats - bushland, coastal areas, wetlands , riparian habitats, and geological and natural features.

Our study of the neighbourhood indicates that there is a lack of ward level recreational plazas and sport spaces. The potential open spaces have been identified, and it is proposed that a ward level plaza be designed in the BDA complex. It is also suggested that two sports areas be introduced, one along 17th cross and another along the ORR.

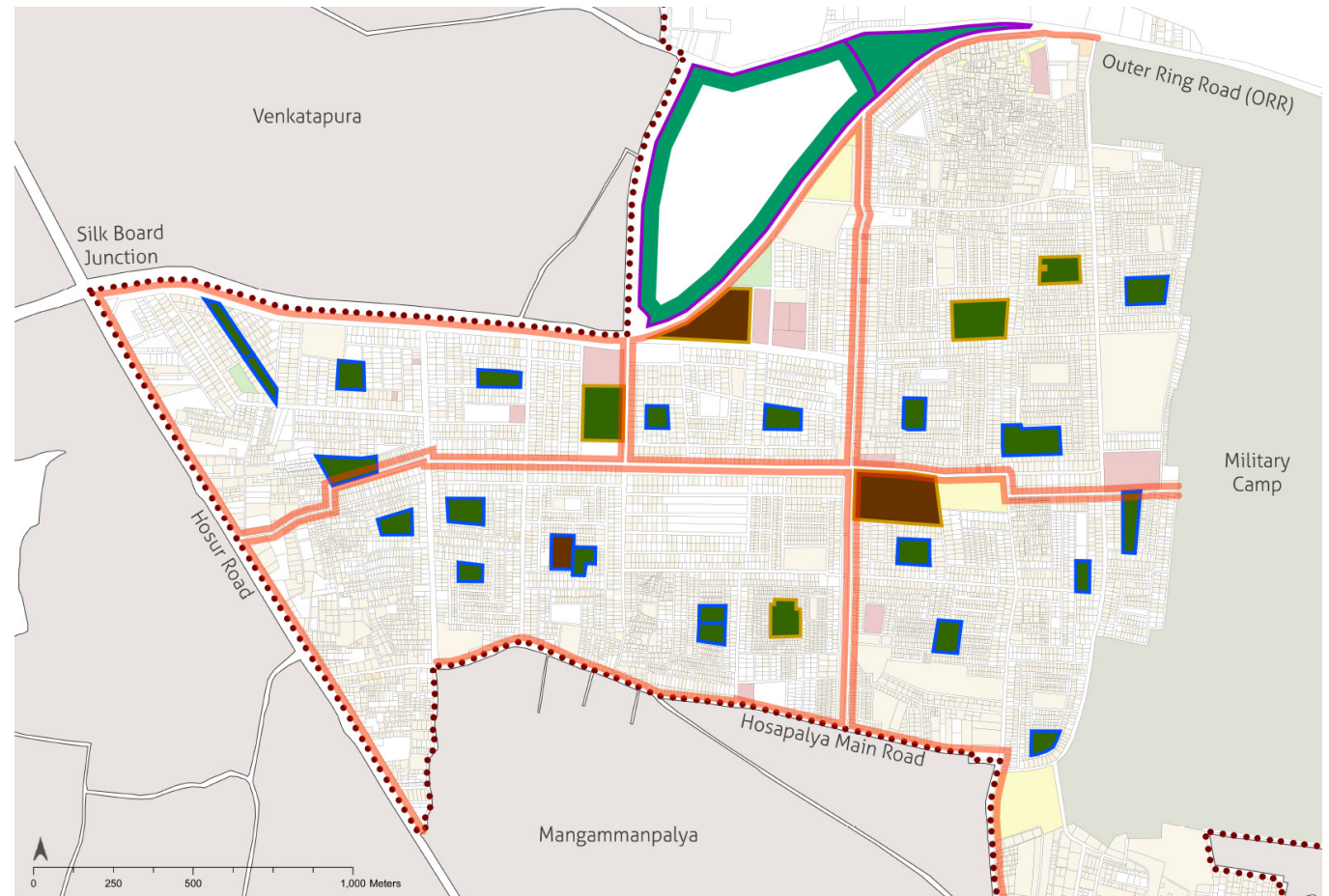


Figure 7.1: Open Public Space proposal

LEGEND

■ Recreational Space

■ Sport Spaces

■ Nature Spaces

■ Schools

■ Govt. owned infrastructure yards

□ Local Level Spaces

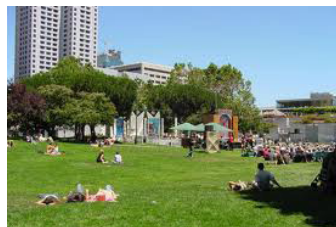
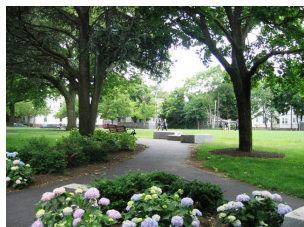
□ Ward Level Spaces

□ City Level Spaces

— Proposed Sidewalk

Types of Open Spaces:

Recreational Parks



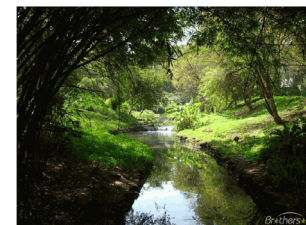
Recreational Plazas



Sport Spaces



Nature Spaces



Design of Open Spaces

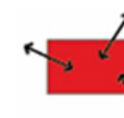


Figure 7.2: Principles for Good Public Open Space Design

The following design parameters are derived from the principles of good public open space design.

- Integrated Bicycle and Pedestrian Networks
- Green Network
- Storm Water Management
- Integration with Existing Landscape
- Porous Ground Surfaces
- Handicap Accessibility
- Vending Space
- Low Maintenance
- Local Context

Secure Pedestrian Access



Ensure a lively edge



Ensure visibility



Upgrade the adjoining streets

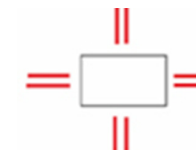


Figure 7.3: Open Public Space proposal
Source: *Shaping Neighbourhoods' A Guide for Health, Sustainability and Vitality*, By – Hugh Barton, Marcus Grant and Richard Guise. SPON Press Taylor and Francis Group (2003)

PUBLIC OPEN SPACE NETWORK | ANALYSIS

“All homes should be within 400m actual distance of a greenspace, and 800m maximum of a space on the green network giving access to round walks” - ***‘Shaping Neighbourhoods’ A Guide for Health, Sustainability and Vitality, by Hugh Barton, Marcus Grant and Richard Guise. SPON Press Taylor and Francis Group (2003)***

HSR Layout has many open areas: parks and nature spaces. There is at least one park within 400 m of every house. The community actively uses some of these parks through activities like yoga classes and buying of vegetables from local vendors. (The latter occurs owing to the situation of HOPCOMS or private vendor carts/ stalls along park edges) .Hence these spaces remain active during the day.

Agara Lake is an excellent city level ‘nature’ space; walking trails around it are currently being developed.

Despite the frequency of these open areas, there are very few that are accessible to all, regularly maintained, and safe throughout the day. There is a definite dearth of open public spaces that cater to certain age groups (eg children’s parks/playgrounds) in the neighbourhood.

The edges around these open areas are also often dead, making the space unattractive. Programming the spaces in and around the open areas with weekly activities, vending, yoga clubs, and laughter clubs can all further the improvement of these spaces.

Currently, the largest open spaces haven’t been utilized. These provide for great opportunities, and we propose that they be developed as plazas and sport spaces for the neighbourhood.

Open spaces also need to be connected by providing an active NMT network around the parks.

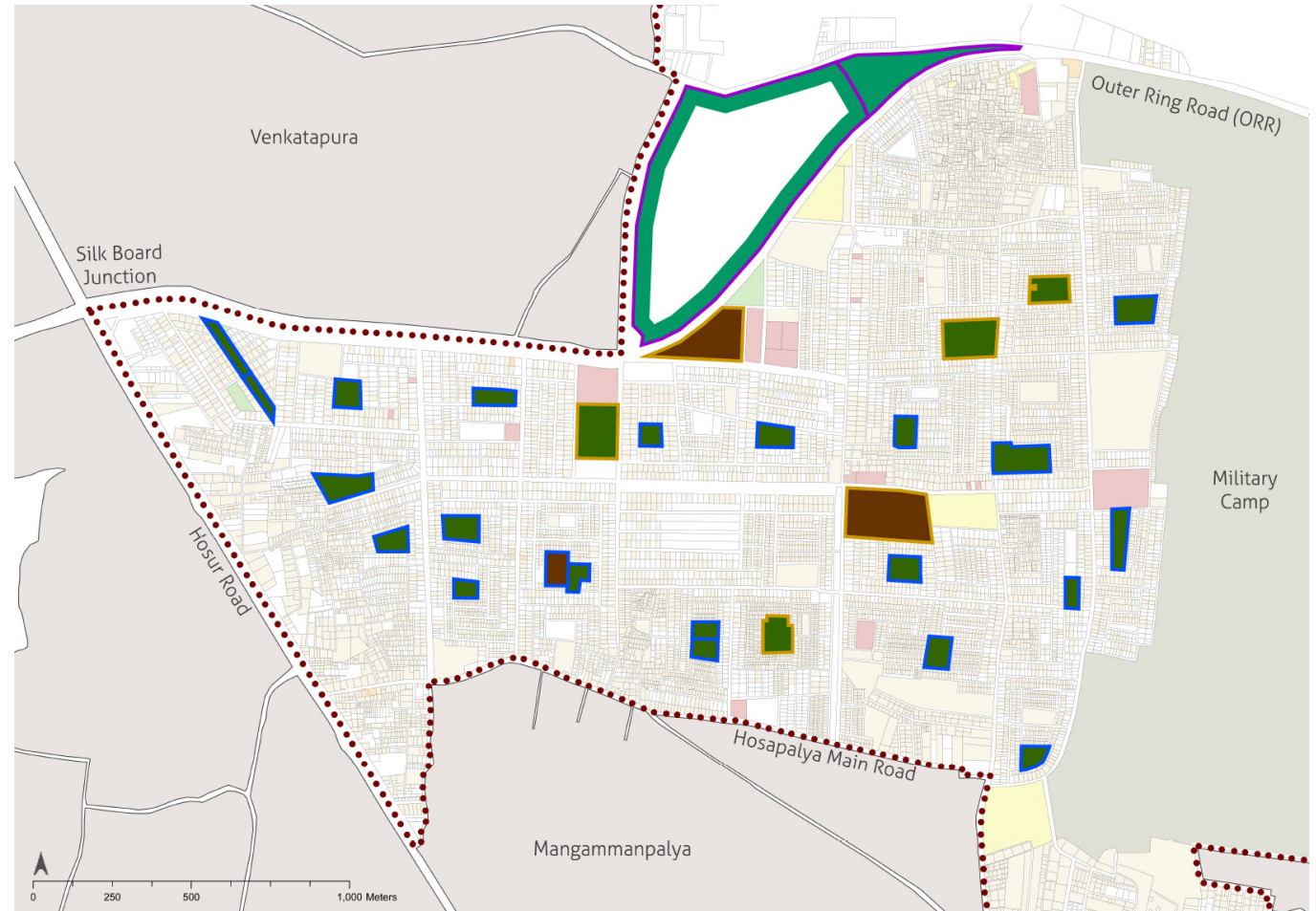


Figure 7.4: Public Open Space Network proposal

LEGEND

 Recreational Space	 Schools	 Local Level Spaces
 Sport Spaces	 Govt. owned infrastructure yards	 Ward Level Spaces
 Nature Spaces		 City Level Spaces

The public open spaces in HSR layout were graded against the principles mentioned in the 'Good Open Space' matrix (Fig 7.2) where 9 is the maximum possible score. Please note that it is difficult to measure spaces for the principles 'Context Sensitive' as this is perception based. There was not sufficient information/technical expertise available to assess the spaces against the 'Financially Feasible' principle.

Sense of Place:

Is there flexible usage of space?

3/9

Comfort:

Is there public seating?

7/9

Presence of buffers to pollution and noise?

7/9

Presence of public toilets and drinking water fountains?

0/9

Safe:

Entrances on main roads?

6/9

Is there pedestrian scale lighting?

5/9

Is there surveillance?

0/9

Management:

Is the space maintained?

5/9

Is there a clear defined property line?

8/9

Is there a list of prohibited activities?

5/9

Accessible:

Is there a paved area/ walking path available?

7/9

Is there convenient ramp access?

0/9

Environmentally Sustainable:

Is there Solar lighting?

0/9



URBAN GREEN HABITAT

PROPOSAL

Elements of Design

An urban green habitat network aims to enhance an individual's connection to nature. The fragments of urban green are best experienced when the user is a pedestrian or a cyclist moving at a slow pace. The walking/cycling trails if punctuated by green interventions can make the experience richer and soothing. An urban green also accommodates a habitat for smaller birds and animals that live within this environment. For this system to emerge the following measures are recommended:

- Identification of habitat niches
- Enhancing interconnectivity
- Protection from human interference
- Enhancing it by related earth, water and green works
- Exploring instances where the network of habitat niches and the NMT network can be integrated
- Exploring different ways of experiencing:
 - Visual experience
 - As a natural system to be observed & explored
 - As a sensory experience, especially sounds & smells for the visually impaired
 - As a psychological link to nature

The urban green connects with mobility in the following ways:

- City mobility becomes a wholesome healing experience, more than just a functional link
- It breaks away from the chaos of city life
- Gives physical comfort by shade and green envelope



Figure 8.1: Urban Green Habitat Network Proposal

LEGEND

 Park Pockets	 Schools	 Continuous indigenous vegetation patch
 Green Series	 Govt. owned infrastructure yards	
 Drain Series		
 Lake	 Proposed Park	

Details of Design



Image 8.1: Ideas for park spaces
Source: accessfayetteville.org

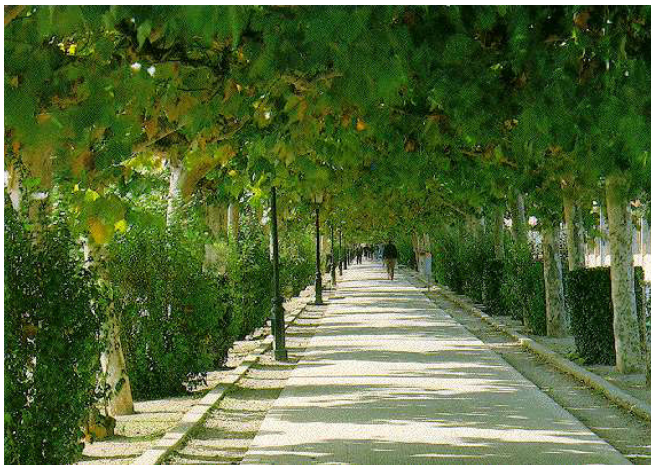


Image 8.3: Ideas for park spaces
Source: upv.es



Image 8.5: Ideas for edge conditions
Source: neavestormwater.com



Image 8.6: Ideas for edge conditions
Source: blogspot.com



Image 8.2: Ideas for swales in park spaces
Source: ercshowcase.com

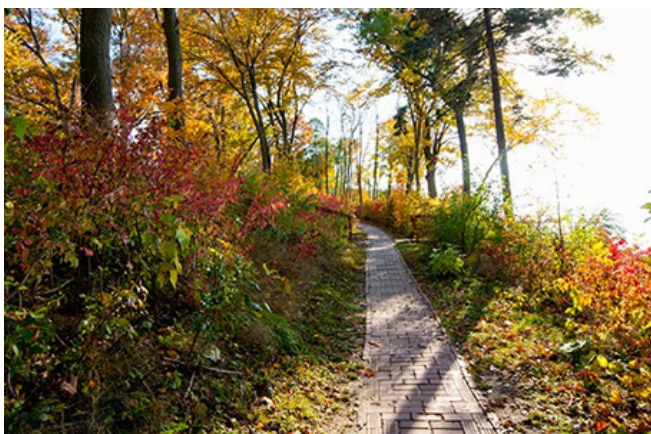


Image 8.4: Ideas for park spaces
Source: lakegenevaescape.com



Image 8.7: Ideas for edge conditions
Source: muralmouth.wordpress.com

URBAN GREEN HABITAT | ANALYSIS

Existing mapping for Sector

HSR Layout, located in the south-eastern side of the city, has a general slope towards the North and West side. Agara lake is to its North and a large, green open space (military campus) to its east.

Natural drains flow North, feeding the Agara Lake. Fragments of parks and stretches of green are seen along the East-West direction.

Drain links can be woven into the parks network and plugged into larger habitat resources like Agara Lake and the military green.

The main idea is to enhance connectivity by linking flowlines in the networks with green infrastructure, and as a result, pedestrian mobility along with it.

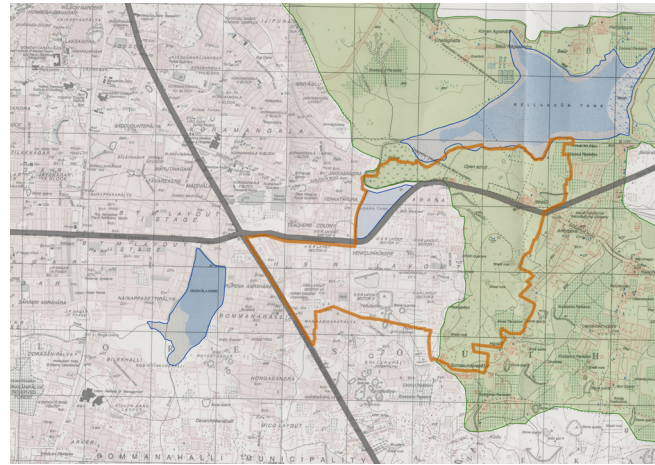


Figure 8.2: Ward 174
Source: Survey of India Maps, EMBARQ India

LEGEND

- Main roads - ORR and Hosur
- Ward Boundary

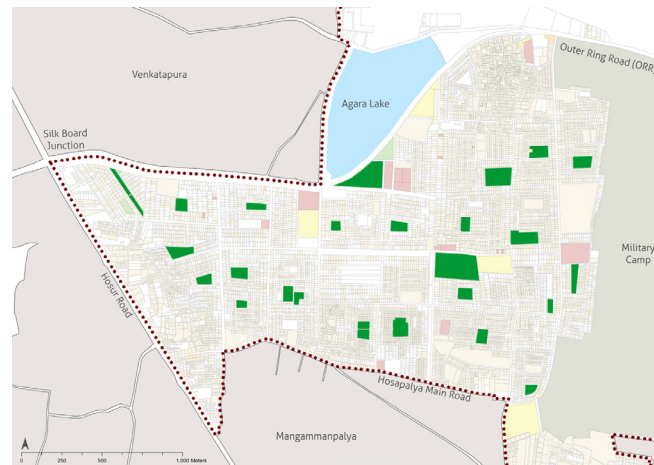


Figure 8.4: Green spaces

LEGEND

- Parks and other green spaces

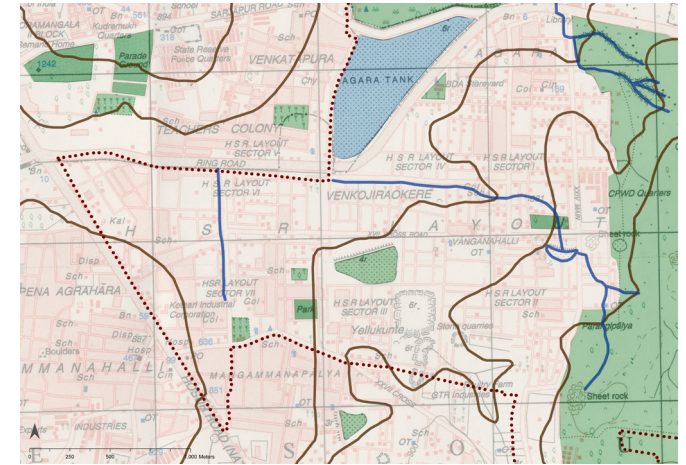


Figure 8.3: Physical mapping
Source: Survey of India Maps, EMBARQ India

LEGEND

- Contour lines
- Major drains

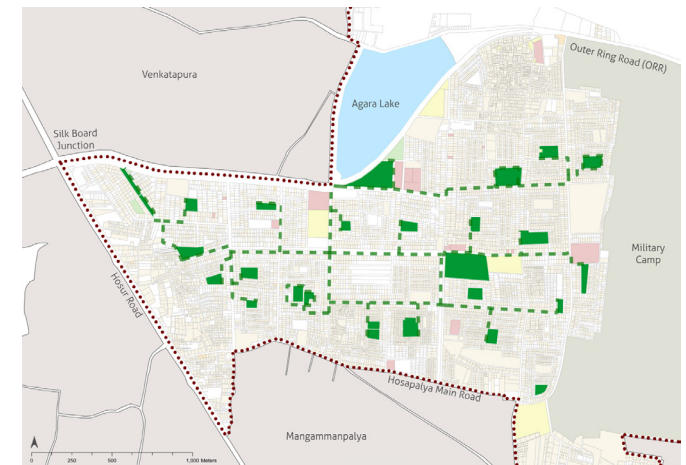


Figure 8.5: Connected Green Spaces

LEGEND

- Parks and other open spaces
- Connections to green spaces



Figure 8.6: Google Earth Imagery
Source: Google Earth 2013

GREEN POCKETS

Existing condition

- Park spaces are mostly walled off from the surrounding areas, preventing any continuity along the ground
- The entire garden space is manicured with lawns and ornamental plants, which blocks any opportunity for natural/indigenous flora and fauna to develop
- With limited entry points into these parks, they behave like locked spaces rather than porous areas

Potential and opportunity

- Parks can be made more porous and can include the larger NMT network within them
- Since there are many parks, and several of them are large, we can allow for a natural habitat to grow in some parts, especially along the edges
- There is opportunity to work with park edges, and make them more inclusive rather than exclusive

Recommendations

- Study the slope and introduce a swale for short runoff across site, making it a natural habitat
- Isolate the area by low fence to reduce human interface in certain parts of the park
- The swale can also allow for diagonal links across the park, and allow for foot and cycle traffic along a specific path
- Such habitat patches can also include composting pits since these have a symbiotic relation with each other
- Introduce vegetation that is local and create natural habitat



Image 8.7: Existing Panorama of Park

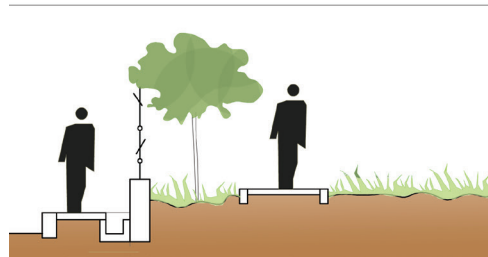


Figure 8.13: Typical existing edge section

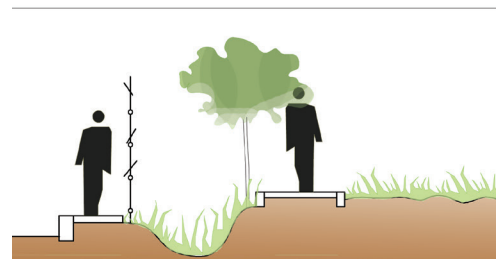


Figure 8.14: Proposed edge section

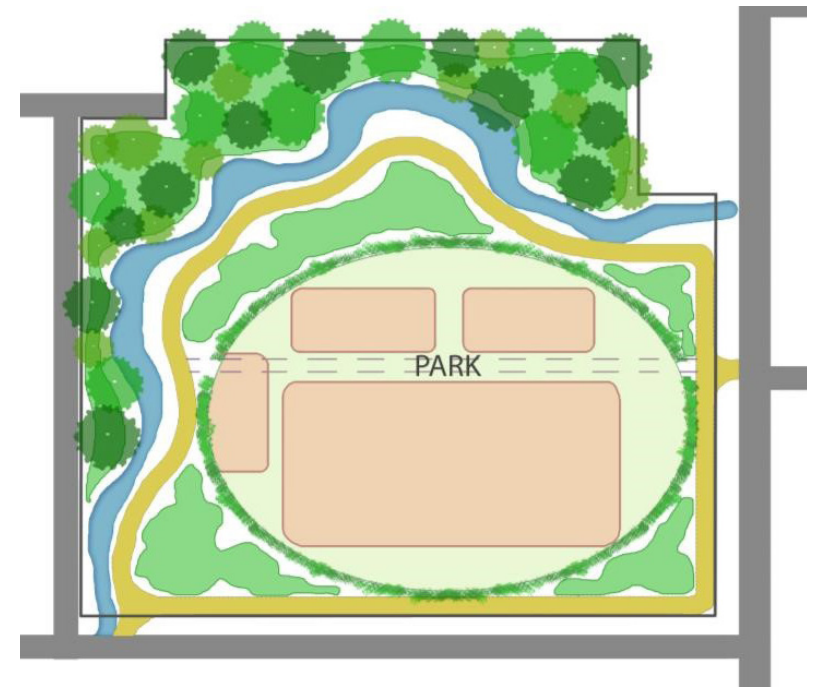


Figure 8.15: Proposed plan for park

GREEN SERIES

Existing Condition

- This is land under infrastructure zones or along utility lines where no building activity is allowed
- In HSR Layout, such land is not articulated and has unassigned programs
- These lands run continuously along major streets across the layout
- Currently, in large sections there is no pavement or barrier to vegetation

Potentials and opportunities

- Due to their continuous length along major roads, they can accommodate non-motorised transport
- It is an opportunity to get uninterrupted green space
- At places where adequate width is available, there is an opportunity to develop parks
- This can also act as a buffer space between roads and walking/cycle paths

Recommendations

- Fencing should be provided in parts along green areas to isolate them from human intervention
- Design bioswales to drain water
- Introduce habitat related vegetation
- Introduce walking/cycling trails along these stretches



Image 8.4: 19th Main, looking North



Image 8.5: 19th Main, looking South



Image 8.6: 17th Cross

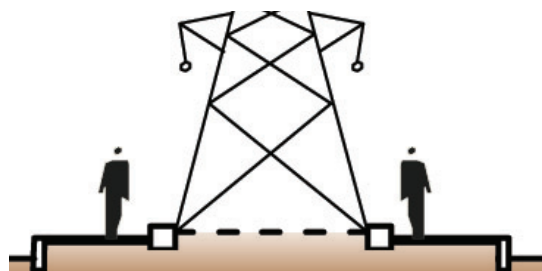


Figure 8.10: Typical section along tension line - Existing



Figure 8.11: Typical section along tension line - Proposed

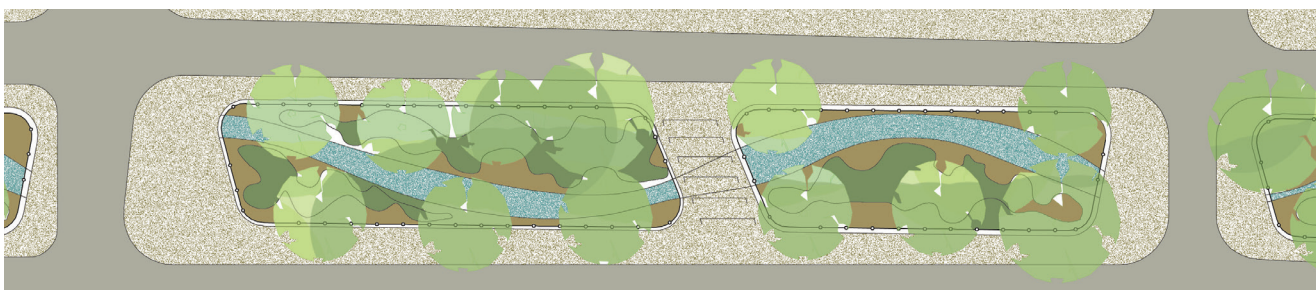


Figure 8.12: Proposed plan along medium tension line

DRAIN SERIES

Existing condition

- Most of the constructed drainage channels have land stretches along them that are not articulated
- The drains usually have a vertical retaining wall, leaving no space for a transition area
- The drains tend to become an eyesore since they are uncovered, and have no buffers around them

Potential and opportunity

- Due to the flowing water and moist conditions all along, these areas are suitable to be developed as natural habitats
- There is a great possibility for NMT and it is encouraged along such green corridors throughout the neighbourhood
- If there is land available near these drains, it can accommodate bus stops and other pause places

Recommendations

- The drain sections need to be reworked as suggested in Figure 8.8. Stepped/pitched conditions can accommodate a wider vegetation belt, thus creating more space for a natural habitat. A wider vegetated belt would help clean storm water flowing into the drains in a natural way and help in flood control to some extent.
- Sewage flows into these should be redirected, leaving the drains to accommodate only natural run-off or storm water.
- The edges of these stepped areas bordering the drains should be planted with shady trees. The paths along these trees can then form scenic walking/cycling routes or pause points



Image 8.2: Drain along 12th Cross, looking West

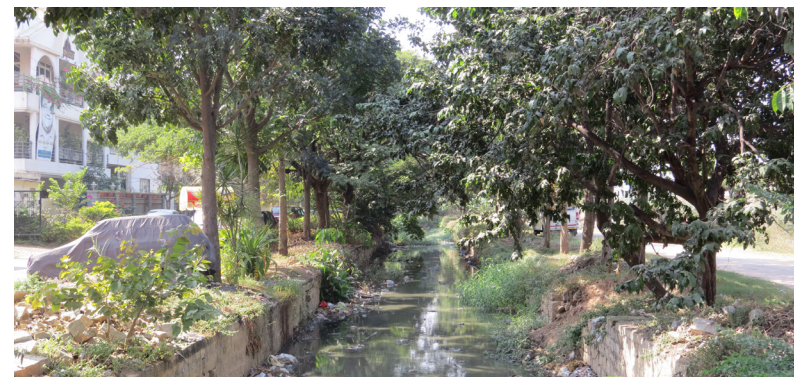


Image 8.3: Drain along 12th Cross, looking East



Figure 8.7: Typical drain section - existing



Figure 8.8a: Typical drain section (pitched)-proposed



Figure 8.8b: Typical drain section (stepped)- proposed

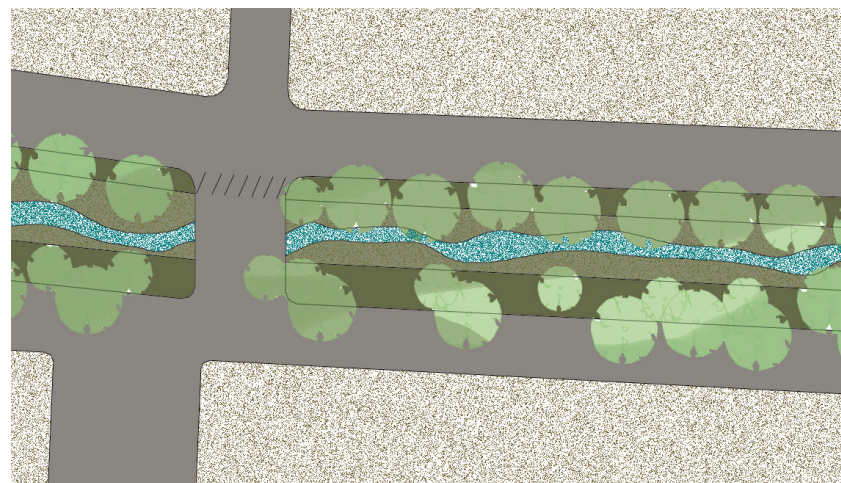


Figure 8.9: Typical drain plan - proposed

LAKES

Existing condition

Agara Lake is about 3,49,296 sqmts in size with a perimeter of 2584 mts. It has varying edge conditions such as -

- The southern edge is bordered by the Outer Ring Road which has a heavy movement of traffic. There is a garden bund trail along this stretch which acts like a buffer
- The western edge has an approximately 23m wide sewage carrying drain that bypasses the lake.
- The northern edge is a bund road (Sarjapur Road) that segregates Agara lake from Bellandur lake.
- These edges are cluttered and unarticulated, either with green or civil works.
- A number of birds are seen in and around this lake edge

Potential and opportunity

The availability of open land stretches between the water body and road interface, provide a great opportunity to integrate the NMT network with natural habitat spaces.

Recommendations

- Pavement to negotiate the road and the lake bund
- Introduce the recommended chain link fence detail to reduce human interference.
- Earth contouring to channel water and encourage vegetation growth.
- Introducing local, natural vegetation appropriate to bird and small animal habitats.



Image 8.8: Panoramic view of drain, lake and ORR edge

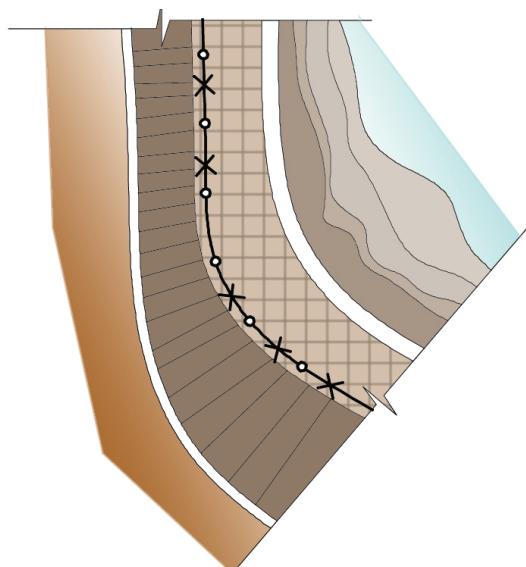
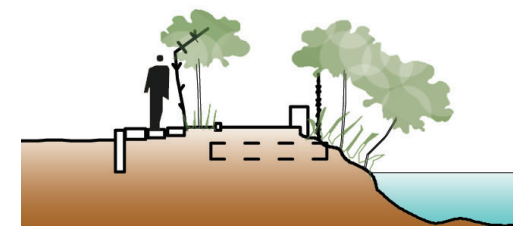


Figure 8.16: Typical edge condition - existing

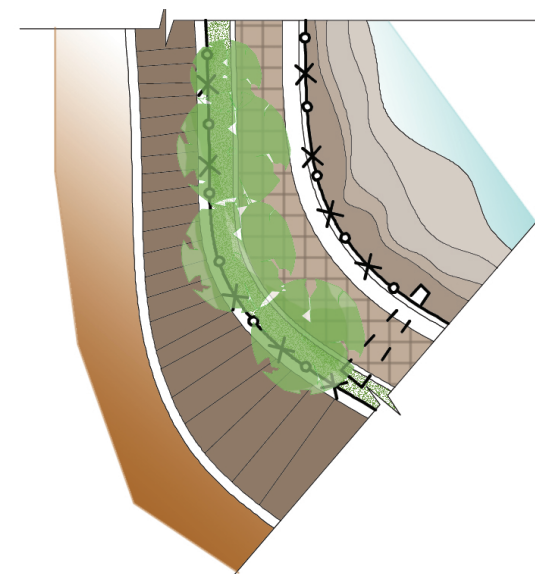


Figure 8.17: Typical edge condition - proposed

TRANSPORT NETWORKS

PROPOSAL

The bus network can be broadly categorised into two types: trunk route systems that ply on the main arterial roads (ORR and Hosur road), and routes that start elsewhere and ply through the ward.

While both the services provide good connectivity to the rest of the city, the arterial routes provide for better service levels and a wider network of routes.

Last-mile connectivity and safe access to these bus services are critical areas of intervention. The internal network also shows a good service level but is limited to very few routes and does not provide good service distribution across the ward.

While there are good service levels available from the BDA complex and 5th main, these locations are not central to the ward itself and are not accessible at walkable distances.

In some cases along bus routes, stops are not at regular intervals. There are also instances of bus stops lacking infrastructure such as shelters, seating and other amenities. (refer Fig 9.1).

As proposed in the diagram, some bus stops may fall very close to each other. They cannot, however be clubbed into one as they service routes that don't co-incide enough.

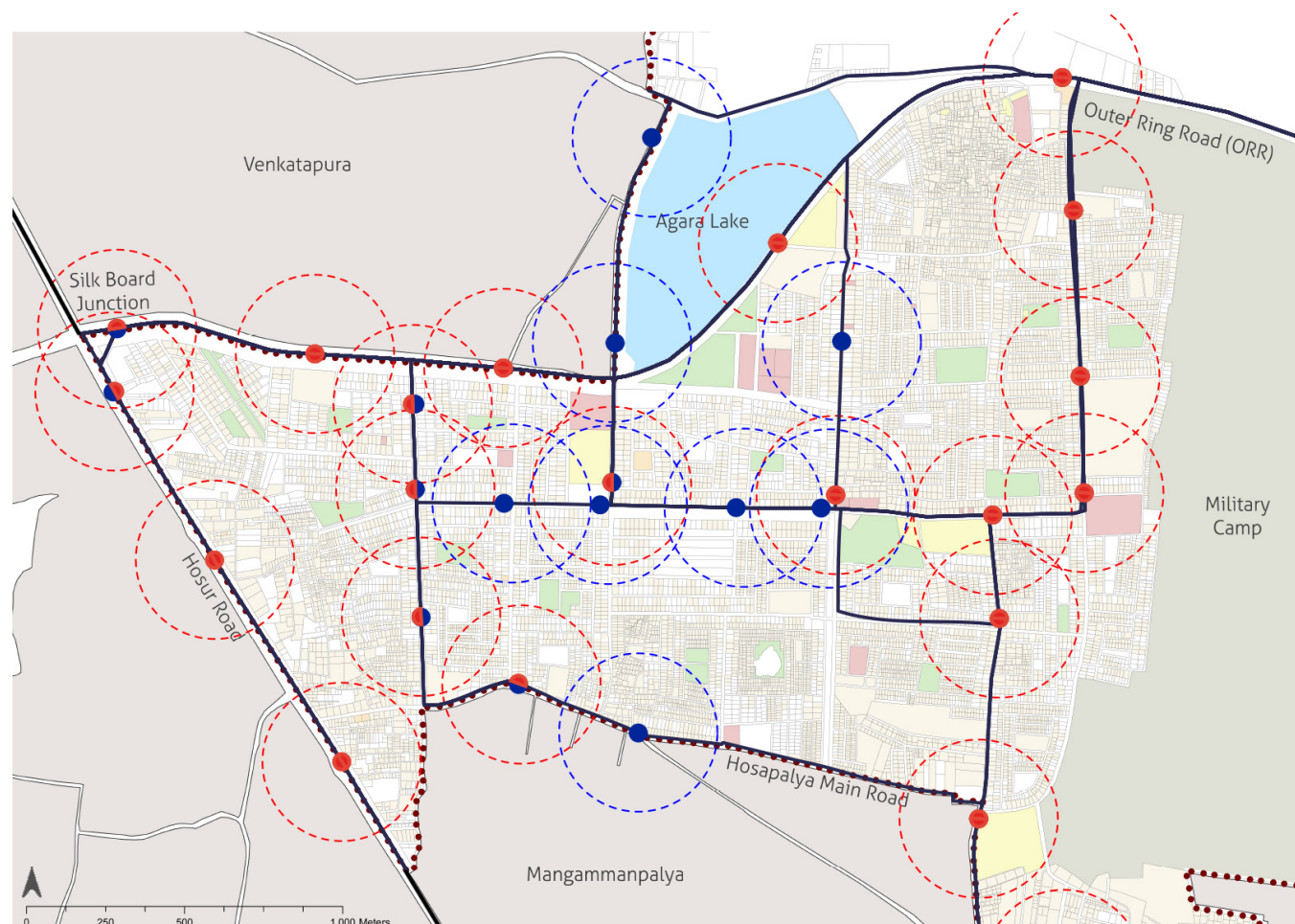


Figure 9.1: Transport Networks Proposal

LEGEND

- Existing Bus Stops
- Missing Bus Stops
(Note, a half red-half blue dot indicates that the bus stop is present on one side of the road, but missing on the other side)
- 2 Minute Walking Radius
- Existing Bus Routes

Intra-ward networks can be addressed by identifying feeder loops in the neighbourhood along which planned mini-bus services of the BMTC can run.

The recommendations are as follows (refer Fig 9.2):

1. Develop feeder systems (pedestrian, cycle and rickshaw) that feed the major trunk routes of the city and the 'U' corridor in the ward. This would include:
 - a. Safe pedestrian access to bus stop locations
 - b. Bus stop waiting areas with facilities such as seating, weather protection, dustbins and other amenities
 - c. Safe cycle routes that are in close proximity to bus stops along with bicycle docking infrastructure.
 - d. Rickshaw drop-off points in close proximity to bus-stops.
2. Reorganize routes running along 14th main, 17th main and the 27th main to cover the entire 'U' corridor before reaching their respective staging areas, i.e. rationalise the U corridor.
3. Reorganize the staging area of the route referred to in the previous recommendation to a point along 17th cross.
4. Identify a mini-bus route that connects the major generators of the neighbourhood and the major bus stops of the neighbourhood.
5. Introduce bus stops in the neighbourhood so that the distance between consecutive bus stops are reduced to approximately 500m.

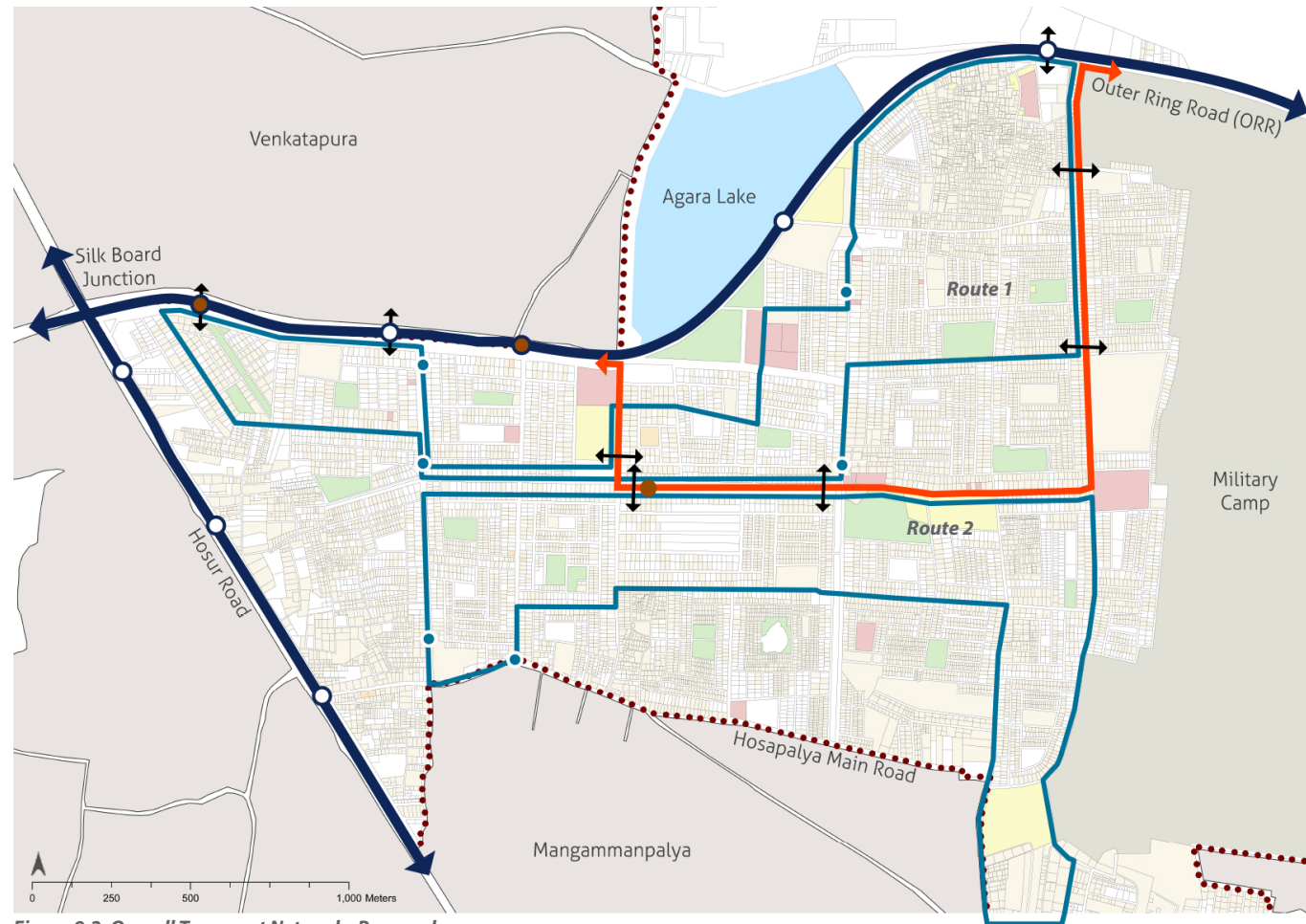









Figure 9.2: Overall Transport Networks Proposal

LEGEND

- | | |
|---|---|
|  Proposed Neighbourhood Trunk Routes |  Trunk Bus Stops requiring better Accessibility |
|  Major City Trunk Routes |  Possible Feeder Bus Routes |
|  Transfer Points to Major Corridor Routes |  Possible Auto-Rickshaw Stand Locations |
|  Transfer Points to Minor Corridor Routes | |

TRANSPORT NETWORKS | ANALYSIS

Bus systems and infrastructure

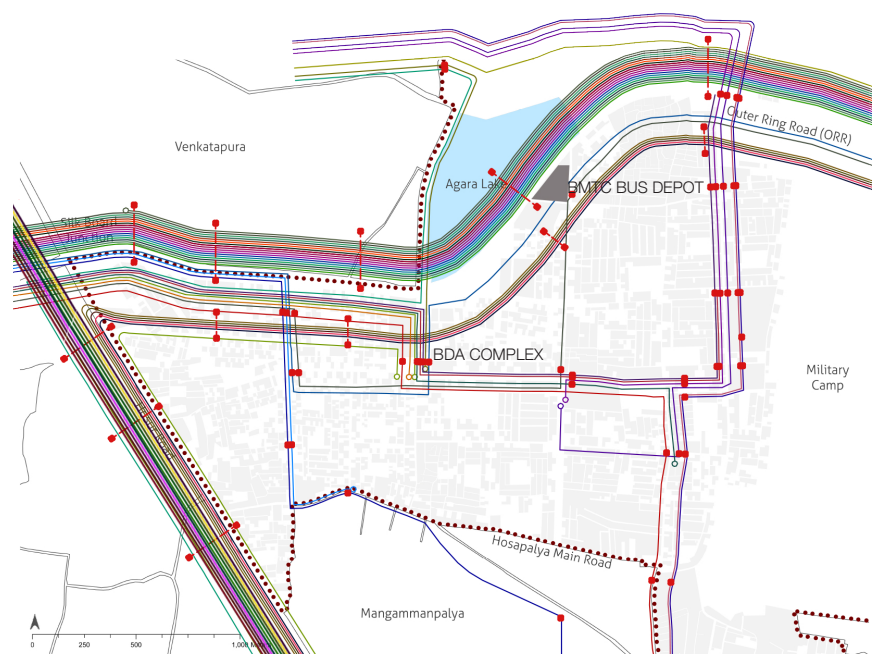


Figure 9.3: Existing Bus Stop Locations & Bus Routes

The study of bus services was done through the evaluation of bus routes, number of routes, frequency and infrastructure in the ward. The study showed that though there are many bus routes plying through the ward itself (this excludes the routes running along ORR and Hosur road), they are concentrated in only a few areas of the neighbourhood.

Levels of service

The segment between BDA complex and the outer ring road on 14th Main, is the most serviced route with as

many as seven routes plying from there followed by 27th cross (refer Fig 9.3). The other main roads in the ward have few routes running on them. Also, the bus routes are planned in a way that circulation within the neighbourhood is difficult without having to change a few buses for the short 2 to 3 km stretch.

Bus frequencies

Bus frequencies on different routes also show service levels to be highest on the 14th main section between BDA complex and the ORR, with a bus running every

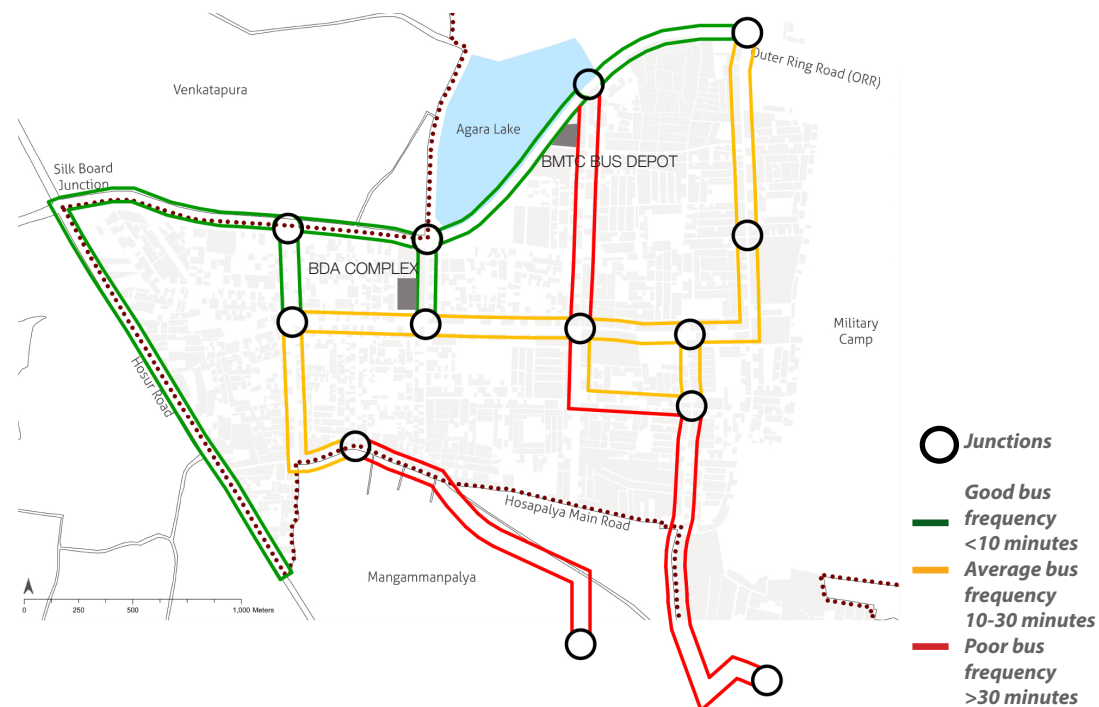


Figure 9.4: Existing Bus Frequencies

5 minutes (refer Fig 9.4). In contrast, in other segments serviced by BMTC, the frequency ranges between 20min to 2 hours.

A look at bus stand locations in the neighbourhood also shows that the bus stops on many routes are placed 700m to 1km away from each other making accessibility from different parts of the neighbourhood difficult. Better distributed bus stop positions will greatly help this situation. Bus stop infrastructure such as signage and shelters are also missing at many locations, making it difficult to locate bus stops and identify the routes served. (refer Fig 9.5).

Existing Bus Network

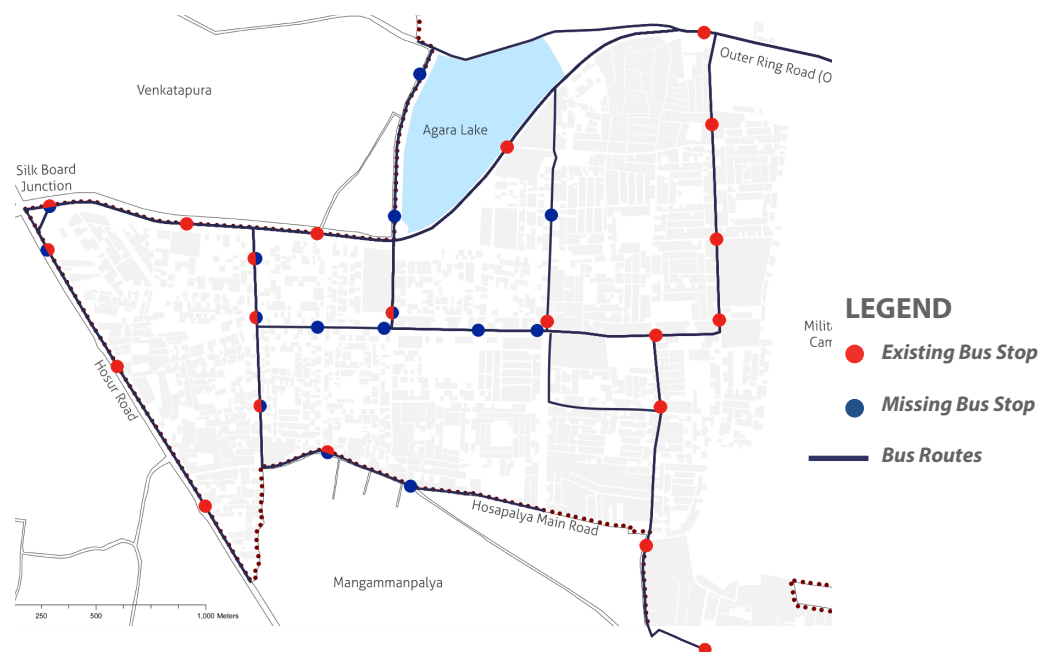


Figure 9.5: Existing Bus Stop Infrastructure

Issues

Reasons for these varied service levels are: Although many buses begin their official route from the BDA complex bus stop, they must ply across the neighbourhood from the BMTC depot (where they are parked overnight), resulting in a dead kilometre route. Also many bus routes operate on particular roads but do not have designated stops on the road. This results in a situation where many buses ply through the neighbourhood, but do not provide the service levels that can easily be achieved.

Opportunities

A revision of the stop locations along all the routes through the neighbourhood and the extension of some routes can help achieve better coverage and service levels within the neighbourhood. Rerouting a few routes will also help fill gaps, thereby providing services that run across the ward before exiting. Also provisions for bus stop infrastructure with information on routes, numbers and timings will help locate and find the bus required by the users.



Figure 9.6: Existing Rickshaw Stand Locations



Image 9.7: Bus Stop design
Source: humantransit.org

DESIGN DETAILS

5TH MAIN ROAD



Keyplan

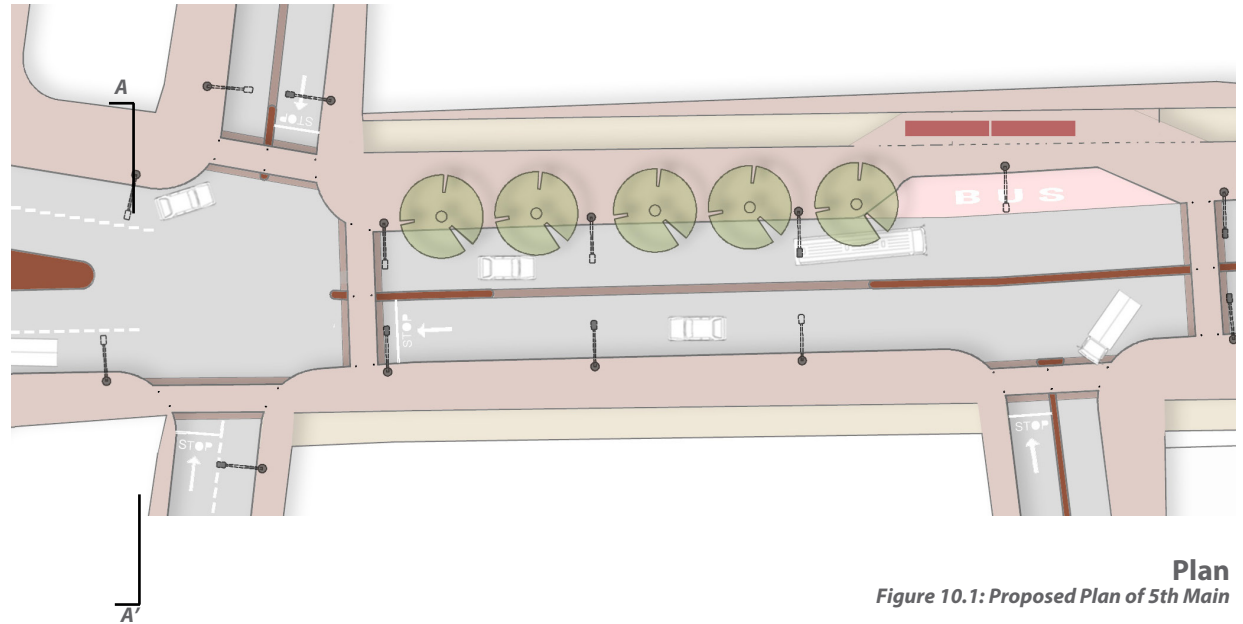
Figure 10.4 Keyplan 5th Main Road_HSR Layout

5th Main, 14th Main, and 27th Main represent some of the major neighbourhood streets of HSR, which are in different stages of commercialization.

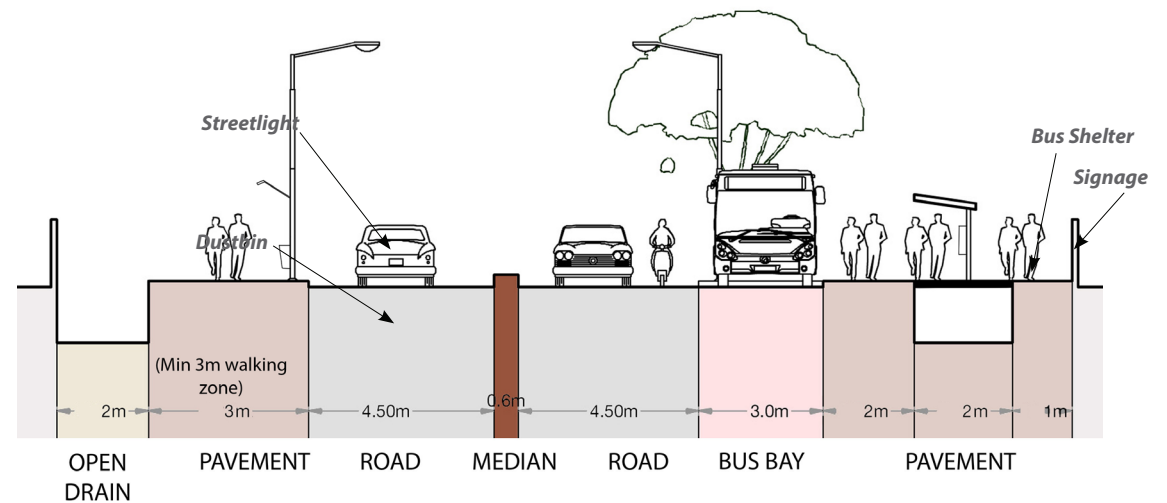
These streets were chosen for the different nature of pedestrian and vehicular activities that they experience; so as to exhibit what the possible interventions may be in different situations. While 14th main is the prime demonstration area in which the proposals look at a complete redesign of the right-of way approach, to include best practices in pedestrian and cycle safety, the other two proposals are retrofits to the existing street design. The proposal for 5th main and 27th main exhibit the minimum level of intervention required to the existing infrastructure in order to make the street safe, secure and accessible to all.

Place Making

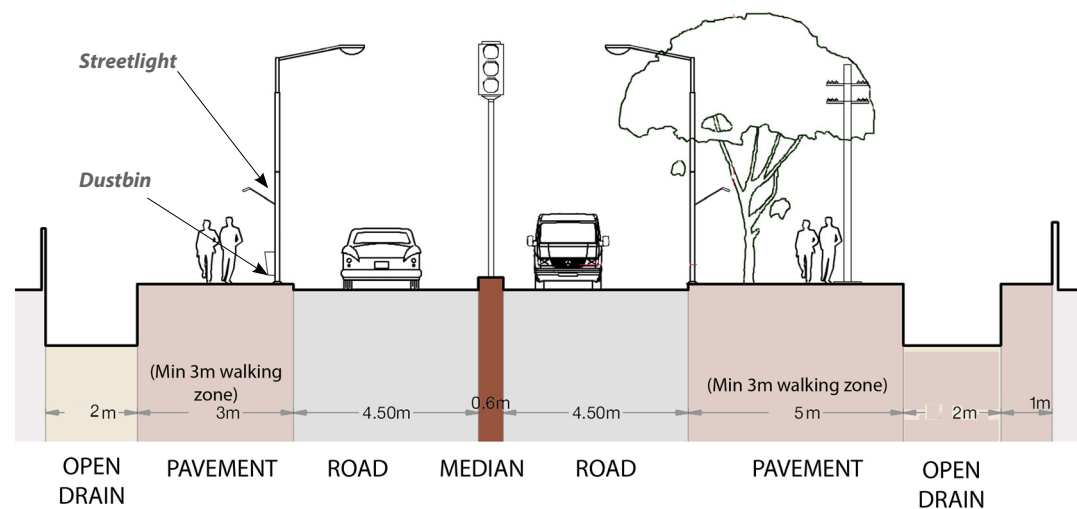
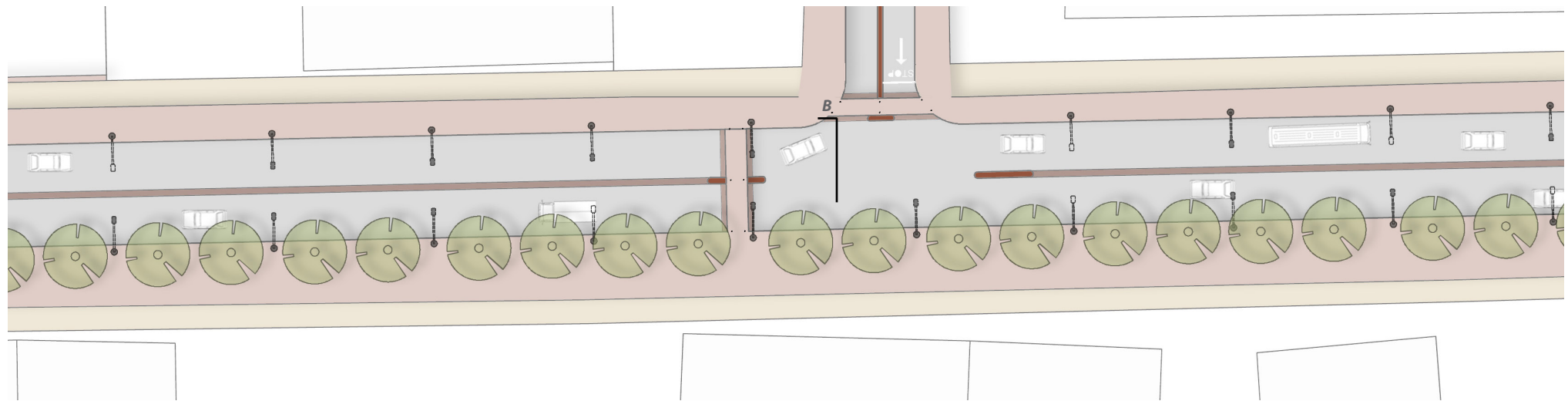
5th Main Road is one of the corridors developing rapidly as a place for commercial and office activities. While the southern entry point of this road is characterized by a multi-storeyed building, there might be opportunities for installing signage and landmark features at the northern entry point and its intersection with 17th Cross road.



Plan
Figure 10.1: Proposed Plan of 5th Main



Section AA'
Figure 10.2: Section AA' of 5th Main



Section BB'

Figure 10.3: Section BB' of 5th Main

Urban Green Habitat Interventions

The wide walkway widths and the adjoining parks and open spaces along this corridor provide an opportunity to create a network of urban green habitats to flourish in the neighbourhood. This section of the neighbourhood already exhibits a richer quality of vegetation and trees which can be worked to the neighbourhood's advantage.

Safe Access Networks

As one of the major streets connecting ORR to Hosur road, and given the limited carriage widths available, parking regulations and pedestrian safety features become important interventions, along with junction improvement plans for this street.

Transport networks

The service levels for this street by BMTC buses are quite low and there are no routes that connect it to the eastern side of the neighbourhood. Some existing routes can be rerouted to solve this problem. Bus stop infrastructure should also be provided on this street.

Public space design

The land adjoining the drain near 17th Cross creates an opportunity to design a public recreational green space with facilities such as public toilets and drinking water fountains.

14TH MAIN ROAD



Keyplan

Figure 10.8: Key Map

Place Making

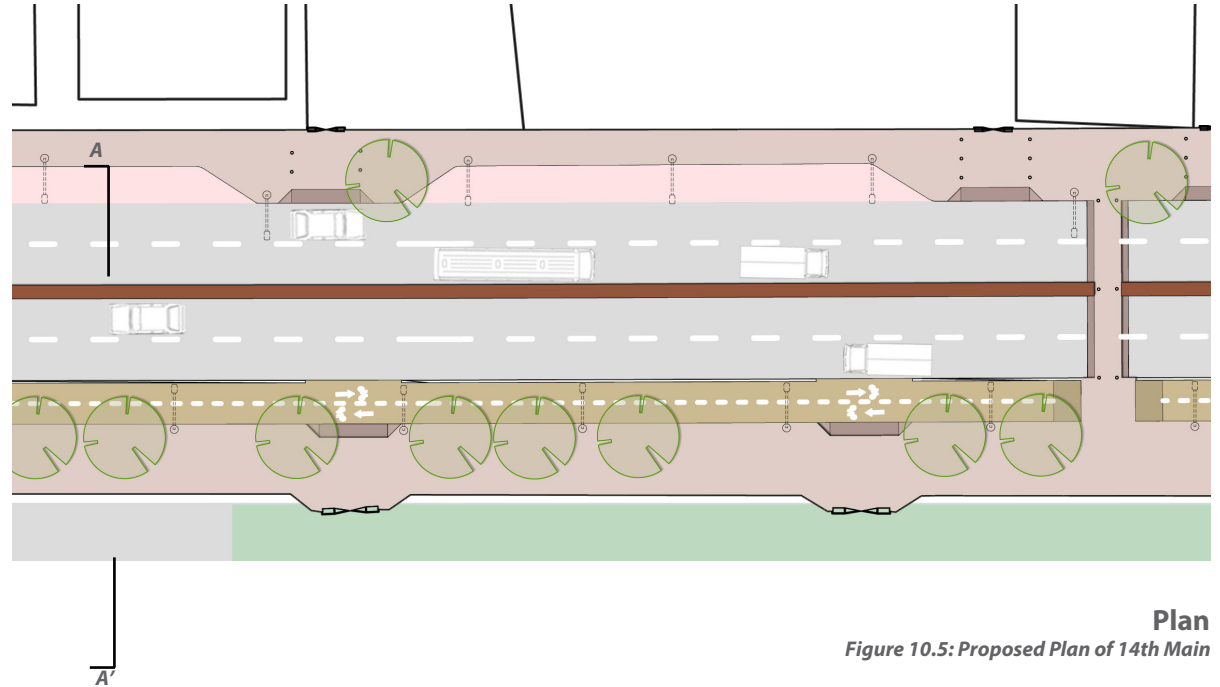
This is one of the most characteristic spaces in the neighbourhood with many commercial outlets, the BDA complex and a school located on this road. As the main entry point into the neighbourhood for many, it serves as a significant point of reference for navigation in and around the ward. Hence providing signage at key locations (such as at the junction of ORR and at the major bus stops) becomes very essential for onward way finding in the ward.

Urban Green Habitat Interventions

This street is a vital connection in the overall Urban Green Habitat Network, as it is in close proximity to Agara Lake. Planning for specific plant species and bio-connectors will be an important feature of this street.

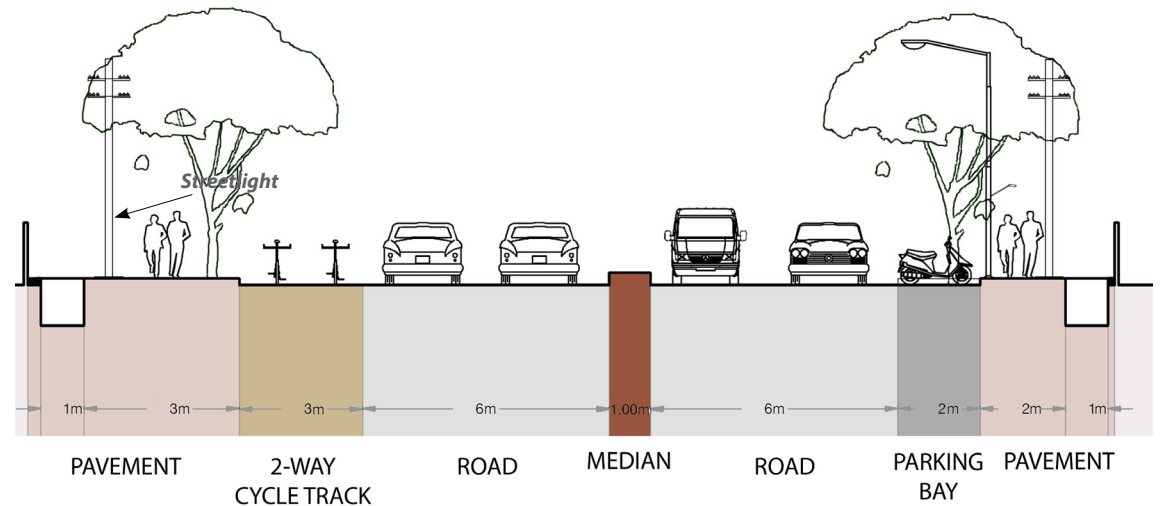
Safe Access Networks

14th Main Road is one of the major access streets in the neighbourhood for pedestrian and vehicular movement.



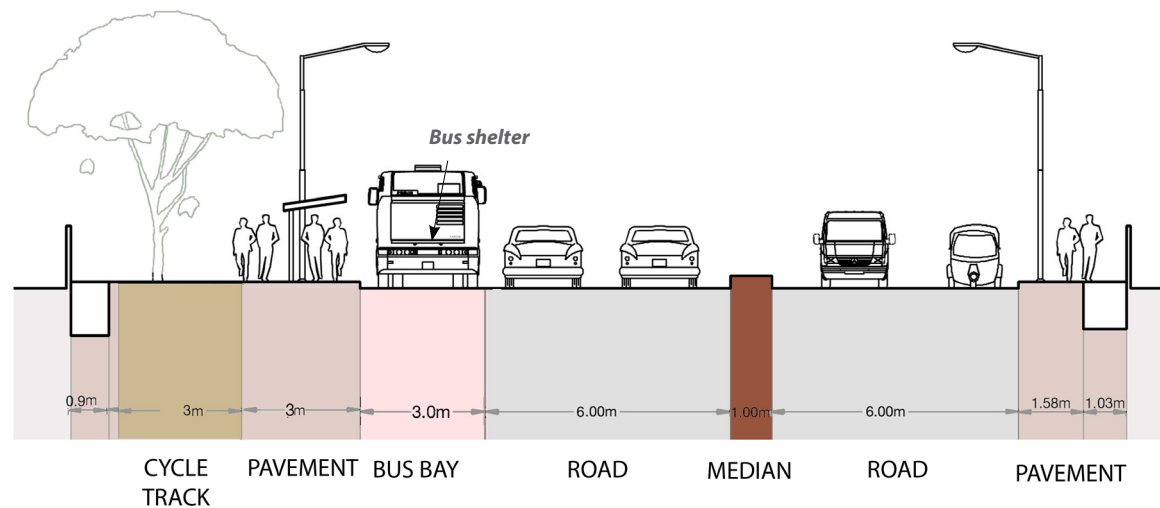
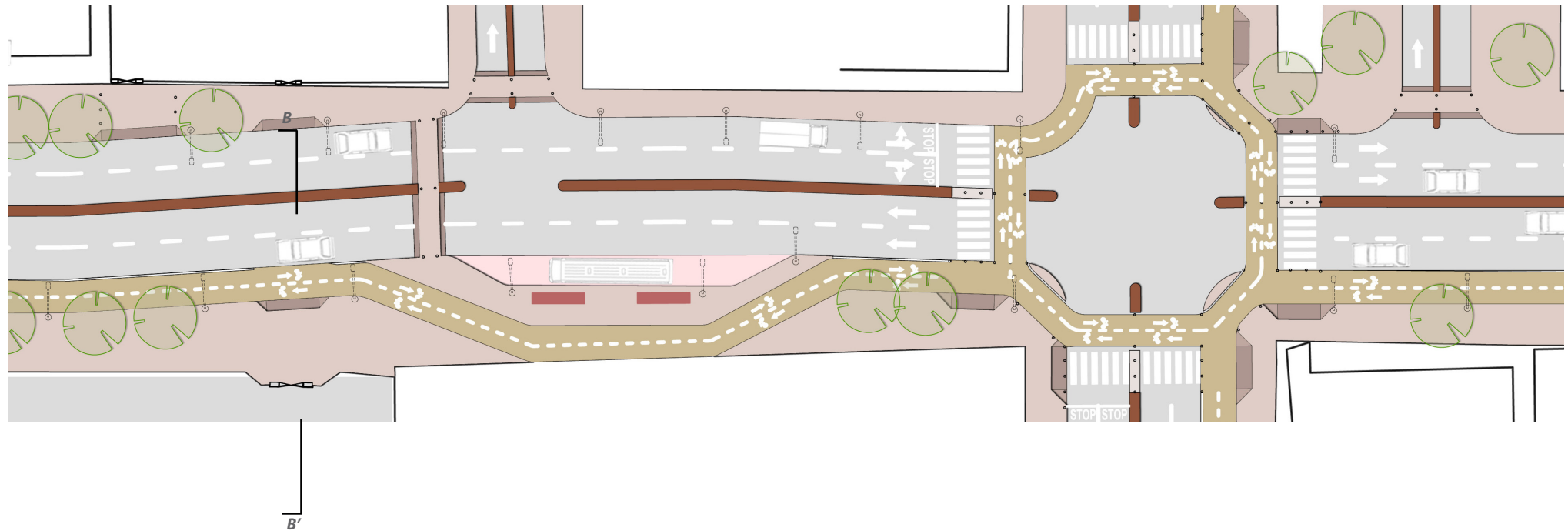
Plan

Figure 10.5: Proposed Plan of 14th Main



Section AA'

Figure 10.6: Section AA' of 14th Main



Section BB'

Figure 10.7: Section BB' of 14th Main

This makes pedestrian safety interventions and speed calming for traffic extremely important. Also, quality of the pedestrian environment will be drastically improved with the provision of more shade, street furniture and pedestrian lighting.

Transport networks

This is currently the best serviced area in terms of public and intermediate public transport (buses, autorickshaws). Providing designated halting bays for these services will allow for better traffic management.

Public space design

The BDA Complex already serves as a pause point for commuters with high connectivity to transit services and IPT. It is also a spill-over space for the offices in the surrounding area. The complex has a high potential to be converted into a well-designed public space for the neighbourhood which provides recreation facilities for residents and visitors alike.

27TH MAIN ROAD



Keyplan

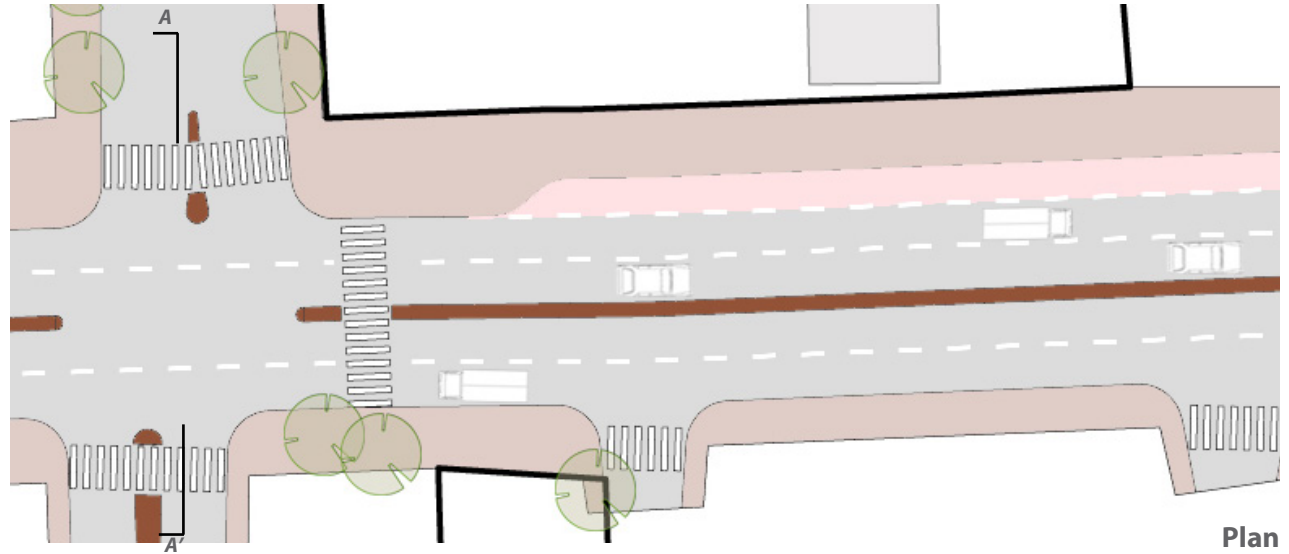
Figure 10.12: Key Map

Place Making

With many commercial outlets and offices, 27th Main Road is a prominent and easily recognisable street of HSR layout. However, locations where issues of orientation may arise are at the junction of ORR and 17th Cross. Eye level pedestrian signage, maps and landmarks at these points will help improve pedestrian orientation and way-finding along the street.

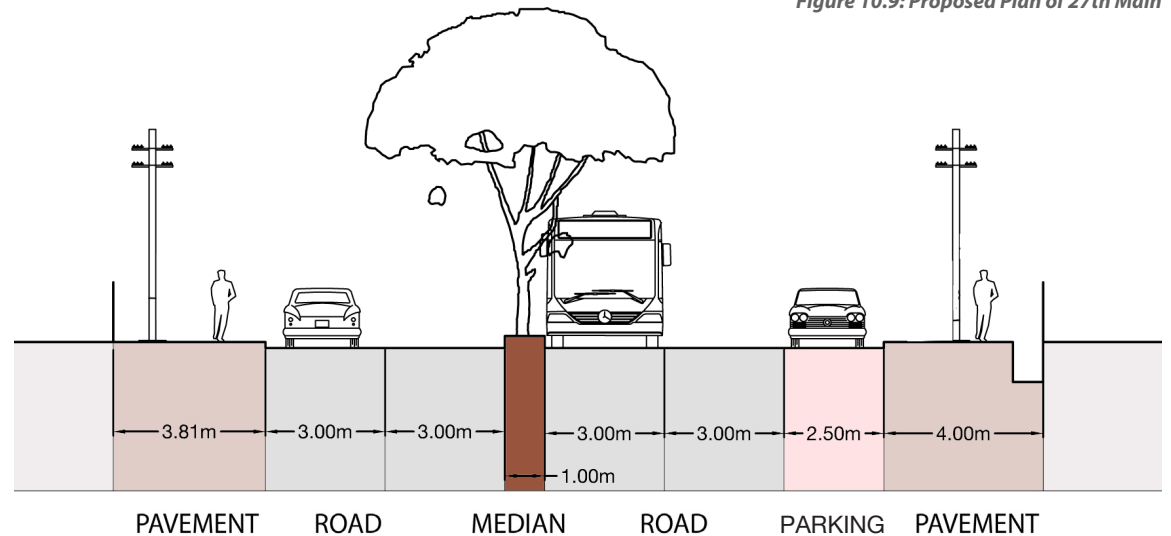
Urban Green Habitat Interventions

This street is a vital connector in the urban green habitat network, but creating physical connections along this street is complex due to the high vehicular and pedestrian movement on this street. However, tree plantations to continue tree cover along the street is a possible solution that can be implemented here.



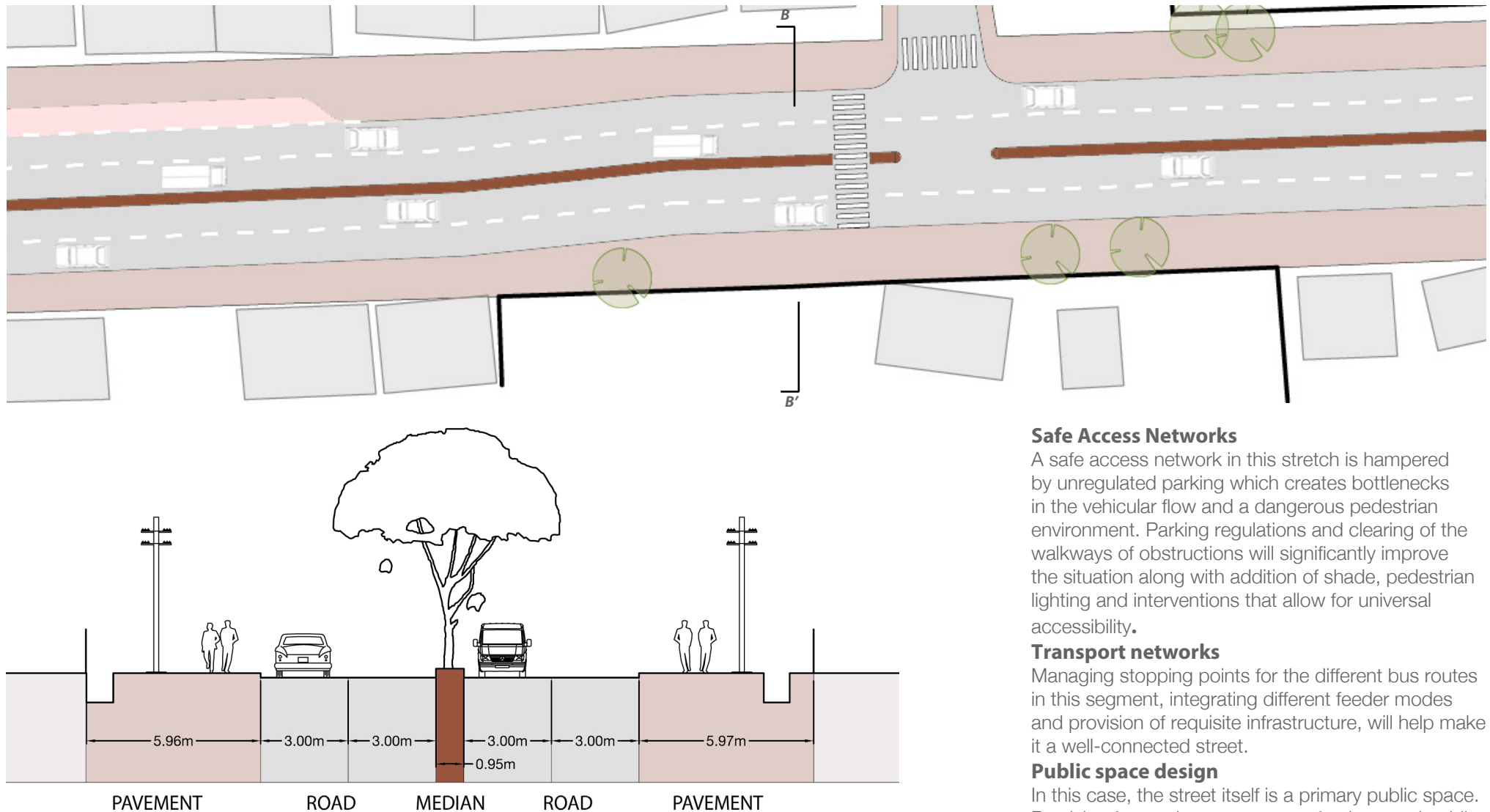
Plan

Figure 10.9: Proposed Plan of 27th Main



Section AA'

Figure 10.10: Section AA'' of 27th Main



Section BB'

Figure 10.11: Section BB' of 27th Main

Safe Access Networks

A safe access network in this stretch is hampered by unregulated parking which creates bottlenecks in the vehicular flow and a dangerous pedestrian environment. Parking regulations and clearing of the walkways of obstructions will significantly improve the situation along with addition of shade, pedestrian lighting and interventions that allow for universal accessibility.

Transport networks

Managing stopping points for the different bus routes in this segment, integrating different feeder modes and provision of requisite infrastructure, will help make it a well-connected street.

Public space design

In this case, the street itself is a primary public space. Provision for seating areas, street furniture and public toilets will help make it a more user-friendly street.

Going Forward

As a next step, EMBARQ India is looking to develop a program to capacitate ward representatives such as corporators, RWAs and CSOs of other wards and neighborhoods, to develop NIPs. With this objective in mind, EMBARQ India hopes to partner with organizations that can help in formulating and administering training modules to reach out to ward representatives. These modules will essentially be focused on the various elements such as developing vision plans for the neighbourhood, convening of stakeholders, facilitating public participation and feedback, assessment of existing neighbourhood issues, developing conceptual designs, project phasing, planning and funding.

Through these partnerships EMBARQ India hopes to reach out to a larger audience and scale up neighbourhood improvement plans across the city and thereby help in initiating a participative approach to local area planning in Bangalore.



Acknowledgements

We would like to thank our donors for the funding support that made this project possible.

We would especially like to thank BBMP Corporator of HSR ward 174, Smt. Latha Narsimhanmurthy for her guidance and support to enable this first initiative of NIP in India. We would like to express our gratitude to MLA Shri Satish Reddy and Lok Sabha MP Shri Ananthkumar for taking keen interest and providing guidance to this partnership.

We would like to acknowledge the support of BBMP Commissioner Mr. Lakshmi Narayana and Executive Engineer Mr. Basavaraj Kabade for their help regarding surmounting technical challenges, DULT Commissioner Ms. V. Manjula for sharing the NMT-DPR for HSR Layout.

We would like to extend our special thanks to Ex Lok-Ayukta Draft Committee member and Head of Lake Committee Agara Mr. Yellappa Reddy, for helping with his comments and reviews.

EMBARQ India would like to thank representatives from the Ward Committee, LDA, BWSSB, BESCOM and Bengaluru Traffic Police who have taken their valuable time to give inputs in the meetings.

EMBARQ India would like acknowledge the valuable comments and suggestions received from the Urban Cycle Planning expert Ms. Lotte Bech.

We would also like to thank Mr. Madhav Pai - Director, EMBARQ India for his constant support and help.

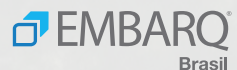
Last but not the least we would like to thank the members of the project team and reviewing teams: Mr. Sanjay Sridhar, Mr. Nikhil Chaudhary, Ms. Arvinda Devaraja, Mr. Ashwin Prabhu, Mr. Srikanth Shastry, Mr. Suraj Nair, Ms. Sonal Shah, Mr. Sameep Arora, Mr. Vagish Nagnur, Ms Lakshmi Rajagopalan ,Ms Sahana Goswami and Ms Divya Kottadiel. Besides this, we are grateful to the support extended by countless number of people who have been part of the project through inputs they made at various stages.

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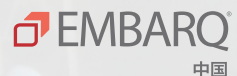
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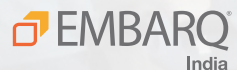
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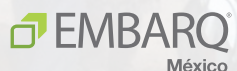
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