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Coimbatore City Municipal Corporation

Green Urban Mobility Partnership

CAPACITY ASSESSMENT AND ENHANCEMENT FOR SAFE STREET DESIGN AND ENABLING NON-MOTORIZED TRANSPORT INFRASTRUCTURE IN COIMBATORE

VOLUME 3: POST TRAINING REPORT AND RECOMMENDATIONS

OBSERVE: CONNECT: TAKE ACTION

A 7-DAY TRAINING PROGRAM ON SAFE STREET DESIGN FOR ENABLING NON-MOTORISED TRANSPORT (NMT) INFRASTRUCTURE IN COIMBATORE

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CONTENTS

ANNEXURES:

LIST OF FIGURES

LIST OF ACRONYMS

CCMC - Coimbatore City Municipal Corporation

CMA – Commissionerate of Municipal Administration

iRAP - International Roads Assessment Programme

NMT - Non-Motorised Transport

TNIUS - Tamil Nadu Institute for Urban Studies

1. INTRODUCTION

In the bilateral Government to Government Negotiations 2015, the Government of India and Germany had agreed to jointly launch a technical cooperation fostering sustainable urban transport system. Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ) GmbH implements this project with Ministry of Housing and Urban Affairs as its political partner. The objective of the "Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT)" project is to improve the planning and implementation of sustainable urban transport in selected Indian cities. The implementation focuses on the pilot cities of Bhubaneswar, Coimbatore, and Kochi, which were selected by the German Government for special support on their way to becoming a Smart City.

Against this background, a Capacity Development Strategy (CDS) framework was developed by the SMART-SUT project to support relevant state and city institutions to improve planning and implementation of sustainable urban transport in Coimbatore, by developing common understanding of the activities involved and promoting coordinated action. The CDS sought to answer the following questions-

1. What capacities are present within the existing system for developing strategies, making cooperation sustainable, taking decisions and managing processes? What action is needed as a result?
2. What needs to change and who needs to change what, so that the desired objectives and results will be achieved? How can that take place? Who needs to learn what on which level, so that the changes can be sustainable and mainstreamed?
3. How can the SMART-SUT project bring about a change in co-operation systems and enabling frameworks, keeping in mind the current socio-political contexts?

2. FRAMEWORK FOR THIS ASSESSMENT

In Coimbatore, the CDS framework is centred around the Coimbatore City Municipal Corporation. The methodology adopted for this assignment is outlined in the work flow diagram as shown in the following page. The methodology is embedded with three broad objectives -

1. Diagnosis
2. Formulating recommendations
3. Implementing recommendations

For the purpose of this capacity assessment and enhancement plan, the entire research and analysis is consistently carried out and presented under 5 main components of realizing NMT infrastructure-

1. Standards & Guidelines - This sections covers the questions regarding road standards, transportation policies, and important concepts in NMT projects
2. Design, Planning, Materials & Specifications - This section covers questions regarding street design process, level of knowledge on various material specifications and components of NMT projects such as - street hierarchies, walking & cycling facilities, barrier free environment etc.
3. Tendering process and Budgeting - This section is directed towards level of knowledge regarding the tendering and

funding procedures for different projects as well as maintenance.

4. Implementation and Operations & Maintenance – This section of the survey covers the implementation aspect of NMT projects, with focus on inter agency coordination during implementation and other processes involved in this phase.
5. Enabling Frameworks – This section is directed towards finding the required amount of training and the kind of gaps the engineers experience frequently

In the background of CCMC's effort to make Coimbatore NMT friendly city and post Covid scenario of anticipated changes in travel behavior, and based on the needs assessment survey taken up by SMART SUT, a 7-day training program was designed to address the gaps identified during the survey. The training program positioned itself as a right opportunity for officials to understand optimal utilization of street space to provide facilities for walking and cycling that encourage people to use walking and cycling preferable mode of transport. Also, in a long-term vision, designing of streets while considering various factors like land use, safety, activity and utilities has become imperative for a city to implement safe access to all.

During the needs assessments, it was identified that capacity enhancement with respect to NMT in CCMC was needed at 2 levels:

1. High-level sensitization

To create general awareness and sensitization among the engineers on need for NMT infrastructure in the city through a hands-on exercise to observe and understand various issues that impact safe walking and cycling along the street followed by an interactive board game that highlights the significance of NMT in our daily travel and its associated monetary benefits.

2. Deep dive training

To provide a detailed overview of planning, design, implementation and maintenance of NMT infrastructure in the city through hand holding training while selecting a street within the city that can be co-designed by including all safe street elements with support from trainers.

The training program spanned over 7 days, spread over 3 weeks had a participation of 62 engineers from CCMC for the High-level sensitization workshop conducted for two days with 31 engineers each day. Out of the 62 engineers, 24 engineers were selected by CCMC for the Deep dive training on NMT planning and street design guidelines for a period of **five days**. It drew on knowledge by subject matter experts in a very interactive manner, where the engineers brought forth their questions and doubts, leading to healthy conversations on the various topics covered under the program schedule (section 5). The training had an efficient balance between classroom sessions and on-site activities to train the engineers both in theoretical and practical way. The sessions covered various components of "Safe streets for all" such as pedestrian environment audit, mapping of streets, street sections, underground utilities and intersection design etc. which helped the engineers to obtain different perspectives of how to design streets for all its users, helping them to think out of the box from their routine and rather linear design schedule. To make it more interactive, the sessions were conducted both in English and Tamil.

3. OBJECTIVE OF THE TRAINING PROGRAM

The universal objective of the training program was to strengthen the capacities of the CCMC engineering staff on street design and enabling NMT infrastructure in the city. Broadly the training program aim to achieve following outcomes:

- To equip CCMC engineers with the knowledge of preparing a NMT friendly street which helps engineers to understand the need for safe street infrastructure in the city and they can include the elements of safe street while designing the streets in the city.
- Impart skills and knowledge for better planning, designing, implementing and maintaining a street with all NMT related infrastructure.
- To help realize the need for strengthening organizational process for NMT related projects in CCMC.

4.

OBSERVE: CONNECT: TAKE ACTION – BACKGROUND

The training program was as an outcome of various interactions held with city officials on importance of capacity development to implement NMT related projects, few of these interactions happened during city level workshops organized as part of various activities under SMART SUT and also during individual interactions for Big bazaar street improvement project, NMT Network Plan etc. During one of the group sessions in 'Complete Streets Through Safe Intersections Workshop' held at Taj Vivanta on 27th January, 2020, the engineers raised the need for periodic trainings on street designs, guidelines and NMT planning as it would help them to cope with the latest trends, concepts and developments occurring around the world with respect to city planning and development, and also to help them review and monitor road projects being taken up by other agencies/consultants.

In a city having a modal share of 33% for NMT trips, and as an agency responsible for maintaining almost all of the local road network (approx 2000 km) which includes footpaths and other additional infrastructure that contributes significantly to a pedestrian's mobility experience in the city, not having a single engineer or staff working dedicatedly on this topic, created a strong case and a good starting point for enhancing at CCMC's capacity development needs in this space.

In the absence of regular trainings on these subjects, engineers mention they generally try to gain knowledge from their peers or through online research. This is clearly evident from the assessments of 31 engineers carried out to understand the training needs on NMT infrastructure.

Following up with the outcomes of the workshop held on 27th January, 2020, a roster of all the engineers working in all five zones of CCMC was listed down and institutional capacity assessment survey was carried out through face-to-face interviews and phone calls to understand the capacity of the engineers with respect to the various process in planning, designing, tendering and implementing NMT projects, their training requirements and the gaps they face at individual, organizational and institutional levels. The results from these capacity assessment surveys were used to structure the training program.

Subsequently, a proceeding order from Coimbatore Corporation was issued to all the engineers to be part of this training program.

5. AGENDA AND SCHEDULE OF TRAINING PROGRAM

Day	Start	End	Activity	Duration	Location	Training Personnel required
Day 1: General Sensitization workshop	10 00	10 20	Introductory presentation Overview of the workshop - Objectives and activities	20 minutes	Indoor	Instructor: 1
	10 20	10 35	Tea break	15 minutes	Indoor	
	10 35	11 30	Tutorial on conducting Pedestrian Environment Audit - Part 1	55 minutes	Indoor	Instructor: 1
	11 30	**13 30**	**Pedestrian Environment Audit - Part 1**	2 hours	Outdoor	*Facilitators: 1 for two teams*
	13 30	14 30	Lunch break	1 hour	Indoor	
	14 15	15 45	Creating awareness to prioritise NMT on our streets - NMT Gaming session	1 hour 30 minutes	Indoor	Facilitators: 1 per table/ game board
	15 45	16 00	Tea break	15 minutes	Indoor	
	16 00	16 30	Introduction to network planning for NMT	30 minutes	Indoor	Instructor: 1
	16 30	17 00	Mapping user groups based on observations from Pedestrian Environment Audit - Part 1	30 minutes	Indoor	Instructor: 1
Day 2: Understanding the site and its users	10 00	10 15	Introduction to Day 2 activities	15 minutes	Indoor	Instructor: 1
	10 15	10 45	Presentation of outcomes of Pedestrian environment audit - Part 1	30 minutes	Indoor	Instructor: 1
	10 45	11 00	Tea break	15 minutes	Indoor	
	11 00	12 00	Role play exercise	1 hour	Indoor	Facilitators: 2
	12 00	13 00	Mapping user groups and their needs	1 hour	Indoor	Facilitators: 1 per team
	13 00	14 00	Lunch break	1 hour	Indoor	
	14 00	14 45	Tutorial on conducting Pedestrian Environment Audit - Part 2	45 minutes	Indoor	Instructor: 1
	14 45	18 00	**Pedestrian Environment Audit - Part 2**	3 hours and 15 minutes	Outdoor	*Facilitators: 1 per team*

Day	Start	End	Activity	Duration	Location	Training Personnel required
Day 3: Designing an NMT corridor-1	10 00	10 15	Introduction to Day 3 activities	30 minutes	Indoor	*Instructor: 1*
	10 15	10 30	Tutorial on Designing the street section	15 minutes		*Instructor: 1*
	10 30	10 45	Tea break	15 minutes	Indoor	
	10 45	13 30	**Designing the street section**	2 hours 45 minutes	Indoor	*Facilitators: 1 per team*
	13 30	14 30	Lunch break	1 hour	Indoor	
	14 30	16 30	**Translating the street section into a plan**	2 hours	Indoor	*Facilitators: 1 per team*
	16 30	16 45	Tea break	15 minutes	Indoor	
	16 45	17 00	**Working with above grade utilities**	15 minutes	Indoor	*Instructor: 1*
Day 4: Designing an NMT corridor-2	10 00	10 45	Tutorial on Intersection design	45 minutes	Indoor	Instructor: 1
	10 45	11 00	Tea break	15 minutes	Indoor	
	11 00	12 30	Designing the Intersection fix	1 hour 30 minutes	Indoor	Facilitators: 1 per team
	12 30	13 30	Preparation for first jury/ review session	1 hour		Facilitators: 1 per team
	13 30	14 30	Lunch break	1 hour	Indoor	
	14 30	16 30	**Review session**	2 hours	Indoor	
	16 30	17 00	Tea break and Closing Comments	30 minutes	Indoor	
Day 5: Testing the design	10 00	11 30	Continuation of street design working session	1 hour 30 minutes	Indoor	Facilitators: 1 per team
	11 30	11 45	Tea break	15 minutes	Indoor	
	11 45	12 30	Introduction to tactical urbanism	45 minutes	Indoor	Instructor: 1
	12 30	13 30	Lunch break	1 hour	Indoor	
	13 30	17 00	**Testing of design on ground - tactical urbanism**	3 hours 30 minutes	Outdoor	Facilitators: 1 per team
Day 6: Exhibiting ideas and designs	10 00	11 15	Preparation for final review	1 hour 15 minutes	Indoor	Facilitators: 1 per team
	11 15	11 30	Tea break	15 minutes	Indoor	
	11 30	13 00	Preparation for final review	1 hour 30 minutes	Indoor	Facilitators: 1 per team
	13 00	14 00	Lunch break	1 hour	Indoor	
	14 00	16 30	**Final review session**	2 hours 30 minutes	Indoor	
	16 30	16 45	Tea break	15 min	Indoor	
	16 45	17 00	Closing comments & feedback session	15 minutes	Indoor	Instructor: 1

6.

INAUGURATION OF THE TRAINING PROGRAM

The training program was inaugurated by the respected Deputy Commissioner of CCMC Ms. S. Madhuranthagi, kick-starting the schedule for the day. Ms. Madhuranthagi thanked GIZ supported SMART-SUT program for taking up this initiative to build and improve the knowledge of the engineers as she motivated and urged all the engineers to make the best use of this opportunity to gain more knowledge and to provide their learnt inputs towards the development of the city.

Figure 1: Inauguration of training programme by Ms. S. Madhuranthagi, Deputy Commissioner, CCMC.

Mr. Ranjith Parvathapuram, Urban Transport Expert, SMART SUT, GFA Consulting group set the context for the training as he explained the various components, objectives and expected results from the training.

7. GENERAL SENSITIZATION SESSION, DAYS 1 & 2

TOPICS

- General introduction on need and objectives of the training program
- Site visits to carry out Pedestrian environment audit (Part 1)
- Role play session to involve engineers into various characters of vulnerable users of street
- NMT Game to sensitize on walking and cycling as preferable mode of transport

The general sensitization session aimed to familiarize engineers with the various elements to be considered while designing streets.

Day 1 of general sensitization session started with Mrs. Vidhya Mohan Kumar, founder and principal at Urban Design Collective presenting a summary of the analysis of capacity assessment survey results that was conducted prior to the training program. Participants were given an understanding of the need for NMT components while designing streets.

Role play session was one of the most interactive sessions as engineers were asked to assume the role of the user group that they had received and then were asked to share the issues that they would face in a street (from the perspective of their adopted role). With all the issues listed down, the engineers discussed among themselves and contrived proposals to tackle the issues. This session helped the engineers to understand the importance of considering and integrating all the user groups when designing a street.

The agenda of imparting the importance of

Figure 2: Engineers at training program.

Figure 3: Detailing the pedestrian environment audit.

Figure 4: Role play session.

Figure 5: Role play session.

NMT and public transport modes over the other modes of travel was portrayed in the form of a board game. At the end of the day, the engineers were able to grasp in the importance and benefits of NMT for a city and its people and cooperatively agreed to provide importance for NMT infrastructure in their future projects.

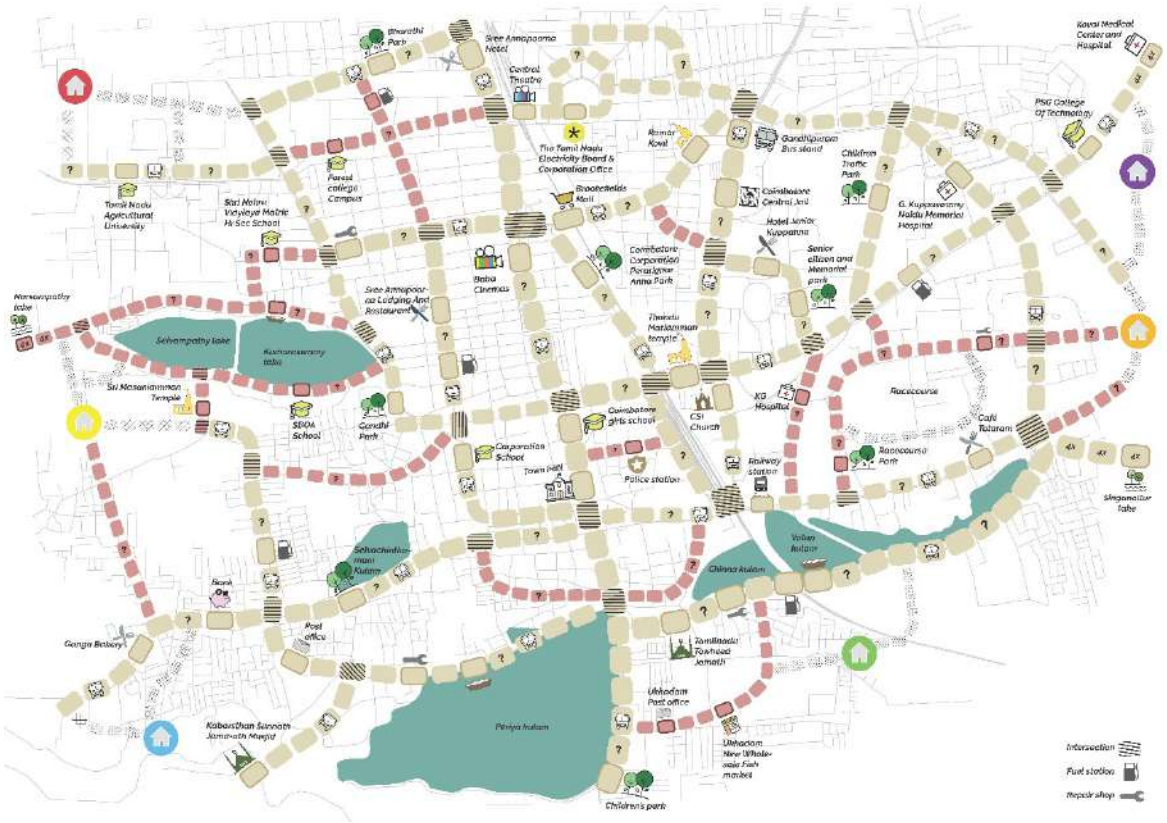


Figure 6: NMT board game

Figure 7: Engineers exploring the Board game on NMT.

Figure 8: Engineers exploring Board game on NMT.

7.1 Day 1 & 2: Field activity - Pedestrian Environment Audit (Part 1)

The premise of this audit was to understand the existing condition of a street to ensure it is safe, comfortable and convenient for pedestrians.

The participant engineers were divided into 10

Figure 9: Engineers conducting pedestrian environment audit.

groups, and they carried out their assignment in the morning by recording the quality and presence of various street elements such as footpath facilities, intersection condition, signages, safety aspects, adjacent traffic, aesthetics and amenities, public transport/ para transit and parking facilities in their allocated road stretches. The observations were recorded in the provided audit forms(ref. **Annex B**). A basic analysis of the data recorded by the engineers during the audits was presented to them in the evening to portray the overall assessment of the streets.

Day 2 of the general sensitization session followed the same schedule as day 1 which was attend by the next set of 31 engineers. As a result of the two days of sensitizing the engineers on designing pedestrian friendly streets and importance of NMT, all the engineers holistically agreed to all the concepts shared in the training session.

" A well deserved initiative to have such sensitization training programs to keep update on the long term solutions for city infrastructure problems, we generally work on a trouble shooting mode to resolve such issues"- CCMC Engineer

Figure 10: Detailing the pedestrian environment audit.

KEY HIGHLIGHTS

- Engineers conducted pedestrian audits along selected stretches to understand the needs of various road users.
- Discussions on issues of the various user groups and contriving measures to tackle such issues.
- Active participation of engineers in the NMT Board game to understand the various benefits from using walking and cycling as preferred mode of transport.

LEARNING OUTCOMES

- Engineers realize the importance of detailed assessment and survey of site conditions to determine issues of various users on road.
- Designing a street from its various user's perspective rather than only looking at vehicles as primary users.

8. INTENSIVE TRAINING WORKSHOP, DAY 1 – UNDERSTANDING THE SITE AND ITS USERS

Intensive training workshop started with Mrs. Vidhya Mohan Kumar recalling the learnings from the general sensitization workshop as the engineers jogged their memory, recollecting what they had learnt.

The selected 24 engineers were split into 4 groups and each group was given a stretch (ref. Annex E)of road that connects various lakes in the city, part of the '8 lakes restoration and rejuvenation project' of the Smart City program, to be redesigned by the end of the workshop. The design proposals for these road stretches are envisaged to be taken up by CCMC for permanent implementation.

The agenda for day 1 of the intensive training workshop was to educate the engineers to map the existing street conditions and to help them understand the usage of their street. In this regard, the engineers carried out various activities and surveys to record, assess and map the street users, existing scenario and the infrastructure provided in the street.

TOPICS

- Detailed data collection of the street, like street widths at various locations, identification of actual building line and street edge on map, activity mapping and traffic surveys
- Sensitization of Engineers on existing street condition through pedestrian safety audit

DAY-1: FIELD ACTIVITY – PEDESTRIAN ENVIRONMENT AUDIT AND MAPPING OF STREET (PART 2)

Provided with tool kits (measuring tapes and stationery) and maps, each group measured the right of way, mapped street activities, building access points and carried out traffic and pedestrian surveys in their allocated stretch. Assisted by a facilitator the questions and doubts of the engineers were solved on site. Being the first site activity in the intensive training workshop, the engineers actively participated in carrying out the pedestrian audit (ref. Annex C) and collating the field data.

KEY HIGHLIGHTS OF THE DAY

- Mapping, marking and assessment of existing street infrastructure for selected streets as per their respective group.

Figure 11: Engineers conducting the pedestrian environment audit and street mapping.

Figure 12: Engineers conducting the pedestrian environment audit and street mapping.

LEARNING OUTCOMES

- Engineers through about the various data collection techniques for conducting traffic and pedestrian surveys.
- Engineers aware of resource requirement and pre-data collection formats for mapping of a street and utilization of results from mapping of a street.
- Formulating the user group hierarchy of a street.

Figure 13: Engineers conducting the pedestrian environment audit and street mapping.

INTENSIVE TRAINING WORKSHOP, DAY 2

The agenda of Day 2 was to develop a thorough understanding of the site and its users. The day started off with the groups recalling the characteristics and observations of their respective site from day 1. Listing down the various user groups observed on the audited streets, each group identified the issues faced by each user group of their site and proposed measures to tackle the issues. Using the recorded data, the engineers were asked to sketch working plans and design cross sections of their respective stretch. Mrs. Vidhya later reviewed the designed cross sections.

TOPICS

- User group assessment
- Basics of Street Plan
- Guidance on Safe intersections
- Preparation of Cross-sections as per varied streets widths

Figure 14: User group assessment.

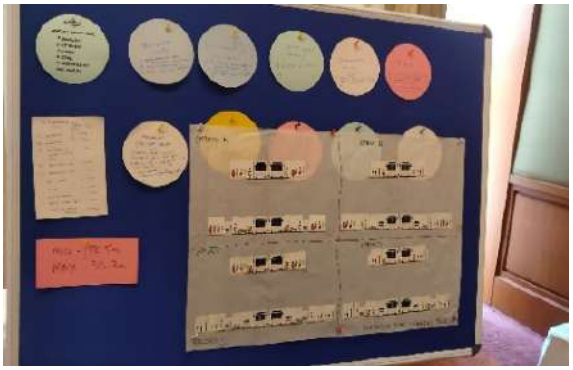


Figure 15: Sketching of street.

Figure 16: Designing a cross-section.

Figure 17: Review of the designed cross-section.

18: Session on complete streets through safe intersections.

Figure 19: Session on complete streets through safe intersections.

Mrs. Zohra Mutabanna started the second session on designing safe intersections. Mrs. Zohra elaborated on safety, mobility, liveliness and physical constrains/ encroachments in intersections and added that they are the key considerations when designing an intersection. Mrs. Zohra went on and explained 6 components (i). Design compact intersections (ii). Integrate public spaces (iii). Simplify geometry (iv). Integrate signal timings with design (v). Analyze network (vi). Safety for vulnerable users, that are needed to create defined intersections. Under safety she spoke about the importance of the 3 "E's" (Engineering, Enforcement, Education) supporting each other in designing a safe intersection. The concepts were explained in reference to the redesigned Gandhipuram intersection, which aided the participants to visualize and understand the concepts with better clarity.

KEY HIGHLIGHTS OF THE DAY

- Sensitization of engineers on importance of intersection improvement and the three "E's", 'Engineering, Enforcement, Education' that are necessary in designing a safe intersection.
- Engineers identified and proposed measures to solve the issues faced by various user groups of their respective street.
- Engineers designed and presented cross-sections of their street.

LEARNING OUTCOMES

- Engineers are made aware of framing survey questionnaires for the various user groups of a street.
- Concept and quick reference to principles of designing intersections.
- Drafting street cross sections based on safe street principles and varied street widths.

INTENSIVE TRAINING WORKSHOP, DAY 3

TOPICS

- Preparation of Street plan as per the required demand and available street widths

Day 3 of intensive training workshop started off with a session by Mrs. Vidhya wherein she shared the various ideas and concepts in effective usage of the right of way, decision making using primary and secondary data, prioritizing vulnerable user groups, etc.. involved in designing streets. Taking a note of the provided technical information, the engineers redesigned their streets in accordance with their cross sections.

In the second session, each group presented their redesigned streets and explained the various changes that they had made to the existing street condition. The designs were then finetuned based on the reviews, comments and discussions of the presentation.

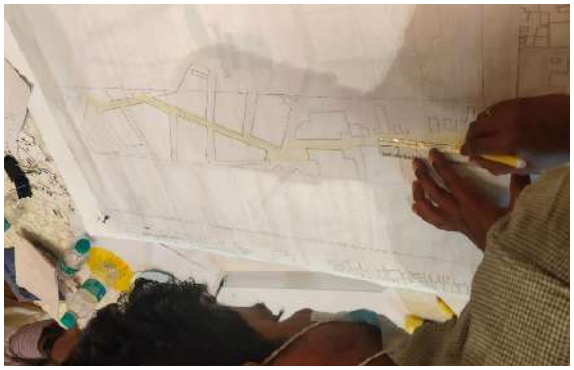


Figure 20: Plan drawing and sketching of street design.

Figure 21: Plan drawing and sketching of street design

Figure 22: Plan drawing and sketching of street design.

Figure 23: Review of the street design.

KEY HIGHLIGHTS OF THE DAY

- Engineers designing and presenting NMT friendly street designs excluding intersections.
- Reviews and discussions on the redesigned street.

LEARNING OUTCOMES

- Designing of NMT friendly streets as per the existing site conditions and without any alterations to the road widths.

INTENSIVE TRAINING WORKSHOP, DAY 4

The agenda for day 4 of intensive training workshop was to help the engineers redesign and integrate their respective intersections with the designed plan. As the engineers were working on their designs, Mr. P. Kumarvel Pandian, IAS, Commissioner, CCMC joined the training program to meet and interact with the participant engineers considering the training programme and shared his inputs on the designs. Having a glance at the works of the engineers, Mr. P. Pandian gave inputs to the engineers saying, **"For better and sustainable transportation, we should provide walking infrastructure for people in all roads. Changes will not happen overnight but gradually"**.

TOPICS

- How to design or redesign Intersections

As the engineers had finished redesigning the intersections in the second session, Mr. N. Rajakumar, IRS, CEO, Coimbatore Smart City and Mr. Raj Khanna, ACP, Traffic, Coimbatore West were invited to review the plans redesigned by the engineers. The day ended as both Mr. Kumar and Mr. Khanna gave inputs and appreciated the engineers of their work.

Figure 24: Mr. P. Kumarvel Pandian, Commissioner, CCMC paid a visit to the training program.

Figure 25: Mr. N. Rajakumar, CEO, Coimbatore Smart City and Mr. Raj Khanna, ACP, Coimbatore West reviewing the redesigned plans.

Figure 26: Mr. N. Rajakumar, CEO, Coimbatore Smart City and Mr. Raj Khanna, ACP, Coimbatore West reviewing the redesigned plans

Figure 27: Designing an intersection.

KEY HIGHLIGHTS OF THE DAY

- Mr. P. Kumarvel Pandian, Commissioner, CCMC encouraged the participant engineers in their design development and shared inputs
- Mr. Raj Khanna, ACP, Coimbatore West and Mr. N. Rajakumar, CEO, Coimbatore Smart City limited reviewed the redesign proposals for the streets.

LEARNING OUTCOMES

- Designing and integrating street plans with intersections while applying the principles taught during the classroom sessions.

INTENSIVE TRAINING WORKSHOP, DAY 5

TOPICS

- Star rating for redesigned streets and Star rating for schools by iRAP
- Detailed guidance to incorporation of Utilities into street design
- Realising the redesigned streets through temporary makeshift- A quick Tactical Urbanism

The last day of the intensive training workshop started with Mr. Jigesh Bhavsar, Technical Manager, iRAP India, sensitizing the engineers on star ratings of roads for safety. Mr. Bhavsar defined star rating as "a simple and objective measure of the level of safety which is 'built-in' to the road" and elaborated on the three processes involved in star rating a road, I. Data collection II. Data entry (ViDA online software) iii. Implementation. Mr. Bhavsar backed his presentation with examples from star rated results of the proposed Big Bazaar Street design helping the engineers to relate and understand the concepts more efficiently. Mr. Bhavsar also explained the star rating for schools which exclusively focuses on the safety of school children. Mr. Bhavsar ended his session urging the engineers to take safety as a very important component when designing a street.

Taking inputs from Mr. Jigesh's session on Star rating of roads for Safety and Star rating for schools, each group of engineers finalized and completed redesigning their respective stretch. Presenting the final designs to Mr. Pandian and Mrs. S. Madhuranthagi, the Commissioner and the Deputy Commissioner appreciated the engineers for their efforts in designing the street and thanked GIZ supported SMART-SUT team for taking up this project of building the capacities of his engineers and successfully completing it. Mr. Pandian later distributed the certificates to his engineers, congratulating them.

The second session started with Mrs. Vidhya sharing insights on effective placement and use of street utilities. She added examples of effectively planned streets with below and above grade utilities helping the engineers to get exposed to new ideas. Mrs. Vidhya emphasized on inter-agency coordination when planning for utilities on a street.

Figure 28: Mr. Ranjith, SMART SUT addressing the engineers.

Figure 29: Mr. P. Kumarvel Pandian, Commissioner, CCMC addressing the engineers.

9.

FIELD ACTIVITY – TACTICAL URBANISM

A temporary tactical intervention of the design proposed by the engineers was carried out on ground by the engineers at **Sundakamuthur Bypass road, Coimbatore** in order to test the design. Changes and demarcations in the stretch were made using of cones and line markings. The redesigned stretch was tested for two hours and it proved to be successful streamlining the traffic and pedestrian flow. With a new change in the neighborhood, nearby residents met the team to appreciate on their efforts. A final group discussion was conducted to assess and understand the various impacts that the temporary design had brought to the existing stretch. **The workshop was concluded...**

Figure 30: Dividing lanes for a temporary tactical intervention.

Figure 31: Engineers observing and recording the geometric changes during tactical.

KEY HIGHLIGHTS OF THE DAY

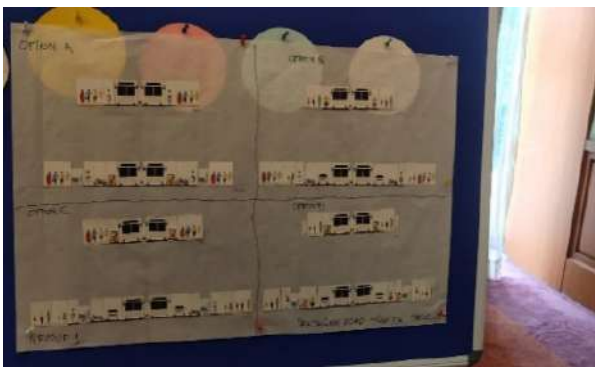
- Mr. Jigesh's presentation on Safety rating of redesigned streets and Star rating for schools to make accessibility around schools safer through International Roads assessment programme (iRAP).
- Testing of the redesigned plan on ground through a temporary makeshift of street redesign proposal for the streets.

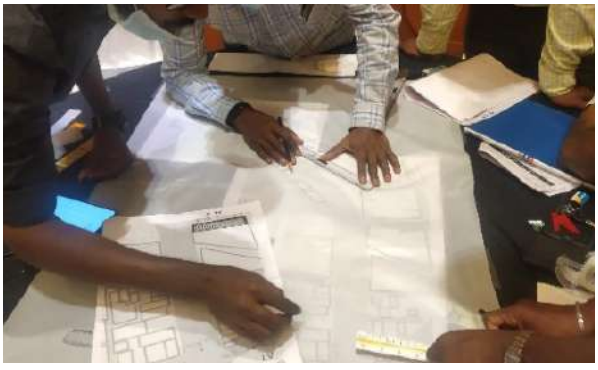
LEARNING OUTCOMES

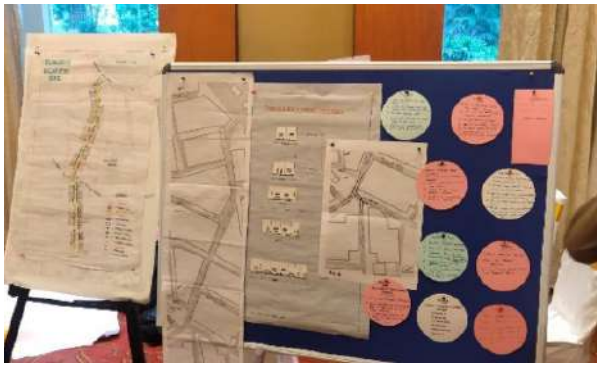
- Sensitization on importance of star rating for redesigned streets to understand potential benefit from improving the streets to provide accessibility to all road users.
- Engineers provided with basic understanding on various elements to be considered when designing streets for vulnerable groups like school children.
- Testing out the critical component of redesigned street during the workshop, engineers picked up a critical intersection on one of the pilot stretch to test out the reduction in travel lanes reduce the speed and enhance safety for other road users

10.

GLIMPSES FROM THE TRAINING PROGRAMME



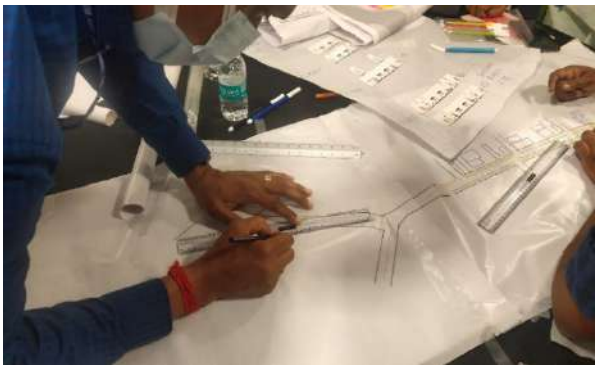






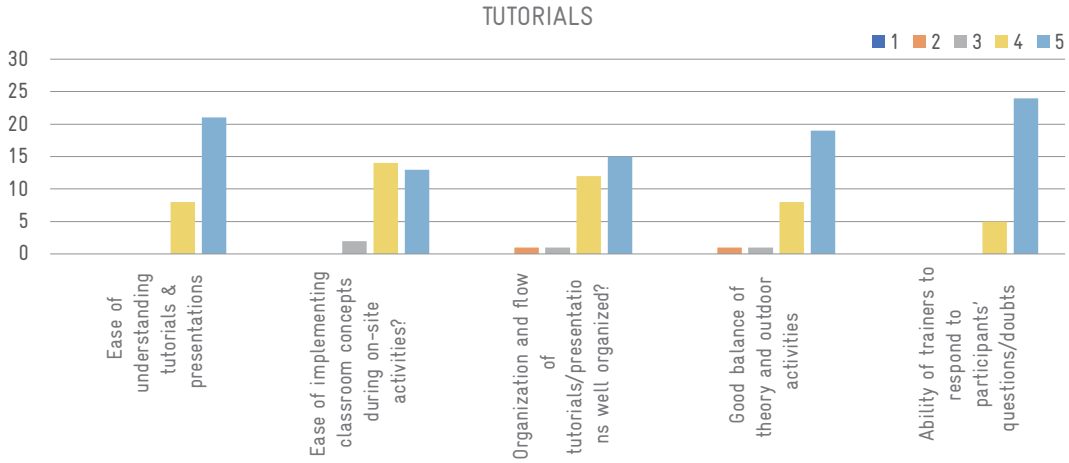


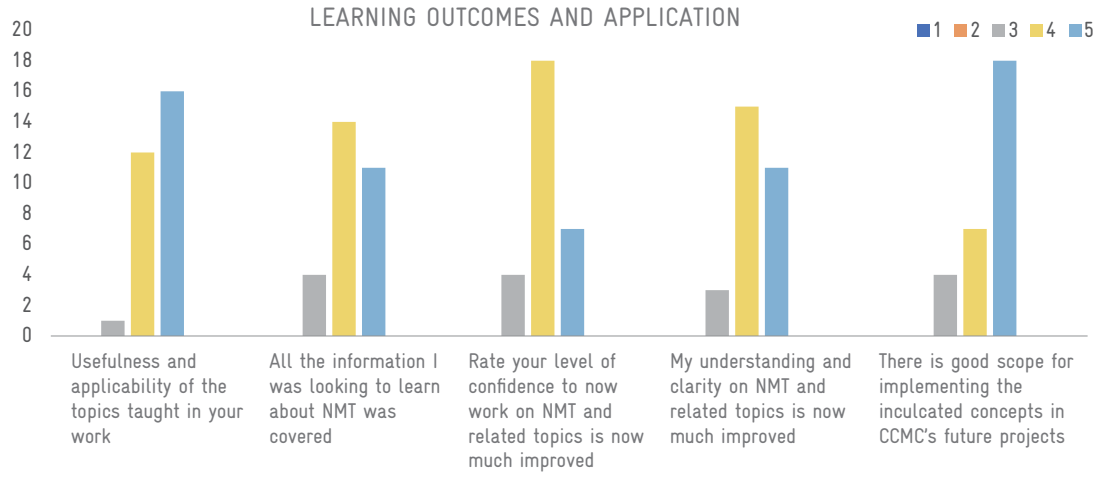


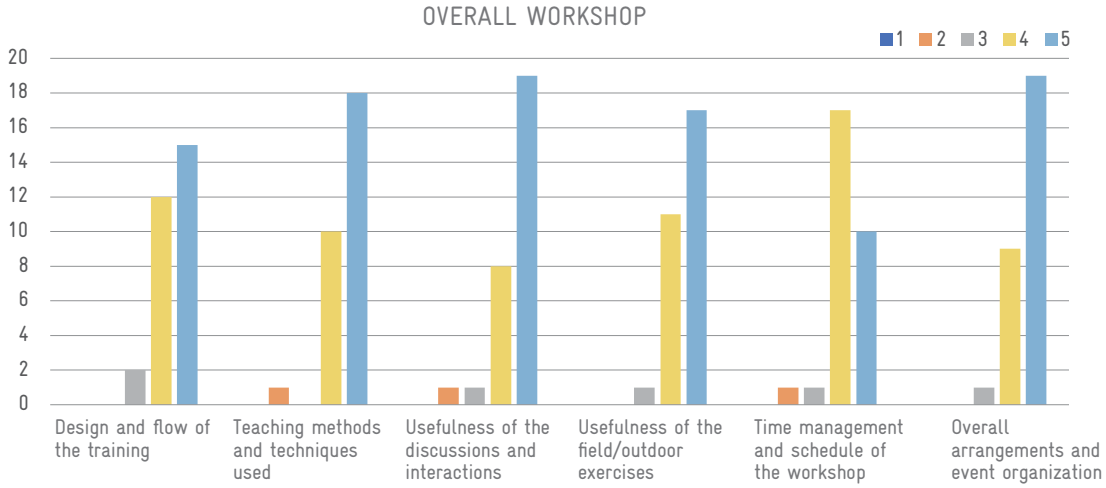



11. FEEDBACK

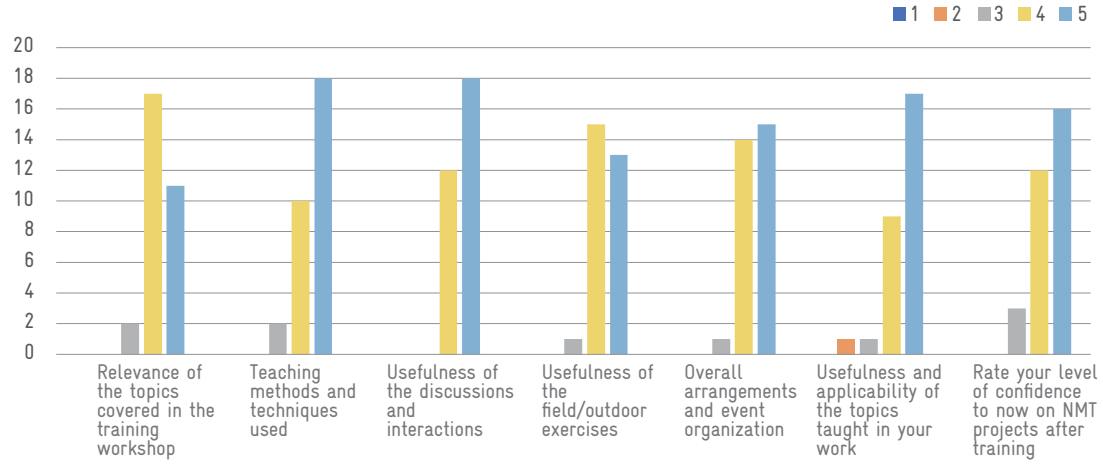
Feedback for general sensitization workshop:

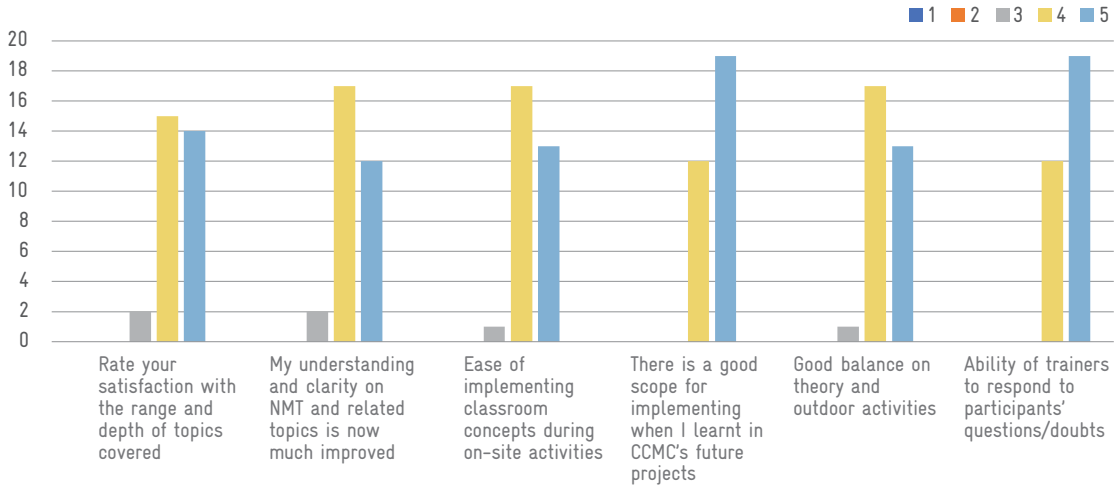






Feedback for intensive training workshop:





12. RECOMMENDATIONS

Capacity development has been an intrinsic part of SMART-SUT's partner engagement strategy right from the onset. The entire process to institutional change management initiated in Coimbatore, which largely focused on strengthening individual and organizational level capacities in the city, brought to light several learnings and realities. Based on these, CCMC will consider following recommendations to strengthen its capacities at various levels, in order to become more prepared and empowered to plan, design, implement and monitor safer and more inclusive road projects.

12.1 Recommendations for individual capacity development:

Enhancement of knowledge and application of codes and standards related to street design should be made compulsory. It is recommended to encourage the practice of using reference materials for easy assimilation and application of key standards and design guidelines such as the ready reckoner or other such documents.

Capacity building is required for all individuals who are likely to be involved in any street related project to enable a holistic approach to street design with an improved understanding of the concept of safe streets for all.

Capacity building is required through training programs to improve the understanding of the design process involved in the conceptualization and creation of integrated street designs with NMT priority. City/State level training institutes like TNIUS can be involved to prepare training curriculum.

Creating awareness among engineers to seek and actively participate in training programs to stay updated on concepts related to best practices in creation of integrated street designs for NMT priority.

Peer learning needs to be encouraged by introducing them to ways of collaborative working across hierarchies and departments. In addition, learning by doing must be actively pursued to ensure that there is clear assimilation of practical knowledge.

12.2 Recommendations for organizational capacity development:

Special projects wing should be strengthened with NMT nodal officers led by Nodal advisor- Executive Engineer Rank to manage projects involving integrated street design concepts with a focus on NMT priority. This should have a team composition across all rungs of the hierarchy – Assistant Engineer, Junior Engineer and Technical Assistant. These roles will be filled on a rotation basis to ensure that more staff have the opportunity to work on such projects. The persons filling these roles must compulsorily complete a training program focused on integrated street design concepts. The nodal advisor in charge of the project at any given time should have reduced work load on all other responsibilities with 75% of their time focused only on street design projects. The team composition for subsequent similar projects must ensure an overlap/ continuity with regard to the personnel who were part of the previous project. This is to ensure that there is knowledge transfer from the direct experience of working on such a project.

Training programs must be made a compulsory requirement for new hires and especially for those who are working on street design projects. It is also important to train the middle rung i.e. assistant engineers and junior engineers as this could result in knowledge transfer across the organization.

To set up clear channels of communication and documentation with respect to working with other departments/ contractors/ consultants to ensure efficient functioning/ delivery of projects at the organizational level. This will also ensure that there are clear channels for knowledge transfer.

Work distribution needs to be streamlined across the hierarchy of the organisation to avoid the current situation of all engineers getting involved in all stages of the project with or without experience. This will also address the issue of tight schedule and lack of time for any enhancement of skills at an individual level.

Any vacant positions at all levels of hierarchy need to be filled with technically sound persons to ensure that decision-making work load is not falling on a few individuals at the higher level and also to ensure that those recruited at junior levels are able to manage the work within their scope without much dependence on their seniors.

12.3 Recommendations for institutional capacity development:

City level plans such as master plan, city mobility plan and NMT Network Plan should be operationalized by identifying implementable projects that fall within the vision frameworks for these documents.

CCMC may initiate the creation of separate budgetary allocations for such projects which are made in line with above mentioned city level plans so that they can be realized in an incremental manner.

There should also be a clearly defined framework for engaging with technical cooperation agencies in a manner that aligns with the city's larger plans for development.

Clear mandates must be prescribed for project-related compliances which makes the awareness and adoption of NMT related standards and codes related to street design a compulsory aspect while working on street-related projects.

Participatory planning must be mandated to ensure that there is a holistic approach to development with enough patronage from end users. A tactical urbanism approach can be mandated using the guidebook for reference to ensure that this is achieved.

13. WAY FORWARD AND NEXT STEPS

1. Formal issuance of notification by CCMC to create the positions of nodal offices for NMT along with an indication of their roles and responsibilities.
2. **Formal submission of the training modules to Commissionerate of Municipal Administration(CMA) and Tamil Nadu Institute for Urban Studies(TNIUS):** At present, TNIUS, a premier training and research Institute in Urban Management promoted by the Government of Tamil Nadu, plans, and conducts training programs for urban local bodies in Tamil Nadu. The focus on urban mobility in the existing training curriculum is limited and while it essentially checks the necessary boxes typically- street lights, road furniture, bus stop design, geometrics, DPR preparation, maintenance, etc. discussions reveal these not being adequate and frequent enough for engineers to address issues related to street design and road safety.

The next step for this work would be TNIUS to adopt the training modules prepared under this project and disseminate the knowledge to various ULBs in Tamil Nadu, thereby making meaningful strides to create a low emissions and green state.

ANNEXURES:

- LIST OF ACCOMPANYING DOCUMENTS:
- ANNEXURE A- TRAINING AGENDA
- ANNEXURE B- PEDESTRIAN ENVIRONMENT AUDIT (PART 1)
- ANNEXURE C- PEDESTRIAN ENVIRONMENT AUDIT (PART 2)
- ANNEXURE D- NMT BOARD GAME
- ANNEXURE E- ROAD STRETCHES CONSIDERED FOR REDESIGN
- ANNEXURE F- SPEAKER PROFILE

ANNEXURE A- TRAINING AGENDA

Day	Start	End	Activity	Duration	Location	Training Personnel required
Day 1: General Sensitization workshop	10 00	10 20	Introductory presentation Overview of the workshop - Objectives and activities	20 minutes	Indoor	Instructor: 1
	10 20	10 35	Tea break	15 minutes	Indoor	
	10 35	11 30	Tutorial on conducting Pedestrian Environment Audit - Part 1	55 minutes	Indoor	Instructor: 1
	11 30	**13 30**	**Pedestrian Environment Audit - Part 1**	2 hours	Outdoor	*Facilitators: 1 for two teams*
	13 30	14 30	Lunch break	1 hour	Indoor	
	14 15	15 45	Creating awareness to prioritise NMT on our streets - NMT Gaming session	1 hour 30 minutes	Indoor	Facilitators: 1 per table/ game board
	15 45	16 00	Tea break	15 minutes	Indoor	
	16 00	16 30	Introduction to network planning for NMT	30 minutes	Indoor	Instructor: 1
	16 30	17 00	Mapping user groups based on observations from Pedestrian Environment Audit - Part 1	30 minutes	Indoor	Instructor: 1
Day 2: Understanding the site and its users	10 00	10 15	Introduction to Day 2 activities	15 minutes	Indoor	Instructor: 1
	10 15	10 45	Presentation of outcomes of Pedestrian environment audit - Part 1	30 minutes	Indoor	Instructor: 1
	10 45	11 00	Tea break	15 minutes	Indoor	
	11 00	12 00	Role play exercise	1 hour	Indoor	Facilitators: 2
	12 00	13 00	Mapping user groups and their needs	1 hour	Indoor	Facilitators: 1 per team
	13 00	14 00	Lunch break	1 hour	Indoor	
	14 00	14 45	Tutorial on conducting Pedestrian Environment Audit - Part 2	45 minutes	Indoor	Instructor: 1
	14 45	18 00	**Pedestrian Environment Audit - Part 2**	3 hours and 15 minutes	Outdoor	*Facilitators: 1 per team*
Day 3: Designing an NMT corridor–1	10 00	10 15	Introduction to Day 3 activities	30 minutes	Indoor	*Instructor: 1*
	10 15	10 30	Tutorial on Designing the street section	15 minutes		*Instructor: 1*
	10 30	10 45	Tea break	15 minutes	Indoor	
	10 45	13 30	**Designing the street section**	2 hours 45 minutes	Indoor	*Facilitators: 1 per team*
	13 30	14 30	Lunch break	1 hour	Indoor	
	14 30	16 30	**Translating the street section into a plan**	2 hours	Indoor	*Facilitators: 1 per team*
	16 30	16 45	Tea break	15 minutes	Indoor	
	16 45	17 00	**Working with above grade utilities**	15 minutes	Indoor	*Instructor: 1*
Day 4: Designing an NMT corridor–2	10 00	10 45	Tutorial on Intersection design	45 minutes	Indoor	Instructor: 1
	10 45	11 00	Tea break	15 minutes	Indoor	
	11 00	12 30	Designing the Intersection fix	1 hour 30 minutes	Indoor	Facilitators: 1 per team
	12 30	13 30	Preparation for first jury/ review session	1 hour		Facilitators: 1 per team
	13 30	14 30	Lunch break	1 hour	Indoor	
	14 30	16 30	**Review session**	2 hours	Indoor	
	16 30	17 00	Tea break and Closing Comments	30 minutes	Indoor	
Day 5: Testing the design	10 00	11 30	Continuation of street design working session	1 hour 30 minutes	Indoor	Facilitators: 1 per team
	11 30	11 45	Tea break	15 minutes	Indoor	
	11 45	12 30	Introduction to tactical urbanism	45 minutes	Indoor	Instructor: 1
	12 30	13 30	Lunch break	1 hour	Indoor	
	13 30	17 00	**Testing of design on ground - tactical urbanism**	3 hours 30 minutes	Outdoor	Facilitators: 1 per team
Day 6: Exhibiting ideas and designs	10 00	11 15	Preparation for final review	1 hour 15 minutes	Indoor	Facilitators: 1 per team
	11 15	11 30	Tea break	15 minutes	Indoor	
	11 30	13 00	Preparation for final review	1 hour 30 minutes	Indoor	Facilitators: 1 per team
	13 00	14 00	Lunch break	1 hour	Indoor	
	14 00	16 30	**Final review session**	2 hours 30 minutes	Indoor	
	16 30	16 45	Tea break	15 min	Indoor	
	16 45	17 00	Closing comments & feedback session	15 minutes	Indoor	Instructor: 1

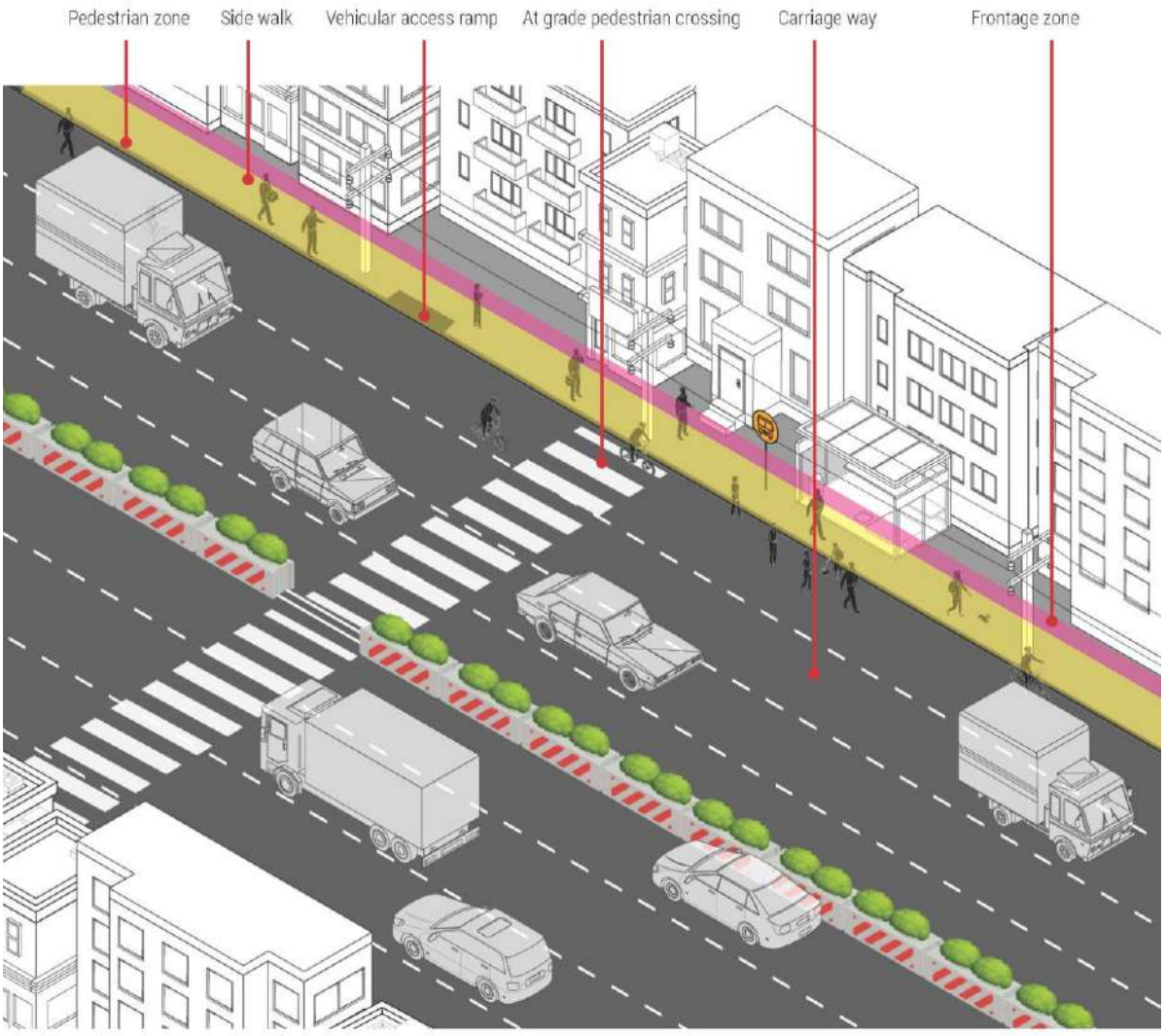
ANNEXURE B- PEDESTRIAN ENVIRONMENT AUDIT (PART 1)

PEDESTRIAN ENVIRONMENT AUDIT | *Part 1*

Why measure walkability ?

Our streets are increasingly becoming the domain of motorized vehicles, with very little consideration given to the needs of pedestrians. Lack of footpaths, poor construction and lack of maintenance are all factors that discourage people from walking regularly.

The premise of this audit is to understand the existing condition of a street to ensure it is safe, comfortable and convenient for pedestrians.



GLOSSARY

Accessibility:
The ease with which a building, place or facility can be reached by people and/or goods and services. Accessibility can be shown on a plan or described in terms of pedestrian and vehicle movements, walking distance from public transport, travel time or population distribution.

Amenity:
Design, aesthetic or other features of a development (building or public space) that increase its marketability or usability to the public. Examples of amenities include: good architecture, open space, landscaping, street furniture, an outdoor amphitheatre, public art etc.

Barrier-Free Design/ Universal design:
Building and site design which is accessible to all people, regardless of age and abilities.

Building access:
The entry / exit points of a building for pedestrians & vehicles

Footpath:
Is defined by the area between the kerb and the property boundary used to support pedestrian movement along the street. Footpaths in some locations can support activities such as footpath dining. Wider footpaths improve pedestrian amenities, ease of movement and connectivity by allowing the provision of street furniture, shade trees and landscaping. Frontage The width of a single lot, measured parallel to the right-of-way.

Frontage zone:
The area adjacent to the property line where transitions between the public sidewalk and the space within buildings occur. (also dead width)

Para transit:
Forms of transportation services that are more flexible and personalized than conventional fixed-route, fixed-schedule service. The vehicles are usually low- or medium-capacity vehicles, and the service offered is adjustable in various degrees to individual users' desires. Its categories are public, which is available to any user who pays a pre-determined fare (e.g., autos, share autos) and semi-public, which is available only to people of a certain group, such as the elderly, employees of a company, or residents of a neighbourhood (e.g., vanpools, subscription buses). These services are usually informal and oftentimes fill the gaps in the public transport network.

Pedestrian:
All people on foot or moving at walking speed, including those who use mobility aids (wheelchairs, scooters, etc.), persons with strollers and buggies, and frail elderly persons.

Right-of-way (RoW):
That part of the street space including the space above and below the surface that is publicly owned and lies between the property lines. This space is generally established for the use of pedestrians, vehicles, or utilities.

Traffic calming:
Measures to reduce the speed of motor traffic, particularly in residential areas. They include education, enforcement and engineering (the three Es).

Walkability:
A condition of a system of routes which are barrier free, interesting, safe, well-lit, comfortable and inviting to pedestrian travel. Essentially, the ease with which it is possible to walk around an area, from one point to another.

Way finding:
The information which orients users of an area to ensure their ability to navigate through an area. This information includes but is not limited to signs, graphic communications, streetscape elements, building design and the street network.

Auditor's name:

_____

Name of the street:

_____

Name of the locality / Area:

_____

Starting location of the street that is being audited:

_____

Ending location of the street that is being audited:

_____

1 FOOTPATH

1.1 General observations

Is a footpath present ?

☐ Yes ☐ No

Is the path provided on both sides of the road ?

☐ Yes ☐ No

What is the type of footpath ?

☐ Constructed continuous footpath (Wheel chair can go along full length)

☐ Constructed but non continuous footpath (Wheel chair can't go along full length)

☐ At grade foot path demarcated by difference in material

☐ No footpath but there is adequate space between the road and property edge to walk

☐ No footpath and no space for walking

Which direction is most of the pedestrian traffic?

☐ Both directions ☐ One direction

☐ Unclear

Is the width of the path uniform throughout the street ?

☐ Yes, it is uniform

☐ No, it varies along the stretch

☐ Not Applicable

1.2 Path condition & Path obstructions

What is the hazard or maintenance issue ?

☐ Uneven or broken surface

☐ Slippery Surface

☐ Protruding tree roots

☐ Low hanging wires or tree branches

☐ Garbage

☐ Construction material or Debris

☐ Manholes

☐ Low mounted road signs

☐ Things protruding from the ground

☐ Waterlogging

☐ Other _____

What are the permanent obstructions ?

☐ Street Signs

☐ Bus stops / shelters

☐ Street furniture / seats

☐ Trees / bushes

☐ EB boxes

☐ Transformers

☐ Telephone boxes

☐ Access ramps to properties

☐ CCTV poles

☐ Street lights

☐ Built Encroachments

☐ Public toilets

☐ Police booth

☐ Overhead cables

☐ Tree branch

☐ Kiosks/ Petty Shop

☐ Other _____

What are the temporary obstructions?

☐ Parked bicycles

☐ Parked Cars

☐ Parked Two Wheelers

☐ Portable signs

☐ Seats from cafes

☐ Shop Stands / Hoarding / Flex banner

☐ Dumpster/Dust bin

☐ Garbage/Debris

☐ Vendors
☐ Pavement dwellers
☐ Barricades
☐ Other _____

1.3 Path connectivity

Is it continuous (i.e. no missing sections?)
☐ Yes ☐ No

Is the path connected to other paths to form a pedestrian network?
☐ Yes ☐ No ☐ Not Applicable

Is it connected to key destinations along the route?
☐ Train / MRTS / Metro Stations
☐ Bus Stand / Depot
☐ Bus Stop
☐ School
☐ Neighborhood grocery stores / provision / ration shop
☐ Park
☐ Community Centre
☐ Office
☐ Healthcare
☐ Other _____

1.4 Accessibility for persons with disabilities (PwD)

Is the surface of the path suitable for use by prams, wheelchairs and mobility-impaired persons ?
☐ Yes ☐ No ☐ Not Applicable

Are kerb ramps provided at the kerb, median and refuge areas to accommodate wheelchairs and prams?
☐ Yes ☐ No ☐ Not Applicable

Is the slope from the path to the road safe, smooth and comfortable to use?
☐ Yes ☐ No ☐ Not Applicable

Are waiting areas level with sufficient maneuvering space to accommodate wheel chairs and all users?
☐ Yes ☐ No ☐ Not Applicable

Can vision impaired pedestrians identify the crossing via tactile surfaces provided?
☐ Yes ☐ No ☐ Not Applicable

Do pedestrian signals have audio-tactile devices for vision impaired pedestrians?
☐ Yes ☐ No ☐ Not Applicable

2 CROSSING/ INTERSECTION

Location of the intersection / crossing #1

_____

What type of crossing is present?
☐ Median island / refuges
☐ Zebra
☐ Automatic Pedestrian Signals
☐ Traffic lights without pedestrian signals
☐ Foot over Bridge
☐ Subway
☐ School crossing
☐ Traffic cop assisted crossing
☐ No facility

How many traffic lanes do pedestrians have to cross ?

_____

Are median islands provided to allow pedestrians to cross in two stages?
☐ Yes ☐ No ☐ Not Applicable

Are crossings at logical locations e.g. entrances/ exits to key destinations or connections to other paths?
☐ Yes ☐ No ☐ Not Applicable

Do pedestrians use the crossing points provided correctly?

☐ Yes ☐ No ☐ Not Applicable

If crossing is prohibited, are pedestrians directed via physical barriers and signs to another crossing point?

☐ Yes ☐ No ☐ Not Applicable

At the traffic junction is the pedestrian signal duration long enough to cross the road ?

☐ Yes ☐ No ☐ Not Applicable

Is the waiting time for pedestrian signal short enough to encourage people to wait for the correct signal to cross the road ?

☐ Yes ☐ No ☐ Not Applicable

At non-signalised intersection: Do the gaps in the traffic flow allow people to cross the road safely?

☐ Yes ☐ No ☐ Not Applicable

Is the waiting area sufficient to accommodate the expected pedestrian volumes ?

☐ Yes ☐ No ☐ Not Applicable

Is the crossing sufficiently well marked, wide enough, at a logical location and clearly visible ?

☐ Yes ☐ No ☐ Not Applicable

Are the kerb ramps and waiting areas located right next to the pedestrian crossing ?

☐ Yes ☐ No ☐ Not Applicable

Location of the intersection / crossing #2

_____

What type of crossing is present?

☐ Median island / refuges
☐ Zebra
☐ Automatic Pedestrian Signals
☐ Traffic lights without pedestrian signals
☐ Foot over Bridge
☐ Subway
☐ School crossing
☐ Traffic cop assisted crossing
☐ No facility

How many traffic lanes do pedestrians have to cross ?

_____

Are median islands provided to allow pedestrians to cross in two stages?

☐ Yes ☐ No ☐ Not Applicable

Are crossings at logical locations e.g. entrances/ exits to key destinations or connections to other paths?

☐ Yes ☐ No ☐ Not Applicable

Do pedestrians use the crossing points provided correctly?

☐ Yes ☐ No ☐ Not Applicable

If crossing is prohibited, are pedestrians directed via physical barriers and signs to another crossing point?

☐ Yes ☐ No ☐ Not Applicable

At the traffic junction is the pedestrian signal duration long enough to cross the road ?

☐ Yes ☐ No ☐ Not Applicable

Is the waiting time for pedestrian signal short enough to encourage people to wait for the correct signal to cross the road ?

☐ Yes ☐ No ☐ Not Applicable

At non-signalised intersection: Do the gaps in the traffic flow allow people to cross the road safely?

☐ Yes ☐ No ☐ Not Applicable

Is the waiting area sufficient to accommodate

the expected pedestrian volumes ?

☐ Yes ☐ No ☐ Not Applicable

Is the crossing sufficiently well marked, wide enough, at a logical location and clearly visible ?

☐ Yes ☐ No ☐ Not Applicable

Are the kerb ramps and waiting areas located right next to the pedestrian crossing ?

☐ Yes ☐ No ☐ Not Applicable

3 SIGNAGES

Is signage provided to guide and direct pedestrians to the key destinations in the area ?

☐ Yes ☐ No

Are street names clearly visible to pedestrians?

☐ Yes ☐ No

☐ Not Applicable (There are no street name board / marking)

Are pedestrian routes/crossings clearly visible to motorists via warning signs and pavement markings ?

☐ Yes ☐ No

☐ Not Applicable (There are no warning signs)

Are the signage and pavement markings visible during day & night ?

o Yes o No

o Not Applicable (There are no signage)

4 PERSONAL SAFETY

Do you feel safe walking on this route section during the day?

☐ Yes ☐ No

Do you feel safe walking on this route section during the night?

☐ Yes ☐ No ☐ I don't know

Are there enough people around to make you feel safe during the day ?

☐ Yes ☐ No

Are there / would there be enough people around to make you feel safe during the night ?

☐ Yes ☐ No ☐ I don't know

Is there good lighting in the area during the night ?

☐ Yes ☐ No ☐ I don't know

5 ADJACENT TRAFFIC

Is separation provided between motorists and pedestrians?

☐ Level difference
☐ Safety Rail
☐ Bollards
☐ Trees/Vegetation
☐ None
☐ Other _____

Is the path used by other traffic?

☐ Wheelchairs
☐ Prams
☐ Bikes
☐ Scooters
☐ Cycles
☐ Other _____

Is oncoming traffic clearly visible to pedestrians (no obstructions blocking sight lines) at crossings?

☐ Yes ☐ No

Are there any traffic calming devices?

☐ Yes ☐ No

If yes what are the traffic calming devices?

☐ Speed humps
☐ Median Islands
☐ Chicanes
☐ Roundabouts

☐ Projecting kerbs
☐ Material
☐ Barricades
☐ Other _____

6 AESTHETICS AND AMENITIES

Is the street segment attractive and pleasant to walk around?

☐ Yes ☐ No

Is shade provided to the path by trees or other built structures?

☐ Yes ☐ No ☐ Not Applicable

Are there any seating/resting spaces along the street segment ?

☐ Yes ☐ No

If yes, is there shade provided at resting places and areas with street furniture, by trees or structures?

☐ Yes ☐ No ☐ Not Applicable

Are there any toilets?

☐ Yes ☐ No

What is the condition of footpath outside toilets?

☐ Constructed continuous footpath (Wheel chair can go along full length)
☐ Constructed but non continuous footpath (Wheel chair can't go along full length)
☐ At grade foot path demarcated by difference in material
☐ No footpath but there is adequate space between the road and property edge to walk
☐ No footpath and no space for walking

Are there dustbins ?

☐ Yes ☐ No

Are there any vendors in this stretch?

☐ Yes ☐ No

7 PUBLIC TRANSPORT/ PARA TRANSIT

Is the stretch a bus route road ?

☐ Yes ☐ No

Is there a bus stop on this stretch ?

☐ Yes ☐ No

Are there any auto pick up points ?

☐ Yes ☐ No

8 PARKING

Is there parking on this stretch ?

☐ Yes ☐ No

If yes, where is it located ?

☐ Both sides ☐ One side

What vehicle is the parking designated for ?

☐ Two wheeler ☐ Four wheeler
☐ Auto

Is there any loading/ unloading activity on this stretch ?

☐ Yes ☐ No

ANNEXURE C- PEDESTRIAN ENVIRONMENT AUDIT (PART 2)

AGE AND GENDER SURVEY

The age and gender survey can form an additional layer of information with the pedestrian counts to understand the social and demographic factors of space usage. It helps to provide a picture of who uses and moves through the city. The balance between different age groups and genders is an indicator of the quality, safety and integration level of public spaces.

WHAT TO SURVEY?

The Age and Gender survey can be conducted by observing passing pedestrians, and for each person, noting down the gender (M/F) and approximate age group:

- Children 0-17
- Adults 18-60
- Seniors above 60

This survey will have to be done for a target number of 100 pedestrians irrespective of the time it takes to reach this count. Pedestrians are recorded in the worksheet using the following abbreviations-

MC - Male child
MA - Male adult
MS - Male senior citizen
FC - Female child
FA - Female adult
FS - Female senior citizen

WHEN TO SURVEY?

This survey can be repeated four times a day, in sync with the morning and evening peak hours and lunchtime.

AGE AND GENDER SURVEY

Location		Surveyor Name	
Date		Note	

This survey was conducted on ☐ a weekday ☐ a weekend

TIME	01	02	03	04	05	06	07	08	09	10
8 AM										
12 noon										
4 PM										
7 PM										

CALCULATIONS

MC	
MA	
MS	
FC	
FA	
FS	
TOTAL	

MC	
MA	
MS	
FC	
FA	
FS	
TOTAL	

MC	
MA	
MS	
FC	
FA	
FS	
TOTAL	

MC	
MA	
MS	
FC	
FA	
FS	
TOTAL	

legend - M - Male, F - Female, C - Child (0-17), A - Adult (18-60), S - Senior (above 60)

PEDESTRIAN COUNT

Pedestrian counts are useful in understanding the volumes and patterns of usage of the public realm across the site area / neighbourhood / city district. When collated, the data on number of people walking in the city can provide valuable insights on what places work well for pedestrian occupation, and factors that contribute to lively use of the public realm despite poor infrastructure or environmental quality.

The pedestrian environment audit again provides the framework for counting pedestrian activity. The following pointers will be useful in executing the pedestrian counting activity.

WHOM TO COUNT?

1. Count all pedestrians walking in each direction.
2. Count children, as well as children carried by their parents
3. Count people in wheelchairs and on rollerskates as pedestrians.
4. Count people riding bicycles separately, as their own category

WHEN TO COUNT?

1. You will need to take a pedestrian count for 10 minutes in every hour at each of the selected locations. This can then be extrapolated to an hourly count by multiplying by 6.
2. Ideally, counts spanning every hour from 7 am to 11 pm would be useful to understand the ebbs and flows in activity. If this is not practical, aim to capture atleast 2 hours of counts each in the morning and evening during rush hours and an additional 2 hours around lunch time (totally 6 hours of counts).

THINGS TO REMEMBER:

1. If you are using a counter/ clicker , reset to zero before each count
2. Count for exactly 10 minutes every hour. Use a stopwatch to monitor if necessary
3. Carry an official letter from the concerned authorities at all times during surveying

PEDESTRIAN COUNT

Location		Surveyor Name	
Date		Note	

This survey was conducted on ☐ a weekday ☐ a weekend

TIME	NO. OF PEDESTRIANS		NOTES
	Direction 1	Direction 2	
07.00 - 07.10			
08.00 - 08.10			
09.00 - 09.10			
10.00 - 10.10			
11.00 - 11.10			
12.00 - 12.10			
13.00 - 13.10			
14.00 - 14.10			
15.00 - 15.10			
16.00 - 16.10			
17.00 - 17.10			
18.00 - 18.10			
19.00 - 19.10			
20.00 - 20.10			
21.00 - 21.10			
22.00 - 22.10			
23.00 - 23.10			

VEHICULAR COUNT

Vehicular counts helps in understanding the nature and volume of the floating population, traffic pattern and density in the stretch / site area. Data obtained from documenting the number of vehicles crossing a particular point at various time intervals can be compared with the standards to determine the width of the carriage way at various sections of the stretch, giving more space for pedestrians.

The following pointers will be useful in executing the vehicular counting activity.

WHAT TO COUNT?

1. Count all vehicles in each direction.
2. Each vehicle category is counted and tabulated separately.

WHEN TO COUNT?

1. You will need to take a vehicular count for 10 minutes in every hour at each of the selected locations. This can then be extrapolated to an hourly count by multiplying by 6
2. Ideally, counts spanning every hour from 7 am to 11 pm would be useful to understand the ebbs and flows in activity. If this is not practical, aim to capture atleast 2 hours of counts each in the morning and evening during rush hours and an additional 2 hours around lunch time (totally 6 hours of counts)

THINGS TO REMEMBER:

1. If you are using a counter/ clicker , reset to zero before each count
2. Count for exactly 10 minutes every hour. Use a stopwatch to monitor if necessary
3. Carry an official letter from the concerned authorities at all times during surveying

VEHICULAR COUNT

Location		Surveyor Name	
Date		Note	

This survey was conducted on ☐ a weekday ☐ a weekend

TIME	CAR		TWO WHEELER		BUS		AUTO		SHARE AUTO		BICYCLE		LORRY	
	Direction													
	1	2	1	2	1	2	1	2	1	2	1	2	1	2
07.00 - 07.10														
08.00 - 08.10														
09.00 - 09.10														
10.00 - 10.10														
11.00 - 11.10														
12.00 - 12.10														
13.00 - 13.10														
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17.00 - 17.10														
18.00 - 18.10														
19.00 - 19.10														
20.00 - 20.10														
21.00 - 21.10														
22.00 - 22.10														
23.00 - 23.10														
TOTAL														

PARKING COUNT

Counting the vehicles parked along the stretch, gives information about the percentage of the road section used for parking. The number of vehicles parked at various instances at the same day helps in deducing the parking demand for the stretch, which can be considered while redisgning the stretch.

The following pointers will be useful in executing the parking counting activity.

WHAT TO COUNT?

1. Count all the vehicles parked in the stretch.
2. Count vehicles parked on either side of the road and tabulate them separately.
3. Count the service vehicles parked during the exercise. Service vehicles include supply vehicles, cleaning trucks etc.

WHEN TO COUNT?

1. You will need to take a parking count for every hour at each of the selected locations. This can then be extrapolated to an hourly count by multiplying by 6.
2. Ideally, counts spanning every hour from 7 am to 11 pm would be useful to understand the ebbs and flows in activity. If this is not practical, aim to capture atleast 2 hours of counts each in the morning and evening during rush hours and an additional 2 hours around lunch time (totally 6 hours of counts)

Additionally, parking patterns can be marked on a map to better understand, where the vehicles are parked with respect to the context. The mapping exercise can be done in a single go if the considered stretch is less than 500m. If more, the stretch can be demargated into different segments and the exercise is carried out for each segment.

MAP OF SITE / STUDY AREA

Use survey drawing. If not available, use google maps.

PARKING COUNT

Location		Surveyor Name	
Date		Note	

This survey was conducted on ☐ a weekday ☐ a weekend

TIME	CAR		TWO WHEELER		AUTO		BICYCLE		SERVICE VEHICLE	
	Side A	Side B	Side A	Side B	Side A	Side B	Side A	Side B	Side A	Side B
07.00 - 07.10										
08.00 - 08.10										
09.00 - 09.10										
10.00 - 10.10										
11.00 - 11.10										
12.00 - 12.10										
13.00 - 13.10										
14.00 - 14.10										
15.00 - 15.10										
16.00 - 16.10										
17.00 - 17.10										
18.00 - 18.10										
19.00 - 19.10										
20.00 - 20.10										
21.00 - 21.10										
22.00 - 22.10										
23.00 - 23.10										

TOTAL										

USER GROUP ANALYSIS

User group analysis is essential to understand the various stakeholders involved in the selected site area. This help in understanding the issues and needs of the various user groups, which can be translated into design considerations.

The following steps are to be followed in the user analysis:

1. List all the user groups involved in the site area based on their usage.
2. Categorize the users into primary, secondary and tertiary stakeholders based on the usage and amount of time they spend on the site.
3. Based on this categorisation, come up with means of engagement to understand the issues faced by each user groups and their needs.

SOME TYPICAL USER GROUP PROFILES

Pedestrians

School and college **students** from nearby institutions, **working population, religious institution visitors** and **shoppers** who use the street as well as transit users.

Motorists

Private vehicle drivers and **public transportation** drivers who frequently use the stretch as well as park the vehicles there.

Police Officers who guide the traffic at intersections and during the Tactical urbanism project.

Residents' Welfare Association (RWA) of nearby neighbourhoods.

Shopkeepers who own or work at shops in the stretch and temporory **street vendors** who keep tempory stalls/kiosks/vehicle stalls.

USER GROUP ANALYSIS

USER GROUP	6-7 AM	7-8 AM	8-9 AM	9-10 AM	10-11 AM	11-12 AM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	7-8 PM	8-9 PM	9-10 PM
01.																
02.																
03.																
04.																
05.																
06.																
07.																
08.																
09.																
10.																
11.																
12.																
13.																
14.																
15.																
16.																
17.																
18.																

ACTIVITY MAPPING

This survey is intended to create a snapshot of the activities in a public space at a given moment. Walk through the space, look ahead of you and map the activities you are passing on your way. Do not turn around or double back. Mark each of the people on the map in the right location, and according to the legend to specify activity type.

WHAT TO MAP?

1. People standing still – looking in at windows, street performers, talking etc.
2. People waiting for transport / traffic
3. People sitting
4. People lying down
5. Children playing
6. People doing physical activities like play, exercise etc.
7. People doing cultural activities – performances etc.
8. People doing commercial activities – hawkers, street vendors etc

Note - During the mapping exercise, only the stationary activities are to be mapped and people walking along the stretch are to be ignored. The above mentioned activities are some of the common activities in a public space and the surveyors need not restrict themselves to these activities.

WHEN TO MAP?

The stationary activities mapping should be done every hour in parallel with the pedestrian counts. Subject to size considerations, mapping stationary activities should take no more than 10 – 15 minutes every hour.

Similar to parking counts, the activity mapping exercise can be done in a single go if the considered stretch is less than 500m. If more, the stretch has to be demarcated into different segments and the exercise is to be carried out separately for each segment.

MAP OF SITE / STUDY AREA

Use survey drawing. If not available, use google maps.

ACTIVITY MAPPING

Location				Surveyor Name	
Date		Time		Note	

This survey was conducted on ☐ a weekday ☐ a weekend

ACTIVITY	SYMBOL	NUMBER
Standing	●	
Waiting for transport	○	
Sitting	■	
Lying down	□	
Children playing	×	
Physical Activities	⊠	
Cultural activities	▲	
Commercial activities	△	
Total		

VENDOR MAPPING

Vendors are an important aspect of street activity. Mapping the vendors in a stretch will give a holistic image of the various vendors operating in the zone and include them as part of the new proposal.

WHAT TO MAP?

1. Only the street vendors are to be marked. This does not include the commercial establishments along the stretch.
2. Document the type of shop - Permanent or Temporary, Movable or Immovable, etc.
3. Document the type of goods sold by the vendors.
4. Document the time period for which the vendor is present on the street
5. Also, document the time interval at which a particular vending activity is at its peak.
6. Document the number of vendors present at a particular vending activity.

WHEN TO MAP?

The vending activities mapping should be done every hour in parallel with the pedestrian counts. Subject to size considerations, mapping stationary activities should take no more than 10 – 15 minutes every hour.

The vendors mapping exercise can be done in a single go if the considered stretch is less than 500m. If more, the stretch has to be demarcated into different segments and the exercise is to be carried out separately for each segment.

MAP OF SITE / STUDY AREA

Use survey drawing. If not available, use google maps.

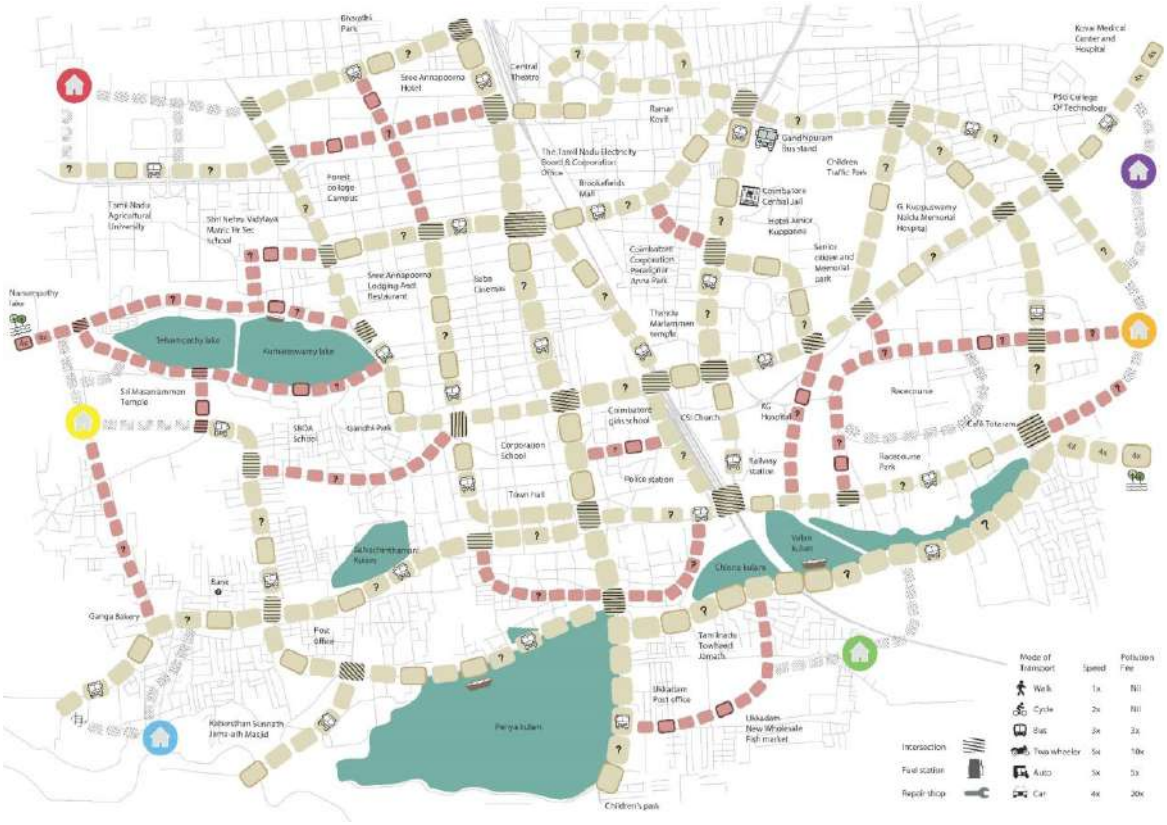
VENDOR MAPPING

Location				Surveyor Name	
Date		Time		Note	

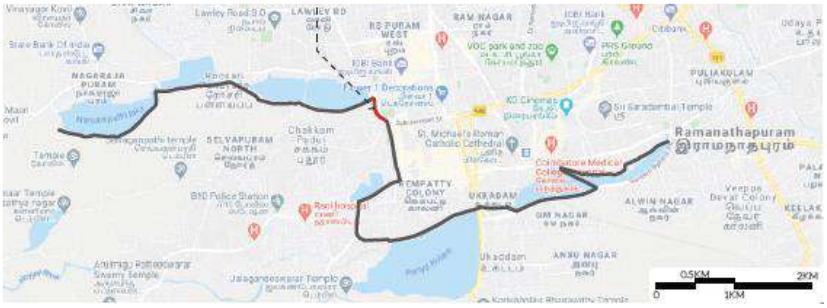
This survey was conducted on ☐ a weekday ☐ a weekend

ACTIVITY	SYMBOL	TYPE OF SHOP	TYPE OF GOODS	TIME DURATION	PEAK TIME INTERVAL	NUMBER OF PEOPLE
Total						

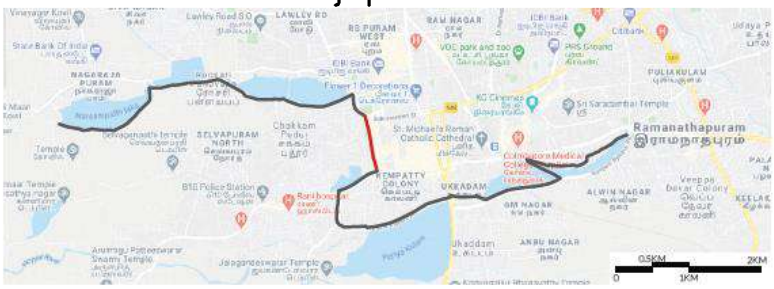
ANNEXURE D- NMT BOARD GAME

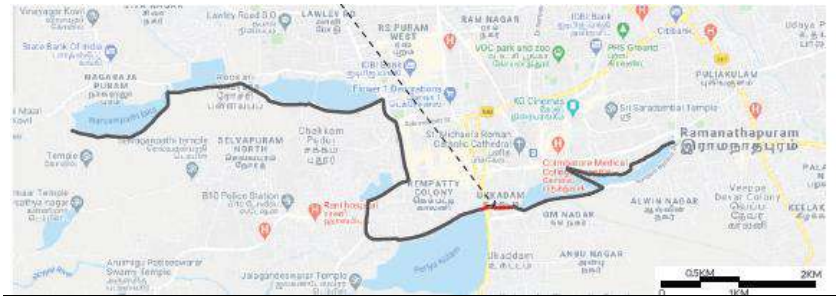


ANNEXURE E- ROAD STRETCHES CONSIDERED FOR REDESIGN.



Ponnaih Rajapuram Main Road





ANNEXURE F- SPEAKER PROFILE

Mr. P. Kumarvel Pandian, IAS
Commissioner, CCMC

Mrs. S. Madhuranthagi
Deputy Commissioner of CCMC

Mr. Ranjith Parvathapuram

Urban Transport Expert, SMART SUT, GFA Consulting Group GmbH

Urban and Transport planner with 10 years of experience.

Mrs. Vidhya Mohankumar

Founder at Urban Design Collective

Urban designer with 17 years of experience in urban design and also a visiting faculty to various universities.

Mrs. Zohra Mutabanna
General Manager at IBI Group

Senior urban planner with 17 years of experience in urban design and transportation planning.

Mr. Jigesh Bhavsar
Technical Manager at iRAP

Transportation engineer with 16 years of experience in road safety.

Ministry of Housing and Urban Affairs (MoHUA) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH are jointly implementing the technical cooperation project "Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT)", commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). The project works with the three Smart Cities of Bhubaneshwar, Coimbatore, and Kochi and respective state governments of Odisha, Tamil Nadu, and Kerala to promote low carbon mobility planning, and to plan and implement sustainable urban transport projects in the fields of public transport, non-motorised transport and modal integration.

As part of the Indo-German bilateral cooperation, both countries have also agreed upon a strategic partnership – Green Urban Mobility Partnership (GUMP) between Ministry of Housing and Urban Affairs (MoHUA) and Federal Ministry for Economic Cooperation and Development (BMZ). Within the framework of the partnership's technical and financial cooperation, the German government will support improvements in green urban mobility infrastructure and services, strengthen capacities of national, state, and local institutions to design and implement sustainable, inclusive, and smart mobility solutions in Indian cities. As part of the GUMP partnership, Germany will also be supporting expansion of public transport infrastructure, multimodal integration, low-emission or zero-emission technologies, and promotion of non-motorised transport in India. Through this strategic partnership, India and Germany intend to jointly achieve effective international contributions to fight climate change.