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Public transport and NMT infrastructure assessment for Erode, Tamil Nadu

*Analysing 'People Near Transit' and
Existing Service Quality of Bus
Stops and Footpaths*



The Institute for Transportation and Development Policy (ITDP) works with cities worldwide to promote sustainable, equitable, and inclusive urban transport. ITDP is a not-for-profit organisation headquartered in New York City with offices in China, Brazil, India, Indonesia, East Africa, Mexico, and the United States. Since 2021, ITDP is represented in India by ITDP Pvt. Ltd. and has worked with national, state, and city governments; multilateral agencies; and civil society organisations to make visible, on-the-ground improvements by providing technical expertise, policy solutions, research publications, and training programmes.

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Executive Summary

This study assesses access to public transport and schools in Erode through a combined **People Near Transit (PNT) analysis** and **on-ground situational audits** of bus stops and pedestrian (NMT) infrastructure. The objective is to understand how well existing infrastructure supports walking and public transport use, especially for vulnerable groups such as children, women, the elderly, and persons with disabilities.

The PNT analysis reveals that while **43.5% of the population lives within a 5-minute walk of any bus stop**, only **13.8%** have access to **frequent transit**, indicating limited reliability and service quality. Transit access is uneven across land uses—commercial and industrial areas are better served, while **slums and institutional areas** remain underserved, raising equity concerns.

Bus stop audits highlight severe infrastructure gaps. **76% of audited stops fall under 'Level of Service C (Poor)'**, with widespread absence of passenger information (77%), poor physical access, inadequate lighting (57%), and missing basic amenities such as shelters and seating (nearly 80%).

User perception surveys reinforce these findings, with over **70% of users feeling unsafe at night** and more than **90% reporting poor or absent seating**.

Access to schools presents equally critical challenges. Although walking accounts for nearly **40% of school and teacher trips**, the footpath network serves only **10 of 78 schools**. **31 schools are accessed via congested or high-traffic roads**, where nearly **90% of traffic comprises two- and four-wheelers**, and vehicle speeds frequently exceed safe school-zone limits. Safety risks are exacerbated by missing pedestrian crossings at **67% of major intersections**.

A strong **gender disparity** is evident: **33% fewer girls walk to school than boys**, and **75% fewer girls use buses**, despite free bus travel for women—indicating that affordability alone cannot overcome safety and accessibility barriers.

Overall, the study underscores the urgent need for **integrated improvements in walkability, safety, and universal accessibility**, prioritising safer school zones, continuous and accessible footpaths, well-lit and information-rich bus stops, improved transit frequency, and stronger first- and last-mile connectivity.

These interventions are essential to make walking and public transport safe, reliable, and trusted modes for all residents of Erode.

Executive Summary

Proposed short-term interventions

Public Transport

- **Transit Coverage:** Expand bus services to cover all major roads by adding **85 km** to the network and introducing circular mini-bus routes for better last-mile connectivity.
- **Transit Frequency:** Achieve **5-minute headways** along the 60 km core corridor. To meet the MoHUA benchmark of 60 buses per lakh population, the fleet must increase from **125 to 375 buses**.
- **Bus Stop Infrastructure:** Ensure shelters along all transit corridors - prioritise **15 new shelters**, and equip all **225 bus stops** with passenger information systems.

Footpath Coverage

- **Safe Routes to Schools:** Upgrade **35 km of streets** around corporation schools with traffic calming and safe crossings.
- **Pedestrian access to bus stops:** Provide footpaths along **60 km of existing transit corridors**.
- **Footpath improvements:** Make **10.85 km of footpaths** universally accessible.
- **Pedestrian-only streets:** Pedestrianise or convert to one-way **4.3 km of narrow core-area streets**.

Glossary

People Near Transit (PNT)	A spatial analysis method that measures the proportion of the population living within a walkable distance (typically 400–800 m) of public transport services.
Non-Motorised Transport (NMT)	Modes of travel that do not use motor vehicles, such as walking and cycling.
Level of Service (LoS)	A scoring system used to evaluate the quality of infrastructure. In this study, LoS A indicates good performance, LoS B moderate, and LoS C poor.
Transit Shed	The geographic area that falls within a defined walking distance of a public transport service.
Frequent Transit	Public transport services operating at short, consistent intervals that reduce waiting times and improve reliability for users.
First- and Last-Mile Connectivity	The ease of access between a user's origin or destination and the nearest public transport stop.
School Zone	The area surrounding a school where traffic speeds, volumes, and street design should prioritise child safety.
Universal Accessibility	Design that ensures streets and public transport infrastructure can be safely and comfortably used by all people, including persons with disabilities, children, and the elderly.

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Overview of the study

Background

Need for the study

One of the critical factors to improve the experience of using public transport and increase the ridership is to **improve the public transport service network**.

As per the Erode's Comprehensive Mobility Plan 2015, walking constitutes 27% of the transport mode share, while public transport constitutes 30%. Strengthening the infrastructure can ultimately benefit a larger number of users in Erode.

The **lack of first and last mile connectivity**, along with the other factors like frequency and reliability, often result in people shifting towards unsustainable transport modes like personal vehicles. **This results in traffic congestion, longer travel times, increased dependency on private vehicles, higher emissions.**

Even when developing first and last mile connectivity, **informed decision-making is essential**. This includes **identifying areas with poor access** in critical zones such as schools and access to public transit stops. It also involves understanding the quality of bus shelter infrastructure, since this determines the comfort, safety and accessibility of bus transport by current users.

Aim of the study

This study brings together different types of primary and secondary data studies to **assess two main aspects: i) the access to public transport, and ii) access to schools**, as these are two of the many generators of pedestrian footfall.

This, in turn, helps understand the **Level of Service (LoS) and operations of the existing Non-motorised Transport (NMT) infrastructure and bus transport infrastructure.**

Types of Studies



People Near Transit (PNT) Analysis



Situational Assessment (SA) of
Bus Shelters and NMT Infrastructure

PEOPLE NEAR TRANSIT ANALYSIS



What is it?

People Near Transit (PNT) is a methodology used to measure the proportion of a city's population that lives within a walkable distance of public transit services.

It is an effective proxy indicator to measure how well a city provides transit access to its residents.

It aids in assessing urban transport systems and services while exposing the accessibility gaps in the existing systems.

What are its objectives?

1. Measuring transit accessibility

To measure the number (or percentage) of urban residents who live within walking distance of public transport.

2. Identifying accessibility gaps & informing planning decisions

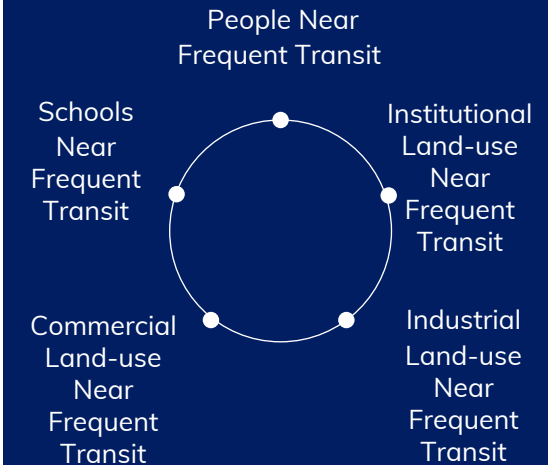
To identify portions of the city which is underserved by existing public transport systems and guide data-driven decision-making to improve the public transport.

Scope of the PNT analysis

A combination of bus-based transport and railway transport has been considered as 'transit' for this study. Bus-based transport includes both public and private buses. The transit shed has been visualised and used for analysis in the following manner:

- **Bus transit shed:** Private bus transport shed + Public bus transport shed
- **Public bus transport transit shed**
- **All transit shed:** Bus transit shed + Railway transit shed

Outcomes of Analysis



What is it?

Situational assessment of NMT and bus stop infrastructure examines safety, usability, and universal design parameters, and assesses how well the current facilities support different user groups.

The insights gained from this assessment highlight existing challenges and identify opportunities for improvement.

What are its objectives?

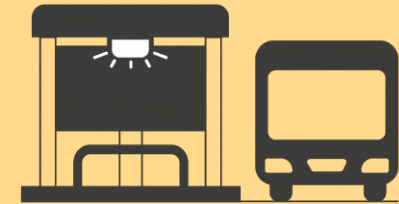
- 1. Quantifying accessibility gaps:** To measure the dimensions of the NMT and Bus Stop infrastructure provided vs the speeds and volume of vehicular traffic.
- 2. Capturing qualitative data:** To capture the use patterns and user perception of users of the existing NMT infrastructure & Bus Stops.
- 3. Creating a geo-spatial database:** To build a street audit methodology and a geospatial database of NMT Infrastructure & Bus Stops.

- 4. To inform planning and budgetary decisions:** To provide recommendations for improvement of the quality, utility, as well as O&M of existing infrastructure and create new infrastructure in areas of high demand.

Audits and surveys as part of Situational Analysis

- 1. NMT infrastructure audit**
To assess efficiency and adherence to standards and guidelines through observation of existing NMT infrastructure.
- 2. Bus stop infrastructure audit**
To assess efficiency and adherence to standards and guidelines through observation of existing NMT infrastructure.
- 3. Perception surveys of pedestrians and bus users**
To understand what challenges are faced by vulnerable groups such as young children, pedestrians, cyclists, and public transport users.
- 4. Speed surveys**
To assess the impact of moving motorised traffic on pedestrians and other vulnerable road users.

SITUATIONAL ASSESSMENT



Coverage

- **21 km of streets audited**
- **30 bus stops audited**
- **500 bus user perception surveys**
250 male, 250 female
- **18 vulnerable, 15 disabled**
- **300 school user perception surveys conducted**
200 Adults - 100 male, 100 female +
100 children – 50 girls, 50 boys
- **25 point speed surveys**
12 roads
2,54,264 vehicles



2

Methodology

Overall Methodology

1. Mixed-method research

- **PNT analysis** is conducted on the basis of **secondary data sets** resulting in **quantifiable gaps in the transit network**.
- **Situation Assessment** of Bus Stop and Pedestrian Infrastructure consists of analysis of **quantitative and qualitative data sets**, obtained through **primary data collection**.

2. Establishment of Level of Service (LoS)

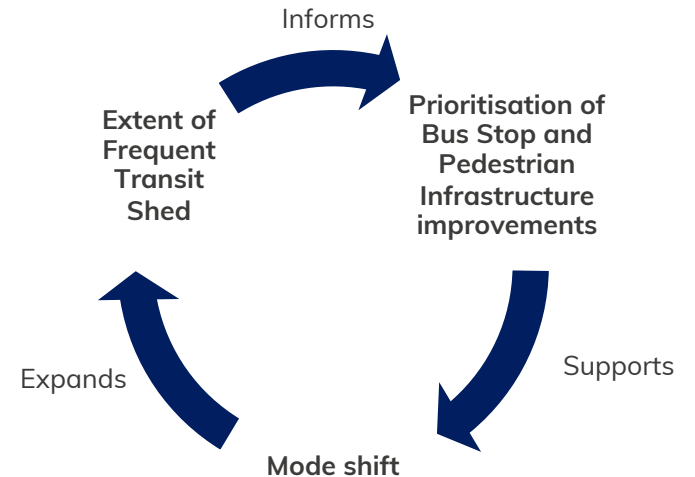
- Bus stop and Pedestrian Infrastructure assessment is quantified through a scoring process, resulting in assignment of Levels of Service.

3. Multi-criteria assessment

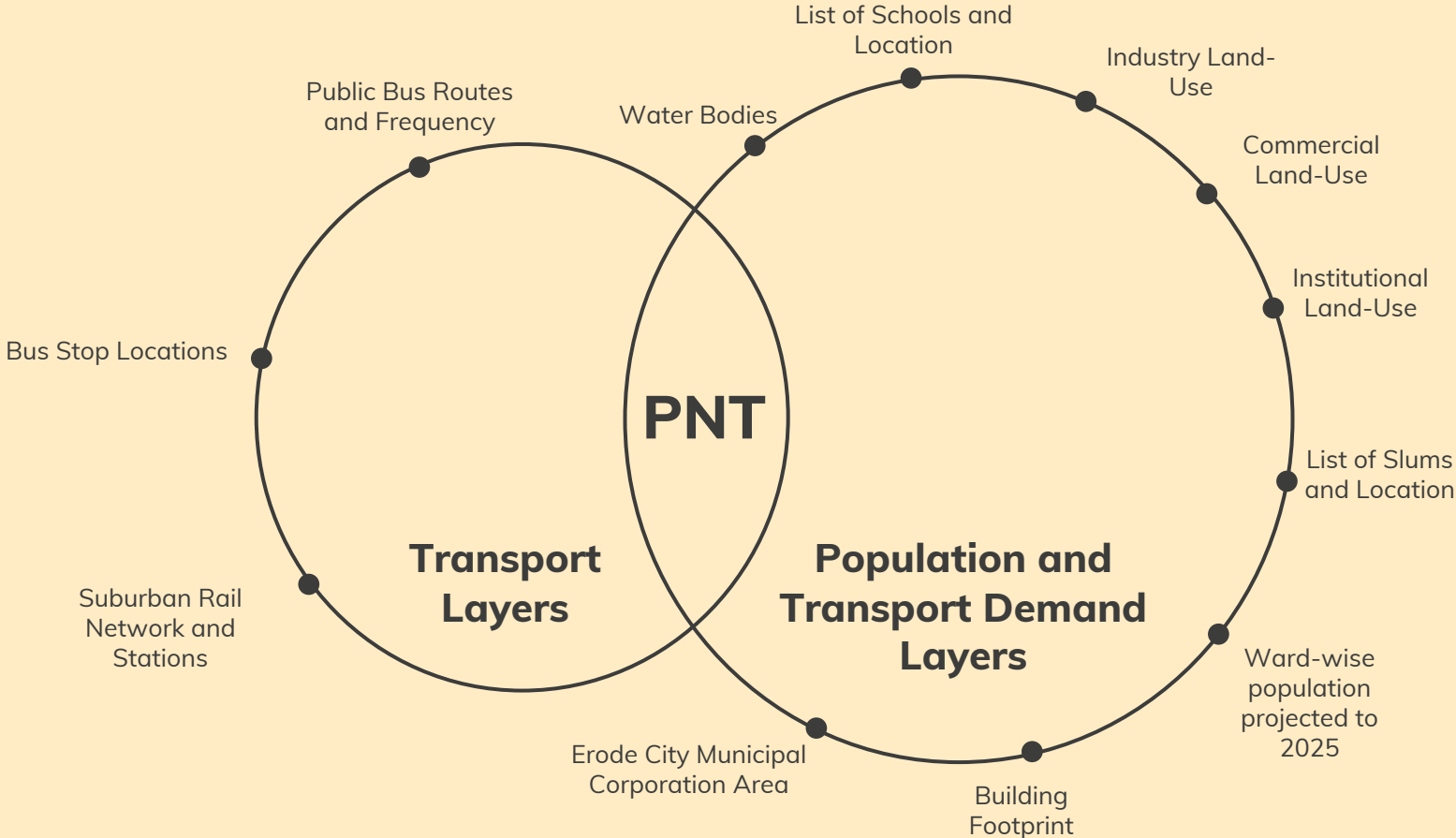
- Two assessment frameworks are developed in order to arrive at comprehensive insights through the process of data triangulation –
 - a. Access to Public Transport
 - b. NMT Infrastructure

4. Cross-referencing

- Insights from the two frameworks are used to develop complementary recommendations.



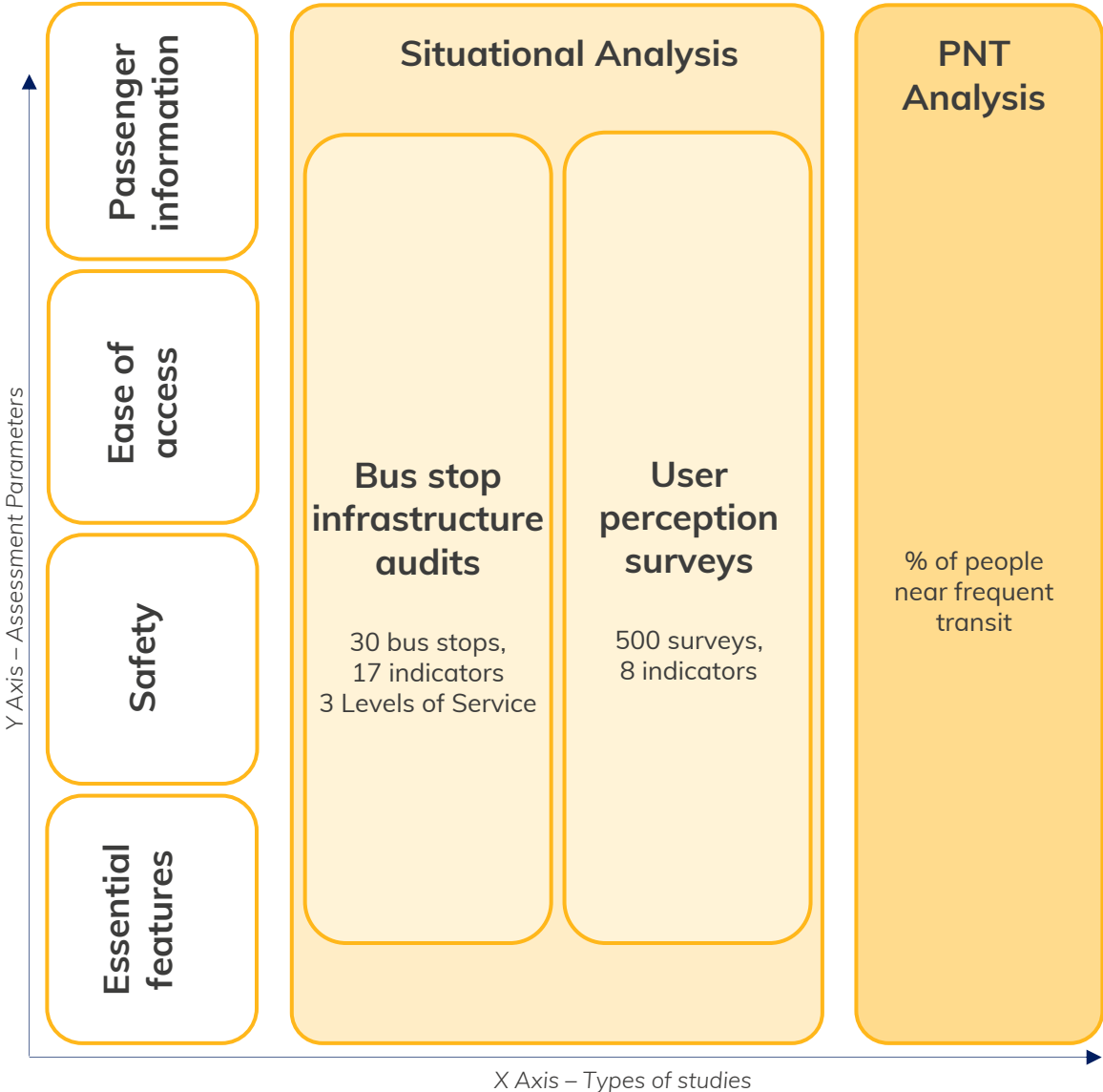
DATA SETS *used for* PEOPLE NEAR TRANSIT ANALYSIS



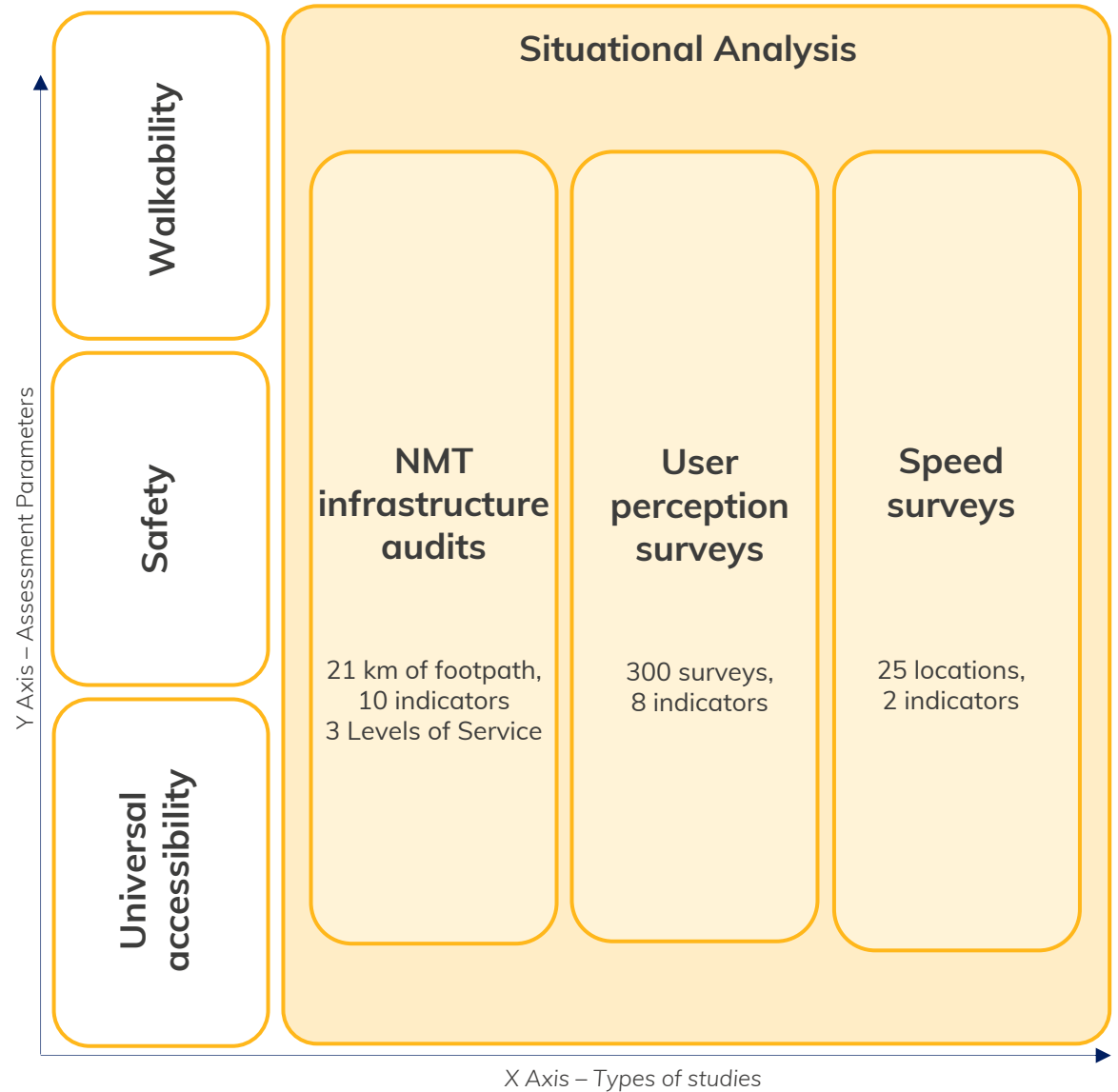
DATA COLLECTION *process* for SITUATIONAL ANALYSIS

Type of Study	Site Selection Criteria	Source	Data Collection Method
NMT Infrastructure Audit	<ul style="list-style-type: none"> • All streets with a footpath in Erode. 	<ol style="list-style-type: none"> 1. Site reconnaissance 2. Discussion with Chief Planner, Erode City Municipal Corporation(ECMC) 	<ul style="list-style-type: none"> • Video capture and observation of footpath condition, encroachments, continuity, pedestrian crossing and stormwater drain. • Measurement of footpath dimensions and lighting levels.
Bus Stop Infrastructure Audits	<ul style="list-style-type: none"> • Six bus stops, one from each of the top five high-frequency corridors, prioritised based on high ridership. • The total of 30 selected bus stops comprise 13% of all bus stops in the city. 	<ol style="list-style-type: none"> 1. Site reconnaissance 2. Discussion with Assistant Engineer, Tamil Nadu State Transport Corporation(TNSTC) 	<ul style="list-style-type: none"> • Measurement of bus shelter dimensions, footpath dimensions, and lighting levels. • Observation of indicators on safety, passenger information, accessibility and essential facilities.
Bus User Perception Surveys	<ul style="list-style-type: none"> • 20 surveys at each bus stop, equally divided into male and female respondents. 	-	<ul style="list-style-type: none"> • Survey template of questions about common challenges and improvements on bus shelter infrastructure, quality of buses, and reliability of bus-based public transport.
School Surveys	<ul style="list-style-type: none"> • The top 10 corporation schools in Erode shortlisted based on student enrolment. • In each school, the sample comprised 10 teachers, 10 parents and 10 students. 	<ol style="list-style-type: none"> 1. Discussion with Chief Planner, ECMC 2. Student enrolment data 	<ul style="list-style-type: none"> • Survey template of questions about common challenges and improvements of street infrastructure for pedestrians.
Speed Surveys	<ul style="list-style-type: none"> • 25 locations identified at the mid-block of streets where bus stops and schools were identified for previous studies. 	<ol style="list-style-type: none"> 1. Site reconnaissance 2. Discussion with Chief Planner, Erode City Municipal Corporation(ECMC) 	<ul style="list-style-type: none"> • 8-hour sampling of vehicles (8:00 am to 12:00 pm; 4:00 pm to 8:00 pm) using Automatic Traffic Counter and Classifier (ATCC) tubes

Framework for assessment of access to public transport



Framework for assessment of NMT infrastructure





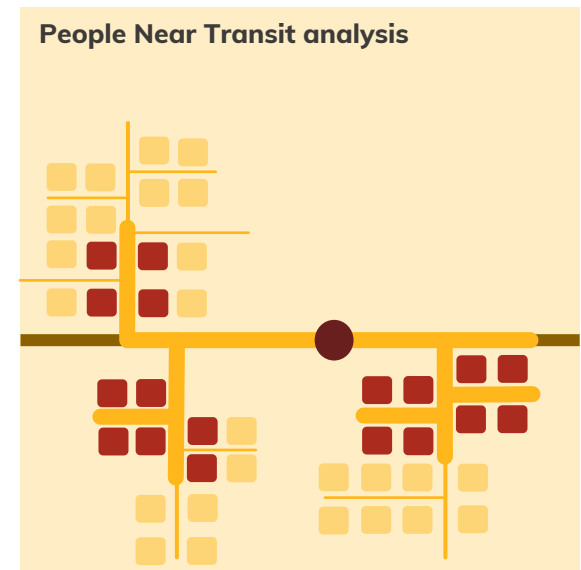
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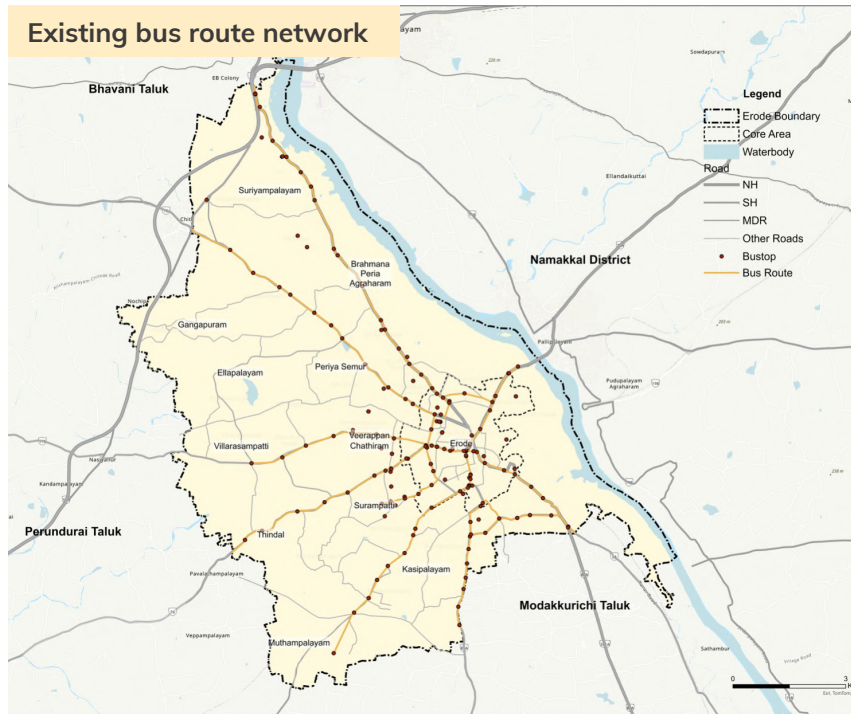
Assessment of access to public transport



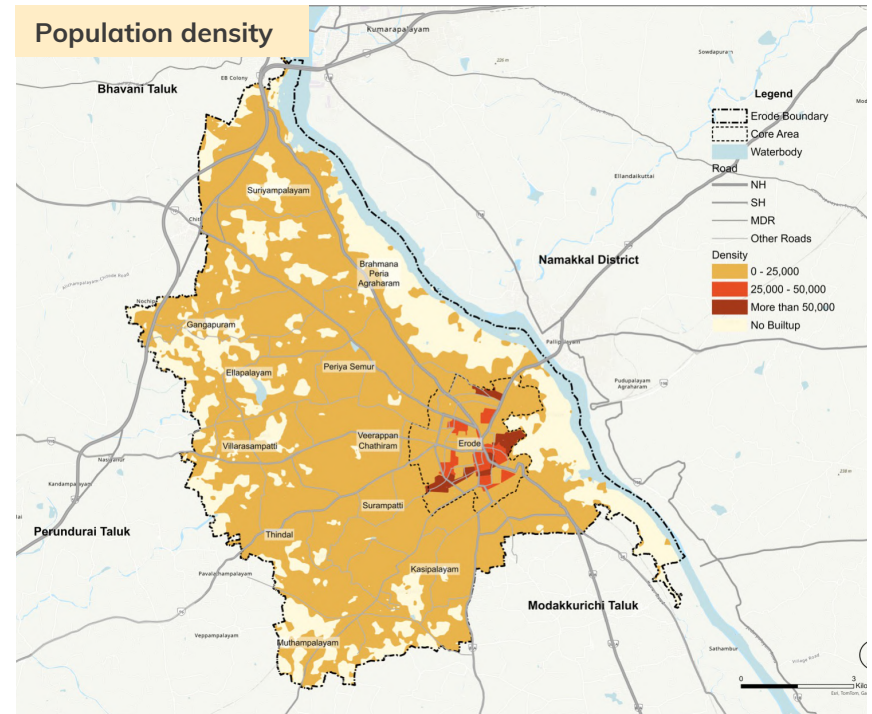
Overview of People Near Transit (PNT) analysis

- 1. Identifying public transport service points:** All key public transport points such as bus stops, railway stations are mapped.
- 2. Creating a catchment area for walkability**
Using GIS tools, all areas accessible within a 400m walking distance (for bus network) and 800m walking distance (for metro and suburban rail) from each node (following the road network) are mapped.
- 3. Creating a 50m buffer**
A 50m buffer around the walkable network lines is created to capture the surrounding population that is easily walkable from the network.
- 4. Overlaying with population density**
Ward boundaries, overlaid with data on total population and area, are used to compute population density.
- 5. Estimating population in the accessible area**
Based on the population density of the wards, the number of people living within walking distance of public transport is estimated.



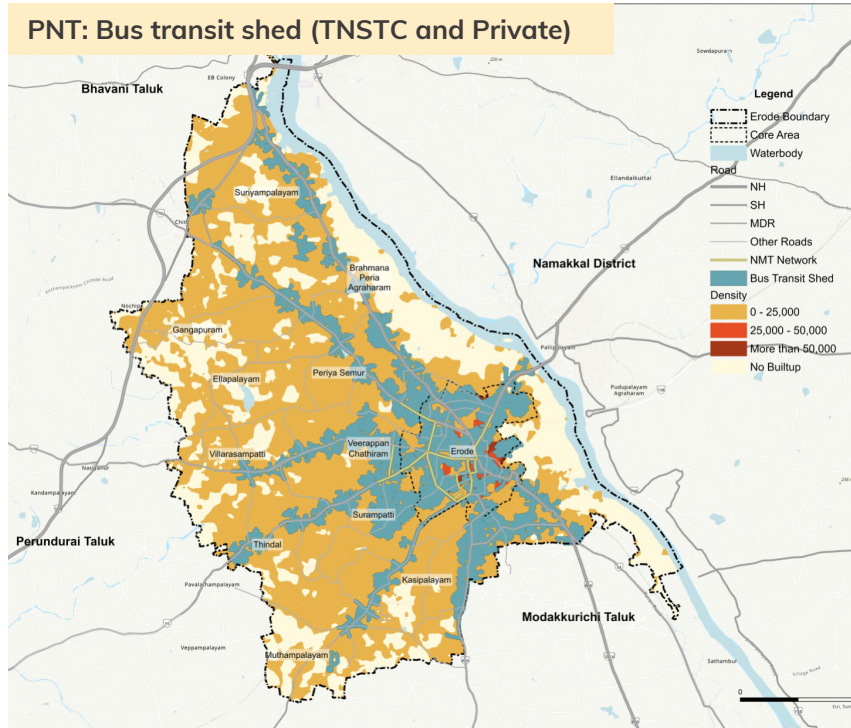


The city's public transport system is anchored by an extensive bus network spanning **55.56 km**, supported by **225 bus stops** that provide broad coverage and enhance urban accessibility. The network is operated by a sizeable fleet comprising **725 TNSTC buses** and **38 private buses**, ensuring consistent service availability across the city. Complementing this, the rail system includes one railway station, adding an additional layer of regional connectivity and strengthening multimodal travel options for commuters.



Erode exhibits a high urban population density, with **9,461 persons per sq.km**, reflecting its compact settlement pattern and concentrated residential activity. The intensity further increases within the built-up areas, where the density reaches **12,962 persons per sq.km**, indicating a more actively utilised and heavily inhabited urban core. These figures underscore the city's growing urban pressure and the need for efficient land use and infrastructure planning.

PNT: Bus transit shed (TNSTC and Private)

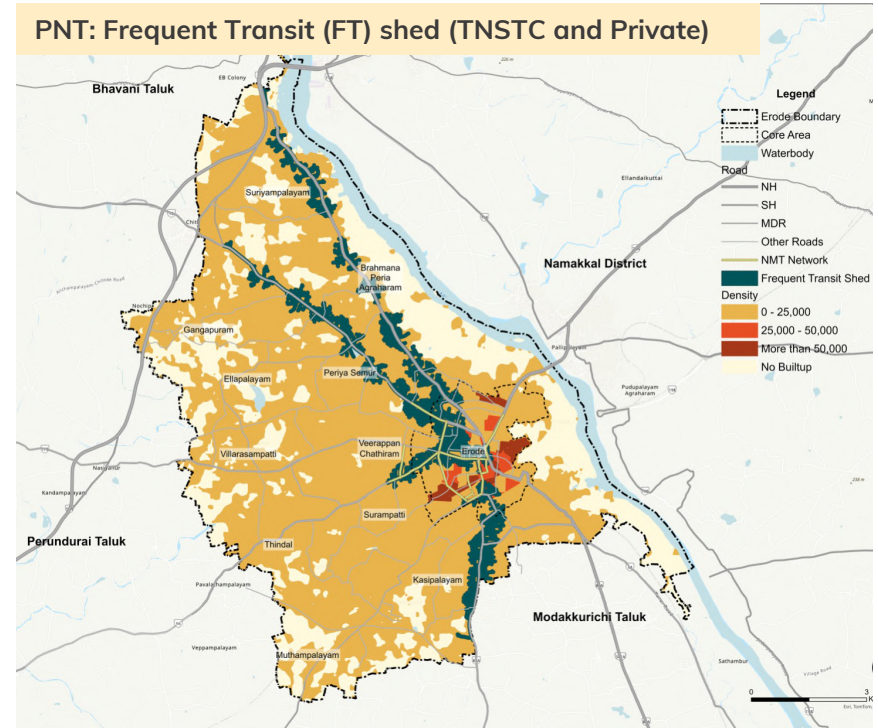


Approximately 43.5% of the city's population falls within a 5-minute walking distance of a bus stop,

indicating a moderate level of accessibility to the bus transit network.

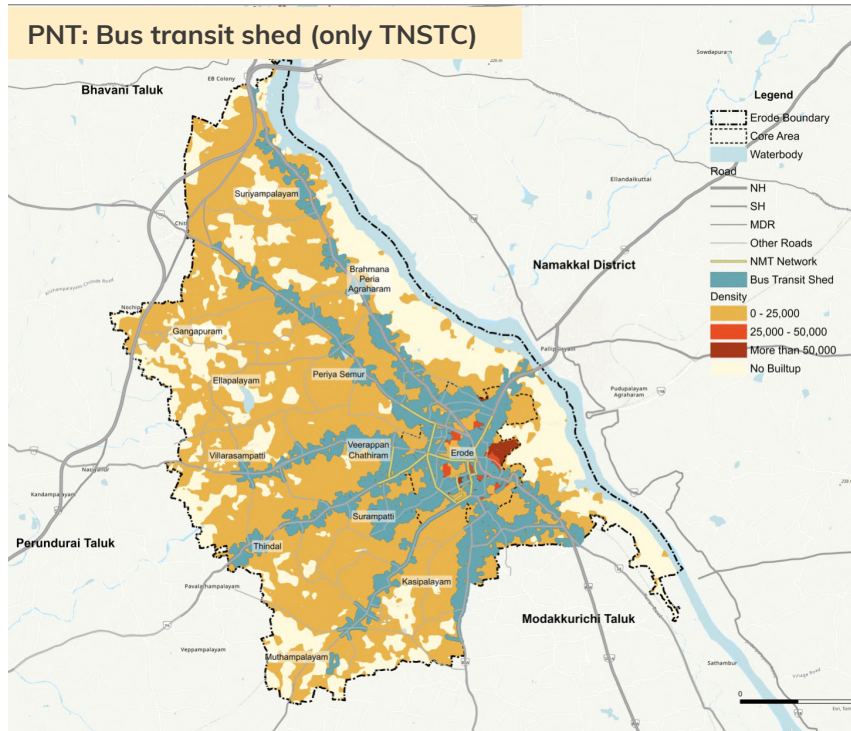
While this reflects a reasonably well-distributed system, it also highlights that more than half of the population remains outside convenient walking reach, underscoring the need for improved last-mile connectivity and expanded transit coverage in underserved areas.

PNT: Frequent Transit (FT) shed (TNSTC and Private)



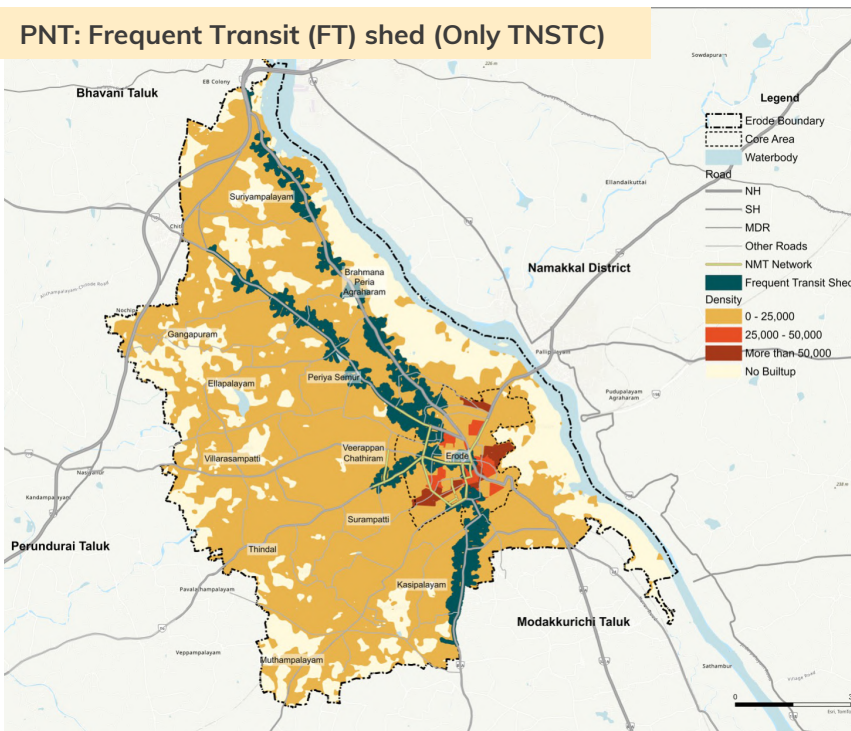
About 14.6% of the population is located within a 5-minute walking distance of a frequent bus transit service,

indicating that high-frequency operations are currently accessible to a relatively limited share of residents. This reflects the concentration of frequent services along select corridors, with significant scope to broaden their reach and enhance overall network reliability.



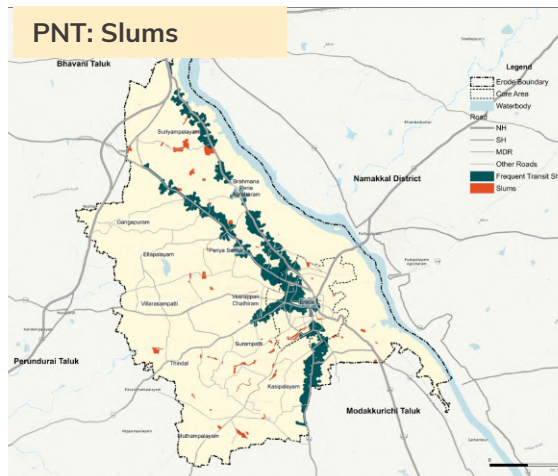
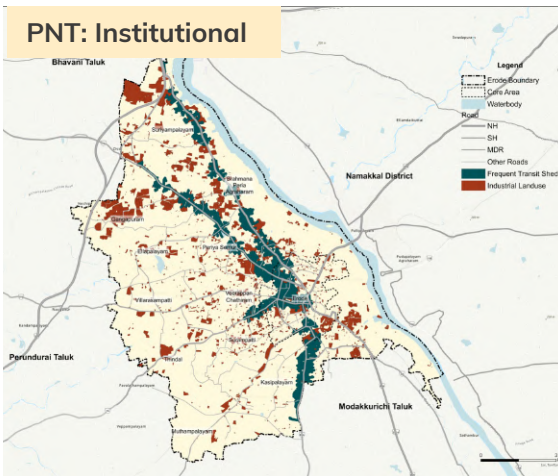
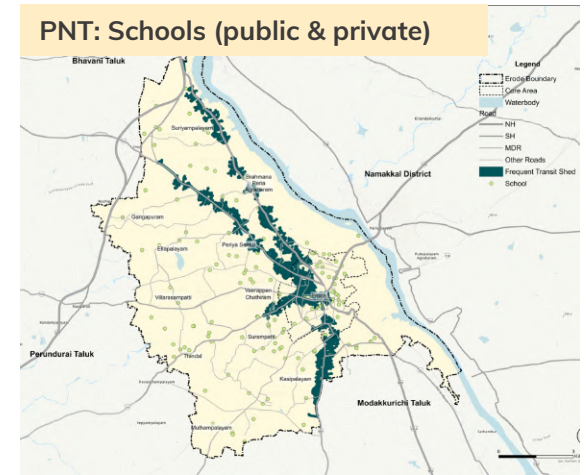
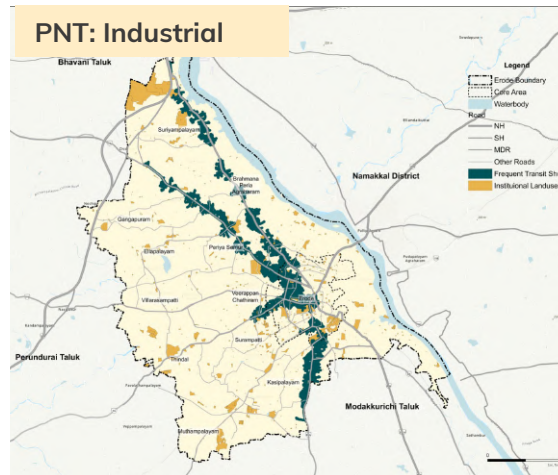
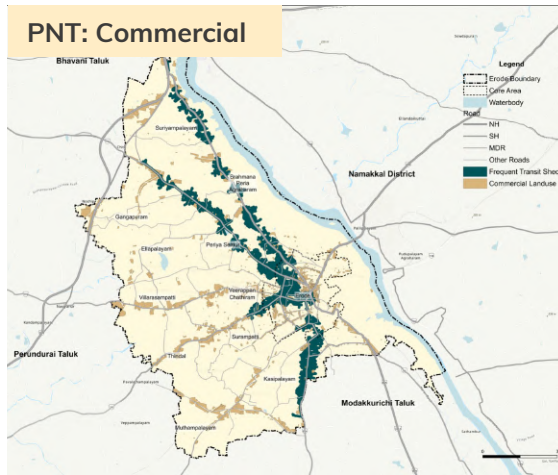
Approximately 39.1% of the city's population falls within a 5-minute walking distance of a bus stop,

indicating a moderate level of accessibility to the bus transit network considering only TNSTC buses. While this reflects a reasonably well-distributed system, it also highlights that more than half of the population remains outside convenient walking reach, underscoring the need for improved last-mile connectivity and expanded transit coverage in underserved areas.



Approximately 13.8% of the population is within a 5-minute walking distance of a frequent bus transit service,

suggesting that only a small share of residents currently benefit from high-frequency routes. This limited coverage highlights the need to expand frequent services to better support dependable, high-quality public transport across the city.



Land Use	Area	Access to Frequent Transit
Commercial	11 %	21.7 %
Industrial	15.6 %	19 %
Schools		18.6 %
Institutional	7.5 %	9.3 %
Slums	1.5 %	1.7 %

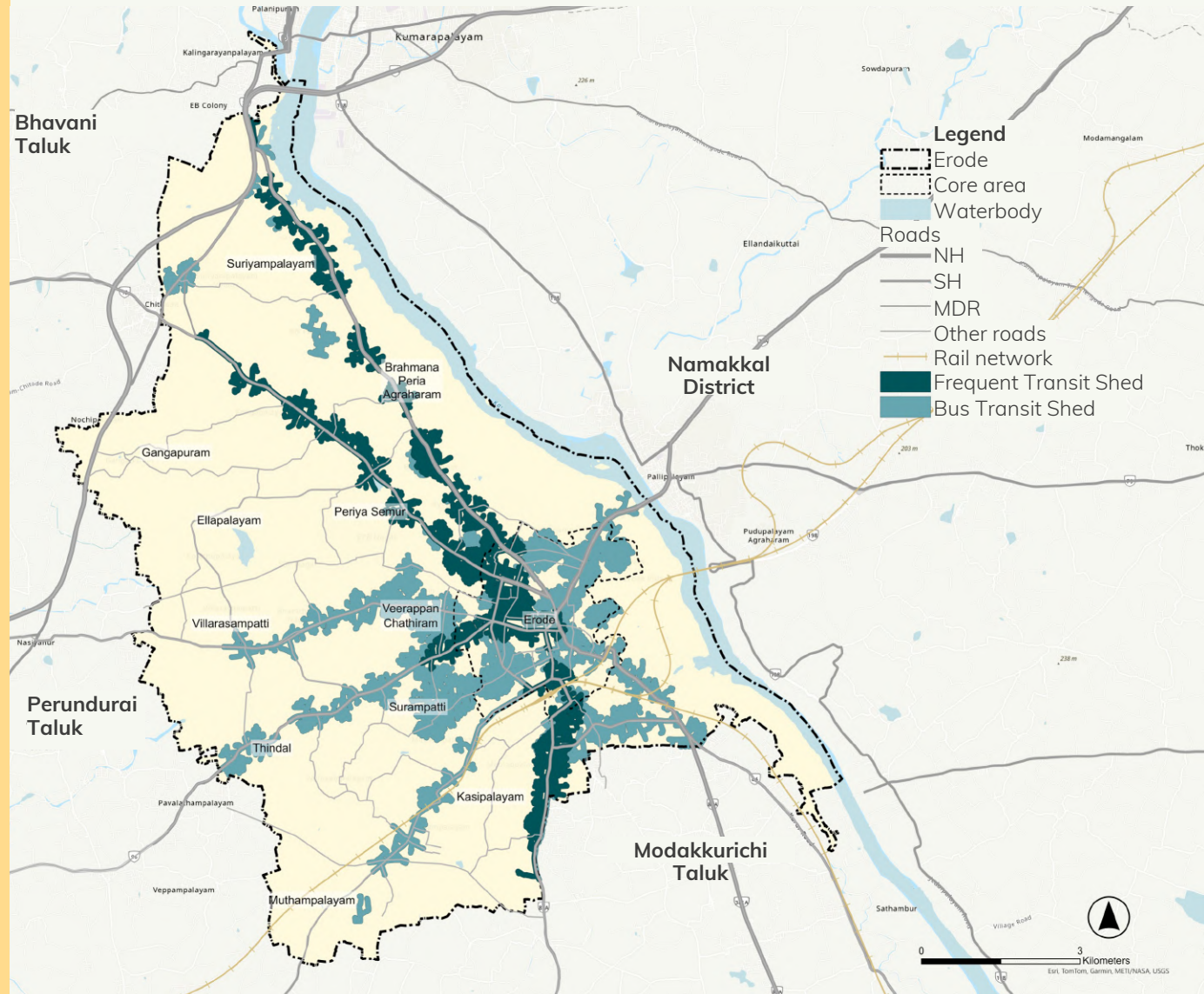
Overall, transit accessibility is uneven, favouring commercial and industrial areas while socially important land users especially **slums and institutions** require **targeted enhancement**.

Inferences from People Near Transit analysis

Gaps identified

Out of the city's total road network of **145 km**, the existing transit network covers only **60 km**, accounting for just **41%** of the overall network.

Furthermore, merely **22%** of the network has frequent transit network access. This highlights a significant coverage and service gap, underscoring the need to enhance overall accessibility by strengthening service quality and frequency across the existing network.



Overview of bus stop audits and user perception surveys

Sample	Particulars
No of stops	30
No. of surveys	500
No of male	250
No of female	250

Data collection method

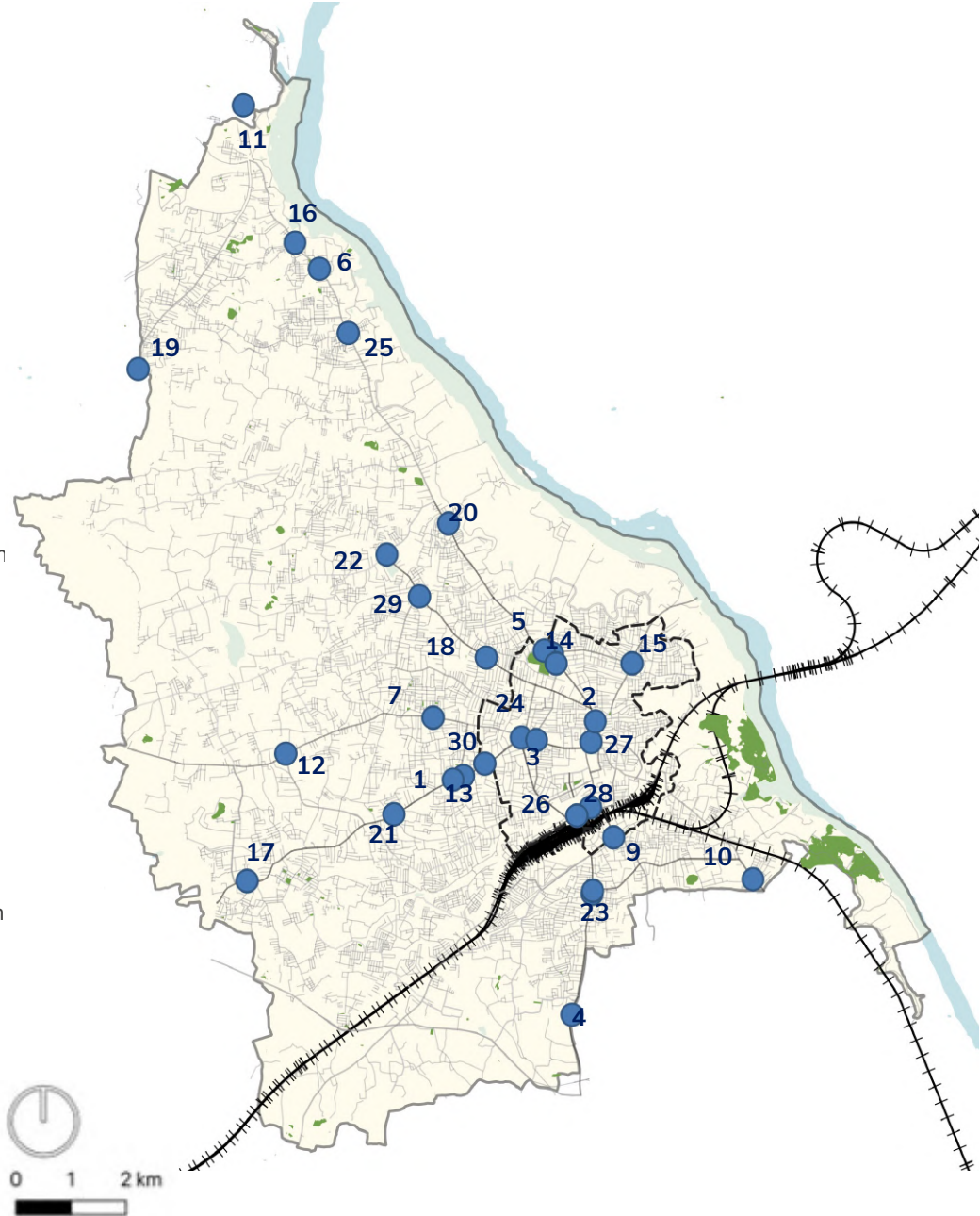
Bus stop audit:

Measurement of bus shelter dimensions, footpath dimensions, and lighting levels and Observation of indicators on safety, passenger information and essential facilities.

User perception surveys:

Survey template of questions about common challenges and improvements on bus shelter infrastructure, buses, and bus based public transport.

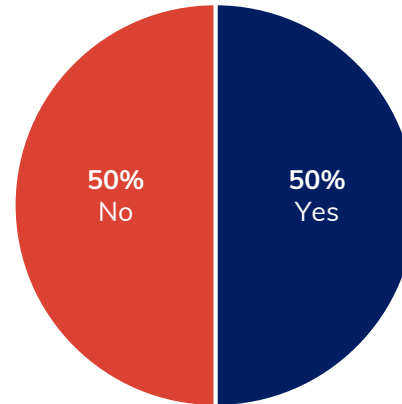
- | S.No | Name of Stop |
|------|------------------------|
| 1 | Teachers Colony |
| 2 | Manikoonda |
| 3 | Savitha |
| 4 | Vaikal Medu |
| 5 | Moolapattarai |
| 6 | Mayavaram |
| 7 | Narayanavalasu |
| 8 | Annamar Bunk |
| 9 | Lotus Hospital |
| 10 | Solar |
| 11 | Lakshmi Nagar |
| 12 | Veerappampalayam |
| 13 | Pirivu |
| 14 | Collectorate |
| 15 | VOC Park |
| 16 | Karungal Palayam |
| 17 | Perumalmalai |
| 18 | Thindal |
| 19 | Veerappanchatram |
| 20 | Chithode |
| 21 | Agraharam |
| 22 | Palayapalayam |
| 23 | Ganiravuthar Kulam |
| 24 | Petrol Bunk |
| 25 | Erode GH |
| 26 | Petrol Bunk |
| 27 | Railway Station |
| 28 | PS Park |
| 29 | Bull Fight Corner |
| 30 | Soolai |
| 30 | Sathyamoorthy Hospital |



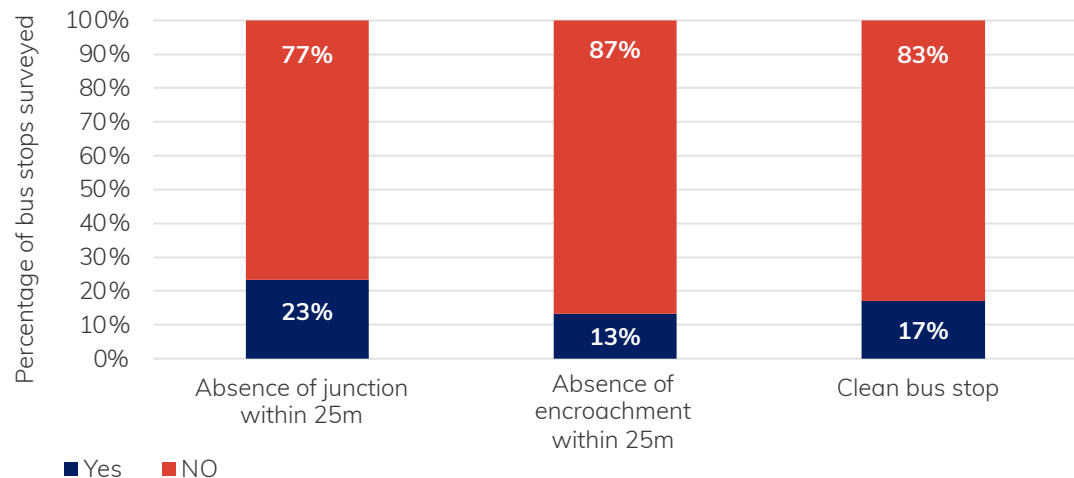
Bus shelters are absent in 50% of high footfall bus stops

- Only **15 of 30 stops** have shelters, and just **2** meet the standard size, indicating a significant gap in basic commuter comfort and protection.
- While **24 stops** have adequate space for upgrades, the lack of compliant shelters suggests missed opportunities for improving user experience.
- **23%** of stops are placed within **25 m** of traffic junctions, creating avoidable operational and safety conflicts during boarding and alighting.
- Encroachment at **13%** of stops further restricts accessibility and reduces effective usable space.
- With **83%** of stops poorly maintained, overall infrastructure quality remains low, underscoring the need for systematic upkeep and management.

Is there an existing bus shelter?

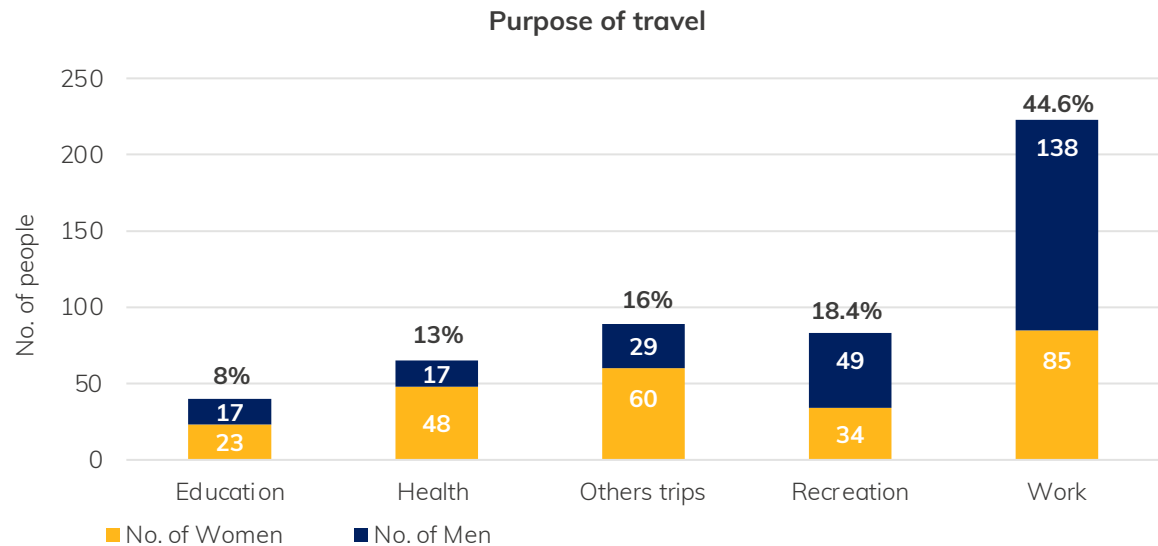
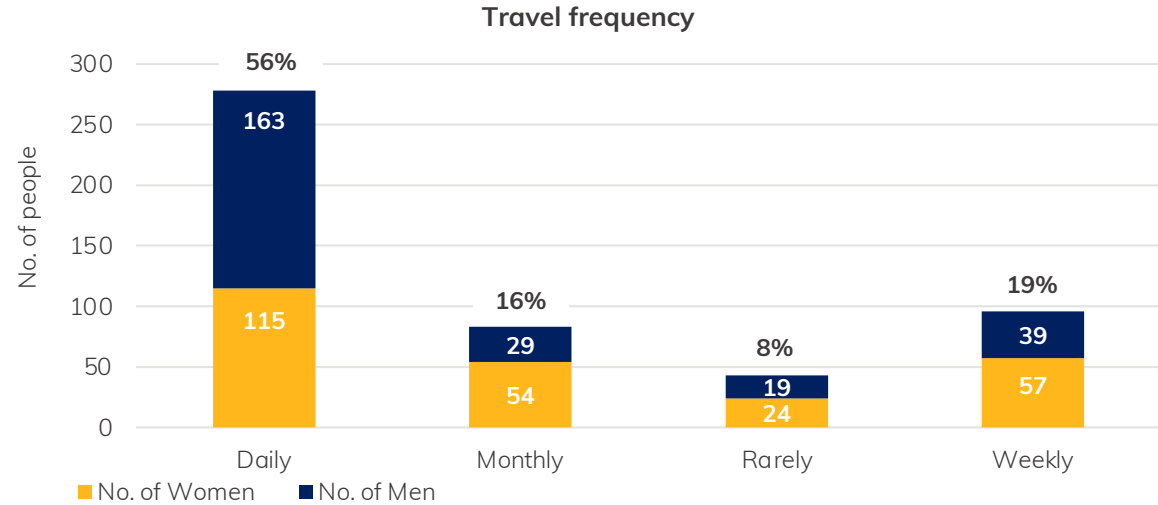


What are the characteristics of the stops?



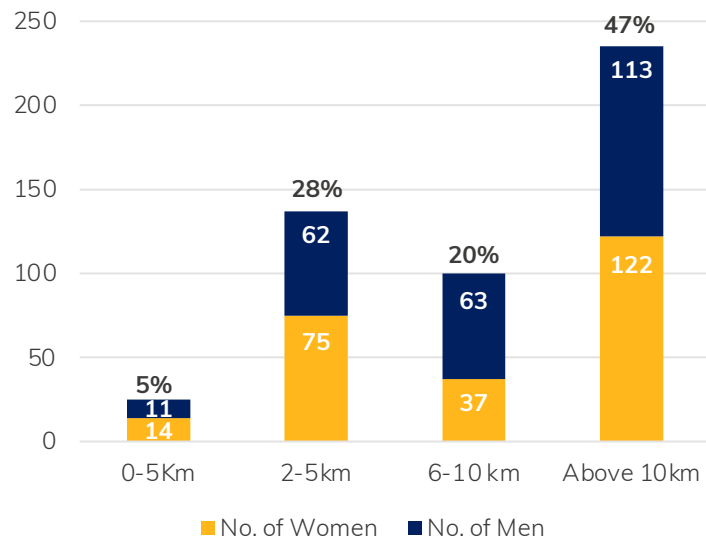
Most bus users travel daily, and the purpose of travel is dominated by work trips

- 56% of surveyed users depend on buses for daily travel, highlighting the need for reliable and well-designed bus stop infrastructure.
- Of those surveyed, 44.6% use the bus as a mode of commute to their workplaces, and 61% of those trips are made by men.
- Women travel significantly more (70% of trips) when it comes to health, and other trips that include running errands, going to the temple or shopping.
- Women also travel more on a weekly, monthly and occasional basis (60% of trips) due to trips the nature of trips highlighted above.



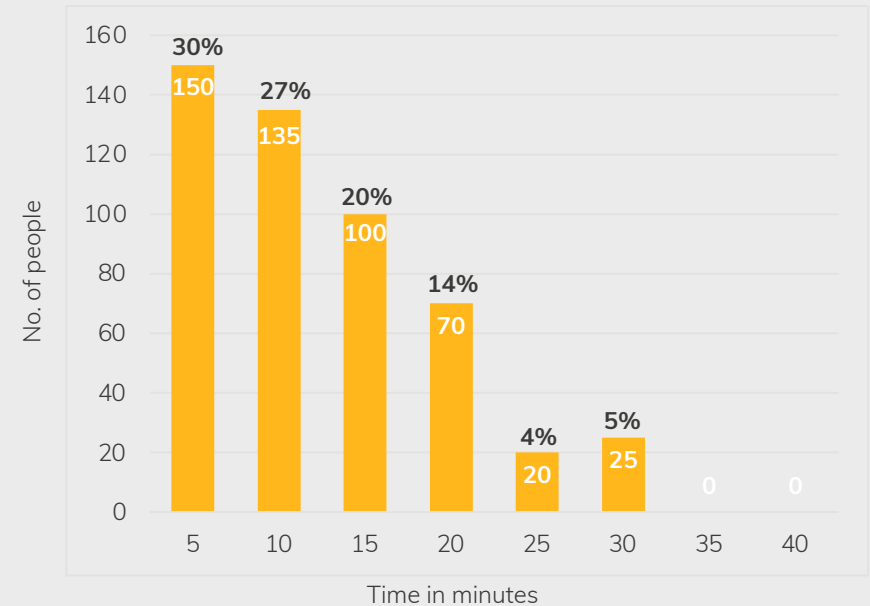
50% of the bus users travel total distances of 10 km or less,

which implies significant travel within Erode corporation limits, prompting the need for a dedicated bus fleet for the ULB, that operates only within the corporation limits.



Distance travelled

Almost **50% of respondents travel more than 10km per trip**, with men and women traveling equally. However, shorter trips that are less than 5 km are covered more by **women (55%)**, whereas trips 6-10km are covered more by **men (63%)**.



Waiting time

43% of surveyed bus users have reported a waiting time of **more than 15 minutes** at bus stops. If we consider frequent bus travel to mean a ride every 5 minutes, almost **70% of respondents experience low-frequency bus service**.

Smart city mission bus shelters



Old bus shelters



No bus shelter



BIG BOYS 18+

HAC

EXPERIENCE CENTRE
Musky Photography

திண்டிவல்

ப.செ.பார்க்

அரசு போக்குவரத்துக் கழகம்
கோவை

BATTERY BOX

SPARE WHEEL

இலங்கை




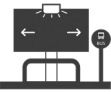
ER



Level of Service (LoS) of bus stop infrastructure

To systematically evaluate each bus shelter, a scoring tab has been established based on four overall key parameters. These parameters are further classified into a total of 18 indicators: 4 for passenger information, 6 for ease of access, 6 for safety, and 2 for essential facilities.

1 point is awarded for meeting an indicator. 0 points is assigned if the indicator is not met.

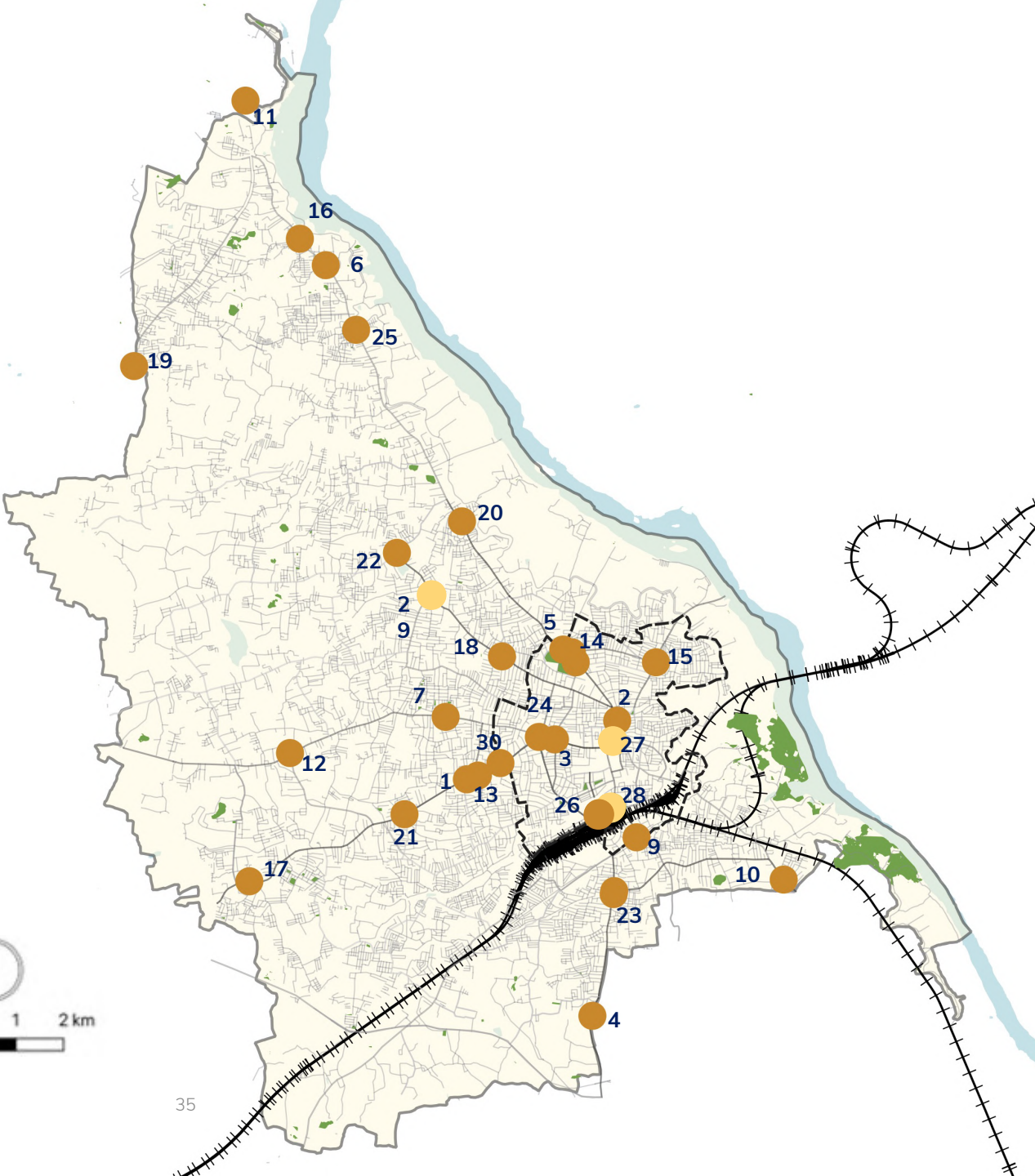
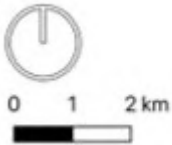
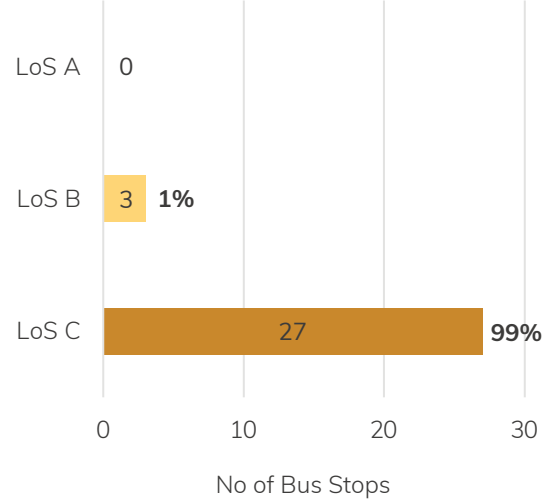
<p>Passenger information</p> 	<ol style="list-style-type: none"> 1. Presence of bus route number 2. Bus stop Name board 3. Real time information 4. Presence of route number
<p>Ease of access</p> 	<ol style="list-style-type: none"> 5. Useable footpath to access the bus stop 6. Bus stop pavement and footpath are on the same level 7. Width of the bus stop waiting area is not less than 1.2m 8. Presence of Ramp with proper ratio 9. Multi-modal integration within 500m of transit modes 10. No encroachment at the bus stop by vending/parking etc..
<p>Safety</p> 	<ol style="list-style-type: none"> 11. Uniform and consistent lighting of 30-40 lux at the bus stop 12. Absence of perceived unsafe dead spaces behind the shelter 13. Information on functional emergency helpline numbers 14. Absence of unsafe/hazardous waiting area for passengers 15. Bus shelter has clear height of 3m 16. Good and functional bus shelter roof
<p>Essential facilities</p> 	<ol style="list-style-type: none"> 17. Presence of seating 18. Others (illuminated signs, tactile locks, other utilities)

The overall score is categorized into three Levels of Service (LoS). This classification helps stakeholders easily identify the quality of bus shelter facilities and prioritize enhancements.

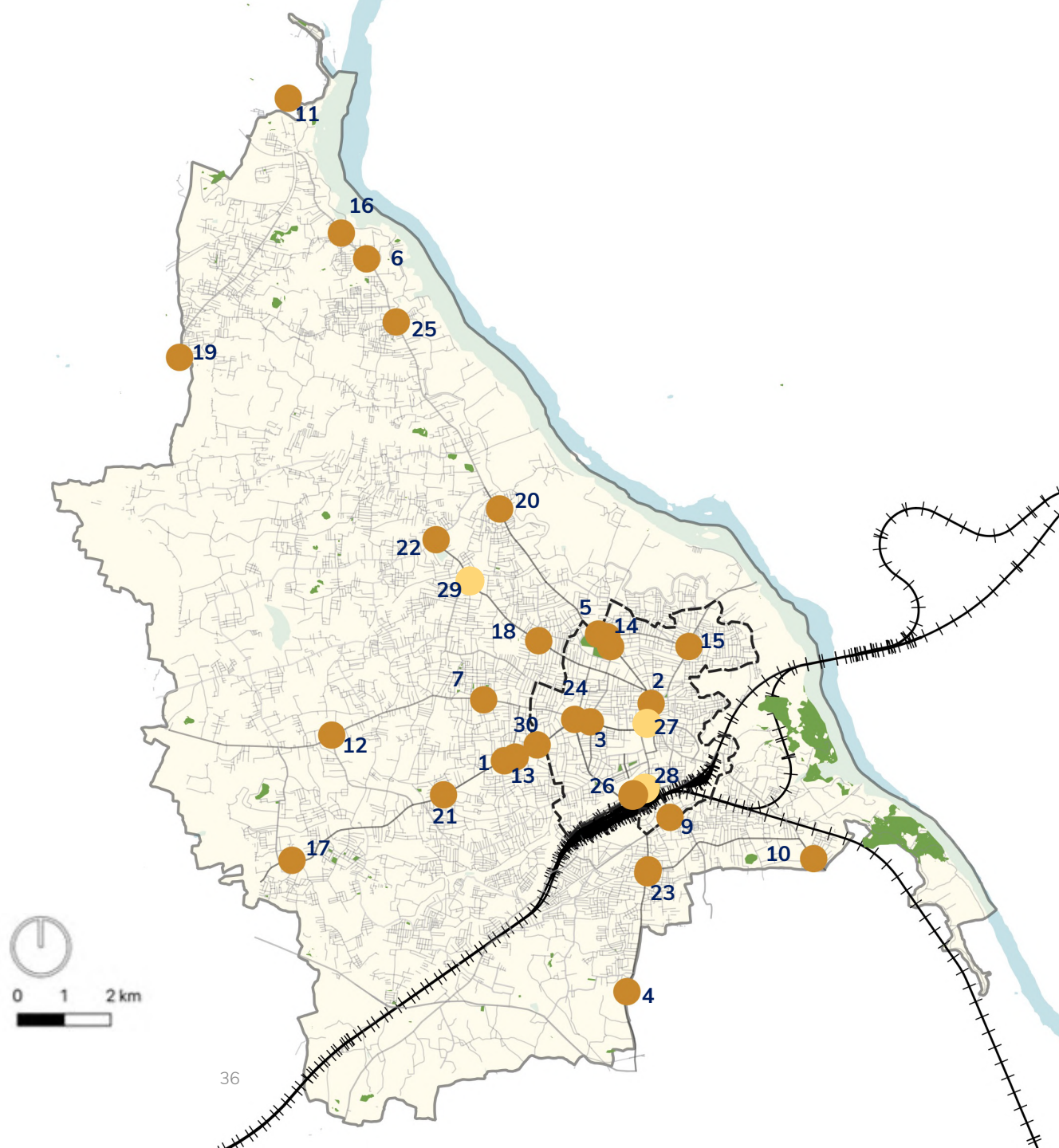
<p>LoS A 14 – 19</p>	<p>LoS B 7-13</p>	<p>LoS C 0-6</p>
--------------------------	-----------------------	----------------------

Out of the 30 bus stops assessed, none meet LoS A standards, and only 7 fall under LoS B. The majority fall under LoS C.

23 bus stops representing approximately 76% of the total number of surveyed bus stops lack adequate facilities, indicating a significant need for infrastructure improvement across the network.



S No	Name	Score
1	Teachers colony	2
2	Manikoonda	2
3	Savitha	2
4	Vaikal Medu	2
5	Moolapattarai	2
6	Mayavaram	2
7	Narayanavalasu	2
8	Annamar Bunk	3
9	Lotus Hospital	3
10	Solar	3
11	Sathyamoorthy Hospital	3
12	Lakshmi Nagar	3
13	Veerappampalayam Pirivu	3
14	Collectorate	4
15	VOC Park	4
16	Karungal Palayam	5
17	Perumalmalai	4
18	Thindal	5
19	Veerappanchatram	6
20	Chithode	5
21	Agraharam	5
22	Palayapalayam	5
23	Ganiravuthar Kulam	6
24	Petrol Bunk	6
25	Erode GH	6
26	Petrol Bunk	6
27	Railway Station	6
28	PS Park	7
29	Bull Fight Corner	9
30	Soolai	8



All bus stops perform poorly in 'ease-of-access', and nearly one-third perform poorly in passenger information.

Category	No. of Indicators
Passenger information	4
Ease of access	6
Safety	6
Essential facilities	4





Performance	Scale
Good	75%-100%
Moderate	50%-74%
Fair	26%-49%
Poor	0-25%

Stop No	Name	Passenger information	Ease of access	Safety	Essential facilities	Total	LoS
1	Teachers colony	0%	0%	50%	50%	11%	LoS C
2	Manikooundu	0%	0%	50%	50%	11%	
3	Savitha	0%	0%	50%	50%	11%	
4	Vaikal Medu	0%	0%	50%	50%	11%	
5	Moolapattarai-2	0%	0%	50%	50%	11%	
6	Mayavaram	17%	0%	0%	0%	11%	
7	Narayanavalasu	0%	0%	50%	50%	11%	
8	Annamar Bunk	0%	0%	75%	75%	16%	
9	Lotus Hospital	17%	0%	0%	0%	16%	
10	Solar	0%	0%	75%	75%	16%	
11	Sathyamoorthy Hospital	0%	0%	50%	50%	16%	
12	Lakshmi Nagar	0%	0%	75%	75%	16%	
13	Veerappampalayam Pirivu	0%	0%	75%	75%	16%	
14	Collectorate	33%	0%	50%	50%	21%	
15	VOC Park	0%	25%	75%	75%	21%	
16	Perumalmalai	17%	25%	25%	25%	26%	
17	Thindal	33%	0%	25%	25%	21%	
18	Chithode	33%	0%	50%	50%	26%	
19	Agraharam	17%	25%	25%	25%	32%	
20	Karungal Palayam	33%	0%	75%	75%	26%	
21	Palayapalayam	17%	0%	25%	25%	26%	
22	Petrol bunk	17%	25%	50%	50%	26%	
23	Erode GH	33%	0%	75%	75%	32%	
24	Veerappanchatram	17%	25%	25%	25%	32%	
25	Petrol Bunk	17%	0%	50%	50%	32%	
26	Railway Station	50%	0%	75%	75%	32%	
27	Ganiravuthar Kulam	33%	25%	50%	50%	32%	
28	PS Park	33%	0%	50%	50%	37%	
29	Soolai	33%	25%	50%	50%	47%	LoS B
30	Bull Fight Corner	67%	0%	50%	50%	42%	

Inferences from bus stops audits and user perception surveys

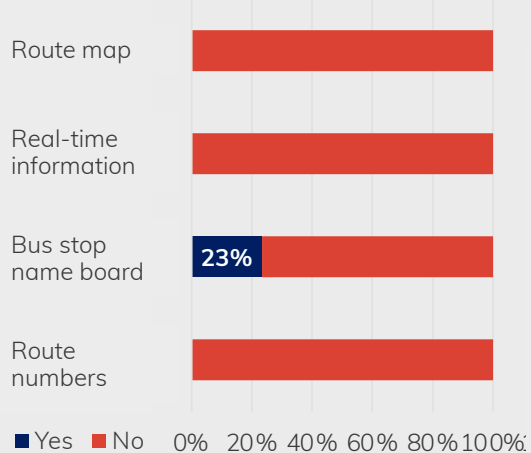
- **Passenger information:** About **77% of bus stops lack basic identification**, with route maps, numbers, and real-time information largely missing.
- **Access:** Poor physical access due to missing footpaths, ramps, and level pavements, limiting universal accessibility for many users.
- **Safety and comfort: Inadequate lighting at 57% of stops** and widespread feelings of insecurity at night, driven by concerns of harassment and theft.
- **Facilities:** Nearly **80% lack proper shelters**, seating is absent or unusable at many stops (reported by over **90% of users**), and basic utilities are missing.

Overall, bus stops lack information, accessibility, safety, and basic amenities, creating unsafe conditions and requiring urgent upgrades.

Passenger information 	Bus stop audit indicators	Bus user perception survey indicators
Ease of access 	<ol style="list-style-type: none"> 1. Presence of bus route number 2. Bus stop name board 3. Real time information 4. Presence of route number 	
	<ol style="list-style-type: none"> 5. Useable footpath to access the bus stop 6. Bus stop pavement and footpath are on the same level 7. Width of the bus stop waiting area is not less than 1.2m 8. Presence of ramp with proper ratio 9. Multi-modal integration within 500m of transit modes 10. No encroachment at the bus stop by vending/parking etc.. 	<ol style="list-style-type: none"> 1. Comfortable access to bus stops 2. Presence of universal accessible design
Safety 	<ol style="list-style-type: none"> 11. Uniform and consistent lighting of 30-40 lux at the bus stop 12. Absence of perceived unsafe dead spaces behind the shelter 13. Information on functional emergency helpline numbers 14. Absence of unsafe/hazardous waiting area for passengers 15. Bus shelter has clear height of 3m 16. Good and functional bus shelter roof 	<ol style="list-style-type: none"> 3. Safety of bus stops at night 4. Absence of air pollution at the bus stop 5. Lack of heat stress in the bus stops 6. Users not facing harassment in the bus stop 7. Users not feeling concerns about theft or personal safety
Essential facilities 	<ol style="list-style-type: none"> 17. Presence of seating 18. Others (illuminated signs, tactile earner blocks, other utilities) 	<ol style="list-style-type: none"> 8. Adequate shade from heat and rain 9. Adequate seating 10. Seating in good condition 11. Good bus stop maintenance 12. Adequate waiting space

Passenger information is almost entirely absent across the network, leaving 77% of bus stops without even basic identification or guidance for users.

Passenger information is severely lacking across the network. **Only 23% of stops have name boards**, and almost none provide route maps, real-time updates, route numbers, or stop flags. This absence of basic signage forces users to rely on prior knowledge or verbal inquiries, leading to a poor, confusing, and less accessible travel experience, especially for new passengers or occasional passengers.



Access to bus stops is constrained, with 100% of bus stops encroached by vendors/parking on either side, and approximately 35% of respondents, who are aged 45–60, reporting challenges related to universal accessibility.

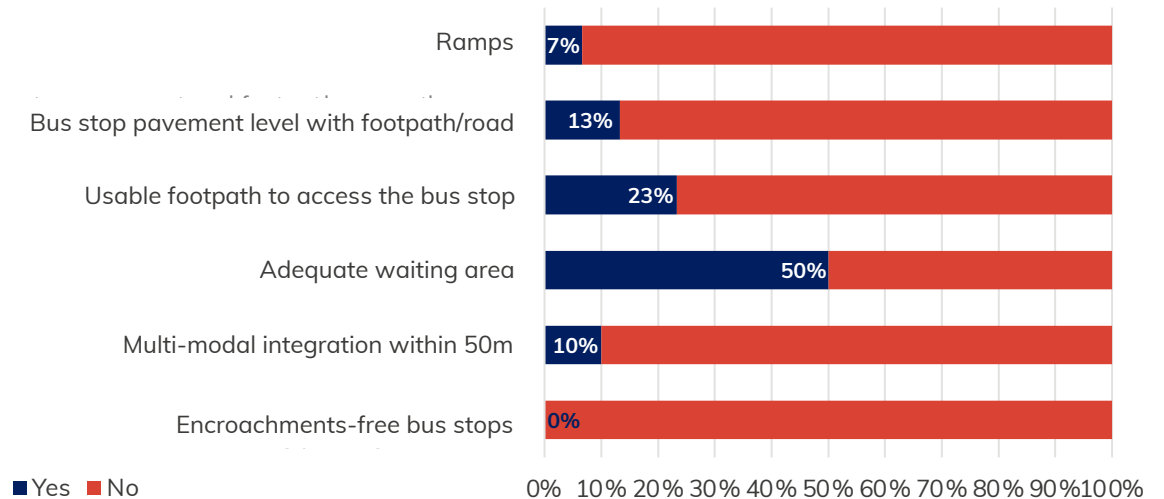
Over one-third of surveyed users (36%) report difficulty accessing bus stops, highlighting persistent gaps in accessibility and comfort.

User discomfort is driven by several concerns, with overcrowding (26%) and poor stop access (25%) as leading issues. This is followed by lack of information (19%), boarding challenges (18%), long waits (17%), and skipped stops (16%).

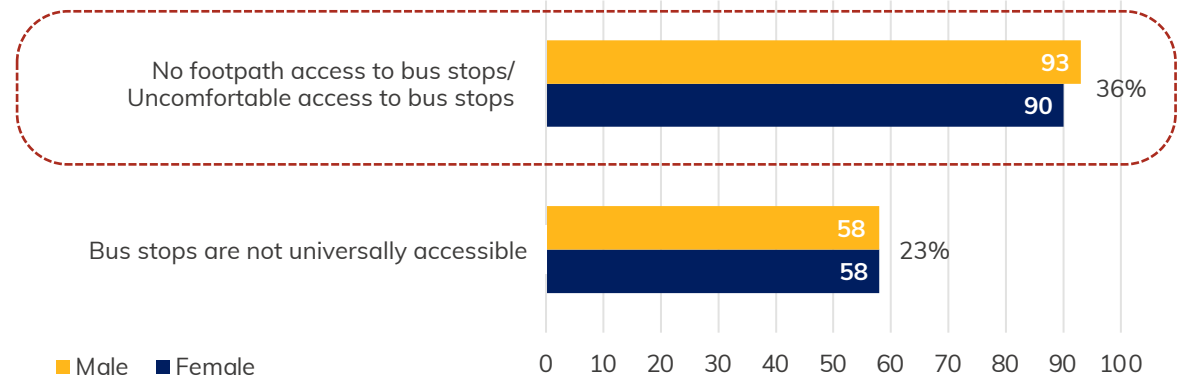
Perception surveys reinforce these findings, with 23% citing the lack of universal accessibility.

Overall, the system shows consistent shortcomings in accessibility, comfort, and reliability, underscoring the need for infrastructure and operational improvements.

Bus stop audit indicators



What are the concerns in accessing the bus stops?



Absence of footpath



Bus stop not universally accessible



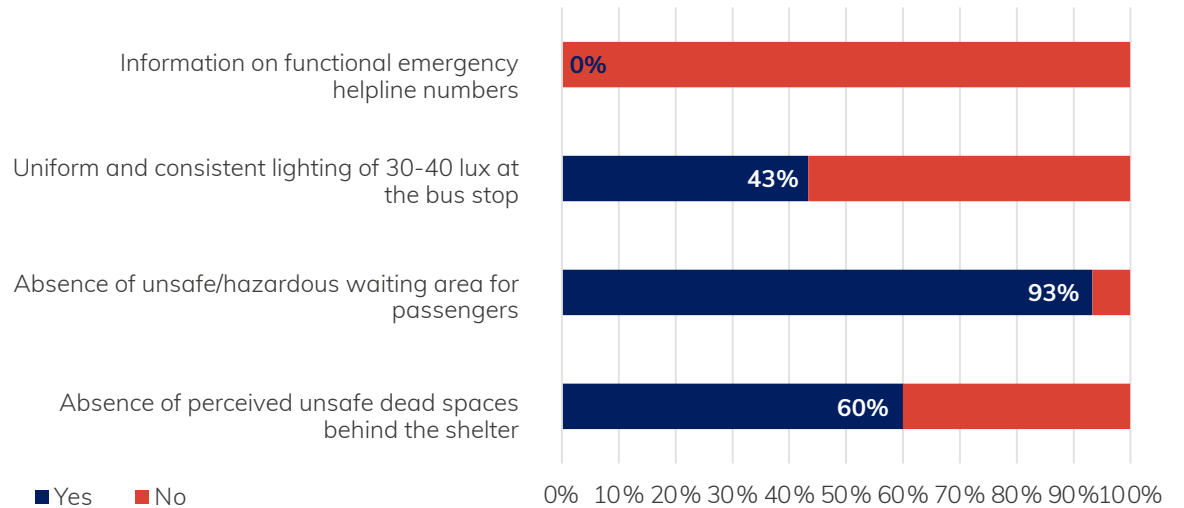
Safety and comfort remain major shortcomings at bus stops with almost 57% of the stops lacking adequate lighting, and more than 45% of users, who are in the 25–40 age group, express discomfort.

Over 70% of users feel unsafe after dark, and around 35% report harassment, pointing to the need for better lighting and monitoring. Environmental discomfort like heat, pollution, and poor shelter further reduces usability.

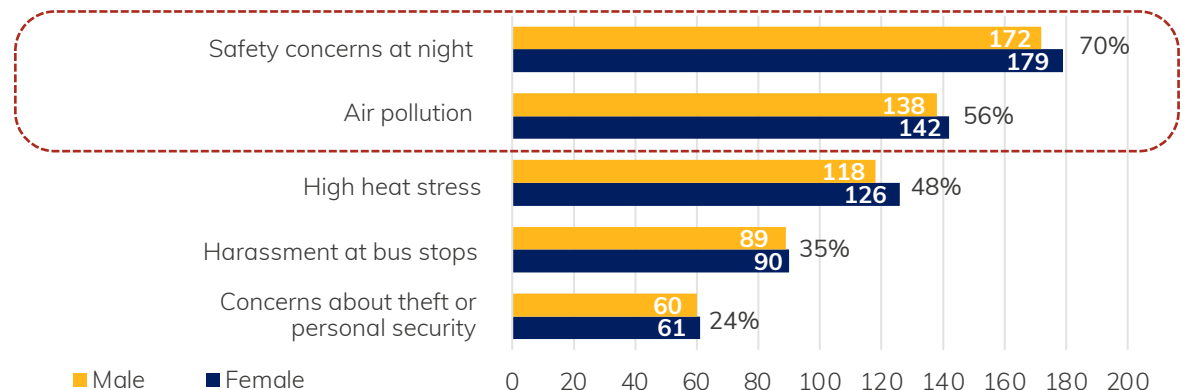
Audit findings reinforce these concerns. Nearly 57% of stops lack adequate lighting, almost none provide functional emergency information, and over 60% suffer from poor maintenance with hazardous dead spaces behind the stops.

Together, these issues highlight a pressing need to enhance safety, visibility, and overall comfort at bus stops.

Bus stop audit indicators



What are the challenges faced in the bus stops?



Inadequate lighting



No pedestrian crossing



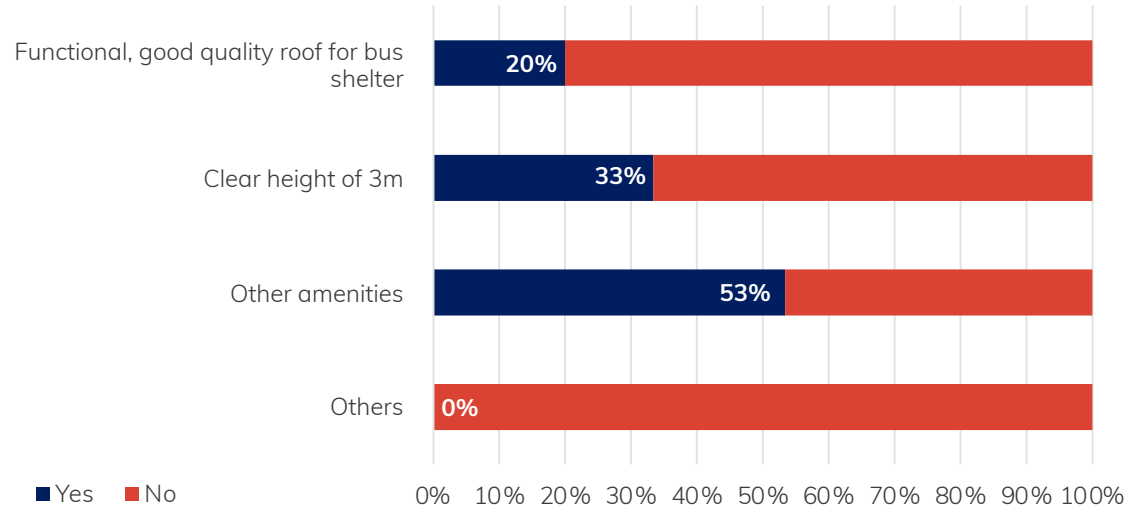
Most essential facilities, including proper shelter, roof, and seating, are absent in almost 80% of the bus stops. 56% of respondents raising these concerns are aged 18-25.

Basic commuter amenities are largely missing across bus stops. Nearly **92% of users** identify the **absence of seating** as a major issue, reflected in audit findings where **47% of shelters lack seating entirely**.

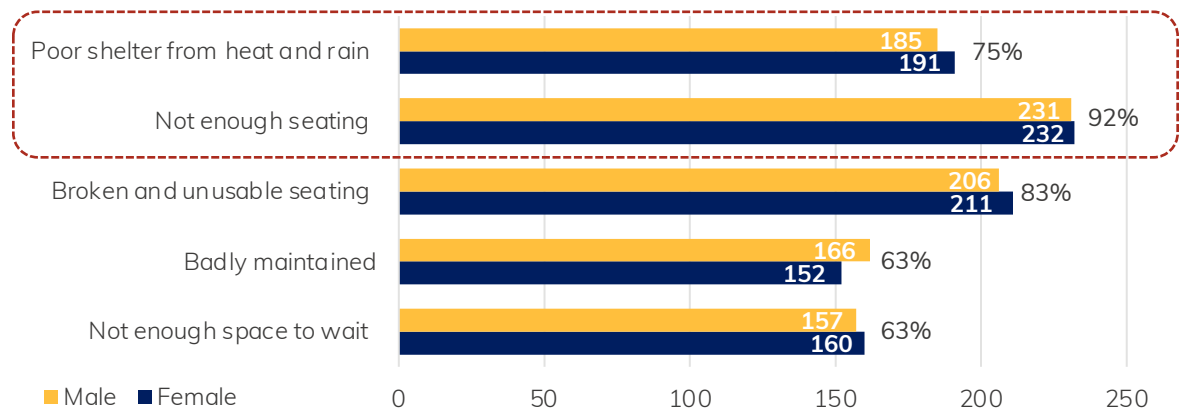
Essential utilities such as ATMs, disposal bins, and toilets are absent at all stops, further reducing user comfort. Additionally, almost **80% of stops lack proper shelters**, reinforcing the urgent need for comprehensive infrastructure upgrades.

*Others refer to additional utilities like ATM, toilets, dustbins and provisions for advertising.

Bus stop audit indicators



What are the concerns in the bus stops?



Inadequate seating



Absence of shelters



User surveys also indicate that a holistic approach is required to improve public transport facilities

The perception survey shows that:

- **68%** of users prioritise enhanced safety measures, while
- **45%** highlight the need for low-floor buses to improve accessibility.

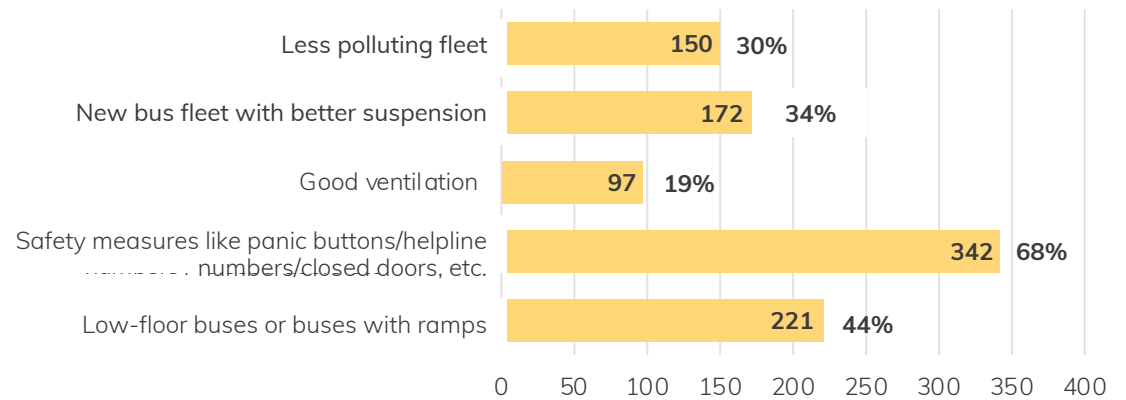
The remaining respondents emphasise additional improvements such as better ventilation and cleaner, less-polluting fleets, reflecting a broader expectation for a more comfortable and environmentally responsible transit system.

The survey indicates that:

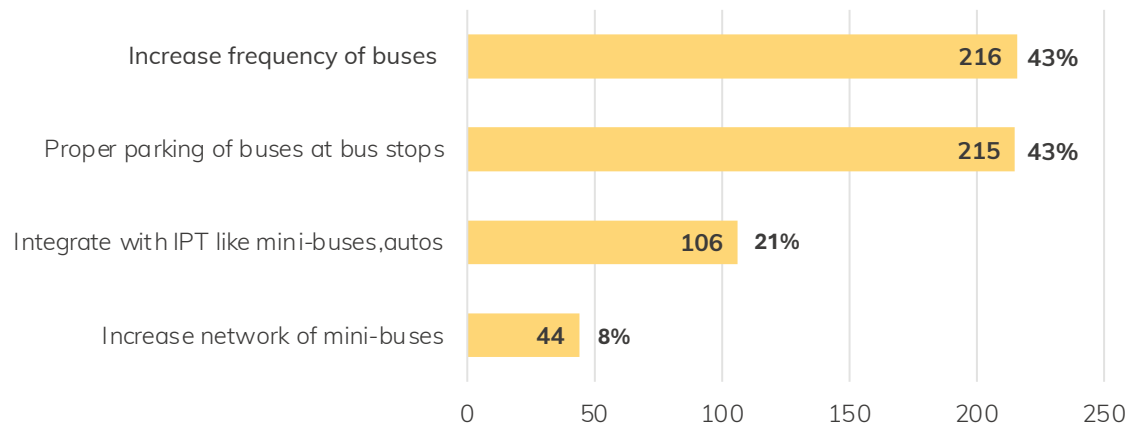
- **43%** of users prioritise increasing bus frequency and ensuring adequate parking space for buses, highlighting the need for more dependable and efficiently managed operations.

Additionally, users emphasise the importance of strengthening the bus network and improving integration with IPT services, suggesting that better connectivity and coordinated services are essential to enhancing the overall travel experience.

What are the improvements that could be made in buses?



What are the improvements that could be made in PT services?





“ People’s opinions

Better lighting, safer stops, and more low-floor buses would make a huge difference in our daily travel.

Woman, 26 years old

Low-floor buses, cleaner interiors, good ventilation, accessible bus stops with ramps would make the ride feel more comfortable.

Woman, 45 years old

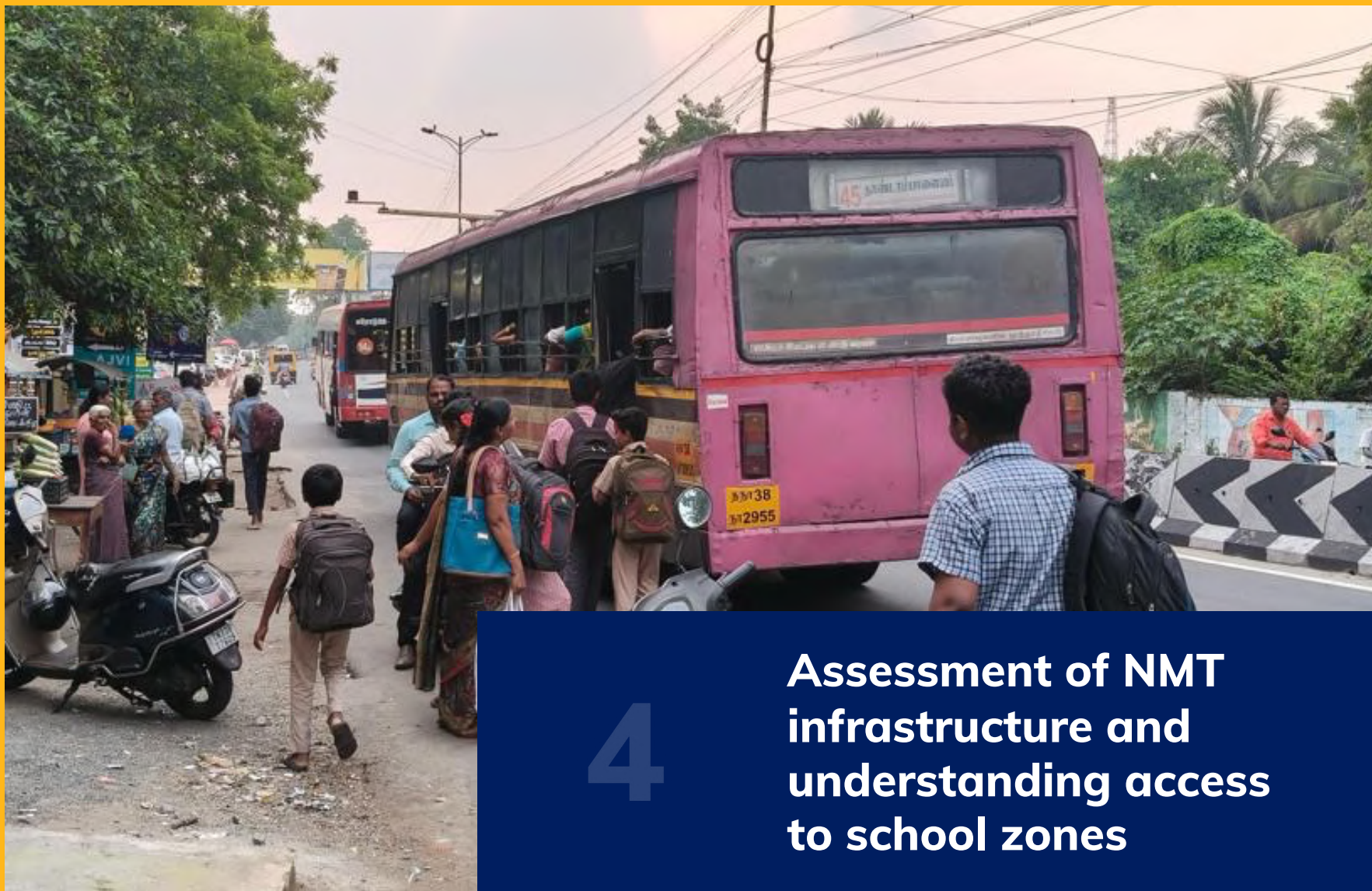
Buses coming on time and better management of waiting areas in the stops would make the commute more pleasant.

Man, 54 years old

There are low-floor buses in Chennai but none in Erode. I have used those buses and they are very comfortable.”

Man with blindness, 40 years old





4

Assessment of NMT infrastructure and understanding access to school zones

Overview of NMT infrastructure audits, user perception surveys and speed-volume surveys around schools

Introduction

The city's NMT infrastructure comprises approximately 21 km of footpath. This full stretch was included in the audit, and **walk access to schools** was evaluated through **perception surveys** conducted at **10 high-enrolment schools**.

To assess traffic speed and safety conditions, **speed surveys** were carried out at locations within a 5-minute walking distance of the selected schools.

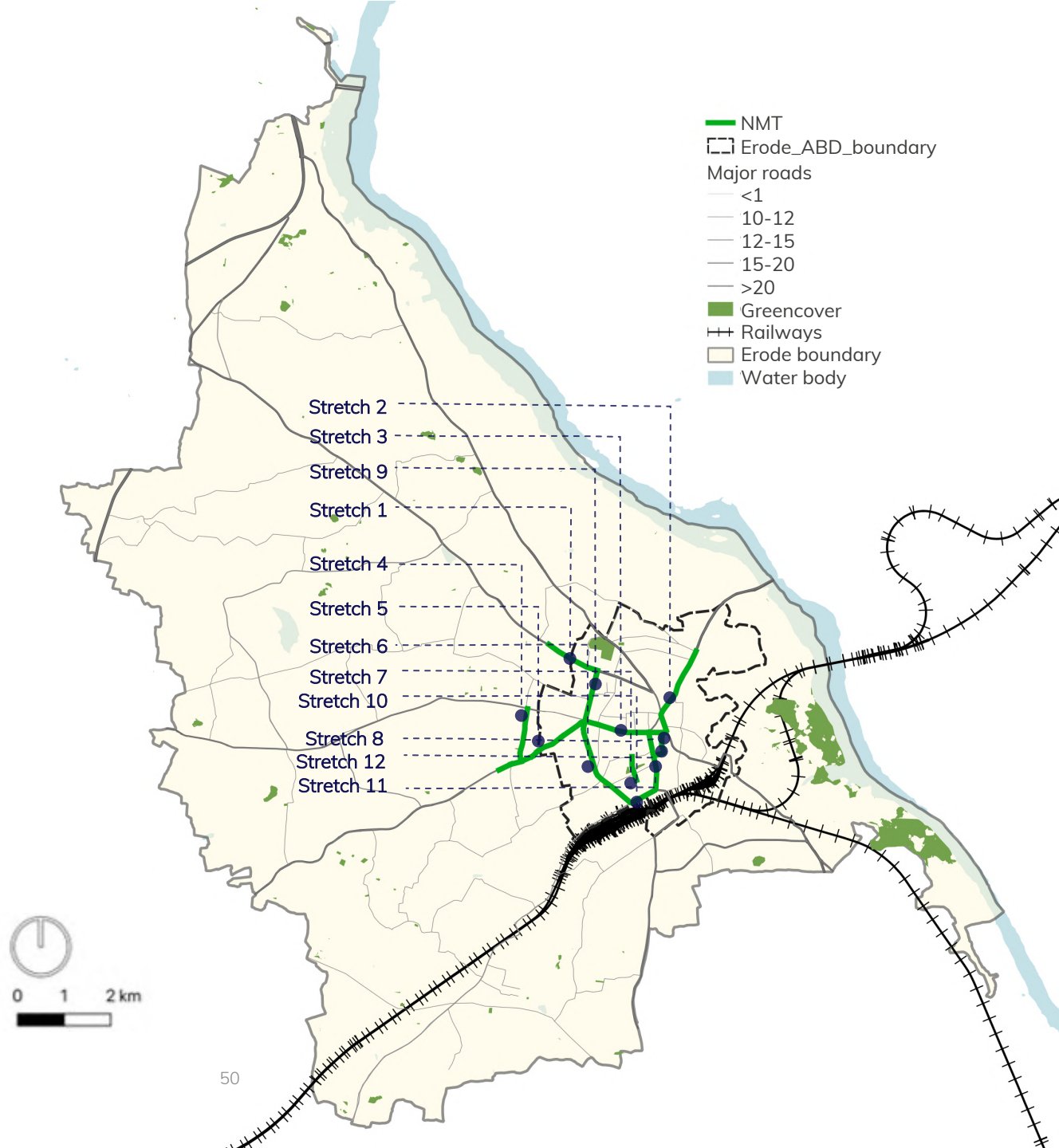
In total, **25 mid-block locations** were surveyed. ATCC tubes were installed, and vehicle speeds were recorded over an 8-hour period, comprising four peak and four non-peak hours.

Sample	Particulars
Length of streets with footpath	21 km (LHS + RHS of streets)
No. of surveys	300 (30 per school)
No. of male respondents	150
No. of female respondents	150
No. of speed survey points	25



NMT infrastructure audit locations

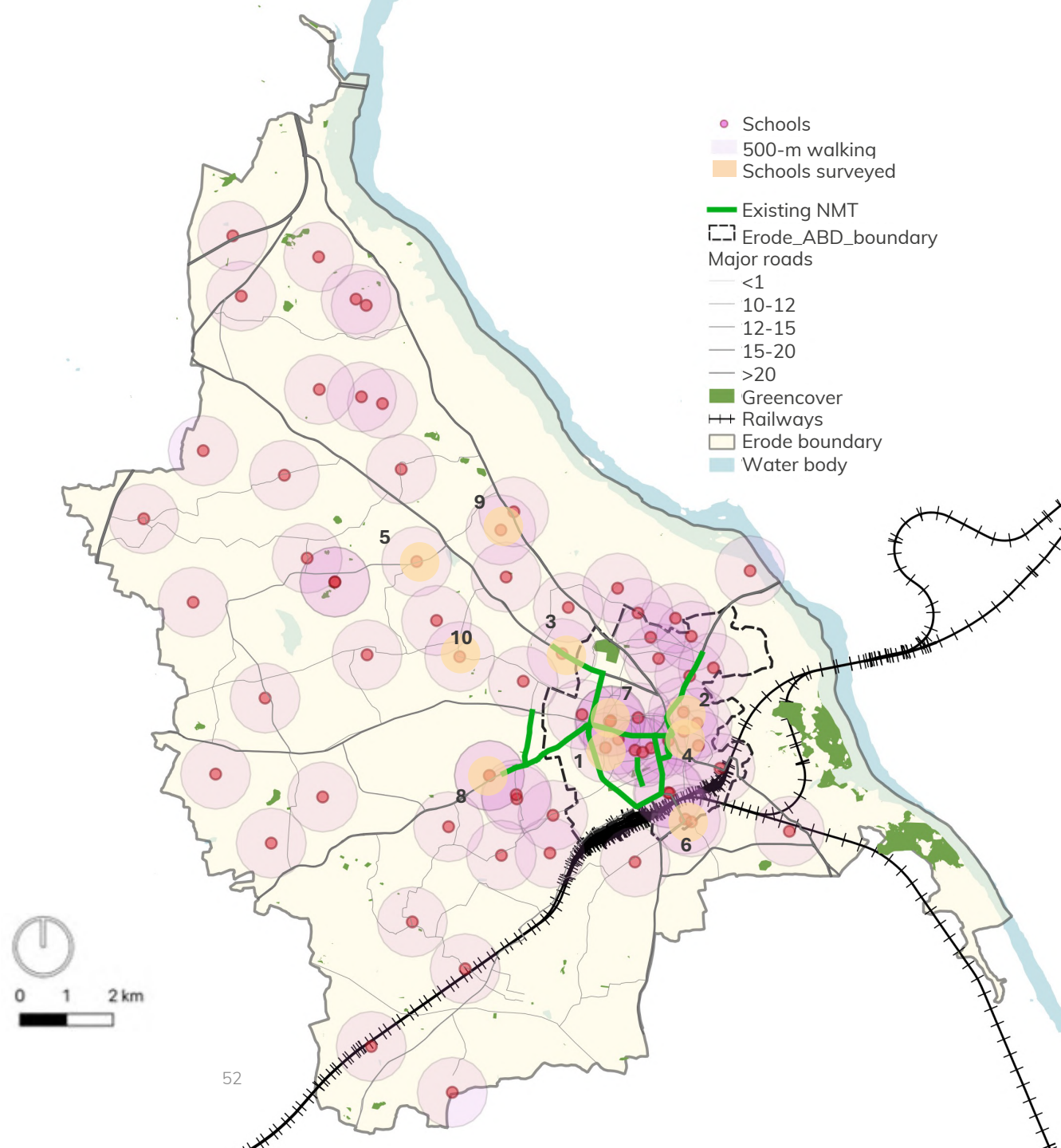
S. No.	Street name	Length of street (metre)
Stretch 1	Sathy Road	2040
Stretch 2	Cauvery Road + Nethaji Road	2660
Stretch 3	Brough Road + Erode Main Road	2590
Stretch 4	Sampath nagar 60ft Road	1600
Stretch 5	Perundurai Road	3040
Stretch 6	EVN Road	3140
Stretch 7	80 feet Road + Residential Street	1540
Stretch 8	State Bank Road	620
Stretch 9	Mettur Road	1580
Stretch 10	Chennimalai Road	840
Stretch 11	Veterinary Hospital Road	320
Stretch 12	Periyar Nagar Road	1780
Grand Total		21750





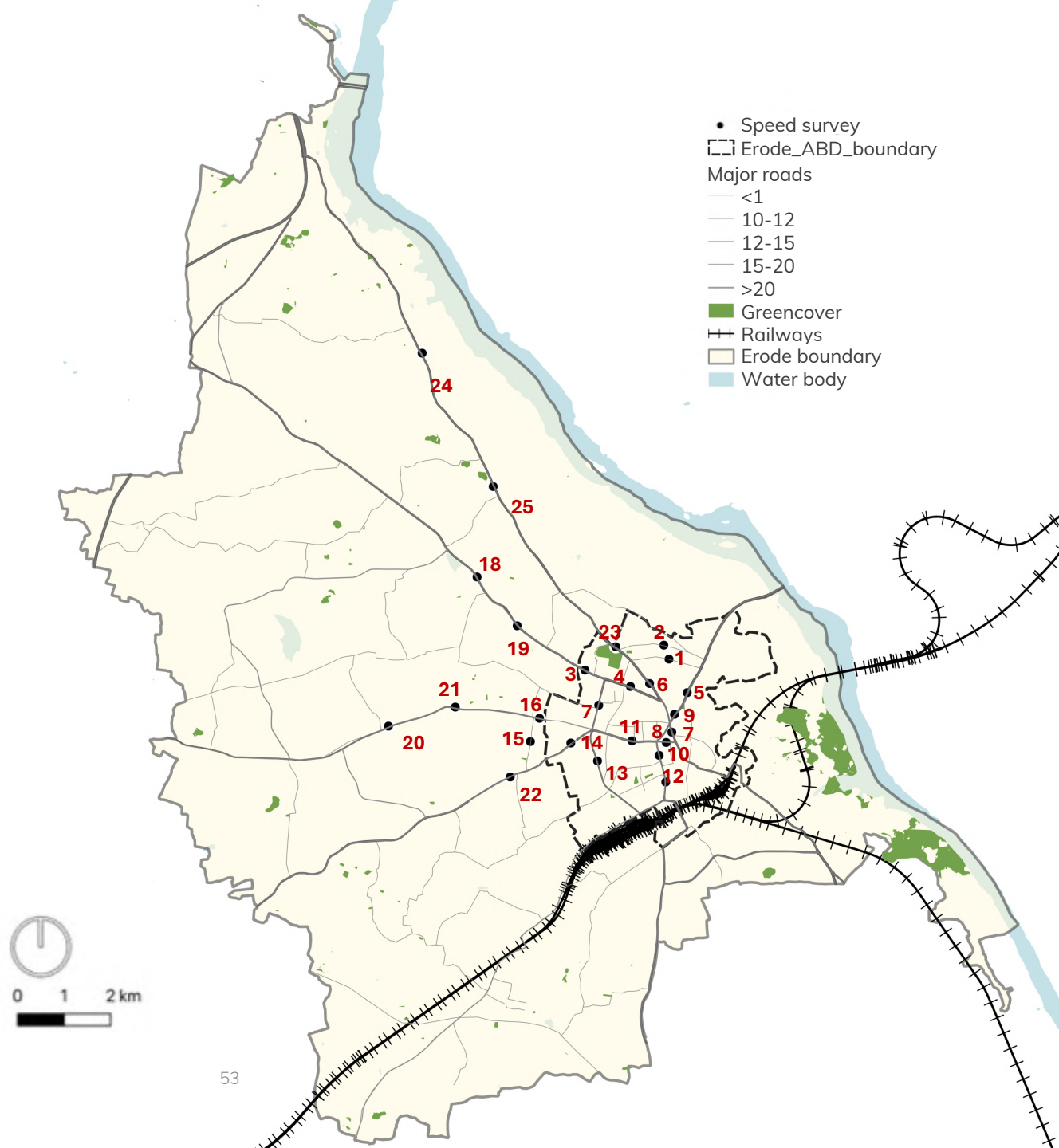
School locations for user perception surveys

S. No.	Name of the school	Strength
1	APS, Kalaimagal Kalvi Nilayam	1080
2	E.K.M.Abdul Gani Elementary school	640
3	Panchayat Union Elementary School, Veerapanchatram	477
4	Govt. Elementary School, Periyar Street, Erode	320
5	Government High School, Chinna Semur	313
6	APS, Rita School	300
7	APS, Sengunthar Nilayam	290
8	Government Higher Secondary School, Kumalankuttai	275
9	APS, Matharsha Hidhayathu Islam B.P. Agragaram	260
10	Panchayat Union Middle School, Manickampalayam	255
Total Strength of schools surveyed		4210



Speed survey locations

Survey Point	Corridor Name
6, 9, 17, 18, 23, 24, 25	Bhavani Road
3, 4, 18, 19	Sathy Road
16, 20, 21	Nasiyanur Road
14, 22	Perundurai Road
8, 10	Brough Road
5, 7	Cauvery Road
1	KNK Road
2	Thirunagar Colony
Survey Point	Corridor Name



Nearly 40% of both adults and children walk to school.

The footpath network serves only 10 of 78 schools in the city. Four of these 10 are part of the list shortlisted for this study.

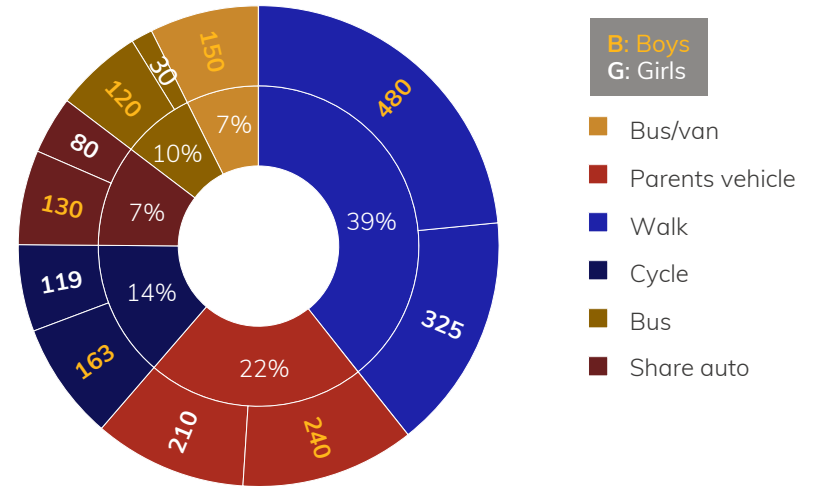
Significant gender gaps exist in school travel. While 42% of girls walk to school, only 37% of girls walk to school. When it comes to buses, 9% of boys use the bus compared to 3% girls despite free travel for girls, highlighting safety and accessibility concerns.

Public transport use is also lower among students (7%) than teachers (28%), indicating greater barriers for younger commuters, especially girls.

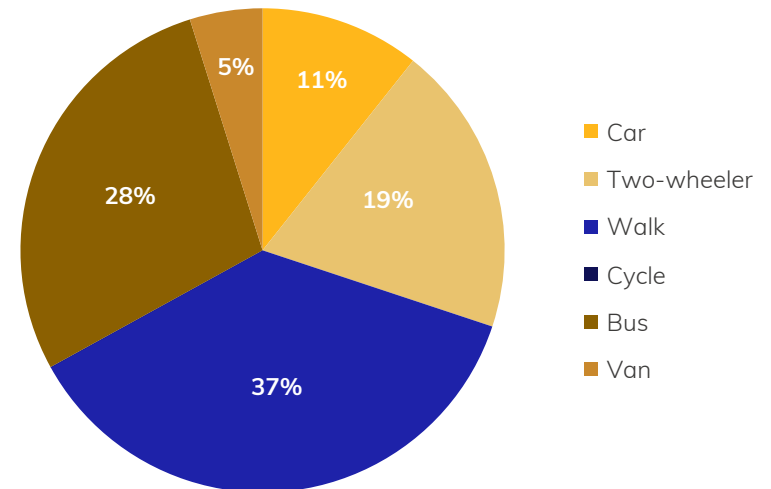
Overall, the findings call for **safer, more inclusive NMT corridors, secure bus stops, better route planning, and improved last-mile connectivity.**

User type	Number
Teachers	103
School students	2236
Girls	1527
Boys	709

Mode share of students



Mode share of teachers

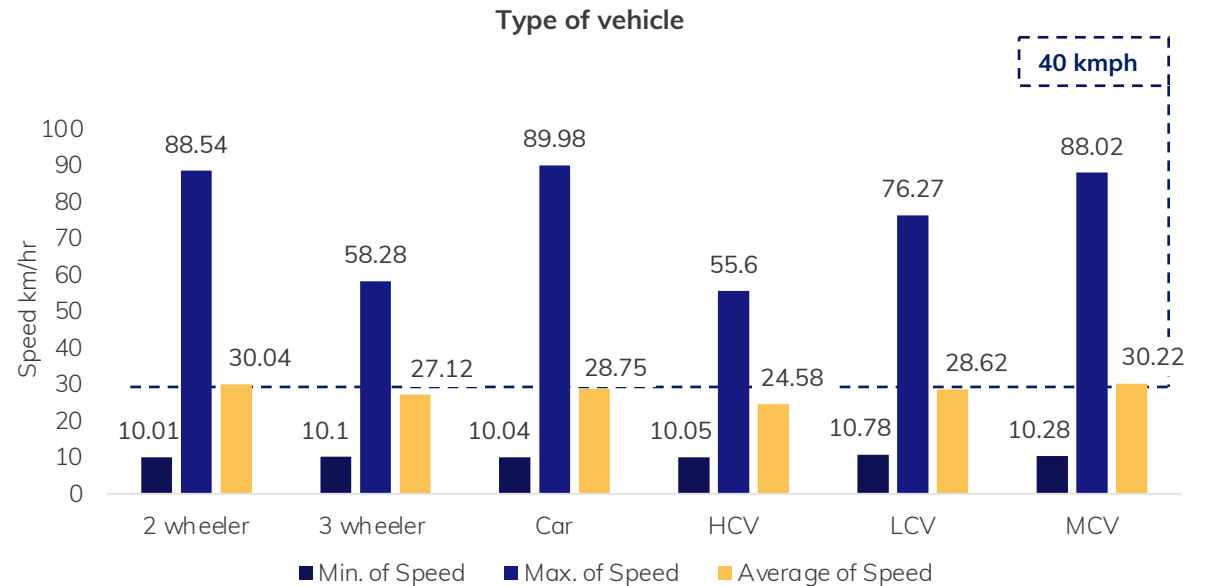
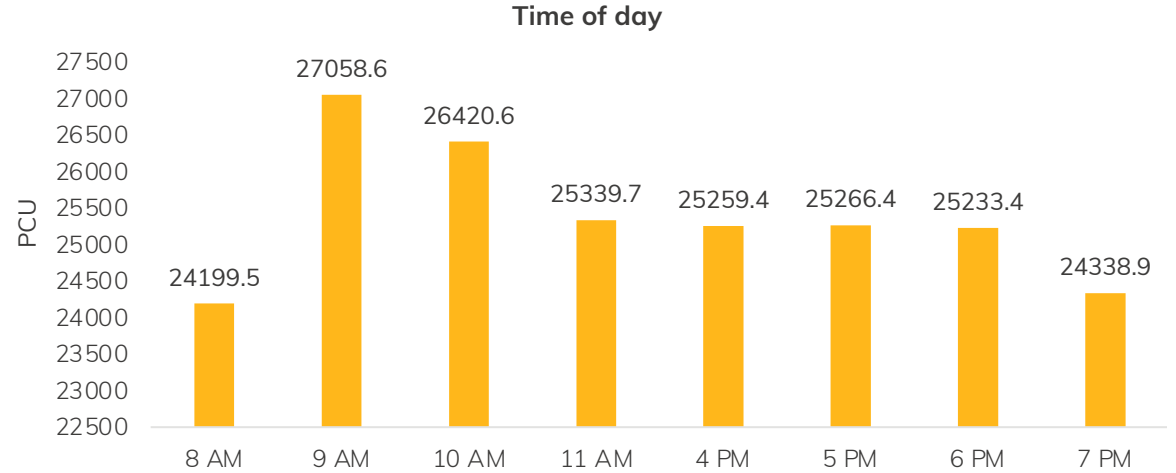


Traffic volume, measured using Passenger Car Units(PCU), is high even during school entry and exit times, between 8 am and 9 am.

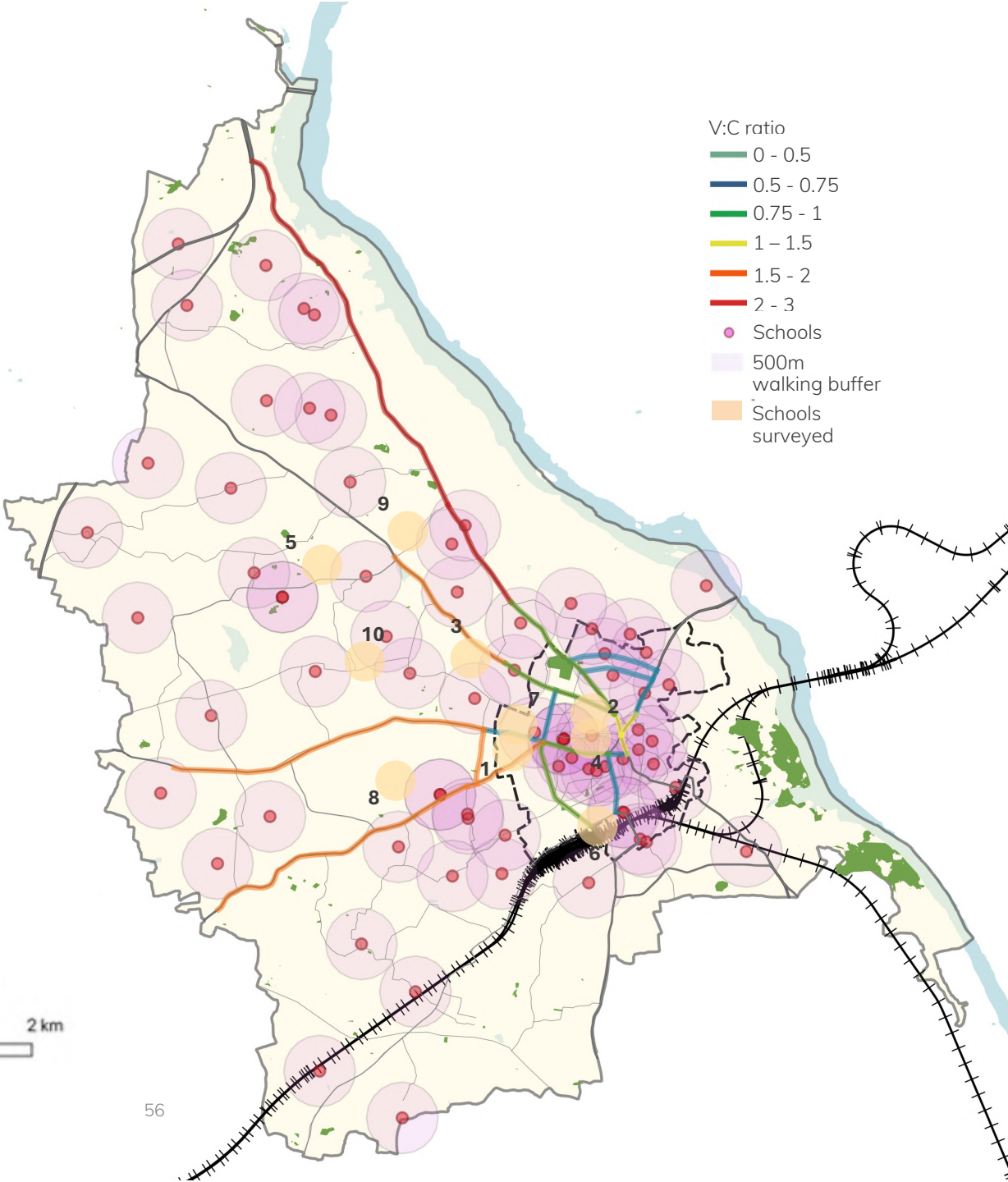
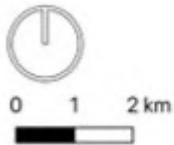
Across the 25 survey locations, the **average daily traffic volume is 203116 in PCU**. Of these, cars account for 46%, two-wheelers for 47%, and the remaining 7% comprises Heavy Commercial Vehicles(HCVs), Light Commercial Vehicles(LCVs), and Multi-axle Vehicles(MCVs).

Cars and MCVs record the highest maximum speeds (around 90 km/h), far exceeding the overall average speed of 29 km/h. The minimum speeds across all vehicle categories remain uniformly low (~10 km/h).

Vehicle type	No. of vehicles	Percentage of vehicles
2 wheeler	115577	47%
3 wheeler	6565	3%
Car	111953	46%
HCV	668	0.2%
LCV	5340	2%
MCV	5161	2%
Total	254264	100%



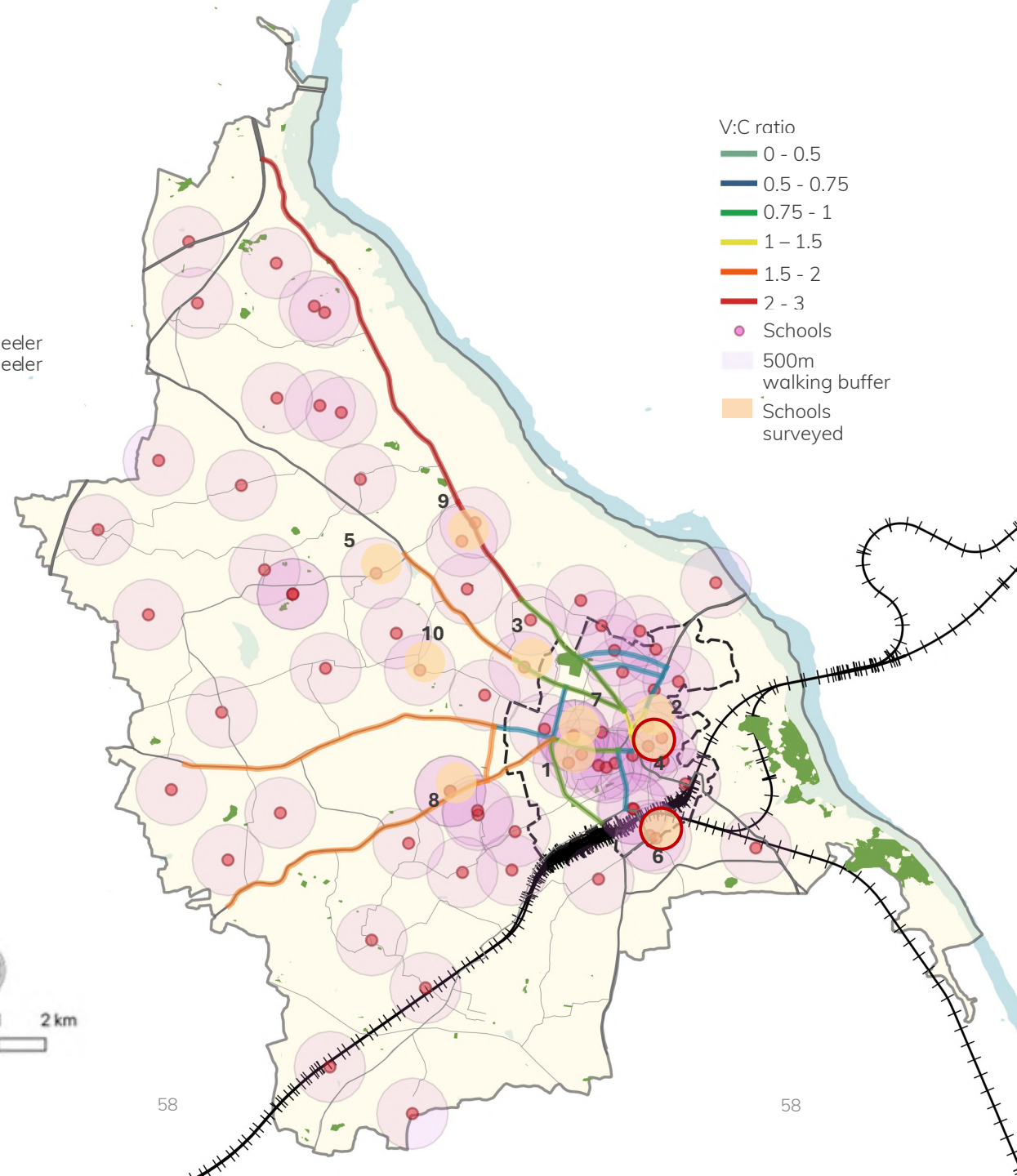
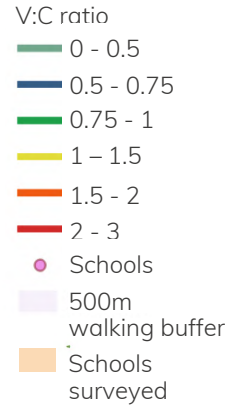
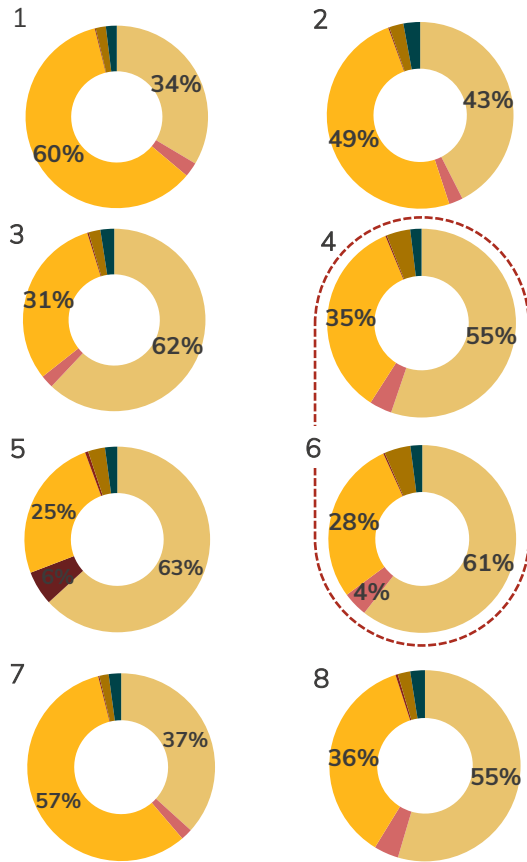
Nearly 40% of major roads face peak-hour weekday congestion, affecting pedestrian safety and air quality near five schools.



Corridor name	V/C	Performance + Presence of footpath	School with direct access
Bhavani Road	1.4	Congestion (no footpath)	3
Sathy Road	1.4	Significant traffic (footpath partially present)	0
Nasiyanur Road	2.5	Significant traffic (no footpath)	1
Perundurai Road	1.1	Significant traffic (footpath present)	1
Bhavani road	0.6	Normal flow (no footpath)	1
Brough Road	1.0	Normal traffic (footpath present)	2
Sathy Road	1.0	Normal flow (footpath partially present)	1
Cauvery Road	0.6	Normal flow (footpath present)	3
KNK road	2.0	Congestion (no footpath)	1
Thirunagar Colony	1.7	Significant traffic (no footpath)	2

V:C ratio 0 - 0.5 ■ 0.5 - 0.75 ■ 0.75 - 1 ■ 1 - 1.5 ■ 1.5 - 2 ■ 2 - 3

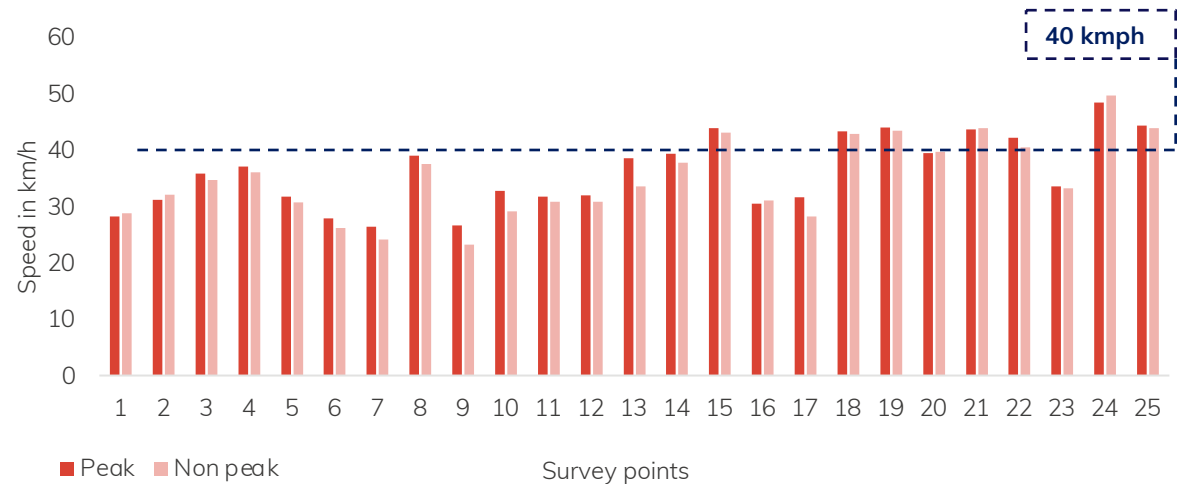
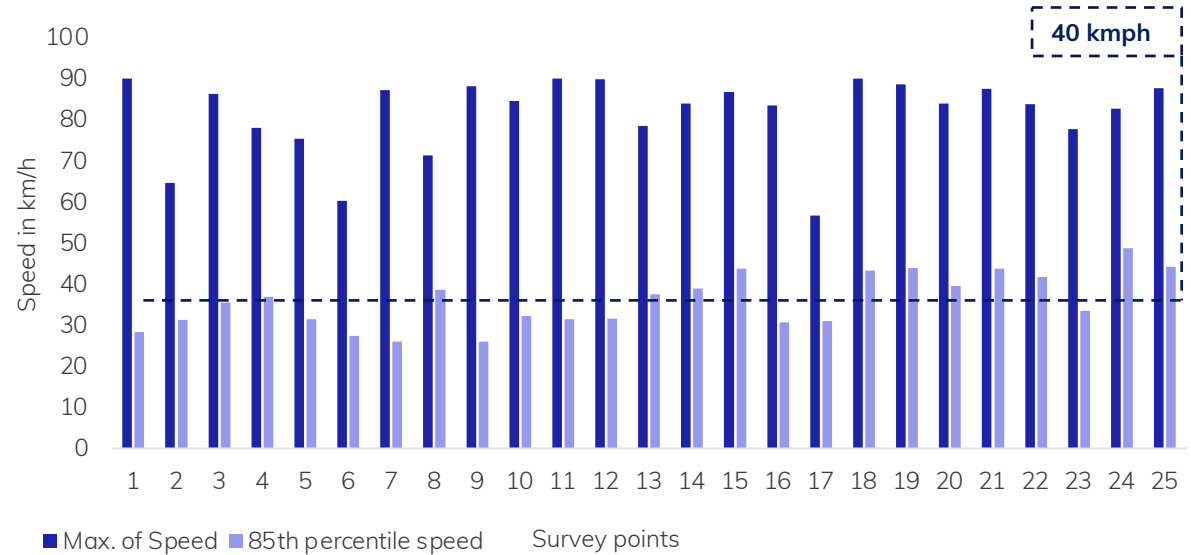
Nearly 90% of traffic is two- and four-wheelers, with some core area schools facing high peak-hour HCV volumes.



Maximum speeds are over 2x of the stipulated school zone speed limit of 30-40 kmph across the city.

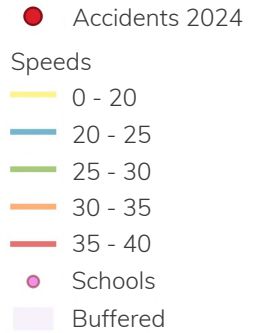
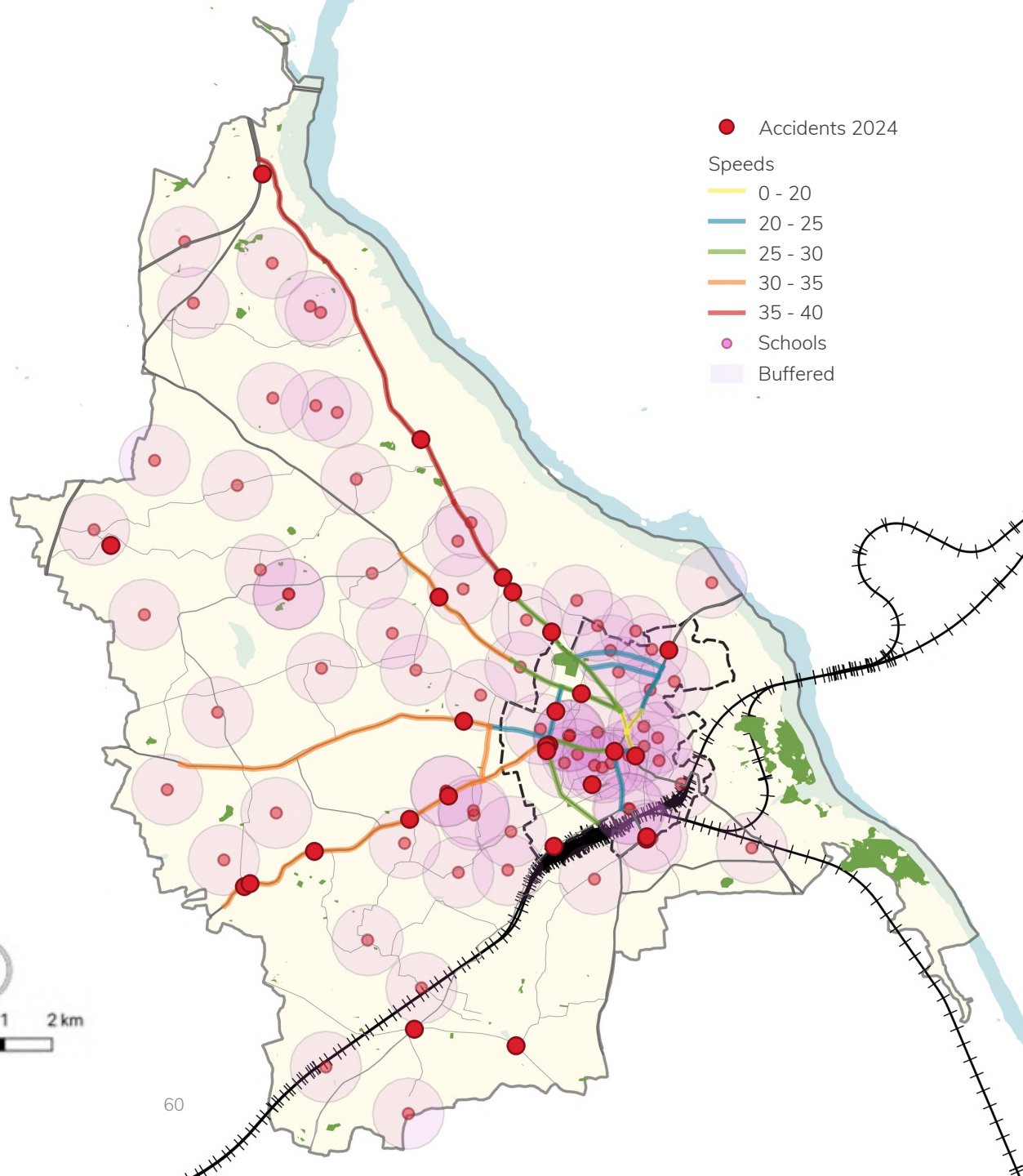
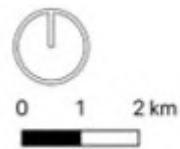
Although most traffic operates within acceptable limits, **maximum speeds often reach 80–90 km/h, and 85th percentile speeds approach or exceed limits—especially on Sathy, Bhavani, and Nasiyanur Roads**—posing increased safety risks.

Survey Point	Corridor Name
1	KNK Road
2	Thirunagar Colony
3, 4, 18, 19	Sathy Road
5, 7	Cauvery Road
6, 9, 17, 18, 23, 24, 25	Bhavani Road
8, 10	Brough Road
14, 22	Perundurair Road
16, 20, 21	Nasiyanur Road



33 out of 172 schools (both private and corporation owned) lie within walking distance of accident hotspots and 10 of them also lie on high-speed sections of arterial roads.

Corridor Name	Max. Speed	Min. Speed	No of Schools on the corridor
Bhavani Road	88.2	10.1	4
Sathy Road	89.9	10.28	2
Nasiyanur Road	36.0	10.2	1
Perundurair Road	89.8	10.8	3
Bhavani Road	86.3	10.8	2
Brough Road	84.43	10.7	8
Cauvery Road	75.2	10.1	4
KNK Road	89.92	10.13	4
Thirunagar Colony	64.59	10.04	4



Footpaths with uniform surface



Narrow footpath



Obstructed footpath





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CHENNAI CITY TRAFFIC POLICE
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Clothing
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Level of Service of NMT infrastructure

To systematically evaluate the performance of the footpaths, a scoring tab has been established based on three key parameters.

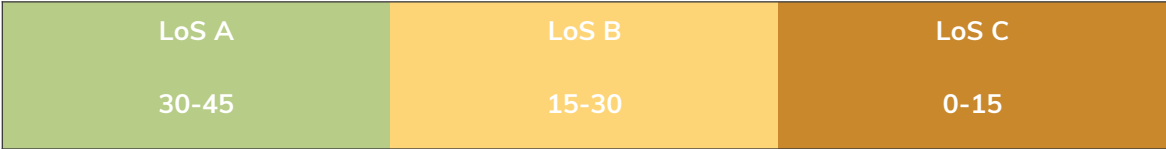
These parameters are further classified into a total of 9 indicators: 5 for walkability, 3 for safety, and 1 for universal accessibility.

Each indicator is scored on a scale of 1-5.

<p>Walkability</p> 	<ol style="list-style-type: none"> 1. Presence of footpath 2. Footpath with even surface 3. Adequate width of footpath 4. Adequate height of footpath 5. Presence of encroachments/obstructions
<p>Safety</p> 	<ol style="list-style-type: none"> 6. Adequate lighting levels 7. Presence of crossing infrastructure Presence of stormwater drains
<p>Universal accessibility</p> 	<ol style="list-style-type: none"> 8. Presence of ramps/tactile pavers

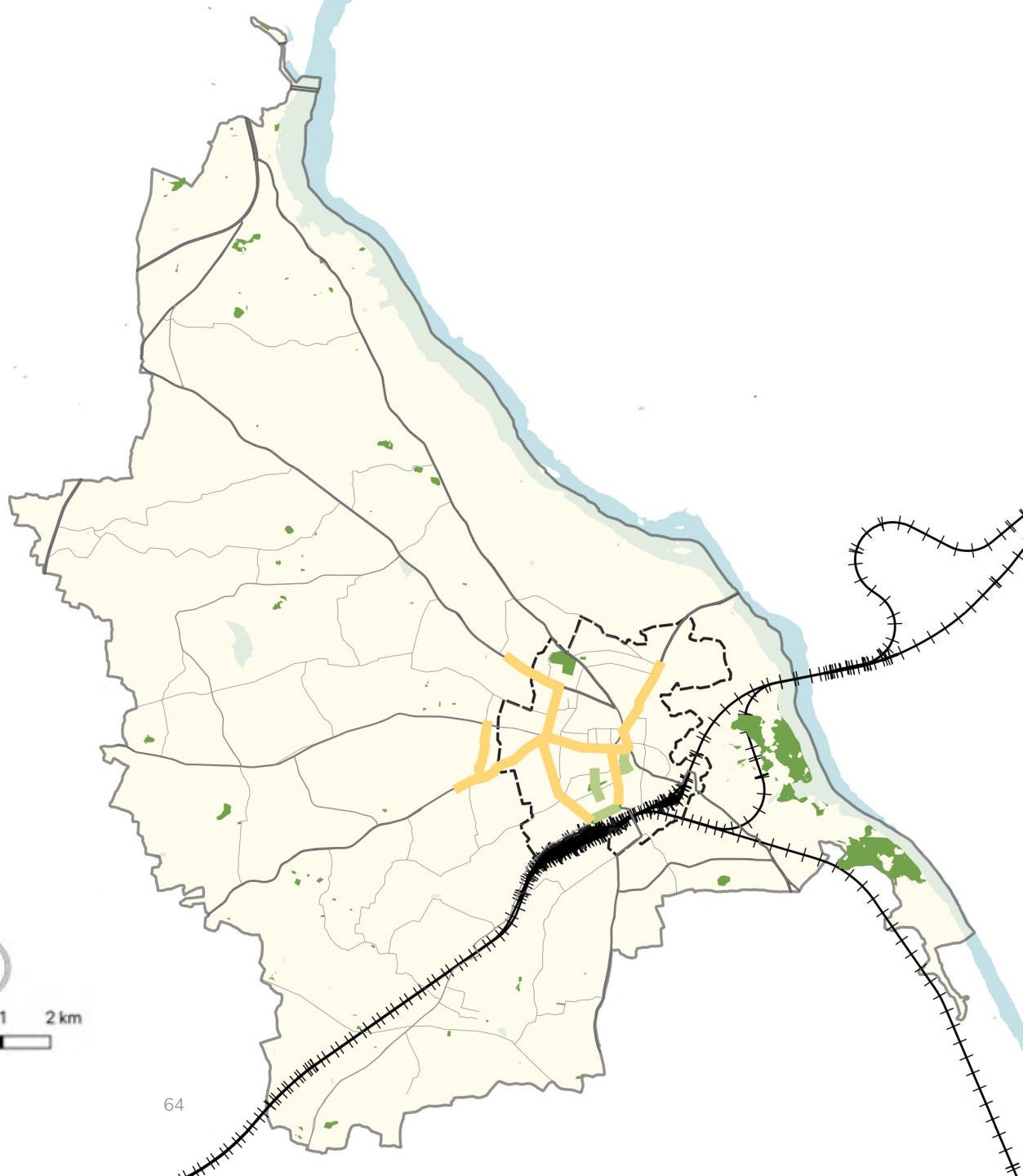
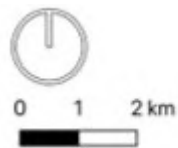
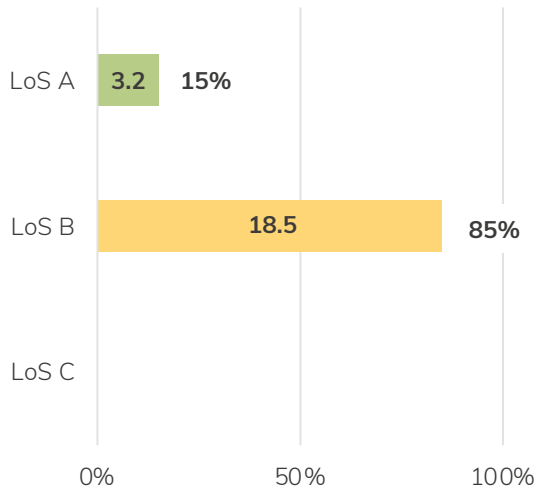
The overall score is categorized into three service levels.

This classification helps stakeholders easily identify the quality of the footpath implemented and prioritize enhancements.

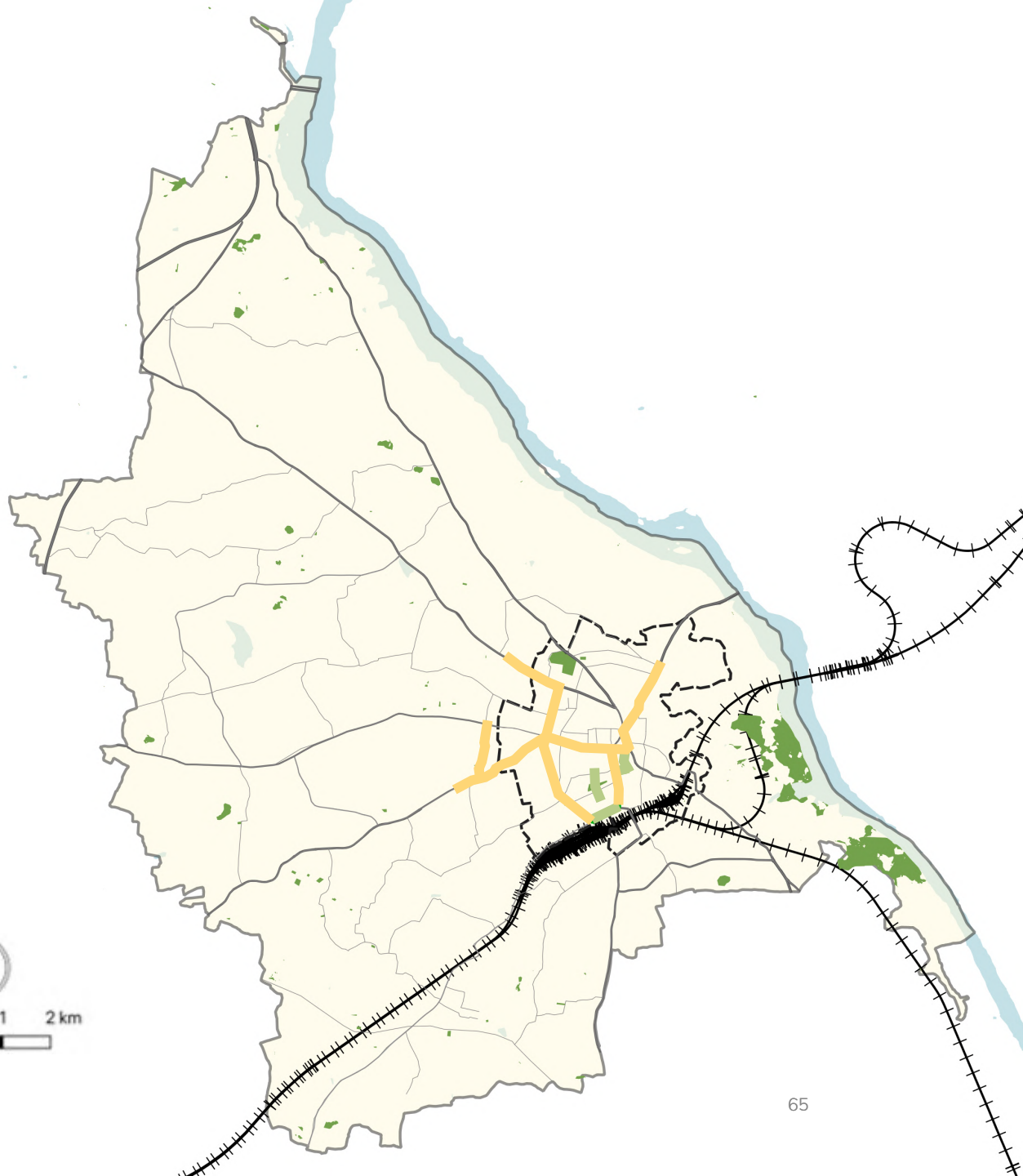
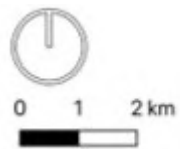


Only 15% of the total length of the footpath falls under LoS level A, and the rest falls under LoS B.

18.5km of implemented footpath fall under LoS B, which means there is a need to design and implement footpath that adhere to IRC codes to ensure walkability, safety, and universal accessibility.



Street Name	LoS
Stretch 1 - Sathy Road	24.3
Stretch 2 - Cauvery Road + Nethaji Road	25.8
Stretch 3 - Brough Road + Erode Main Road	21.9
Stretch 4 - Sampath Nagar 60ft Road	29.1
Stretch 5 - Perundurair Road	21.9
Stretch 6 - EVN Road	29.1
Stretch 7 - 80 feet Road + Residential Street	32.6
Stretch 8 - State Bank Road	32.5
Stretch 9 - Mettur Road	16.2
Stretch 10 - Chennimalai Road	31.5
Stretch 11 - Veterinary Hospital Road	34.8
Stretch 12 - Periyar Nagar Road	26.4



The entire length of the footpath available is not designed for vulnerable population such as children, seniors or people with disabilities. The footpaths perform poorly in the universal accessibility parameter.

Category	No. of Indicators
Walkability	5
Safety	3
Universal Accessibility	1

Performance	Scale
Good	75%-100%
Moderate	50%-74%
Fair	26%-49%
Poor	0-25%




Street Name	Walkability	Safety	Universal accessibility	Total	LoS
Stretch 1 - Sathy Road	61%	53%	20%	54%	LoS B
Stretch 2 - Cauvery Road + Nethaji Road	56%	72%	23%	57%	
Stretch 3 - Brough Road + Erode Main Road	56%	45%	25%	49%	
Stretch 4 - Sampath Nagar 60ft Road	69%	70%	28%	65%	
Stretch 5 - Perundurair Road	45%	61%	30%	49%	
Stretch 6 - EVN Road	66%	73%	33%	65%	
Stretch 7 - 80 feet Road + Residential Street	79%	73%	35%	72%	LoS A
Stretch 8 - State Bank Road	92%	51%	38%	72%	
Stretch 9 - Mettur Road	10%	78%	40%	36%	LoS B
Stretch 10 - Chennimalai Road	68%	82%	43%	70%	LoS A
Stretch 11 - Veterinary Hospital Road	86%	73%	45%	77%	
Stretch 12 - Periyar Nagar Road	59%	62%	48%	59%	LoS B

Inferences from NMT audits, user perception surveys, speed-volume surveys

- **Walkability:** Footpaths are largely unusable due to inadequate height, insufficient width, frequent obstructions, encroachments, parking, and uneven or broken surfaces.
- **Safety:** Safety is compromised by congested school-access roads, traffic dominated by two-wheelers and four-wheelers, higher HCV volumes near some schools, and lack of pedestrian crossings at most major intersections, leading to frequent near-misses and falls.
- **Universal accessibility:** Although ramps exist along 58% of footpaths, they are often poorly designed and ineffective, leading to weak universal accessibility.

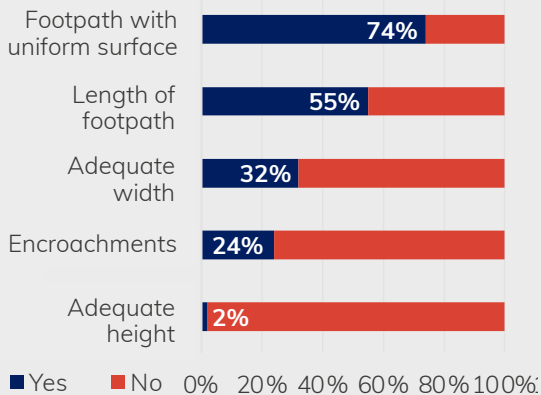
Overall inference:

School streets remain unsafe, with fragmented footpath infrastructure.

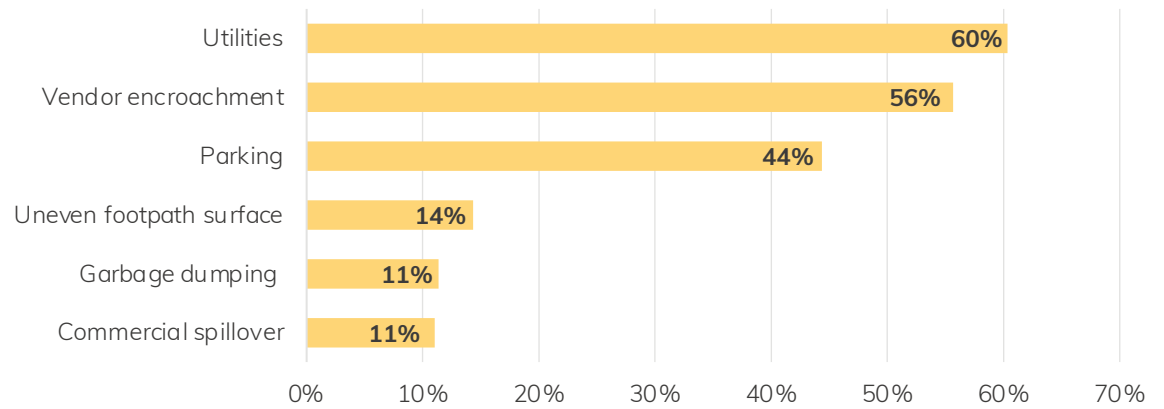
	NMT audit indicators	School user perception survey indicators
Walkability 	<ol style="list-style-type: none"> 1. Presence of footpath 2. Footpath with even surface 3. Adequate width of footpath 4. Adequate height of footpath 4. Presence of encroachments/obstructions 	<ol style="list-style-type: none"> 1. Low/No encroachments navigated on footpath 2. Surface condition is smooth and even 3. Footpath is used
Safety 	<ol style="list-style-type: none"> 5. Adequate lighting levels 6. Presence of crossing infrastructure 7. Presence of stormwater drains 	<ol style="list-style-type: none"> 4. Lack of concern about threat to personal safety and security 5. Absence of reckless driving on the streets 6. Absence of speeding vehicles 7. Presence of dedicated crossing points 8. Presence of traffic-calmed streets 9. No experience of accidents/witnessing accidents 10. No experience of tripping and falling 11. No experience of near-miss collisions with moving vehicles 12. Absence of extreme heat and air pollution 13. Presence of adequate street lighting
Universal accessibility 	<ol style="list-style-type: none"> 8. Presence of ramps/tactile pavers 	<ol style="list-style-type: none"> 14. Presence of Universal Design

68% of existing footpaths have inadequate width, 98% have inadequate height, and 76% have obstructions, making them unusable.

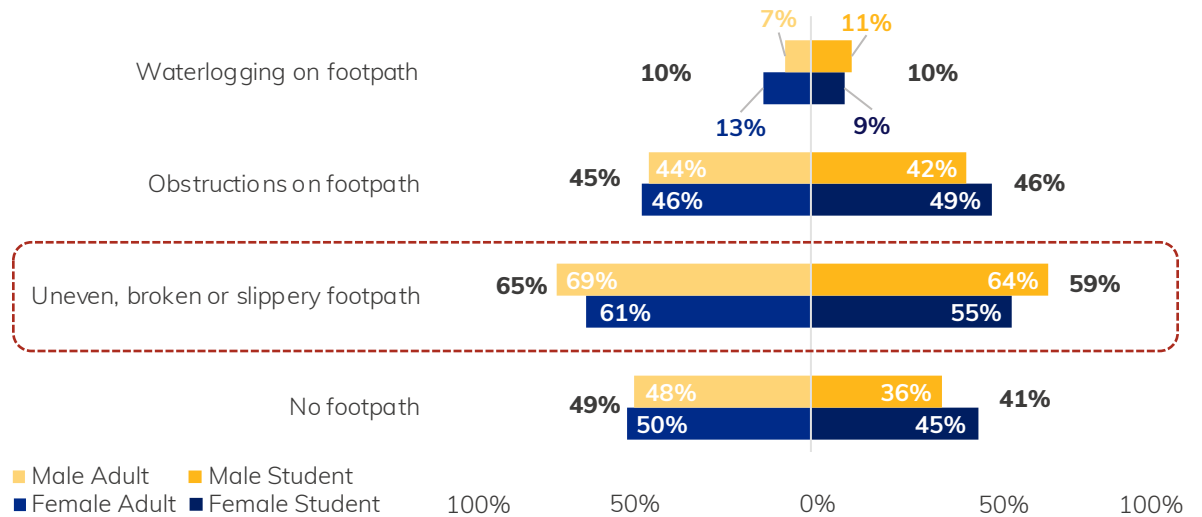
While out of the footpaths surveyed, **74% are have uniform surface**, school user surveys indicate several challenges to walkability: **obstruction (45%) uneven footpath surfaces (45%) and absence of a footpath (45% on average)**. Around 52% people cite street utilities, vendor encroachment and parking as a hindrance to walking. **Uneven, slippery or broken footpaths are the most cited reasons (62% on average)** for people not using the footpath.



What are the most commonly observed obstructions to walking?



What are the reasons for not using the footpath to walk?

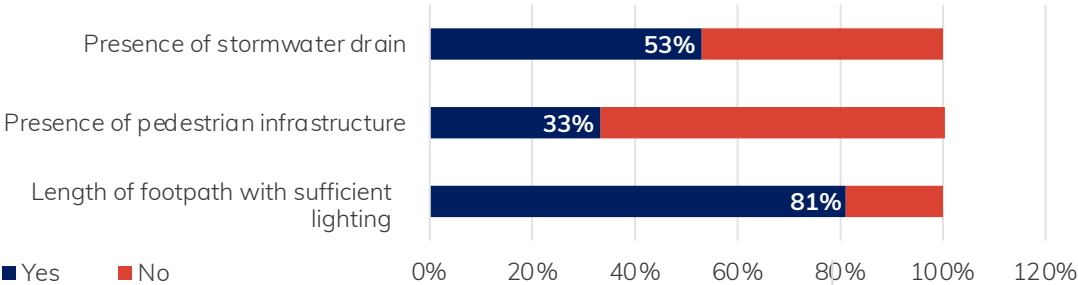


Safety of pedestrians are impacted largely by a lack of dedicated and traffic-calmed pedestrian crossings.

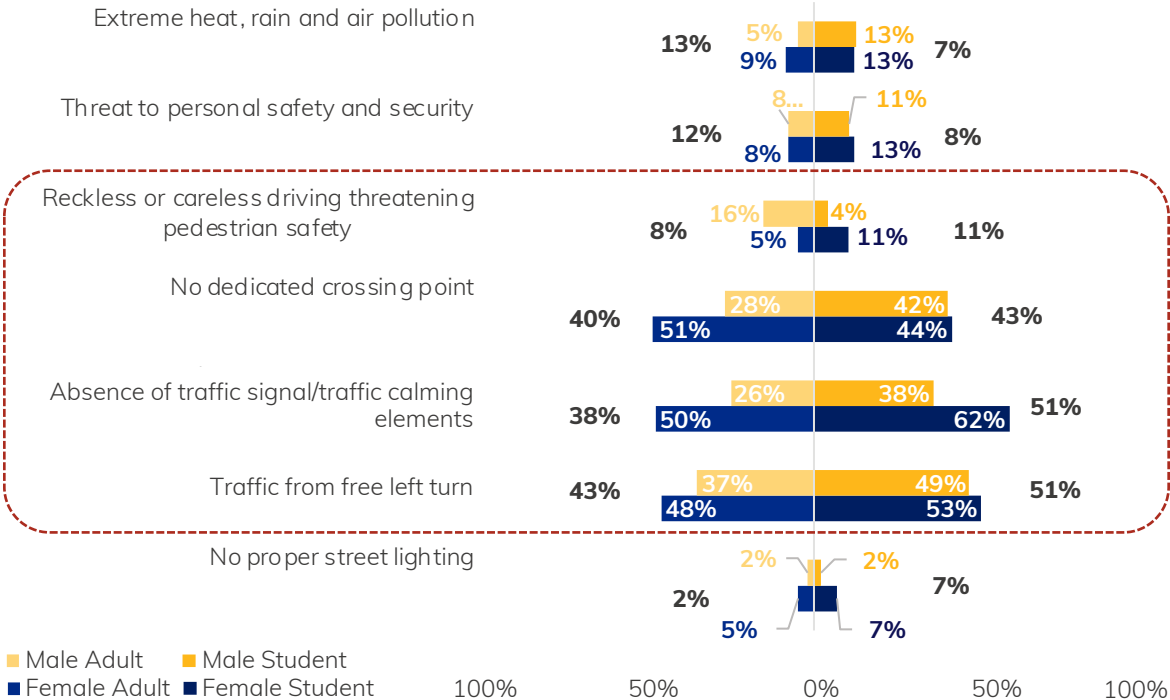
67% of all major intersection arms do not have crossing infrastructure of any kind. This is perceived as a safety concern by 40% of adults and 43% of children.

50% of women and 62% of girls mention a lack of signals or traffic calming elements at crossing points as reasons for streets being unsafe. Oncoming traffic from free left turns is also cited as a safety concern, equally by students and adults of both sexes.

81% of footpaths have adequate lighting levels, and this is corroborated by the user responses where very few respondents (4.5% on average) highlight improper street lighting.



What are the reasons of feeling unsafe as a pedestrian on the streets?



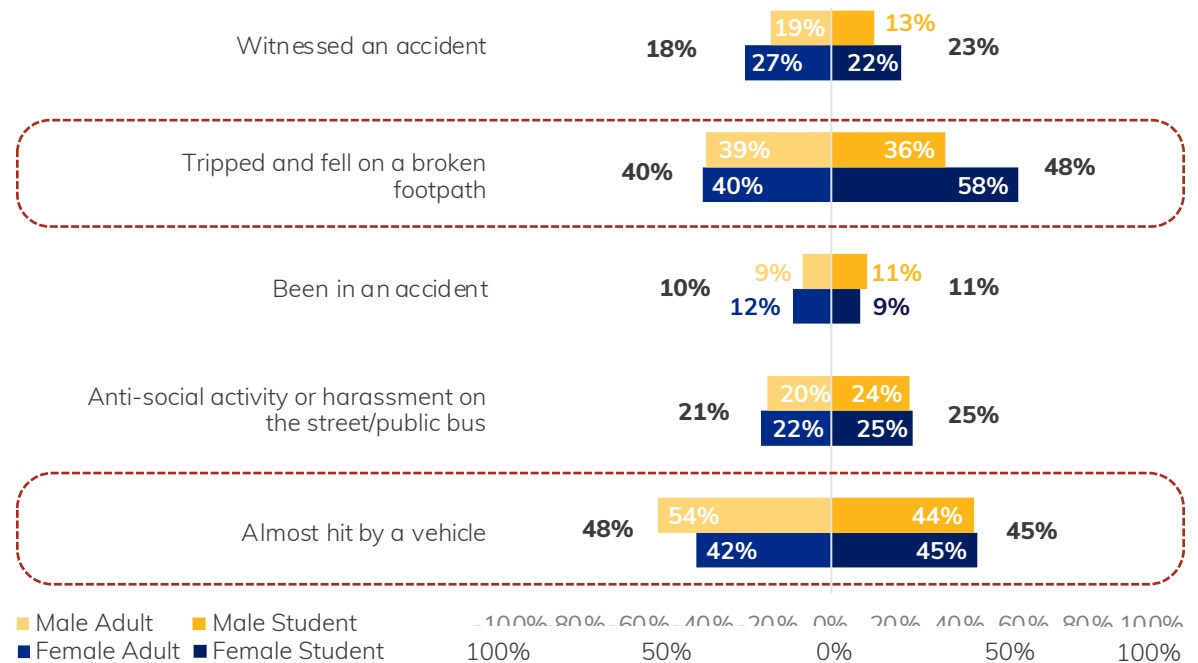
Those who commute on foot have often had unpleasant experiences.

58% of female students and 40% of women have experienced instances of tripping and falling on the street.

48% of adults and 45% of children have experienced being nearly hit by speeding vehicles.



Have you faced bad experiences on the streets?



Universal accessibility

Despite ramps present on 58% of the length of the footpath, they are ineffective as the **ramps are being used for vehicular access rather than pedestrian access.**

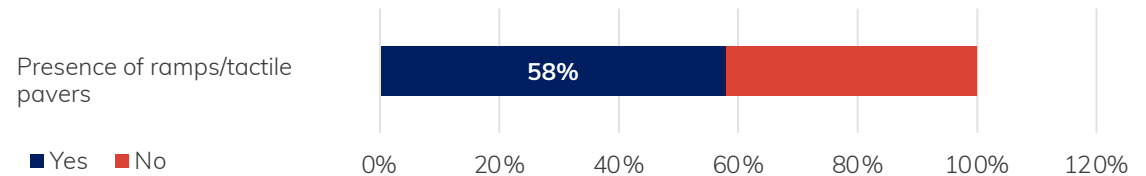
Street utilities, vendor encroachment, and parking were cited by most people (52% on average) as hindrance to walking. However, **uneven, slippery or broken footpath was the most highly cited reason (62% on average) for not using the footpath.**



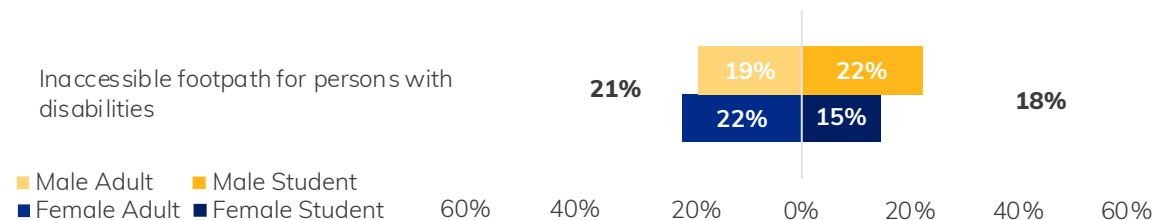
Lack of ramps



Broken and obstructed pathway



Are the footpaths accessible to differently abled/vulnerable persons?





5

Recommendations and way forward



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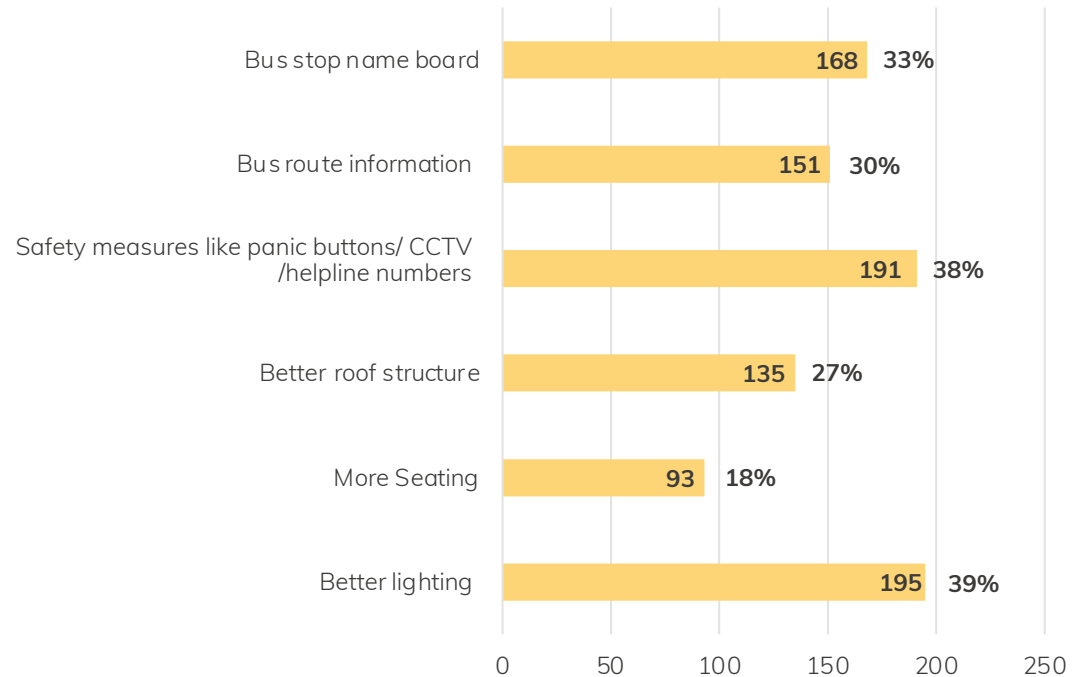
FM

Recommendations to improve bus stop infrastructure

Recommendations to improve bus stop infrastructure

The survey shows clear priorities: **better lighting (40%)**, **stronger safety measures (38%)**, **improved upkeep of shelters, and nameboards (35%)**, highlighting the need for safer, brighter, and better-maintained bus stops.

What are the improvements that could be made in bus stops?

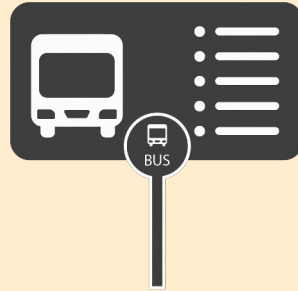


Parameters of good bus transport

1

Passenger information

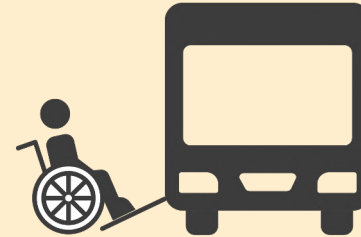
Install clear, standardized signage and real-time arrival information at every stop.



2

Ease of access

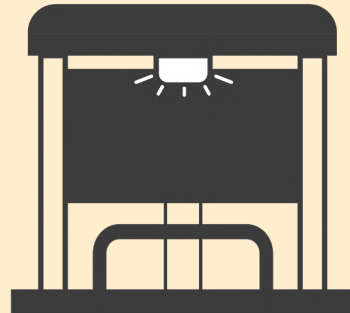
Provide continuous, universally accessible pedestrian connections with level boarding, and ramps at all bus stops.



3

Safety

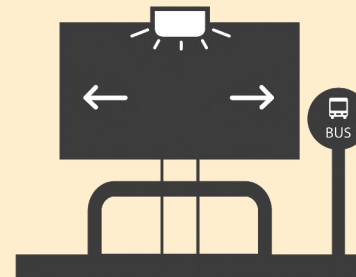
Improve lighting, shelter design, and emergency information to enhance visibility and perceived security.



4

Essential facilities

Ensure all stops have basic amenities such as seating, shelters, tactile indicators, and illuminated signage.



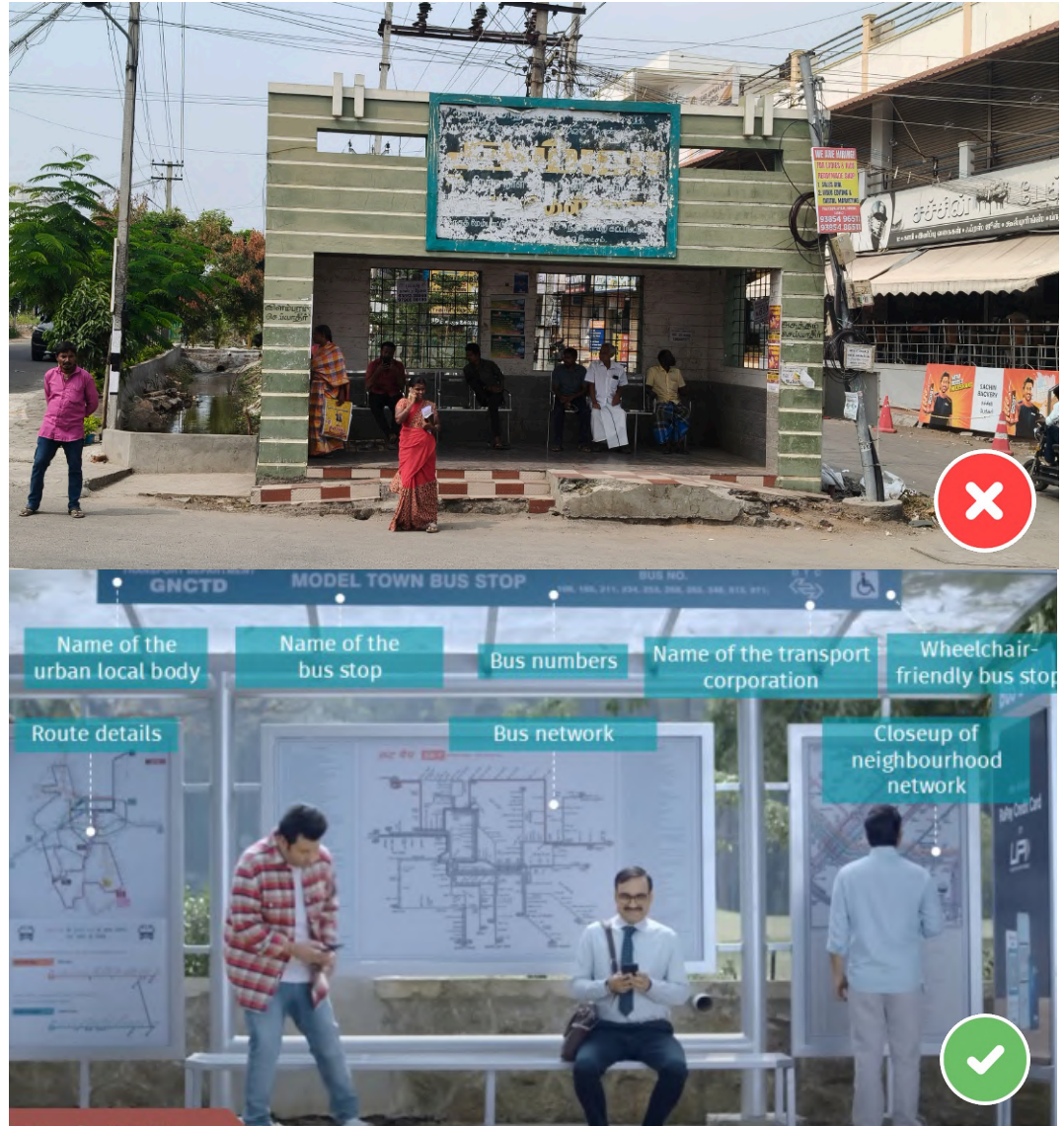
Passenger information

Route information:

- Display **updated route numbers clearly** within the shelter and ensure they are regularly verified for accuracy.
- Accommodate **route maps** or simple route lists in existing shelters for better passenger guidance.
- Introduce a **standardised shelter ID system** to improve identification, maintenance, and system management.
- Provide **braille route numbers and bus stop names** on the shelter pole to enhance accessibility.
- Use a **combined signage pole** with route information.

Nameboards:

- Display **bilingual bus shelter names** in both the waiting area and on the roof, with roof lettering large enough to be visible from a distance.
- Maintain **consistent names across shelters**. For clarifying direction, specify 'towards [destination name]' with route numbers.
- **Standardise naming** via a joint review with TNSTC, ECMC, and stakeholders.
- Ensure **nameboards indicate bus services** and list **additional services** (private, mini buses).
- Include a **wheelchair-accessible icon** where applicable.

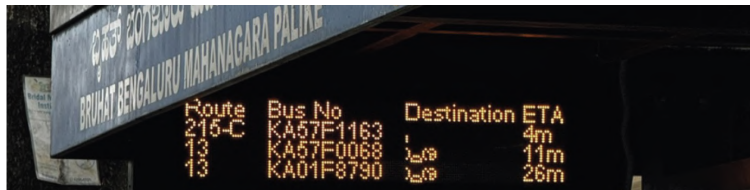


Suggested Improvements

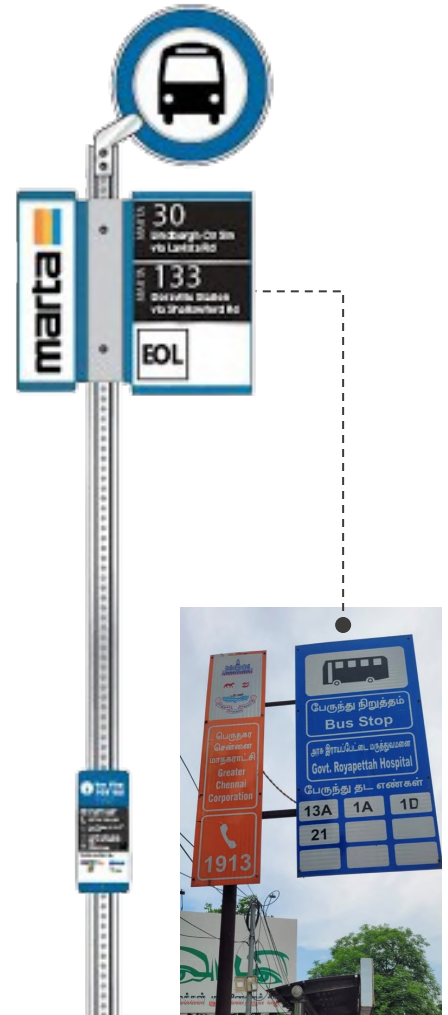
Bus stop information design



Real-time Information display board



Bus stop pole signage



Ease of access

Pathway:

- Connect shelters to paved, **obstruction-free footpaths** for safe and accessible user movement.
- Provide a **dedicated bus-stop pavement** wherever footpaths cannot be built.
- **Prioritize multimodal integration** by locating shelters within **500m** of metro or suburban rail stations.

Condition of bus stop waiting area:

- Provide **seamless accessibility** by keeping the pavement of the bus shelter at the same level as the footpath.
- Ensure that all shelters **follow IRC norms**: a 0.15 m pavement height and a minimum 1.2 m width of waiting area. At present, the height of the shelter pavement is 0.4 m, which is unsafe as the steps negate wheelchair access, and also increase the risk of tripping.
- Develop **universally accessible designs**, along with expert input and review with relevant stakeholders.
- Provide **even, non-slippery surfaces** and **tactile paving** at both shelters and along the approach road, for the ease of visually impaired users.

Chithode Bus Stop, Erode



Ibrahim Sahib Salai, Chennai



Safety

Gender focused safety considerations:

- Provide **uniform lighting of 30–40 lux** at shelters as per IRC standards to ensure safety and visibility. Presently, many bus stops rely on advertising panels or ambient street lighting, which is inadequate and compromising safety—especially for women and vulnerable users.

Optimised safety:

- Avoid **dead spaces behind shelters**. This helps reduce anti-social behaviour, and creates a safer, welcoming and gender-sensitive waiting environment. Improve visibility and user comfort.
- **Eliminate protruding or hazardous elements** in the waiting area to ensure user safety.
- **Display functional emergency helpline numbers prominently** at every shelter to improve access to support during emergencies.

Lakshmi Nagar, Erode



Amir Khusro Park, New Delhi



Essential facilities

General:

- Use sturdy poles and durable roofing to provide reliable weather protection for passengers.
- Conduct regular inspections to identify damage and ensure timely maintenance, keeping shelters safe and fully functional.
- Provide ergonomic seating with a height of 0.4–0.6 m to ensure comfort and accessibility.
- Avoid low or damaged seats, as they reduce usability and inconvenience passengers.
- Ensure regular maintenance so seating remains safe, functional, and user-friendly.

Chithode Bus Stop, Erode



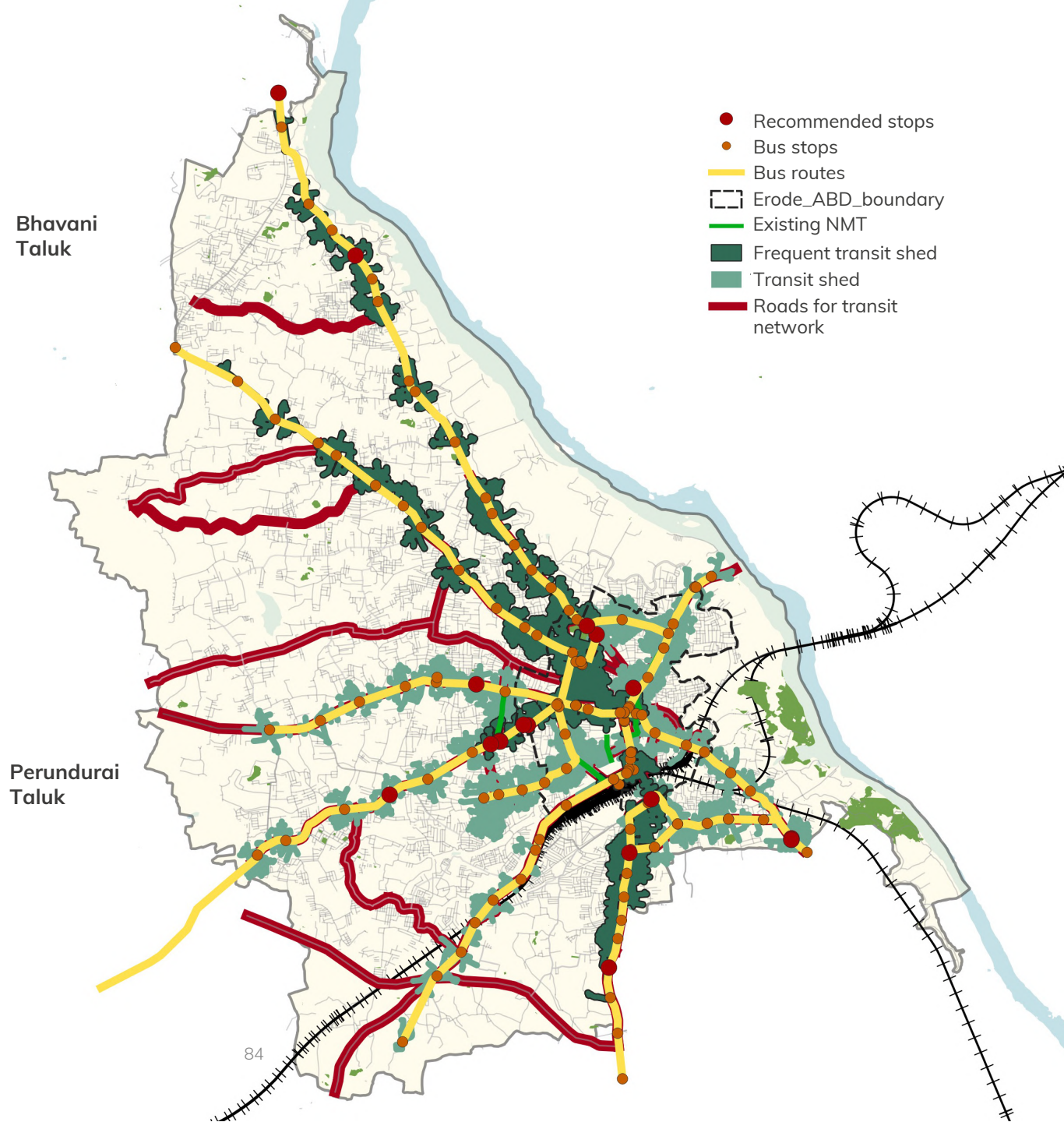
Raj Nagar, New Delhi



**Way forward to improving bus
stop infrastructure and public
transport service**

Proposed interventions

- Enhance transit coverage along NH, SH, MDR and ODR, within the ULD boundary, where only 43% is served by buses, by establishing dedicated transit corridors supported with feeder services such as mini-buses or IPT to serve underserved areas in between.
- Improve service frequency of the transit corridors, where only 22% of transit corridors currently qualify as frequent transit, by augmenting fleet capacity to reduce waiting times and encourage a stronger shift toward public transport.
- Prioritise high footfall bus stops to place new smart bus shelters, as per standards, wherein the number of bus shelters shall be decided based on the demand.



Way forward – Public transport

Areas of Improvement	Benchmark	Details
Transit coverage	100% of all major roads, approximately 85 km, to have transit coverage– NH, SH, MDR and ODR.	<ul style="list-style-type: none"> • Short-term: Circular routes to deploy mini-buses, connecting the arterial bus routes with a minimum budget of Rs. 50 lakhs to operationalize the existing fleet. • Medium to Long-term: Increase fleet size of 250 buses in 4 phases, with 62 buses added in each phase with an approximate budget of Rs. 50 cr. <p>60 buses per lakh population is the benchmark set by MoHUA, city-focused bus fleet needs to be increased to 375 from the current 125 numbers.</p>
Transit frequency	100% of the current transit corridor, approximately 60km, to be made a frequent transit.	<ul style="list-style-type: none"> • Medium to Long-term: Introduce 10% of the new fleet partly to existing bus routes to increase headway.
Bus stop infrastructure	<p>100% of all bus stops along the existing transit corridor to have bus shelters.</p> <p>100% of bus stops to have name boards, way-finding signage, timetables, route maps, and helpline/grievance numbers.</p>	<ul style="list-style-type: none"> • Short-term: 15 bus stops to be prioritised for new bus shelters with a total budget of Rs.5 cr. • Medium-term: All 225 bus stops to have passenger information with a total budget of Rs. 25 cr. <p>The initiative is aligned with the Comprehensive Mobility Plan's recommendations for improved passenger facilities, including the provision of additional bus shelters, and the Master Plan's emphasis on enhancing the attractiveness and accessibility of public transport.</p>

Recommendations to improve NMT infrastructure

Recommendations to improve NMT infrastructure

In order to improve infrastructure for the most **fundamental mode of travel – walk** – therefore, needs to be addressed at the three levels of **walkability, safety, and universal accessibility**.

Parameters of good bus transport



1

Walkability

Streets which provide footpaths as stated in IRC:103 with clear, unobstructed and continuous walkways incorporating the adjacent land-use are evidently desirable by all.



2

Safety

Using pedestrians lights, adding buffer zones, identifying safe crossing spots will help to improve the safety on streets.



3

Universal accessibility

Providing table-top crossings, filling the gaps in continuity, provision of safe buffer spaces, vertical and horizontal wayfinding signages and getting more eyes-on-street is the way forward.

Recommendations for the implementation of a good footpath

Areas of Improvement	Recommendations
<p>Planning Efficiency</p>	<p>Create Networks - Networks are necessary to ensure safe and continuous access is provided to bus stops, transit nodes, schools, and other public spaces.</p> <p>Prepare Phasing Plans - Phasing plans help identify priority stretches and budget accordingly</p> <p>Conduct Regular Impact Assessments - A scoring based assessment of streets helps understand level of intervention, scope of budget as well as phasing of implementation. This will create a renewed focus on creating healthy streets.</p>
<p>Integrated Approach</p>	<p>Adopt a Coordinated Approach - Layout drawings and Good for Construction (GFC) drawings should be prepared in alignment with different line departments such as Stormwater, Electrical, Telecommunications, Water Supply and Sewage.</p> <p>Incorporate Parking Management - Consultants and service providers who manage designated paid parking should be on-boarded and design should be vetted.</p> <p>Integrate trees, and other contextual features - Contextual features, especially trees, property edges, entrances etc., should be integrated into the street.</p>

Recommendations for the implementation of a good footpath

Areas of Improvement	Recommendations
<p>Quality of Design</p>	<p>Follow Uniform Design Guidelines - The width and height of footpath, pedestrian signages, as well as other requirements of good pedestrian infrastructure should be designed as per guidelines across all projects, uniformly and holistically.</p> <p>Provide Adequate Number of Pedestrian Crossings—Adequate numbers and types of pedestrian crossings need to be incorporated, and they must also be strategically positioned.</p> <p>Provide Traffic Calming Measures - Design parameters such as height, marking, and the integration of various types of traffic calming measures are crucial for ensuring safety.</p> <p>Ensure a Universally Accessible Footpath, Signage, and Other Public Amenities—Ramps, tactile pavers, and signage must be placed as per the guidelines.</p> <p>Delineate designated parking space—Parking slots should be part of the design of footpaths, with clear blub-outs, on one side or both sides of the road, depending on the road space available.</p>
<p>Seamless Implementation</p>	<p>Distinguish Project Types - Repairs, modifications, and complete transformation should be identified based on the type of infrastructure and its impact.</p> <p>Include Stakeholder Consultations - Users of the street should be involved in the process of implementation. Awareness shall be created around street rights and rules.</p> <p>Adopt a Coordinated Approach of Implementation - Project timelines and schedules should be aligned with different departments. While the ownership may belong to one, a multi-stakeholder project status should be assigned.</p>

Recommendations for the maintenance of footpath

Areas of Improvement	Recommendations
Impact Assessments	ECMC should follow the five-year horizon outcomes. Assessments or performance audits such as this report should be carried out periodically and use the data to inform network planning, phasing as well as budget allocation.
Enforcement	As observed earlier, vehicular and vending encroachment has been biggest deterrent for ease of movement. Vehicular and vending enforcement needs to be done on priority to ensure good streets.
Operations and Maintenance	The operational costs of infrastructure such as public toilets, street lighting, and parking need to be integrated with the implementation framework. It is also important to undertake a lifecycle analysis of different materials such as paint marking, bollards, lighting fixtures, landscaping, tree pits, among others that are vulnerable to the vagaries of weather as well as load stress.
Scale-Up	The city should introduce development of street-networks at a neighbourhood level, as opposed to streets in isolation. This can be achieved through projects like 'Safe Routes to School'.
Communications and Outreach	Citizens are unaware of the new infrastructure being developed, and hence many pedestrians still use carriageway instead of the footpath. Citizens need to be well informed, motivated and educated to use the new street infrastructure.
Cycling Infrastructure	Cyclists are almost invisible in the design of streets. They can be accommodated through the provision of cycle parking, dedicated cycle lane (in the case of arterial streets) as well as speed control measures. Cycling infrastructure still needs a lot of research to encourage people for cycling.
Footpath improvements	Any modifications, repairs, and improvements shall be made as per standards. Such improvements shall be prioritise safety and accessibility-related interventions. Duplication or disturbance of existing infrastructure shall be avoided. However, existing infrastructure can be repurposed, especially in the case of stormwater drains.

Best practice streets from Pune

Location: DY Patil Road



Best practice streets from Coimbatore

Location: Race Course Road
Oasis Consultancy



Location: DB Road
Arthagam Architects



Location: Periakulam Lake
Oasis Consultancy

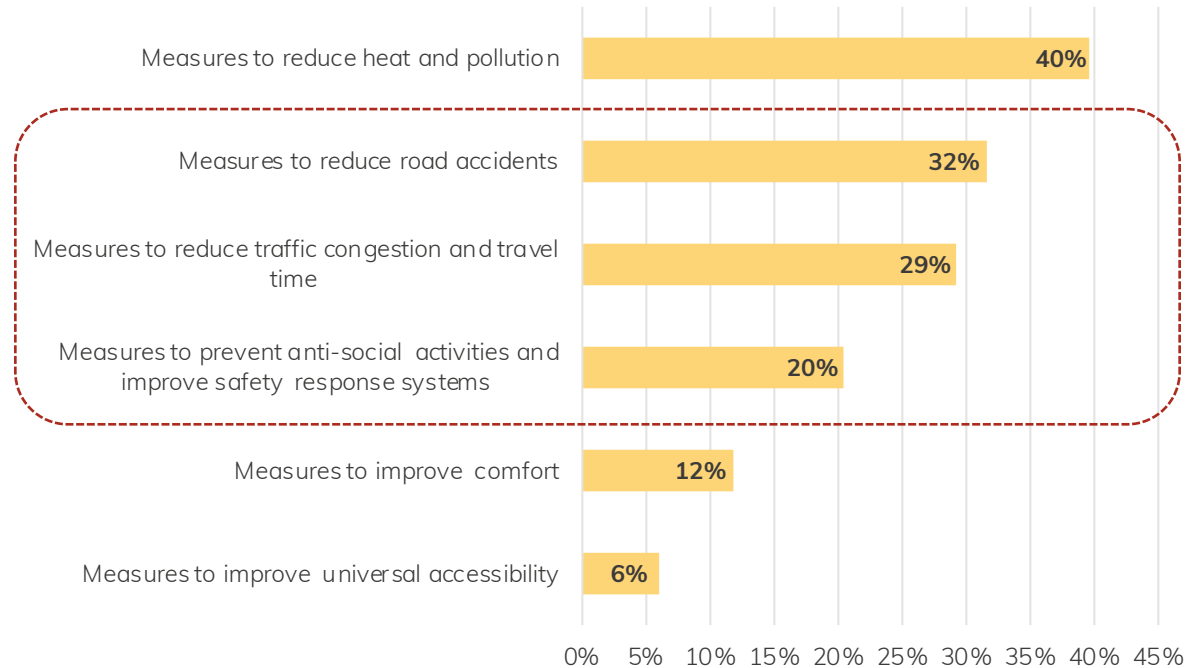


Priority areas for NMT infrastructure improvement from user surveys

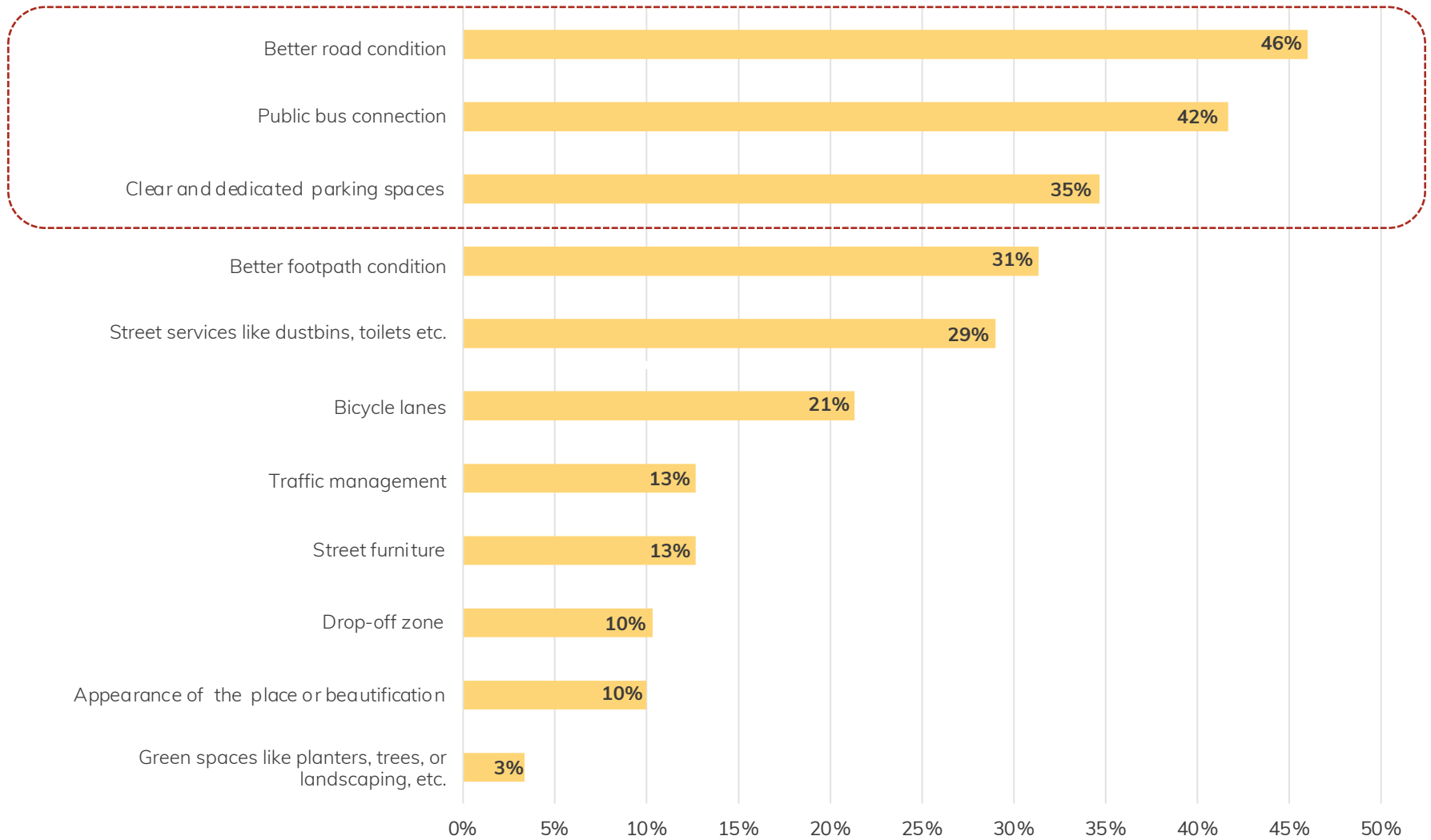
Respondents **prioritise environmental quality, traffic safety, and congestion reduction**, indicating that interventions should focus on **climate resilience, road safety, and traffic management**, with comfort and accessibility as secondary measures.

Across all groups, safety, reliable public transport, and better walking and cycling conditions dominate, with students highlighting speeding, unsafe crossings, and poor NMT infrastructure, underscoring the need for a **Comprehensive School Zone Safety and Mobility Plan**.

What are the overall improvements needed?



What are the NMT improvements you need?



**Way forward to improving
NMT infrastructure**

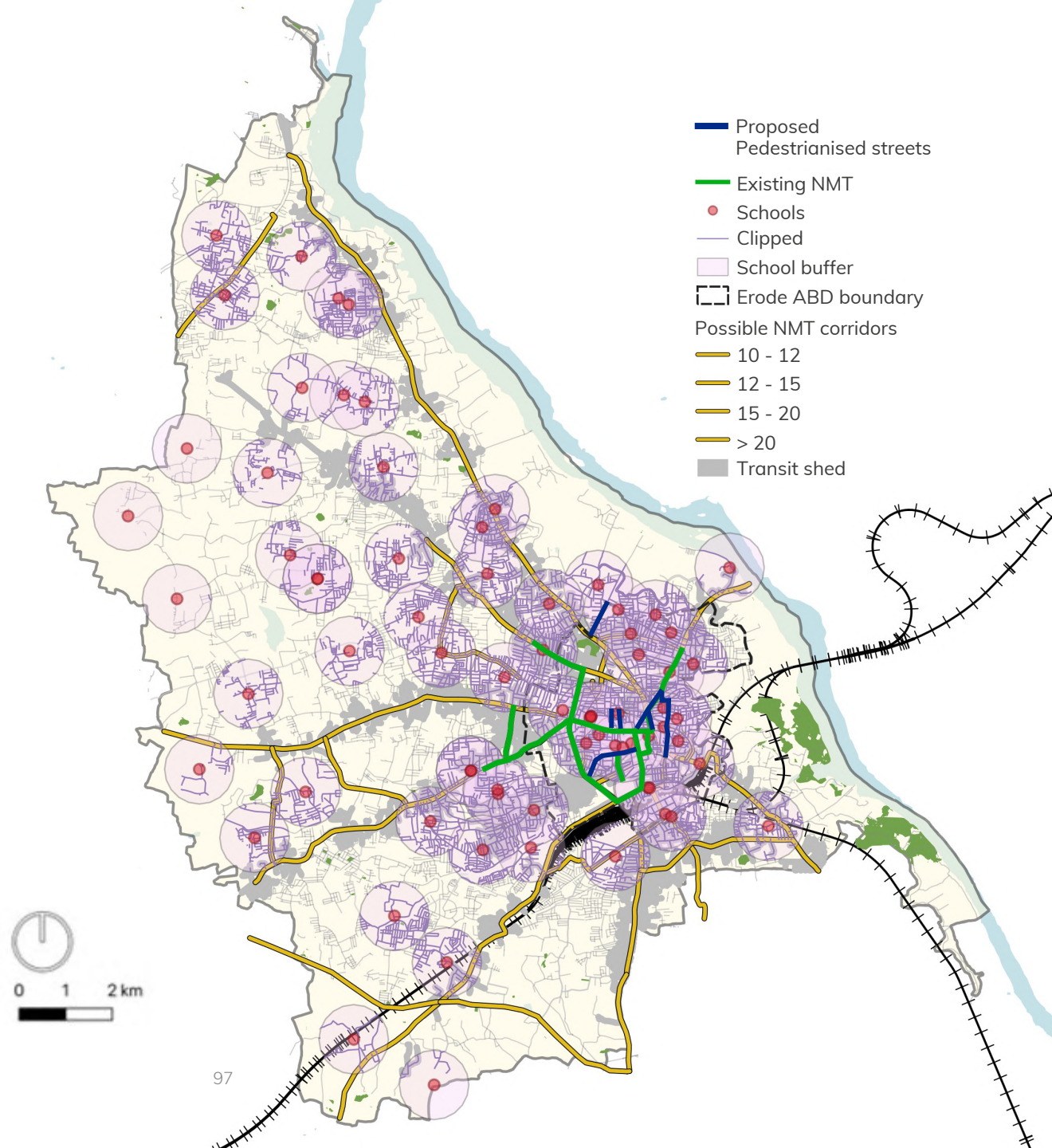
Proposed interventions

Prioritise primary and secondary road access to all corporation schools that are within walking distance to accident hotspots or high-speed/volume corridors, for NMT infrastructure development as identified through speed-volume analysis

Improve existing footpath infrastructure and usability by incorporating universal design and removing barriers.

Prioritise streets with less than 9m right-of-way as pedestrian corridors in the core city area. In these stretches, vehicular traffic is either limited or completed re-routed in an effort to decongest the core and improve NMT access.

Prioritise roads with RoW >9 m for NMT infrastructure development, within a 5-minute walking distance of bus stops, as identified through the PNT analysis, to strengthen first- and last-mile access to bus stops.



Way Forward - Pedestrian Infrastructure

Areas of Improvement	Benchmark	Details
School streets & bus route roads	100% of corporation schools to have traffic-calmed streets, crossing points and safe walking paths, over a length of 35km. These safe routes are especially important near accident hotspots, high-speed and high-volume corridors.	<ul style="list-style-type: none"> • Short-term: Improve 1 km of a school street as a tactical trial pilot with a cost of Rs.25 lakhs. <p>This can be taken up as part of the State Road Safety Policy, Erode city Comprehensive Mobility Plan's targets of creating 165 km of footpaths and 35 km of cycle corridors, and the Supreme Court directive recognising the right to walk as part of the fundamental right to life under Article 21.</p>
	100% of streets with RoW >9m in a 5-min walking distance from every bus stop, approximately 60 km, to be priority zones for NMT.	<ul style="list-style-type: none"> • Medium-term: Improve a length of at least 20 km of footpath (LHS + RHS). <p>The Master Plan's proposal to improve footpaths along 78 km of bus route roads,</p>
Footpath infrastructure	100% of existing footpath, of length 10.85km, to incorporate universal design details such as kerb ramps, tactile pavers, and bollards (instead of railings). Obstructions to walking must be relocated or removed.	<ul style="list-style-type: none"> • Short-term: Improve footpath in a 500m walking radius of the GH hospital junction, to become universally accessible with an approximate budget of Rs.1cr. • Medium-term: Take up retrofitting in clusters comprising of 2-3 km of footpath length each with an approximate budget of 1cr.
Pedestrian-friendly streets	Major streets with less than 9m RoW in the core area, of a total length of 4.3km, are to be made one-way or fully pedestrianised.	<ul style="list-style-type: none"> • Short-term: Create a pilot of a walkable urban block around the City Municipal Corporation headquarters campus, on Brough Road, which will help create a new footpath, safe school street, improve the existing footpath, and create completely pedestrianised streets at a cost of approximately Rs. 2cr. • Medium to Long-term: Improve urban blocks or clusters of streets in a phased manner, with a dedicated annual budget.

Conclusion

Taken together, the evidence makes a compelling case for an integrated and people-centred mobility strategy. **Expanding transit coverage and frequency, upgrading bus stop infrastructure to universal design standards, strengthening first-and-last-mile connectivity, and implementing safer school zones with continuous, accessible footpaths** are not isolated interventions – they are interconnected investments in public health, social equity, climate resilience, and economic productivity.

By prioritising walking and public transport as the backbone of urban mobility, Erode has the opportunity to shift from a vehicle-oriented system to a people-first transport network. **With coordinated planning, targeted budget allocations, and sustained institutional commitment**, the city can transform its streets into safe, inclusive, and vibrant public spaces – ensuring that mobility in Erode is not just available, but accessible, reliable, and dignified for all.





6

Annexures

Audit templates

1. Bus infrastructure audit template
2. Bus user perception survey questionnaire
3. NMT audit template
4. School user perception surveys
5. School Admin surveys



1. Bus stop infrastructure audit template

Bus Stop Infrastructure Survey	
General Instructions: Bus Stops can be surveyed at any part of the day, preferably during non-peak hours with slow traffic movement.	
Section A: General Information	
Is the bus stop located less than 25m to a junction?	Yes / No
Is there an encroachment of parking within 25m distance from either side of the bus stop ?	Yes / No
If yes, What is the nature of Encroachment?	Vendors/Littering/Utility Boxes / Transformers and other electrical items/Construction Debris/Commercial Spillover/NA
Proximity to other transit stations (like railway station/bus terminus) within 50m?	Yes / No
Section B: Bus Stop Infrastructure (Take photos of the Bus Stop from the front, left and right)	
No. of Bus Shelters:	
Bus Stop Size (L*B) (for bus shelters placed next to each other, consider the total length) :	
Mention the existing width of the waiting area in meters (*Bus stop should have at least 1.2 m wide clear waiting space, based on IRC:70-2017)	
Does the bus stop have a clear height of 3m ? (based on IRC:70-2017)	Yes / No
Condition of Bus Stop roof	Good / Average / Poor
Is there space behind the bus stop?	Yes / No
What is the condition of the space?	Unused / Dark and Dingy / Used / Encroached
Are there any protruding objects that can be a hazard/risk to the passengers waiting at the bus stop?	Yes / No
Is Yes, Kindly explain:	
Is there space to provide bus shelter of size 9m x 2.5m?	Yes / No
What is the level of cleanliness of the bus stop?	Clean / Dirty / Garbage Dumped / Covered in Road Dust
Are there any utilities at the bus stop?	ATM / Dustbin / Toilet / Other Utilities / None

1. Bus stop infrastructure audit template

Section C: Pedestrian Access to Bus Stop		
Presence of a footpath to access the bus stop for 25m on either side	Yes / No	Remarks
Width of footpath (in m)		
If the average width of the footpath connecting the bus stop is more than 4.5m, is the bus stop located in the Multi-Utility Zone ?	Yes / No	
If the width is less than 4.5m, is the bus stop pushed to the wall to ensure sufficient space in the front for the walking zone.	Yes / No	
Existing height of the footpath (in m) (Standard height - 0.15m, based on IRC:70-2017)		
Condition of Footpath		Paved and Even / Paved but uneven / Broken and Uneven / Unpaved / Encroached
Is the bus stop's pavement on the same level as the footpath ?	Yes / No	
If Yes, What is the difference in height? (in m)		
Is there a ramp from footpath to bus stop? (Minimum width of ramp is 1.2m and slope ratio is 1:12)	Yes / No	
Section D: Essential Facilities		
Does the Bus Stop have seating?	Yes / No	
What is the condition of the seating?		Good / Average / Poor
Does the bus stop have an average illumination of 30-40 lux?	Yes / No	
Do all bus shelters in the location have illumination of 30 lux?	Yes / No	
How many bus shelters do not have sufficient lighting?		All / more than half / half / less than half / None
Does the street light before and after the bus stop provide illumination of 30-40 lux?		

1. Bus stop infrastructure audit template

Section E: Passenger Information	
Is there a bus stop flag?	Yes / No
Updated bus route numbers	Yes / No
Bus Stop Name Board	Yes / No
Real time information	Yes / No
Route Map	Yes / No
Major landmarks nearby	Yes / No
Functional emergency hotline numbers	Yes / No
Provision of double sided bus stop info signs for visibility from both directions.	Yes / No
Provision of reflectorized or illuminated signs for night time visibility.	Yes / No
Provision of tactile warmer blocks at the bus stop towards the bus/ boarding door	Yes / No
Mention other existing utilities at the bus stop (*If applicable - Dustbin, toilet, ATM etc.)	

2. Bus user perception survey

S.No.	Questions for Bus Users	Options							
Commute Pattern									
1	What is your current purpose of travel and frequency of this travel?	Work	Market	Social/ Recreational	Health	Education	Other		
		(5-7 days/week)	(3-4 days/week)	(1-2 days/week)					
2	What is your primary mode of transport for the everyday commute?	Public Bus	Private Bus	Auto-Rickshaw	2-wheeler	4-wheeler	Train	Cycle	Walk
3	What is the average distance covered that you travel in a day?	Less than 2 km	2-5km	6-10 km	above 10km	Can't say			
4	Average time taken to travel (to and fro) in minutes:								
5	Explain the route that you take from origin to destination and vice-versa	Origin (Mention Area + Landmark/Street name)	Destination (Mention Area + Landmark/Street name)	Intermediate journey (Mention Area + Landmark/Street names)					
6	What is the average weekly expenditure on commute? (do not ask children)								
7	What is the monthly income of the individual (in INR)? (do not ask children)	Below 20,000	20,000- 50,000	50,000- <100,000	100,000 or above	Prefer not to disclose			

2. Bus user perception survey

S.No.	Questions for Bus Users	Options							
Challenges in Accessibility									
1	How far are the nearest transit stops from your home or workplace?	Less than 100 m	100 to 500 m	500 m to 1 Km	More than 1 Km				
2	How do you usually travel to or from a Transit stops?	Walk	Cycle	Auto-Rickshaw	2-wheeler	4-wheeler			
3	Is it easy to find auto-rickshaws or shared autos (IPT) when you need them?	Yes	No						
4	What are the common concerns about the design of the bus stop?	Poor shelter from heat and rain	Not enough seating	Broken and unusable seating	Badly maintained	Not enough space to wait			
5	What are some safety concerns faced by you, while traveling by bus or waiting at the bus stop?	Bus Stops are not safe at nights	Harrassment in bus stop	Harrassment in buses	High Heat Stress in Bus Stop	High Heat Stress in Buses	Air pollution	Concerns about theft or personal security	

2. Bus user perception survey

6	Do you face any difficulties using public transport, in general?	Overcrowded buses	Buses do not stop at the bus stop	Long wait time	alighting and boarding discomfort	Basic information not provided	No universal accessibility to the bus stops	No Footpath access to bus stops
7	Willingness to introduce app-based services in the city?	Yes	No					
8	Is there availability of a proper seating/waiting space?	Yes	No					
Improvements								
1	What are the improvements you would like to have in the bus stops?	Better Lighting	More Seating	Better roof structure	Safety measures like panic buttons /CCTV / helpline numbers / mirrors etc	Bus Route Information	Bus Stop Name Board	Other:_____
2	What are the improvements you would like to have in the buses?	Low Floor Buses or bus with ramp access	Safety measures like panic buttons / helpline numbers / closed doors etc	Good ventilation	New bus fleet with better suspension	Less Polluting Fleet		
3	What are the improvements you would like to have in public transport system?	Increase Frequency of Buses	Integrate with IPT like mini-buses, autos	Increase network of mini-buses	Proper parking of buses at bus stops			

2. Bus user perception survey

[Internal] Questions for the surveyor								
	To be answered by the surveyor through observation.							
1	Gender of the respondent	Male	Female	Transgender	Other			
2	Age	Below 13	13-18	18-25	25-40	40-60	above 60	
3	User type/Vulnerability	Not applicable	Visual	Locomotor	Pregnant	Hearing	Caregiver-with a child	Elderly
4	Street name							
5	Bus Stop Name							
6	Name of person administering the question							
7	Remarks							

3. NMT infrastructure audit template

Section A: Infrastructure Survey		
LHS	Parameters	RHS
<p>a. No footpath present b. Footpath infrastructure is highly fragmented and incomprehensible c. <50% of the stretch has continuous footpath (anything less than 50m out of every 100m) d. 50-75% of the stretch has continuous footpath (50m-80m out of every 100m) e. >75% of the stretch has continuous footpath (more than 80m out of every 100m)</p>	<p>Footpath What is the major footpath condition along the stretch? (based on visual observation + map rereference of landmarks. tape based measurement is not required)</p>	<p>a. No footpath present b. Footpath infrastructure is highly fragmented and incomprehensible c. <50% of the stretch has continuous footpath (anything less than 50m out of every 100m) d. 50-75% of the stretch has continuous footpath (50m-80m out of every 100m) e. >75% of the stretch has continuous footpath (more than 80m out of every 100m)</p>
<p>a. Footpath wherever present has broken tiles and / or uneven surfaces and Unusable b. Footpath wherever present has broken tiles and uneven surfaces in some portions but is usable c. Footpath wherever present has mostly uniform surface and usable d. Not Applicable</p>	<p>Condition of Footpath</p>	<p>a. Footpath wherever present has broken tiles and / or uneven surfaces and Unusable b. Footpath wherever present has broken tiles and uneven surfaces in some portions but is usable c. Footpath wherever present has mostly uniform surface and usable d. Not Applicable</p>
<p>Mostly <1.8m Mostly 1.8 - 2m Mostly >2m</p>	<p>Average. Width of Footpath (measure footpath width at every 200m interval or where RoW drastically changes)</p>	<p>Mostly <1.8m Mostly 1.8 - 2m Mostly >2m</p>

3. NMT infrastructure audit template

Section A: Infrastructure Survey		
LHS	Parameters	RHS
<p>Mostly <150mm Mostly 150mm with some height variations Mostly uniform 150mm Mostly >150mm 0mm</p>	<p>Max. Height of Footpath (measure footpath width at every 200m interval or where RoW drastically changes)</p>	<p>Mostly <150mm Mostly 150mm with some height variations Mostly uniform 150mm Mostly >150mm 0mm</p>
<p>Mostly 10 lux at mid-block < 10 lux at mid-block Mostly 30 lux or more at intersections < 30 lux at intersections</p>	<p>Lighting Levels (1. take readings on footpath, at points where there is sudden change in lighting levels. 2. take one readings at intersections)</p>	<p>Mostly 10 lux at mid-block < 10 lux at mid-block Mostly 30 lux or more at intersections < 30 lux at intersections</p>
<p>Ramps / tactile tiles / dropped kerbs / auditory signals</p>	<p>Universal Design (Select multiple)</p>	<p>ramps / tactile tiles / dropped kerbs / auditory signals</p>

3. NMT infrastructure audit template

<p>a. No part of the footpath has encroachments b. <50% of footpath has encroachments (anything less than 50m out of every 100m) c. 50-75% of footpath has encroachments (50m-80m out of every 100m) d. >75% of footpath has encroachments (more than 80m out of every 100m) e. Not Applicable</p>	<p>Encroachment What is the extent of encroachment?</p>	<p>a. No part of the footpath has encroachments b. <50% of footpath has encroachments (anything less than 50m out of every 100m) c. 50-75% of footpath has encroachments (50m-80m out of every 100m) d. >75% of footpath has encroachments (more than 80m out of every 100m) e. Not Applicable</p>
<p>Vendors/ Littering / Utility Chambers / Parking/ Transformers and other electrical utilities/Construction Debris/Commercial Spillover/NA</p>	<p>Encroachment Type (Select multiple)</p>	<p>Vendors/ Littering / Utility Chambers / Parking/ Transformers and other electrical utilities/Construction Debris/Commercial Spillover/NA</p>
<p>a. No part of the footpath has encroachment by parking b. <50% of footpath encroached by parking (anything less than 50m out of every 100m) c. 50-75% of footpath encroached by parking (50m-80m out of every 100m) d. >75% of footpath encroached by parking (more than 80m out of every 100m) e. Not Applicable</p>	<p>Parking What is the nature of parking?</p>	<p>a. No part of the footpath has encroachment by parking b. <50% of footpath encroached by parking (anything less than 50m out of every 100m) c. 50-75% of footpath encroached by parking (50m-80m out of every 100m) d. >75% of footpath encroached by parking (more than 80m out of every 100m) e. Not Applicable</p>

3. NMT infrastructure audit template

Major Intersection type	Signalised / Unsignalised Remarks:_____	
Number of intersections	Major : _____ Minor:_____	
Pedestrian Crossing Infrastructure at Major Intersections on the stretch (Select multiple)	Intersection 1: Zebra Crossing / Pedestrian Signal / Refuge island / Table-top crossing / FoB/ None Intersection 2: Zebra Crossing / Pedestrian Signal / Refuge island / Table-top crossing / FoB/ None Intersection 3: Zebra Crossing / Pedestrian Signal / Refuge island / Table-top crossing / FoB / None	
Open drain / concealed drain/ combination	Stormwater drain Type	Open drain / concealed drain/ combination
a. <50% of the stretch has concealed SWD without defined kerb (anything less than 50m out of every 100m) b. 50-75% of the stretch has concealed SWD without defined kerb (50m-80m out of every 100m) c. >75% of the stretch has concealed SWD without defined kerb (more than 80m out of every 100m)	Stormwater drain Extent (in case of concealed drain)	a. <50% of the stretch has concealed SWD without defined kerb (anything less than 50m out of every 100m) b. 50-75% of the stretch has concealed SWD without defined kerb (50m-80m out of every 100m) c. >75% of the stretch has concealed SWD without defined kerb (more than 80m out of every 100m)
Residential / Commercial / Mixed-Use / Institutional	Land Use	Residential / Commercial / Mixed-Use / Institutional

4. User perception survey – school students, teachers and parents

S.No.	Questions for School Teacher, Parents and Students	Options										
Commute Pattern												
1	What is your primary mode of transport for the everyday commute?	Public Bus	Private Bus	Auto-Rickshaw	2-wheeler	4-wheeler	Train	Cycle	Walk			
2	What is the average distance covered that you travel in a day?	Less than 2 km	2-5km	6-10 km	above 10km	Can't say						
3	Average time taken to travel (to and fro) in minutes -											
4	Explain the route that you take from origin to destination and vice-versa	Origin (Mention Area + Landmark/Street name)	Destination (Mention Area + Landmark/Street name)	Intermediate journey (Mention Area + Landmark/Street names)								
5	What is the average weekly expenditure on commute? (do not ask children)											

4. User perception survey – school students, teachers and parents

S.No.	Questions for School Teacher, Parents and Students	Options										
Challenges in commute												
1	What are the common challenges faced while walking or cycling on the roads?	No footpaths or sidewalks	Poorly maintained footpaths (e.g., uneven, broken, or slippery surfaces)	Obstacles on footpaths (e.g., parked vehicles, street vendors, or debris/encroachment)	Unsafe pedestrian crossings (e.g., no zebra crossings or signals)	Inaccessible footpaths for differently abled individuals (e.g., no ramps or tactile paving)	Water-logging or poor drainage on footpaths during rains	Reckless or careless driving threatening pedestrian safety	Harassment or unsafe behaviour while walking	Air pollution affecting walking comfort	Concerns about theft or personal security	No proper street lighting
2	If there is a footpath, what are the common obstructions?	Vendor encroachment	Utilities	Parking	Uneven footpath surface	Garbage dumping	Commercial spillover					
3	What are the common problems faced while crossing the road?	Free left turning traffic	Lack of Signal/Traffic Calming Elements	No dedicated crossing point	Others							
4	Have you ever had a bad experience during your travel?	No	Almost hit by a vehicle	Tripped and fell on a broken path	Witnessed an accident	Waited more than 15 minutes to cross the street	Anti-social activity or harassment on the street/public bus	Been in an accident	Other			

4. User perception survey – school students, teachers and parents

5	Do you think the current pedestrian infrastructure (sidewalks, zebra crossings, footbridges) around the school is adequate and safe for students? (do not ask children)	Yes	No									
6	Is there any part of the street you feel unsafe? If yes mention where and why											
7	Is the street well-shaded?	Yes	No									
8	Do you find public conveniences on the street like seating/toilets that are usable? If yes, would you use them?	Yes I would use them	Yes but I wouldn't use them	No								

4. User perception survey – school students, teachers and parents

Improvements												
1	What would make you feel safer on your way to school? Select multiple responses:	Measures to reduce road accidents	Measures to reduce heat & pollution	Measures to reduce traffic congestion and travel time	Measures to prevent anti-social activities and improve safety response systems	Measures to improve comfort	Measures to improve universal accessibility					
2	If you could change the design of the school road to make it safer, what would you like to include? Select multiple responses	Better road condition	Public bus connection	Better footpath condition	Bicycle lanes	Clear and dedicated parking spaces	Street furniture	Street service infrastructure (garbage / lighting)	Drop-off zone	Traffic management	Appearance of the place/ beautification	Green spaces (planters, trees, landscaping, etc.)
3	If there is one thing that the government can do to make commuting to school, safe, what would it be?											
4	Would you be willing to participate in or support road safety initiatives (e.g., walking school buses, safety workshops) aimed at improving school access for children?	Yes	No									
5	Will you be willing to walk or cycle more if good infrastructure is provided?	Yes	No									

5. User perception survey - Schools

S.No.	Questions for School Administration	Options			
General					
1	School Name				
2	Select which best describes the level of education provided at your school	Primary	Secondary	High School	
3	Select which best describes the gender segregation of your school If the school is Co-ed only up to a certain grade, please select only OTHER and mention the details in the box	Co-Ed	Girls Only	Boys Only	Other
Commute Pattern					
1	School Timing Kindergarten : __ to __ Pupil Count: _____ Primary: __ to __ Pupil Count: _____ Secondary: __ to __ Pupil Count: _____ Special Timings: __ to __ Pupil Count: _____ Other _____ : _____ to _____ Pupil Count: _____				
2	Please mention the total number of students, disaggregated by gender (boys & girls) in your school (as of 2024)				
3	Please mention the total number of Teaching staff in your school (as of 2024)				
4	Please mention the total number of Non-Teaching staff in your school (as of 2024)				
5	Distribution of students' mode of transport (please provide actual numbers): School bus/van Boys_____Girls_____Total_____ Parents Vehicle Boys_____Girls_____Total_____ Walk Boys_____Girls_____Total_____ Cycle Boys_____Girls_____Total_____ Public Transportation (MTC / Metro) Boys_____Girls_____Total_____ Auto/Share-autos Boys_____Girls_____Total_____				

5. User perception survey - Schools

6	Are parking facilities available for faculty within the campus?	Yes, there is designated parking	No, faculties and staff park vehicles outside the school compound				
7	Does your school implement traffic control measures during student entry and exit?	Traffic Coordinators	Drop-Off Zone control	Mode-of-transport separation at multiple exits	Staggered entry/exit timings	Specific Safety Measures for walking, cycling modes of commute	Other
8	How does your school currently implement the above measures?	We don't manage the traffic currently	The school watchman manages this	We've collaborated with the traffic police to manage the traffic flows	We've appointed and trained some of the school children as Kids traffic cops to train them and manage traffic	Other	
9	What is the school's policy on student transportation (e.g., walking, cycling, school buses)?						
10	Are there any road safety programs that your school is conducting for students?	Yes	No				

5. User perception survey - Schools

Safety Concerns															
1	What are the most common safety concerns raised by parents, teachers, or the community regarding students' commute to school?	No foot-paths or side-walks	Poorly maintained footpaths (e.g., uneven, broken, or slippery surfaces)	Obstacles on footpaths (e.g., parked vehicles, street vendors, or debris/encroachment)	Unsafe pedestrian crossings (e.g., no zebra crossings or signals)	In-accessible footpaths for differently-abled individuals (e.g., no ramps or tactile paving)	Water-logging or poor drainage on foot-paths during rains	Reckless or careless driving that threaten pedestrian safety	Harassment or unsafe behaviour while walking	Air pollution affecting walking comfort	Concerns about theft or personal security	No proper street lighting	Extreme heat/rain/cold	Over-crowding and congested footpaths	Other reasons (please specify)
2	Would the school be open to implementing or supporting new initiatives like walking school buses, safety awareness campaigns, or stricter drop-off/pick-up protocols?	Yes	No												
3	Are there any traffic congestion issues during school hours?	Yes	No												
4	List the streets and the time around which congestion is commonly observed														

Survey-wise score cards

1. Bus infrastructure audit score– passenger information
2. Bus infrastructure audit score– ease of access
3. Bus infrastructure audit score– Safety
4. Bus infrastructure audit score– Essential Facilities.
5. NMT infrastructure audit score – walkability
6. NMT infrastructure audit score – safety
7. NMT infrastructure audit score – universal accessibility



1. Bus infrastructure audit score– Passenger information

Bus stop name	Encroachment	Multi-modal integration within 500m of transit modes	Width of the bus stop waiting area is not less than 1.2m	Useable footpath to access the bus stop	Bus stop pavement and footpath are on the same level	Presence of ramp with proper ratio
Thindal	0	0	1	0	0	1
Collectorate	0	0	0	1	1	0
Petrol bunk	0	0	1	0	0	0
VOC Park	0	0	0	0	0	0
Erode GH	0	0	1	1	0	0
Teachers colony	0	0	0	0	0	0
Bull fight corner	0	1	1	1	1	0
PS park	0	0	1	0	0	1
Manikoonda	0	0	0	0	0	0
Veerappanchatram	0	0	1	0	0	0
Savitha	0	0	0	0	0	0
Petrol Bunk	0	0	1	0	0	0
Annamar Bunk	0	0	0	0	0	0
Vaikal Medu	0	0	0	0	0	0
Lotus Hospital	0	0	1	0	0	0
Soolai	0	0	1	1	0	0
Chithode	0	1	1	0	0	0
Agraharam	0	0	1	0	0	0
Karungal Palayam	0	0	0	1	1	0
Solar	0	0	0	0	0	0
Palayapalayam	0	0	1	0	0	0
Sathyamoorthy hospital	0	0	0	0	0	0
Lakshmi nagar	0	0	0	0	0	0
Moolapattarai	0	0	0	0	0	0
Railway station	0	1	0	1	1	0
Perumalmalai	0	0	1	0	0	0
Mayavaram	0	0	1	0	0	0
Ganiravuthar kulam	0	0	1	1	0	0
Narayanavalasu	0	0	0	0	0	0
Veerapanpalayam	0	0	0	0	0	0

2. Bus infrastructure audit score– Ease of access

Bus stop name	Bus stop flag	Presence of bus route number	Bus stop name board	Real time information	Presence of route map
Thindal	0	0	0	0	0
Collectorate	0	0	0	0	0
Petrol bunk	0	0	1	0	0
VOC Park	0	0	1	0	0
Erode GH	0	0	0	0	0
Teachers colony	0	0	0	0	0
Bull fight corner	0	0	0	0	0
PS park	0	0	0	0	0
Manikoonda	0	0	0	0	0
Veerappanchatram	0	0	1	0	0
Savitha	0	0	0	0	0
Petrol Bunk	0	0	0	0	0
Annamar Bunk	0	0	0	0	0
Vaikal Medu	0	0	0	0	0
Lotus Hospital	0	0	0	0	0
Soolai	0	0	1	0	0
Chithode	0	0	0	0	0
Agraharam	0	0	1	0	0
Karungal Palayam	0	0	0	0	0
Solar	0	0	0	0	0
Palayapalayam	0	0	0	0	0
Sathyamoorthy haspital	0	0	0	0	0
Lakshmi nagar	0	0	0	0	0
Moolapattarai	0	0	0	0	0
Railway station	0	0	0	0	0
Perumalmalai	0	0	1	0	0
Mayavaram	0	0	0	0	0
Ganiravuthar kulam	0	0	1	0	0
Narayanavalasu	0	0	0	0	0
Veerapanpalayam	0	0	0	0	0

3. Bus infrastructure audit score– Safety

Bus stop name	Absence of perceived unsafe dead spaces behind the shelter	Absence of unsafe/hazardous waiting area for passengers	Uniform and consistent lighting of 30-40 lux at the bus stop	Information on functional emergency helpline numbers
Thindal	0	1	0	0
Collectorate	1	1	0	0
Petrol bunk	0	1	1	0
VOC Park	1	1	1	0
Erode GH	1	1	1	0
Teachers colony	1	1	0	0
Bull fight corner	1	1	0	0
PS park	1	1	0	0
Manikoonda	1	1	0	0
Veerappanchatram	0	1	0	0
Savitha	1	1	0	0
Petrol Bunk	0	1	1	0
Annamar Bunk	1	1	1	0
Vaikal Medu	1	1	0	0
Lotus Hospital	0	0	0	0
Soolai	0	1	1	0
Chithode	0	1	1	0
Agraharam	0	1	0	0
Karungal Palayam	1	1	1	0
Solar	1	1	1	0
Palayapalayam	0	1	0	0
Sathyamoorthy hospital	1	1	0	0
Lakshmi nagar	1	1	1	0
Moolapattarai	1	1	0	0
Railway station	1	1	1	0
Perumalmalai	0	1	0	0
Mayavaram	0	0	0	0
Ganiravuthar kulam	0	1	1	0
Narayanavalasu	1	1	0	0
Veerapanpalayam	1	1	1	0

4. Bus infrastructure audit score– Essential facilities

Bus stop name	Presence of seating	Others	Bus shelter has clear height of 3m	Good and functional bus shelter roof
Thindal	1	0	1	0
Collectorate	0	0	0	0
Petrol bunk	1	0	1	0
VOC Park	0	0	0	0
Erode GH	1	0	0	0
Teachers colony	0	0	0	0
Bull fight corner	1	0	1	1
PS park	1	0	1	1
Manikoonda	0	0	0	0
Veerappanchatram	1	0	1	1
Savitha	0	0	0	0
Petrol Bunk	1	0	1	1
Annamar Bunk	0	0	0	0
Vaikal Medu	0	0	0	0
Lotus Hospital	1	0	1	0
Soolai	1	0	1	1
Chithode	1	0	0	0
Agraharam	1	0	1	0
Karungal Palayam	0	0	0	0
Solar	0	0	0	0
Palayapalayam	1	0	1	1
Sathyamoorthy haspital	1	0	0	0
Lakshmi nagar	0	0	0	0
Moolapattarai	0	0	0	0
Railway station	0	0	0	0
Perumalmalai	1	0	0	0
Mayavaram	1	0	0	0
Ganiravuthar kulam	1	0	0	0
Narayanavalasu	0	0	0	0
Veerapanpalayam	0	0	0	0

5. NMT infrastructure audit score– Walkability

Street Name	Continuity of Footpath	Condition of Footpath	Adequate Width	Adequate Height	Lack of Encroachments
Stretch 1 - Sathy Road	4.3	2.6	1.3	2.0	2.1
Stretch 2 - Cauvery Road + Nethaji Road	3.8	4.3	0.9	1.0	1.6
Stretch 3 - Brough Road + Erode Main Road	3.9	2.6	1.0	2.0	2.3
Stretch 4 - Sampath Nagar 60ft Road	4.7	3.3	3.0	1.9	2.0
Stretch 5 - Perundurai Road	2.0	2.0	1.9	1.1	1.8
Stretch 6 - EVN Road	3.1	2.8	2.7	1.3	3.2
Stretch 7 – 80-foot Road + Residential Street	3.8	4.2	4.3	1.5	2.2
Stretch 8 - State Bank Road	3.7	4.7	4.0	2.0	3.7
Stretch 9 - Mettur Road	0.3	0.3	1.0	0.2	0.4
Stretch 10 - Chennimalai Road	3.7	3.3	3.0	2.0	2.5
Stretch 11 - Veterinary Hospital Road	3.5	5.0	5.0	2.0	2.0
Stretch 12 - Periyar Nagar Road	2.9	2.9	1.9	1.6	2.2

Each indicator is scored on a scale of 1-5

6. NMT infrastructure audit score– Safety

Street Name	Continuity of Footpath	Condition of Footpath	Adequate Width
Stretch 1 - Sathy Road	4.3	2.6	1.3
Stretch 2 - Cauvery Road + Nethaji Road	3.8	4.3	0.9
Stretch 3 - Brough Road + Erode Main Road	3.9	2.6	1.0
Stretch 4 - Sampath Nagar 60ft Road	4.7	3.3	3.0
Stretch 5 - Perundurai Road	2.0	2.0	1.9
Stretch 6 - EVN Road	3.1	2.8	2.7
Stretch 7 – 80-foot Road + Residential Street	3.8	4.2	4.3
Stretch 8 - State Bank Road	3.7	4.7	4.0
Stretch 9 - Mettur Road	0.3	0.3	1.0
Stretch 10 - Chennimalai Road	3.7	3.3	3.0
Stretch 11 - Veterinary Hospital Road	3.5	5.0	5.0
Stretch 12 - Periyar Nagar Road	2.9	2.9	1.9

Each indicator is scored on a scale of 1-5

7. NMT infrastructure audit score– Universal accessibility

Street Name	Presence of Ramps/Tactile pavers
Stretch 1 - Sathy Road	1.0
Stretch 2 - Cauvery Road + Nethaji Road	1.1
Stretch 3 - Brough Road + Erode Main Road	1.3
Stretch 4 - Sampath Nagar 60ft Road	1.4
Stretch 5 - Perundurair Road	1.5
Stretch 6 - EVN Road	1.6
Stretch 7 – 80-feet Road + Residential Street	1.8
Stretch 8 - State Bank Road	1.9
Stretch 9 - Mettur Road	2.0
Stretch 10 - Chennimalai Road	2.1
Stretch 11 - Veterinary Hospital Road	2.3
Stretch 12 - Periyar Nagar Road	2.4

Each indicator is scored on a scale of 1-5

