



# Coimbatore Street Design & Management Policy

Coimbatore City Municipal Corporation  
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Prepared by the Institute for Transportation and Development Policy for

Coimbatore City Municipal Corporation

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## Definitions

**Accessibility:** Facilities offered to people to reach social and economic opportunities, measured in terms of the time, money, comfort, and safety that is associated with reaching such opportunities.

**Average trip length:** The average distance covered by a transport mode for a trip. It is measured in kilometres.

**Bus rapid transit (BRT):** High quality bus based mass transit system that delivers fast, comfortable, reliable and cost-effective urban mobility through the provision of segregated right-of-way infrastructure, rapid and frequent operations, and excellence in marketing and customer service.

**Complete streets:** Streets that are designed for all uses as per actual local demand, including all modes of mobility as well as street vending, trees, street furniture etc.

**Cycle sharing system:** A flexible form of personal PT with cycles stored in a closely spaced network of stations. A registered user can check out a cycle from a station and return it to any other station. Typically, usage is free for short duration use.

**Greenway:** A waterway or strip of land set aside for recreational use of environmental protection and where vegetation is encouraged along with exclusive facilities for cycling and walking.

**Mass rapid transit (MRT):** A high quality public transport system characterized by high capacity, comfort, overall attractiveness, use of technology in passenger information system, and ensuring reliability using dedicated right of way for transit vehicles (i.e. rail tracks or bus lanes).

**Mobility:** Conditions under which an individual is capable to move in the urban environment.

**Mode share:** The share of total trips carried out by different modes of urban transport including walking, cycling, bus, rail, share auto-rickshaws, private auto, two wheelers and cars.

**Non-motorized transport (NMT):** Human powered transportation such as walking and cycling.

**On-street parking:** The space occupied by vehicles to park along the edge of the street or carriageway which otherwise could have been used by motorized or nonmotorized traffic.

**Paratransit:** The term refers to informal public transport, including vehicles like auto rickshaw, vans, tempo, jeeps, private city buses and private city minibuses that operate on a shared or per seat basis on informally organized routes operated by private sector and has intermediate stops. The service may or may not have a predefined “fare structure.” The term “intermediate public transport (IPT)” means the same, but is avoided in this document for consistency.

**Public Transport (PT):** Shared passenger vehicle which is publically available for multiple users. The term “PT” as used in this document and other toolkits includes city buses, MRT and paratransit.

**Parking management:** A mechanism to ensure the efficient use of street space, and over time, parking fees can be implemented to manage demand.

**Right of Way (ROW):** Measure of the width of the road taken from compound wall/edge to compound wall/edge.

**Sustainable transport modes:** The following modes are categorized as “sustainable modes” of urban transport because when compared with personal motor vehicles, they consume the least amount of road space and fuel per person-km and also cost much less to build the infrastructure: walking, cycling, and public transport (including a regular bus service as well as a MRT systems).

**Traffic calming:** Traffic calming measures ensure pedestrian and vehicle safety by reducing at least speed and potentially also the volume of motor vehicles. Traffic calming slows down vehicles through vertical displacements, horizontal displacement, real or perceived narrowing of carriageway, material/colour changes that signal conflict point, or complete closure of a street.

**Vehicle Kilometres Travelled (VKT):** Vehicle kilometers travelled by all the personal motor vehicles (in the city) in one day.



# Introduction

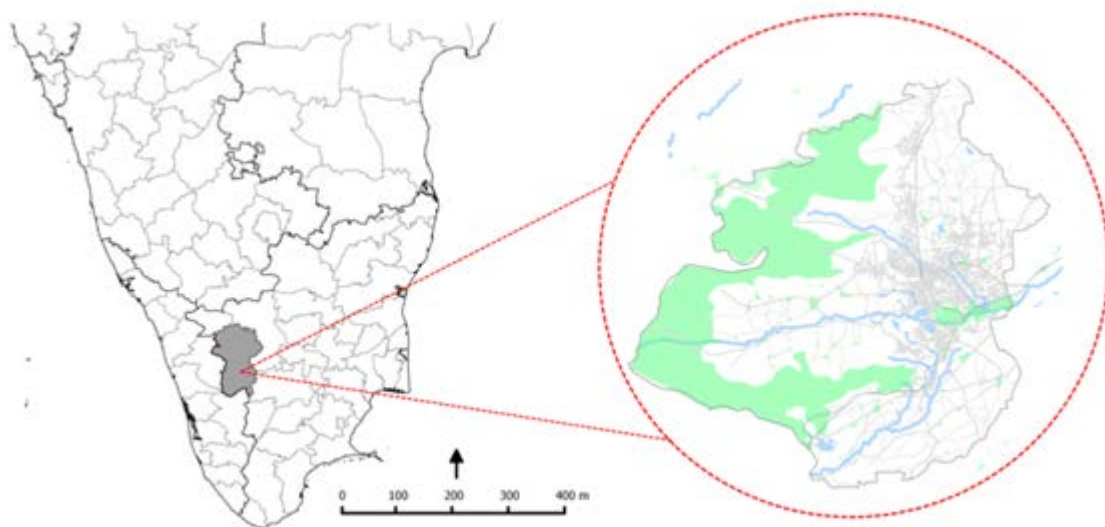
## Background

The Coimbatore City Municipal Corporation (CCMC) has initiated the process of creating a Street Design and Management Policy to ensure the implementation of high quality transport systems. It aims to create a policy environment that supports increased accessibility by prioritizing the use of walking, cycling, and public transport. Too often, transport planning has concentrated on infrastructure, traffic, costs, and benefits, with environmental factors limited to engineering consideration. However, mobility planning now focuses on the movement of “people, not vehicles’, a goal clearly expressed in the 2006 National Urban Transport Policy (NUTP).<sup>1</sup>

In harmony with the focus on moving people, the Policy seeks out to achieve a more equitable allocation of road space by incorporating a focus on non-motorised transport (NMT) and public transport (PT) based approach in the planning, design, managing, and budgeting stages. In adopting a NMT-PT based approach, cities strive to stabilise the use of personal motor vehicles (PMVs), thereby, improving health, safety, and environmental quality, and enhancing social equity and economic activity.

## City overview

Coimbatore is the second largest city in the Indian state of Tamil Nadu. The City is the district headquarters and is well known for its textile and automobile industries. The city is also an emerging hub for information technology-related industries. Due to its close proximity to the Western Ghats, Coimbatore has pleasant climate throughout the year.



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<sup>1</sup> Ministry of Urban Development, Government of India (2006). National Urban Transport Policy. <http://urbanindia.nic.in/policies/TransportPolicy.pdf>.

*Figure i. Map of Tamil Nadu including Coimbatore District (left) and the Coimbatore Local Planning Area boundary (right)*

The city is well positioned at the junction of major roads from Tamil Nadu, Kerala, and Karnataka. Three National Highways pass through the city: NH-47 (Kanyakumari-Salem), NH-67 (Coimbatore-Nagapattinam), and NH-209 (Bengaluru-Dindigul). The hill station Ooty is only 90 km from the city and is easy to reach by road and mountain rail service throughout the year.

According to the 2011 census, Coimbatore metropolitan area has a population of 2.2 million.<sup>2</sup> Coimbatore's population is estimated to grow to nearly 3.8 million by 2031.<sup>3</sup> With increasing population, the city is witnessing rapid motorisation, increased congestion and pollution. With suitable interventions at this stage, it can avoid the pitfalls of cities of similar characteristics and can set high standards for other cities to follow.

The CCMC is the authority responsible for planning and service provision in the city. Headed by a Municipal Commissioner, CCMC utilises eleven departments to carry out civic operations. CCMC's Engineering Department is responsible for maintenance of Coimbatore's 2,376 km of roads as well as its schools, public toilets, community temples, and health clubs.<sup>4</sup> The Town Planning Department is responsible for the planning activities, including sanctioning plots for construction, identifying encroachments based on complaints, sanctioning Transfers of Development Rights, and preparing survey maps. Town Planning manages the reserved buildings and land, and is the decision making body regarding how land is allocated for various purposes.

## The path to NMT-PT-based transportation

A good transport system connects people and boosts a city's economy. It should be sustainable—socially, economically, and environmentally. In Coimbatore, like all Indian cities, citizens aspire to the convenience, status, and comfort of private motorized travel, which translates into rapid motorisation and significant urban problems. Motorisation fuels spatial decentralisation and sprawl, which decreases general accessibility to economic and social opportunities for those who cannot afford PMVs. This in turn creates demand for more motorisation, which is a fundamental driving force behind increase in air pollution, transport related global greenhouse gas emissions, pressures for conversion of land to urban uses, dependency on petroleum and demands for expanded infrastructure.

When planning transport infrastructure and services, it is important to differentiate between mobility and accessibility. *Mobility*, which represents an individual's capability to move, is measured in terms of "how far do we go?" and "how quickly do we get there?" *Accessibility* describes the ability to reach social and economic opportunities, and is often measured in terms of the time, money, discomfort and risk that is required to reach such opportunities.

For example, in cities with high levels of congestion, citizens who travel by automobile may experience relatively poor levels of mobility (slow travel speed, low individual travel mileage). However, the cities themselves may be economically successful due to their accessibility (cumulative number of opportunities, activities that are clustered together, many travel options, overall low cost of

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<sup>2</sup> <http://www.census2011.co.in/census/city/492-coimbatore.html>

<sup>3</sup> Assuming a growth rate of 2.95 per cent per year.

<sup>4</sup> <http://www.coimbatore.tn.nic.in/pdf/SHB043.pdf>

travel). Transport systems exist to provide economic and social connections—travel is rarely an end in itself. Thus, a “good” transport system provides more accessibility per unit of mobility.

Local transport policies play an important role in influencing aspirations for PMVs, and moderating the demand for motorised travel. CCMC recognizes walking, cycling and the use of public transport as important modes to enhance accessibility and improve mobility. Thus, it is necessary to develop programs and infrastructure designed to support and grow these modes - hence this policy. The Policy focuses on street design and management and making optimal use of its resources by:

- **Emphasising on making walking and cycling safe and attractive.** NMT provides basic mobility, affordable transport, access to public transport, as well as health and recreation benefits. Improving conditions for NMT reduces the demand for travel by PMVs. Such improvements increase the convenience, comfort and safety of walking and cycling and therefore benefit existing users as well as encourage new users.
- **Providing high quality public transport.** High quality buses with ITMS, supported with terminals and depots makes public transport attractive even to personal vehicle users. To support the demand for PT, cities should also strive to provide mass rapid transit (MRT).
- **Stabilising and/or reducing the use of PMVs.** Stabilising the use of PMVs at today’s level can be achieved through various mechanisms like reducing parking supply, charging for parking according to demand and employing several other appropriate including congestion charging. As the city provides attractive alternatives to PMVs, in the form of high quality NMT and PT facilities, people shift to these alternatives.

## Use of NMT-PT modes in Coimbatore

In view of the NUTP’s goal of moving people and not vehicles, the Sustainable Cities through Transport (SCTT) programme<sup>5</sup> assisted Coimbatore realise ways to improve support for walking and cycling, enhance public transport, and improve safety and air quality. The SCTT programme study indicated a brisk increase in the number of PMVs in Coimbatore - at a rate of 10 per cent per annum. If this growth continues, the study estimates that the number of trips made by personal motorised modes will increase by 19 per cent over the next 15 years. This scenario also assumes that Coimbatore’s pedestrians, cycle and public transport mode shares continue to decline.

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<sup>5</sup> In partnership with the Institute for Transportation and Development Policy (ITDP), the Commissionerate of Municipal Administration (CMA) launched the SCTT programme to address the mobility issues in tier-2 cities like Coimbatore.

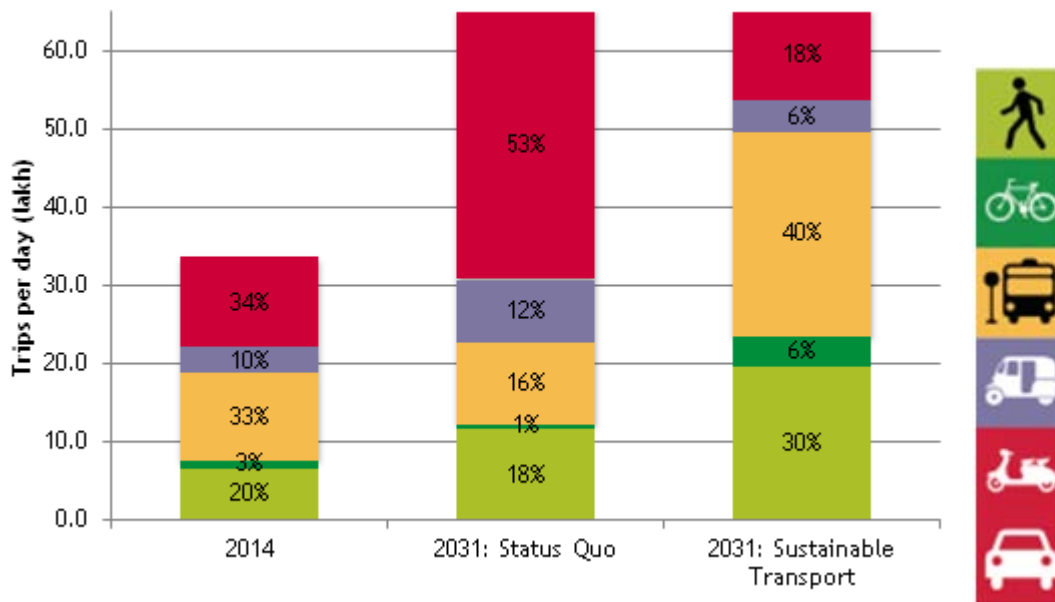


Figure ii. If existing trends continue, Coimbatore will see a doubling in the number of daily motor vehicle trips (“Business-as-usual”). If Coimbatore invests in better NMT facilities and public transport these trends can be reversed (“NMT-PT Based Transportation”).

Pedestrian trips account for 20 per cent of daily journeys, and that cycling represents 3 per cent of trips. Considering that walking and cycling account for 23 per cent of all trips in Coimbatore, and that all trips via public transport require pedestrian trips at the beginning and end of each journey, improving conditions for pedestrians and cyclists could impact almost 56 per cent of all commuters.

If the cities continue with status quo, public transport mode share is also expected to decline from 33 per cent to 16 per cent in 2031. Thus, it is not only important to increase the number of city buses and introduce high-quality MRT network, but also enhance NMT infrastructure to improve access to public transport.

CCMC has already has begun several important initiatives to improve conditions for NMT users through the Smart Cities Model Roads project and the Lake Rejuvenation project. The Model Roads project aims to re-design and build complete streets that prioritises NMT infrastructure along 13 km of street length within the city. The Lake Rejuvenation project focuses on redeveloping 35 km of Coimbatore’s lake-fronts into world-class NMT corridors, connecting one another and creating an NMT network across the city. These interventions would help arrest the decline in the use of NMT modes while providing improved safety for NMT users.

## The role of Street Design and Management Policy in Coimbatore

The Policy is intended to guide the rollout of the projects mentioned above and other NMT and PT projects in the city, facilitating good design, implementation, and management practices. It not only addresses infrastructural needs, but also includes services and mechanisms that make cycling, walking, and PT safe, convenient, and comfortable.

It is important to note that when it comes to promoting NMT-PT based infrastructure and services, no single measure suffices. A package of infrastructure provisions, transportation and land use policies, and promotional programmes is necessary for any city to successfully increase and safely maintain the

number of cyclists and pedestrians. This Policy will explore the following to support cyclists, pedestrians, and other NMT users:

- Develop a vision and set goals for a 15 year planning horizon;
- Provide leadership incentives for cities to focus on NMT and public transport;
- Provide performance measures to determine the effectiveness of the Policy;
- Set street design principles;
- Set built environment regulations;
- Guide street network planning that prioritises NMT;
- Provide an evaluation and monitoring programme;
- Prioritise funding for NMT improvements and infrastructure;
- Provide a detailed institutional framework for project implementation.

Changing the tide of rapid motorisation requires many small steps. Over time, this Policy will assist Coimbatore in making NMT and PT safe and enjoyable for all city residents.

# Street Design and Management Policy

## 1. Vision

- 1.1. The city will have a general sense of well-being through the development of quality and dignified environment where people are encouraged to walk, cycle, and use public transport; there is equitable allocation of public space, infrastructure, and funds; and access to opportunities and mobility for all residents.
- 1.2. The Urban Local Body (ULB) aims to:
  - 1.2.1. **Enable equitable access for all** by improving access and mobility for all residents; promoting social and economic empowerment through the provision of improved low-cost mobility; enabling gender equity through the provision of non-motorised transport (NMT) and public transport (PT) facilities that are safe for women to use; enabling social inclusion by creating NMT facilities that follow principles of universal design and are usable to the greatest extent possible by everyone, regardless of his or her age, ability, or status in life; and by creating a changed culture that accepts the use of walking, cycling, and public transport as acceptable and aspirational means to move around in the city.
  - 1.2.2. **Optimise resources such as space, funds, time, and energy** by investing in modes whose infrastructure requires less space and costs less per person-trips and by encouraging dense, compact, and mixed-use development that contribute to shorter trips; prioritising NMT modes and public transport that consume less resources per person-trip compared to personal motor vehicles (PMV); ensuring that more people live and work close to public transport facilities that can be conveniently and comfortably accessed by foot and non-motorised vehicles (NMVs).
  - 1.2.3. **Improve road safety and personal security** by reducing conflict, road crashes, and deaths; improving traffic safety; and creating public spaces that are safe at all times of the day for all users.
  - 1.2.4. **Increase environmental-friendliness** by reducing local and global environmental impacts of the ULB's transport system through expanded use of zero pollution modes; and promoting low pollution modes that consume less fuel, helping cities retain their air quality.
  - 1.2.5. **Enable participation by community** such as local residents, businesses, and other stakeholders in the preparation of designs to foster the community's active use and sense of ownership of these spaces.

## 2. Goals

- 2.1. The ULB aims to increase the use of walking, cycling, and public transport by creating a safe and pleasant network of footpaths, cycle tracks, greenways, and other facilities to serve all citizens in the metropolitan area. It will strive to meet the following desirable outcomes by designing streets consistent with principles of Complete Streets, and incorporating appropriate environmental planning and water

management techniques. The ULB also urges other concerned agencies to take complementary actions to realise these goals.

*Table 1. Outcomes*

<b>Outcomes</b>	<b>15 year horizon</b>	<b>10 year horizon</b>	<b>5 year horizon</b>
<b>Increasing share of sustainable modes (walking, cycling and public transport)</b>	The mode share of walking and cycling shall be increased to at least 50 per cent of all trips, and maintained at this level.  Mode share of public transport modes shall constitute 50% of all motorised trips.  Share of private shared mobility modes shall at least 20% of all motorised trips.	At least 80% of the final goal shall be met.	At least 25% of the final goal shall be met.
<b>Reducing Vehicle Kilometers Travelled (VKT)</b>	VKT by PMVs shall be within 20% or less of baseline year levels.	VKT by PMVs shall be retained at or below the higher of the 5 and 15 year horizon levels.	VKT by PMVs shall be within 15-20% or less of baseline year levels.
<b>Improving traffic safety</b>	Fatalities shall be 10.0 or less per lakh population	At least 75% of the final goal shall be met.	At least 25% of the final goal shall be met.
<b>Improving air quality</b>	The ULB will meet or exceed CPCB ambient air quality norms on at least 350 days a year.	100% of the final goal shall be met.	At least 50% of the final goal shall be met.

2.2. The ULB will make investments in, and manage well, walking, cycling, public transport infrastructure, and PMV use to meet the following output goals that contribute to achieving the desired outcomes listed above. Output goals are determined for short (5 year), medium (10 year), and long (15 year) planning horizons, as follows. The ULB also urges other concerned agencies to take complementary actions to realise these goals.

*Table 2. Output goals*

<b>Goal</b>	<b>15 year horizon</b>	<b>10 year horizon</b>	<b>5 year horizon</b>
<b>Improving infrastructure for walking</b>	All streets that have a right-of-way (ROW) of 12m or more shall have footpaths compliant to IRC 103-	At least 75% of streets that have a ROW of 12m or more shall have footpaths compliant to IRC 103-	At least 25% of streets that have a ROW of 12m or more shall have footpaths compliant to IRC 103-

	<p>2012 or better.</p> <p>All streets with ROW less than 12m ROW shall have a footpath on one side and/or traffic calming measures to create safe, low-speed space that can be shared by motorised and non-motorised modes.</p>	<p>2012.</p> <p>At least 75% of streets with ROW less than 12m shall have a footpath on one side and/or traffic calming measures.</p>	<p>2012.</p> <p>At least 25% of streets with ROW less than 12m wide shall have a footpath on one side and/or traffic calming measures.</p>
<p><b>Improving infrastructure for cycling</b></p>	<p>100% of streets shall be made safe for cycling, by creating dedicated cycle tracks or using traffic calming measures to create safe, low-speed space that can be shared by motorised and non-motorised vehicles.</p> <p>Bicycle parking slots shall be provided free of charge every 100m of street edge.</p> <p>Development Regulations shall mandate bicycle parking in all buildings and ensure that they are located within 100m of building entrances.</p> <p>The ULB shall implement a cycle sharing system with at least 200 cycles per 1 lakh population.</p>	<p>At least 75% of the final goal shall be met.</p>	<p>At least 25% of the final goal shall be met.</p>
<p><b>Improving reach of public transport</b></p>	<p>At least 80% of the population in the city shall be within 400m walk of public transport stop/station with a service of 12 or more schedules per hour.</p>	<p>At least 75% of the final goal shall be met.</p>	<p>At least 25% of the final goal shall be met.</p>
<p><b>Improving reach of MRT (if applicable)</b></p>	<p>At least 50% of the population in the city</p>	<p>At least 75% of the final goal shall be met.</p>	<p>At least 25% of the final goal shall be met.</p>



	shall be within 400m walk of public transport service with 12 or more schedules per hour.		
<b>Improving quality of PT</b>	100% of the fleet shall match or surpass the UBS II bus specification	At least 75% of the final goal shall be met.	At least 25% of the final goal shall be met.
<b>Providing universal accessibility</b>	All public facilities - PT, NMT, public space, public buildings - will be usable by everyone, regardless physical ability.	At least 75% of the final goal shall be met.	At least 25% of the final goal shall be met.
<b>Managing PMV usage</b>	All streets that have a parking occupancy of more than 60% during peak hours shall be brought under an IT-enabled parking management system along with demand-pegged pricing.	At least 75% of the final goal shall be met.	At least 50% of the final goal shall be met.

### 3. Principles of Street Design and Management

- 3.1. The ULB will use the following principles to guide street design and management in the city and urges other public agencies in the metropolitan region to follow suit:
- 3.1.1. Streets that support and invite multiple uses—including safe, active, and ample space for pedestrians, cycles, and public transport—are more conducive to the public life in urban neighbourhoods and efficient movement of people and goods than streets designed primarily to move private motor vehicles.
- 3.1.2. Decisions regarding the design and use of the city’s limited public street space shall prioritise space for walking, cycling, and public transport over space for private motor vehicles, following the hierarchy of uses<sup>6</sup> shown in below.

*Table 3. Transport framework priority by mode*

Consider	Mode
First	Pedestrian access / Walking

<sup>6</sup> In some special circumstances, public transport may take precedence over cycling infrastructure.

Non-motorised vehicles movement and parking

Public Transport / Intermediate Public Transport

NMV goods carriers

Freight movement (Light > Heavy)

Taxi services/ car-pooling/ car-sharing

Private motor vehicle movement

Last Private motor vehicle parking

- 3.1.3. Road space on all streets shall be equitably allocated for all users. Space for movement and parking of PMVs will be provided only after adequate space has been provided for NMT and PT modes.
- 3.1.4. The design of streets will not discriminate against users by their age, ability, gender, income, race, ethnicity, or religion. An equity-based approach to street design will ensure that services and infrastructure meet the needs of all users.
- 3.1.5. Footpaths, pedestrian crossings and other elements of the pedestrian environment shall be universally accessible by all users, in compliance with Ministry of Urban Development's Harmonised Guidelines and Space Standards for Barrier-Free Built Environment for persons with Disability and Elderly Persons (2016).
- 3.1.6. Streets shall offer space for relaxation, interaction, vending, and other activities by installing elements such as trees, furniture, and lighting.
- 3.1.7. Streets will be appropriately designed and maintained to address the unique characteristics of the neighbourhood, be it historic centres, commercial business districts, or residential areas. Streets will be designed so as to conserve existing watersheds, and natural systems.
- 3.1.8. Use of PMVs shall be discouraged through appropriate travel demand management (TDM) measures like reducing parking supply, pegging parking fee to demand, restrict access or controlling through movement of PMVs on certain streets through part or full pedestrianisation, and congestion charging.
- 3.1.9. NMT planning will be transparent, in close consultation with key stakeholders. Broad and economically diverse citizen participation will be ensured in all stages of planning and implementation.
- 3.1.10. All ULB-sponsored studies and transport plans will strive to increase the use of NMT, public transport, and shared mobility modes, and control the use of PMVs.

## 4. Street Typologies and Network Planning

- 4.1. The ULB will classify streets into four typologies namely, local street, minor collector, major collector, and arterial street, in accordance with their function, surrounding land use, and other characteristics. Streets will be designed in accordance with their typology. Characteristics and design features for each of these typologies is detailed in Table 4.
- 4.1.1. Local streets: Their primary function shall be for local activities and access to properties and not through movement of traffic. The primary land-use shall be residential. They will typically have an ROW of less than 12m and shall not allow access to heavy vehicles. There may not be a dedicated footpath on such streets. However, the ULB will design the streets as shared space that give priority to NMT modes. Various traffic calming elements will be employed to ensure that vehicle speeds are below 20kmph—safe for intermingling of pedestrians, cyclists, and motor vehicles. The ULB may allow vehicle parking where feasible.
- 4.1.2. Minor collector streets: They are meant to serve local traffic and connect local streets to arterial streets. The primary land use shall be mixed-residential. They shall be designed with dedicated footpaths and carriageway for vehicle movement. The width of the carriageway shall not exceed 6.5m (for two-way movement). Pedestrians shall have the right to cross such streets at any location. Speed reduction measures such as speed breakers and table-top crossings will be employed to limit vehicle speeds to under 30 kmph and ensure safety of NMT users. Public transport feeder buses may operate on such streets. The ULB may allow vehicle parking where feasible.
- 4.1.3. Major collector streets: These are larger collector streets meant for for local traffic movement and to connect to arterial streets. They are expected to have mixed use with a large degree of street level retail activity. They shall have adequately sized footpaths and street furniture to cater to the adjacent land use. The carriageway will be restricted to 5.5m per direction of movement, with an intermittent median of 1-2m width. The medians shall include pedestrian refuges for safe street-level crossing, at least once every 50 m. Public transport feeder buses as well as medium frequency main line buses may operate on such streets. The ULB may allow vehicle parking where feasible. The ULB may also implement cycle tracks on these streets if they form a part of a larger cycling network.
- 4.1.4. Arterial streets: They are meant for motorised movement across the city. However, they shall have safe NMT facilities at street edges. Such streets are expected to have mixed use with a larger proportion of retail/commercial use. The ULB will explore the possibility of implementing high-frequency and high-quality mass rapid transit, such as bus rapid transit (BRT), on these streets to improve transit access. Safety for pedestrians will be ensured by providing at-grade pedestrian crossing with a median refuge at least once every 200 m. On-street parking shall be restricted, except when there is space available for a service lane with parking.

*Table 4. Street typologies*

Features	Street Typology			
	Local	Minor Collector	Major Collector	Arterial
<b>Primary function</b>	Meant for local activities and access to properties; not meant for through traffic	Meant for local traffic movement and to connect to arterial streets	Meant for local traffic movement and to connect to arterial streets	Meant for movement across the city; should have dedicated space at edge to local activities
<b>Landuse</b>	Residential use	Primarily residential use with some mixed use	Mixed use with significant retail activity at street level	Mixed use with predominance of commercial activity
<b>Maximum design speed</b>	20 kmph	30 kmph	40 kmph	50 kmph
<b>Footpath<sup>7</sup></b>	Shared space; may also have a footpath	> 2.3 meters (at least on one side)	> 3.0 meters (on both sides)	> 3.0 meters (on both sides)
<b>Cycling</b>	In mixed traffic	In mixed traffic	May have dedicated cycle tracks if part of a cycling network	May have dedicated cycle tracks if part of a cycling network
<b>Carriageway</b>	3.5-5.5m, Shared space with priority to NMT modes	4.5-6.5m, undivided; for two way movement	<5.5m per direction	6.5-9m per direction
<b>Public Transport</b>	No	Feeder service	Feeder buses & medium frequency mainline bus services (< 30 Bus/Hr)	High speed / high frequency bus service (>30 Bus/Hr). May have dedicated lanes.
<b>Medians and mid-block openings</b>	Not applicable	No medians Pedestrians can cross the carriageway anywhere	Intermittent median; Width >1m Pedestrian crossings with a median refuge, at least once every 50m Frequent cuts for vehicular movement	Continuous median; Width >1m Pedestrian crossings with a median refuge, at least once every 200m No cuts for vehicular movement except at intersections
<b>Intersection</b>	X	Maybe open when crossing an arterial; Signalised	Maybe open when crossing an arterial; Signalised	Open when crossing another arterial; Signalised

<sup>7</sup> Footpath clear width with buffer; not including space for furniture, utilities, trees, and landscaping.

		Open when crossing a major or minor collector, or a local street; Unsignalised	Open when crossing a major or minor collector, or a local street; Unsignalised	Maybe open when cut by a major collector; Signalised  Closed for minor collectors and local streets;  At least one intersection every 500m
<b>At-grade pedestrian crossing at intersections</b>	Raised	Raised	Not raised when signalised; Otherwise, raised	Not raised
<b>Typical ROW</b>	<12m	12-18m	18-24m	>24m
<b>Speed reduction measures</b>	Speed breakers; chicanes; landscape	Speed breakers; table top crossings	Table top crossings	Traffic signals
<b>Vehicle Type</b>	No HCV	No restrictions except during certain times of the day	No restrictions except during certain times of the day	No restrictions except during certain times of the day
<b>On-street parking</b>	Maybe	Maybe	Maybe	Only from service lane, if one exists;  Temporary stops for drop-offs and pick-ups may be allowed.

4.2. The ULB will collaborate with key stakeholders to identify and develop select streets as *special streets* that limit access to PMVs.

4.2.1. NMT-only streets: All motor vehicle traffic will be prohibited, using barriers and enforcement to prevent their entry and encroachment of NMT space. Appropriate penalties will be applicable on infractions. Such streets will be designed in compliance with disability access guidelines, with bicycle parking, and access for emergency response vehicles. Commercial deliveries to properties on such streets will be restricted to outside of normal hours. The ULB will identify streets where pedestrian density is the highest, such as those in important market streets, historical and cultural areas, and develop them as NMT-only streets with plazas, seating, trees and structures for shade, as well as space for organized street vending.

4.2.2. NMT-PT-only streets: PMV traffic will be prohibited but public transport services will be allowed, in addition to pedestrians and cyclists. The ULB

will identify such streets based on the amount of NMT traffic and the need for access by and through movement of public transport modes.

- 4.2.3. Greenways: The ULB will develop spaces along natural features such as water bodies, lakes, marshes, and parks, as a network of exclusive facilities for walking and cycling only, with a variety of public spaces and natural features. Motor vehicle traffic will be prohibited on this network. Such greenways shall have a minimum clear width of 7m to accommodate two-way movement of cyclists and pedestrians.
- 4.3. The ULB will create a complete pedestrian network, linking all buildings and destinations, accessible to all persons and protected from motor vehicles. Such a network will be created by developing all streets in the city with walking facilities or by employing measures that improve pedestrian safety in shared spaces. All footpaths must be compliant with IRC 103:2012.
- 4.4. The ULB will create a cycling network to ensure that streets are safe for cycling within a neighbourhood as well as across the city. The ULB will identify streets for dedicated cycle tracks, or create traffic calmed streets to ensure safety of cyclists on their entire travel route.

## 5. Urban Planning

- 5.1. The ULB urges concerned agencies, such as the Urban Development Authority and others, to provide a dense network of complete streets and paths that give priority to NMT modes. The ULB will work with concerned agencies to
  - 5.1.1. Create a fine-grained comprehensive network of streets that are safe for walking and cycling. The NMT network shall have at least 80 intersections per square km.
  - 5.1.2. Support the creation of a citywide greenway network to improve access for pedestrians and cyclists, and provide through access for pedestrians and cyclists in city gardens and other public spaces.
  - 5.1.3. Ensure that all new construction and redevelopment limit the small block size so that the longest block face is less than or equal to 150 m.
  - 5.1.4. Prohibit pedestrian cul-de-sacs and ensure that pedestrians have access to the shortest path for all journeys.

## 6. Built Environment Regulation

- 6.1. The ULB will apply the following built environment regulations to ensure that the pedestrian realm is active and vibrant in all of its own buildings and properties. The ULB will also urge concerned agencies, such as the Urban Development Authority and others, to adopt and include these regulations in documents such as the Master Plan, Detailed Development Plans, and Development Control Regulations. The ULB will work with concerned agencies to:

- 6.1.1. Ensure that at least 90 per cent of buildings have visually active frontages<sup>8</sup> to create a pedestrian realm that is active, vibrant, and safe. These could be in the form of actual openings and/or transparent frontages (windows/patios) that are visually penetrable and provide a means of passive surveillance.
- 6.1.2. Prioritize physically permeable frontage<sup>9</sup> abutting public walkways. This can include entrances to restaurants and cafes, storefronts, and residential housing that contribute to a vibrant public realm. The average number of shops and building entrances per 100m of street frontage shall be at least 5.
- 6.1.3. Adopt minimum build-to lines to ensure that private buildings are oriented towards the streets rather than towards internal plots and thus provide “eyes on the street.”
- 6.1.4. Ensure that front setbacks, where present, are not used for motor vehicular parking, but instead become an extension of the pedestrian environment.
- 6.1.5. Ensure that for residential buildings, compound walls are transparent above a height of 300mm.
- 6.1.6. Ensure that for plots with frontage on more than one street, the main vehicle access, i.e. driveways, shall be provided from the secondary street. To reduce pedestrian-vehicular conflicts, average number of driveways intersecting pedestrian walkways will be limited to 2 or less per 100m of block frontage.
- 6.1.7. Provide a diverse mix of uses, including employment, housing, regional attractions and public spaces to create a high quality urban environment, especially near mass rapid transit stations.
- 6.1.8. Encourage compact urban development by creating high density developments at, and around, MRT stations. Such developments shall be integrated with the surrounding community through walking, cycling, and public transport.

## 7. Multi-modal Integration

- 7.1. The ULB will design streets and public spaces that are integrated with and supportive of public transport services. Where it has the power to do so, it will develop accessible multi-modal interchanges (MMIs) at intercity transit station, public transport stations and bus stops. Such interchanges shall be designed in accordance with the hierarchy of modes listed in Table 3 in this Policy.

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<sup>8</sup> Visually active frontage measures the opportunities for visual connection between sidewalks and the interior ground floors of adjacent buildings. Not only shops and restaurants, but also workplaces, residences and all types of premises qualify.

<sup>9</sup> Physically permeable frontage measures active physical connections through the block frontage via entrances and exits to and from storefronts, building lobbies, courtyard entrances, passageways, and so on.

- 7.1.1. The ULB will provide bus shelters and/or rapid transit stations at key destinations<sup>10</sup>, and at frequent intervals. Bus stops will be located in the furniture zone or on bulb-outs in the parking lane, leaving clear space for pedestrian movement behind and allowing bus passengers to board without waiting and/or stepping into the carriageway.
- 7.1.2. Bus bays inconveniences and slows down the movement of bus services. Therefore, they will not be constructed except in cases where they provide improved intermodal access to intercity railway and bus stations, rapid transit stations, or other key destinations.
- 7.1.3. The ULB will create clear, direct, and short transfers between rail systems, bus stops, and paratransit stops that minimise horizontal and vertical displacement. These pathways shall comply with disability access guidelines and shall offer consistency and clarity in station entrances and interfaces, spaces, layout, and visual cues. The ULB will prioritise at-grade access to BRT stations.
- 7.1.4. The ULB will provide paratransit stands at key destinations, and at frequent intervals.
- 7.1.5. The ULB will provide protection from rain and sun inside stations and stops and along connections between modes.
- 7.1.6. The ULB will coordinate feeder service schedules and routes with schedules of trunk services to minimise customer wait times.
- 7.1.7. The ULB will adopt priority measures to ensure the efficient movement of surface public transport modes, such as buses and rickshaws, to and from the station area.
- 7.1.8. The ULB will provide clear and consistent wayfinding and signage to support efficient navigation to public transport stations in station areas. The ULB will provide static information such as route maps, route destinations, and transfer opportunities.
- 7.1.9. The ULB will provide for safe and efficient movement of pedestrians and cyclists in the influence areas around public transport stops and stations.
- 7.1.10. The ULB will provide an attractive pedestrian environment on all approach streets within one km radius of MRT stations, particularly on routes serving major destinations. All pedestrian links will provide a high level of priority and safety and shall be compliant with this Policy.
- 7.1.11. The ULB will provide clearly marked and protected access for pedestrians and cyclists at station areas to minimise conflicts, particularly at passenger pick-up and drop-offs, bus facilities, and parking access points.
- 7.1.12. The ULB will provide secure and plentiful bicycle parking at station entrances with additional cycling amenities at high volume locations.
- 7.2. The ULB will provide last mile connectivity to mass rapid transit stations via innovative programs such as cycle sharing. Cycle sharing systems refer to the shared use of a common cycle fleet. The principle is simple: Individuals use the cycles on an “as needed” basis and return the cycles to a network of closely spaced cycle stations. With a smart card or other form of identification, a user can check out a cycle from a

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<sup>10</sup> Key destinations are the main places that people need to access including: municipal offices, public transport nodes and stations, common workplaces, schools, markets, shops, sites of worship, and recreation areas.



station and return it to any other station. These systems imply short-term cycle access and provide users with an environmentally friendly and low-cost form of public transport. The ULB will implement cycle sharing systems that employ the following best practice features:

- 7.2.1. A dense network of stations across the coverage area, with spacing of approximately 300m between stations.
- 7.2.2. A fully automated locking system at stations that allows users to check cycles in or out without the need for staffing at the station
- 7.2.3. Radio frequency identification devices to track where a cycle is picked up, where it is returned, and the identity of the user
- 7.2.4. Real-time monitoring of station occupancy rates through general packet radio service (GPRS), used to guide the redistribution of cycles
- 7.2.5. Real-time user information provided through various platforms, including the web, mobile phones, and/or on-site terminals
- 7.2.6. Pricing structures that incentivise short trips, helping to maximise the number of trips per cycle per day.
- 7.2.7. Cycles with specially designed parts and sizes to discourage theft and sale as whole or for parts.

## 8. Planning and Implementation

- 8.1. To guide implementation of this Policy, the ULB will develop long-range NMT plans and regularly update them. NMT plans will be adaptable and flexible. They will include reporting on the existing scenario, evaluation of the past and current initiatives, examining available funding resources, and explaining future efforts.
- 8.2. In accordance with this Policy, the ULB will create street design guidelines, known as the “Street Design Manual” (SDM) (see Schedule B). The SDM will be based on this Policy, as well as the Street Design Elements and Standards detailed in Schedule A.
  - 8.2.1. The SDM will include standards and design guidelines for footpaths, cycle tracks, carriageway, BRT, and other street elements.
  - 8.2.2. The SDM will detail out various street typologies in accordance with Section 4 of this Policy and shall include design templates for various street types based on land use, traffic characteristics, ROW and other criteria.
  - 8.2.3. The SDM will include standards and design guidelines for intersections.
  - 8.2.4. The SDM will include guidelines on materials to be used for various elements and construction detailing.
  - 8.2.5. The SDM will include signage and road marking guidelines so that NMT elements are consistently branded to make the network of NMT facilities legible to all users.
- 8.3. The ULB urges concerned agencies at the city-and state-level, such as Highways Department, Urban Development Authority, transit agencies, and others, to adopt street design standards consistent with the provisions of this Policy.
- 8.4. The ULB will coordinate various decisions regarding the planning, design, and use of public right-of-ways in accordance with this Policy. These actions will be coordinated through an approval or decision concerning any public and private project that impacts, or is adjacent to a publicly accessible right-of-way.
- 8.5. All designs shall comply with the street design guidelines as adopted by the ULB.

- 8.6. Where there are conflicting standards in guidance provided by agencies such as the Indian Roads Congress<sup>11</sup>, the ULB will prioritise NMT modes in the allocation of street space, the design of street design elements, and street management.
- 8.7. The ULB will urge that all transport-related planning, plans, and studies (including surveys, plans, forecasts and models, and implementation plans undertaken by professional staff, consultants and / or international agencies) consider the impact of proposed interventions on NMT users and the ULB's ability to meet the provisions of this Policy.
- 8.8. The ULB will facilitate annual collection of data related to NMT users and user behaviour including but not limited to:
  - 8.8.1. Gender, age, and income profiles of pedestrians and cyclists,
  - 8.8.2. Cordon counts of pedestrian and cycle volumes.
  - 8.8.3. Mapping of crashes involving pedestrians and cyclists to aid in the identification of black spots.
- 8.9. The ULB will assure that the transport mode share data are periodically updated, that all NMT modes are included in all studies of urban transport systems, that all transport investment proposals to assess the impact on NMT users, and that such studies are freely available for public scrutiny.
- 8.10. The ULB will prioritise known black spots for NMT improvements.
- 8.11. The ULB will ensure (and urge where appropriate) that new developments, both public and private, often include the rebuilding of portions of the public right-of-ways and shall serve as models for implementation of the Street Design and Management Policy. Great efforts shall be made that new ULB developments lead by example.
- 8.12. The ULB will require, where possible, that NMT user participation is included in transport-related planning processes.
- 8.13. The ULB will provide regular updates and seek input on such NMT projects and programs from stakeholders through appropriate frameworks, as outlined in Section 13.

## 9. Street Management, Maintenance and Enforcement

- 9.1. The ULB will ensure that all projects involving construction of new streets or retrofitting of existing streets improve safety and convenience for NMT users per the SDM.
- 9.2. The ULB will urge the Traffic Police to manage intersections with a focus on pedestrian and cyclist mobility and safety:
  - 9.2.1. Signal phases shall include adequate time for pedestrians.
  - 9.2.2. Green phases shall be timed to facilitate cycle and public transport movement.
  - 9.2.3. Motor vehicle users will give the right-of-way to pedestrians and cyclists.
- 9.3. The ULB will effectively manage the use of PMVs by implementing a formal parking management program:
  - 9.3.1. The ULB will develop a robust management system that improves the enforcement of no-parking zones and keeps PMVs from obstructing NMT facilities.

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<sup>11</sup> Relevant IRC publications include the Guidelines for Pedestrian Facilities (IRC 103-2012), Geometric Design Standards For Urban Roads And Plains (IRC 86-1983), and Guidelines For Capacity Of Urban Roads In Plain Areas (IRC 106-1990).

- 9.3.2. The ULB will clearly demarcate parking and no-parking zones. Footpaths, cycle tracks, and other NMT facilities will be designated as no-parking zones.
- 9.3.3. The ULB will urge Traffic Police to ensure that footpaths, cycle tracks, and other NMT facilities remain free of encroachment by parked vehicles.
- 9.3.4. The ULB will utilize all revenue collected from the parking management program to fund public transport and NMT improvements that support meeting the goals in listed in this Policy.
- 9.4. The ULB will manage vending as follows, in accordance with the provisions of the national Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act 2014 and relevant state rules:
  - 9.4.1. The ULB will identify locations where there is existing and potential demand for goods and services of street vendors.
  - 9.4.2. The ULB will enhance and preserve existing culturally significant street vending markets.
  - 9.4.3. The ULB will provide supportive infrastructure such as cooperatively managed water taps, electricity points, waste bins, and public toilets.
  - 9.4.4. The ULB will regulate street vending by providing vendor infrastructure in locations that ensure the continuity of footpaths and cycle tracks.
- 9.5. The ULB will institute a repair and maintenance programme to keep all footpaths and cycle tracks in a good state of repair and cleanliness.
- 9.6. The ULB will provide designated spaces for trash collection so that trash containers and trash collection activities do not hinder the use of NMT facilities.
- 9.7. The ULB will adopt a zero tolerance approach for managing encroachments on footpaths. The ULB will remove all temporary and permanent obstructions that force pedestrians to walk on the carriageway. The ULB will relocate vendors as per the provisions of Section 9.4.
- 9.8. During construction projects that compromise the use of NMT infrastructure, the ULB will provide alternative means for pedestrians and cyclists to circulate.
- 9.9. The ULB will implement and maintain street furniture for NMT users as follows:
  - 9.9.1. The ULB will provide street furniture, such as benches, waste bins, tables, public way-finding signage, shelter, water taps, and other amenities to make streets an attractive place to spend time, promote sanitary conditions, and to function as traffic calming elements.
  - 9.9.2. The ULB will locate street furniture in appropriate locations that receive proper shade, and maintain 3m clear width path of travel so that they do not obstruct through movement of pedestrians and cyclists, and avoid unnecessary clutter.
  - 9.9.3. The ULB will coordinate the placement of street furniture with other user amenities (especially advertising panels and utility boxes) to maintain a 2m clear width path of travel to not obstruct through movement of pedestrians and cyclists.
  - 9.9.4. The ULB will scale the quantity of street furniture to meet demand, adjacent land uses and street activity (e.g. larger quantities will be provided at key destinations, public facilities, commercial hubs, etc.). Refuse collection furniture / waste bins will be provided at frequent intervals (e.g. every 20 m) on streets with large numbers of pedestrians and commercial activity.

- 9.9.5. The ULB will conduct maintenance, replacement, and cleaning to ensure that all street furniture elements (especially waste bins) remain in usable and sanitary condition.
- 9.10. The ULB will manage advertising and hoardings in public ROWs as follows:
  - 9.10.1. The ULB will coordinate the placement of advertising panels with other user amenities (especially utility boxes) to maintain an unobstructed 2m wide, 2m high clear path of travel to facilitate movement of pedestrians and cyclists, as well as avoid unnecessary clutter and protruding objects.
- 9.11. The ULB will manage service utility providers to ensure that access points for storm water, sewage, electricity, telecommunications, and other services meet the following standards:
  - 9.11.1. Access points for underground and overground utilities will be designed in such a way that they do not conflict with NMT user movements. Manhole covers will be level with footpaths, cycle tracks, and the surfaces of other NMT facilities. Utility access points will be designed to minimise disruption from maintenance.
  - 9.11.2. Storm water systems will be designed so that storm water drains off of NMT infrastructure into appropriate channels and catch pits. At no point will footpaths, cycle tracks, or other NMT facilities lie at the lowest level in the street cross section, except in the case of NMT-only streets. Stormwater facilities will be maintained regularly to prevent flooding of NMT infrastructure.

## **10. City Leadership**

- 10.1. The ULB will provide the necessary leadership by emphasising a paradigm shift from current urban transport planning methods to the new focus on NMT and public transport.
- 10.2. The ULB will proclaim NMT as priority modes and will issue policy guidelines and instructions to professionals regarding priorities in the design of transport facilities.
- 10.3. The ULB will conduct extensive training and outreach to the ULB engineers, administrators, and elected officials on NMT user needs, design principles, and promotion strategies.
- 10.4. The ULB will encourage and provide incentives for its own employees to walk, cycle, and use public transport as part of their daily commuting.
- 10.5. The ULB will urge other institutions to prioritise non-motorised modes in physical designs, regulations, management practices, and investment plans for transport systems.

## **11. Public Awareness**

- 11.1. Working with the Traffic Police, the ULB will carry out a diverse public information campaign to generate widespread support and publicize the individual and social benefits of transport by NMT modes. The ULB also will coordinate NMT advocacy and planning through national organisations. While policy impacts are local, interfacing with national bodies can help coordinate local groups with national efforts to fund and promote India-wide NMT initiatives.

- 11.2. The ULB will explore alternative programs with the local business community to promote and encourage NMT use. For example, the ULB may reduce the business taxes / fees, or waive enforcement of parking requirements, or utilise other financial incentives to reward businesses or organisations that facilitate employees, customers, or the general public traveling by NMT modes. Recognised NMT-supporting amenities include, but are not limited to the following:
- Provide incentives for employees to commute by NMT modes (or public transport).
  - Disincentivize use of PMVs by removing subsidies, such as free parking, and levying fees and taxes that reflect the true costs of PMV ownership and use.
  - Provide secure bicycle parking.
  - Provide fleet of well-maintained cycles for employees to use for short errands or trips from the office.
  - Provide on-site employee changing rooms with showers.
  - Provide cycle repair station, maintenance supplies such as tools, pumps and tubes, or a dedicated cycle maintenance staff at the company premises.
  - Provide employees with cycle-related training, such as finding safe cycle routes to work, safe riding skills, bicycle maintenance, driver training (share the road with bicyclists), or other related topics.
  - Utilise local logistics and courier services that are NMT-based.
  - Organise cycle rallies or other cycle-related events for employees.
  - Sponsor a local riding club or cycle racing team (e.g., employee, local, youth, professional).
  - Sponsor individual employees who participate in local charity cycle rides or events.
  - Sponsor or directly improve (with ULB review and approval) existing street furniture, municipal footpaths, cycle tracks, or bus shelters.
- 11.3. The ULB will support efforts to appreciate the city's history and traditions through neighbourhood walking and cycle tours. The ULB will specifically create wayfinding signage and network maps to guide participants.

## **12. Funding Development and Infrastructure**

- 12.1. The ULB will provide sufficient budgetary support to build and maintain the necessary NMT infrastructure. Specifically, the ULB will ensure that at least 60 per cent of its street infrastructure budget is allocated to NMT infrastructure.
- 12.2. The ULB will prioritize funding NMT improvements in areas where there is high NMT use.
- 12.3. The ULB will channel foreign loans and investment toward projects that improve conditions for NMT users.

## **13. Institutional Framework**

- 13.1. Preparation of detailed street designs require qualified staff trained in basic transport planning and urban design principles. The ULB will set up a dedicated Street Design Cell to oversee detailed design, construction, and general maintenance of streets.

Such a Street Design Cell shall include dedicated internal staff as well as external specialised consultants to guide the city on specific aspects of street design such as project management, landscaping, engineering works and signages. The Street Design Cell will be responsible for the following.

**13.1.1. Planning and monitoring of Complete Streets**

- Developing comprehensive, city-wide street network plans, and the SDM, and periodically revising it as needed.
- Developing an implementation plan, clearly identifying new streets for implementation, developing implementation timeline, and identifying financing sources for street design projects.
- Maintaining a database of topographic survey data, geo-technical information, and other databases required for detailed design and implementation.
- Monitoring project implementation and maintaining a database of as-built drawings.
- Developing, adopting and monitoring performance metrics to evaluate impact.

**13.1.2. Detailed designing and implementation of Complete Streets**

- Engaging with consultants to develop, and review detailed street designs.
- Identifying contractors for implementation and overseeing works at various stages.
- Coordinating between contractors, consultants, and experts to address on-site issues during construction.
- Conducting public stakeholder meetings as required.
- Mediating any conflict between stakeholders (both public and governmental) during construction.
- Monitoring physical infrastructure, to ensure that it is maintained over time and meets appropriate maintenance standards.

**13.1.3. Capacity building**

- Convening conferences, workshops and seminars to understand and disseminate best practices in street design among city officials, consultants and others.

**13.1.4. Community engagement and advocacy**

- Building support for and communicating benefits of street design projects to the public through advocacy campaigns, media, and others.

13.2. Successful implementation of street design projects will involve cooperation between multiple stakeholders, such as urban local bodies, traffic police, planning agencies, consultants and others, at different stages. The ULB will develop appropriate frameworks to engage with stakeholders, both at the city and zonal levels.

- 13.2.1. To improve inter-agency coordination at the city-level, the ULB will set up and convene regular meetings of an NMT Sub-Committee under the city’s Unified Metropolitan Transport Authority (UMTA). In case UMTA doesn’t exist, the ULB shall constitute a Land Use and Transit Integration (LUTI) Committee, constituting representatives from all stakeholders. Such a LUTI Committee can then transition into the UMTA, at a later stage.
- 13.2.2. The ULB will set up Zonal Review Committee to oversee detailed street design at the zonal level. The ULB will convene regular meetings of the Review Committee to oversee detailed design produced by consultants, construction implementation and monitoring as well as to address inter-agency issues that may arise during this process. The Committee will include with the following members.
- Officials from the Municipal Corporation, such as,
    - Staff of the Street Design Cell,
    - City Engineer,
    - Zone Engineers<sup>12</sup>,
  - Representative from public transport agencies,
  - Representative from traffic police,
  - Representative from local planning authority,
  - Representative from non-government or community organisations, and
  - External consultants/ experts with the Street Design Cell
- 13.3. The ULB will also partner with academic institutions and technical organisations to conduct training programs to train officials, engineers and staff in the basics of street design.

## 14. Performance Measurement

- 14.1. The ULB will measure the effectiveness of the Street Design and Management Policy using the following indicators.

*Table 5. Performance indicators*

Goals	Indicator	Desired direction
Increasing share of sustainable transport modes	Mode share of walking, cycling, public transport, private shared mobility modes	Increase
	Mode share of PMVs	Decrease
Improving infrastructure for pedestrians and	Coverage of footpaths <sup>13</sup>	Increase

<sup>12</sup> In case a project extends across multiple zones, relevant officials from all these zones shall be part of the Review Committee.

<sup>13</sup> Only footpaths that comply with the standards in the Street Design and Management Policy and the SDM are to be counted.

cyclists	Coverage of cycle tracks <sup>14</sup>	Increase
Reducing vehicle kilometres traveled	Number of PMVs registered in last 2 years	Decrease
	PT ridership	Increase
	Mode share of NMT (walking, cycling)	Increase
	Use of shared modes of transport	Increase
Improving reach of PT	% population living within 400m of PT bus stop and frequency of 12 buses per hour	Increase
Improving reach of MRT	Length of MRT system built	Increase
	People near transit (within 400m of MRT)	Increase
Providing universal accessibility	% of public transport and NMT facilities in compliance with “Persons with Disabilities Act, 1996	Increase
Improving quality of PT	Size of bus fleet: % of desired fleet at 50 high quality buses/ lakh population	Increase
Improving traffic safety	Number of fatalities per lakh population per year	Decrease
	Length of streets with IRC:103:2012 compliant, unobstructed footpaths, per lakh population	Increase
	Length of roads with cycle tracks + cycle-only roads, per lakh population	Increase
Improving air quality	Number of poor air quality days	Decrease
	Total PMV kilometres traveled	Decrease

14.2. The ULB will create an inventory of footpaths and cycle tracks, conduct surveys of transport system users, and compile other records to measure progress as per the indicators listed above.

14.3. The ULB will commission progress reports that indicate compliance with this Policy, performance as per the indicators listed above, and progress toward achieving the goals outlined in Section 2. The ULB will make progress reports available for public scrutiny and feedback.

<sup>14</sup> Only cycle tracks that comply with the standards in the Street Design and Management Policy and the SDM are to be counted.



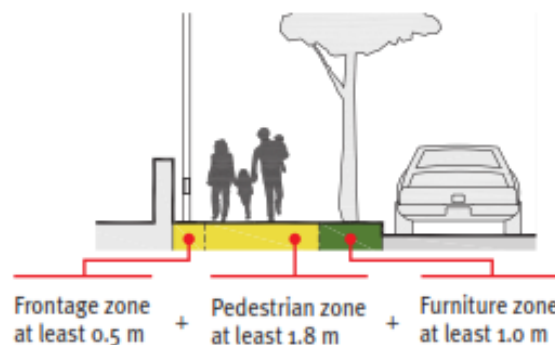
- 14.4. The ULB will ensure that NMT infrastructure designs are reviewed and the re-evaluated per their contribution to performance indicators listed above.

## Schedule A: Street Design Elements and Standards

The ULB recognises that NMT and PT are major modes of transport across the city, and shall adopt the following design standards and guidelines to develop infrastructure that supports and expands the use of these modes.

### 1. Footpaths

- 1.1. Footpaths will be provided where there are none; and where footpaths exist, widths will be increased depending on pedestrian volumes in order to prevent pedestrian overflow onto the carriageway and to ensure continuity. Footpaths will meet the following standards, in compliance with IRC:103 - 2012:<sup>15</sup>
- 1.1.1. Footpaths shall include space for business frontage (frontage zone<sup>16</sup>), space for pedestrian mobility (pedestrian zone<sup>17</sup>) that is at least 1.8m wide in residential areas and 2.5m in commercial areas, and space for landscaping and street furniture (furniture zone<sup>18</sup>) (Figure 1).
- 1.1.2. Height of the footpath shall not exceed 150mm above the carriageway.
- 1.1.3. Footpath surface shall be evenly paved and smooth for all users, including those on wheelchairs.



<sup>15</sup> IRC:103 - 2012, Guidelines for Pedestrian Facilities; and ITDP *Better Streets, Better Cities* section 2.1 p8

<sup>16</sup> A *frontage zone* provides a buffer between street-side activities and the pedestrian zone. Next to a compound wall, the frontage zone can become a plantation strip.

<sup>17</sup> A *pedestrian zone* provides continuous space for walking and shall be clear of any obstructions, level differences, or other obstacles to pedestrian movement.

<sup>18</sup> A *furniture zone* is a space for landscaping, furniture, lights, bus stops, signs, and private property access ramps

Figure 1. Footpaths comprise of three main zones: A. the frontage zone, B. pedestrian zone, and C. the furniture zone.

- 1.2. The ULB shall ensure that footpaths and other elements of the pedestrian environment are accessible to all users, in compliance with Ministry of Urban Development's Harmonised Guidelines and Space Standards for Barrier-Free Built Environment for persons with Disability and Elderly Persons (2016).
- 1.3. The ULB shall pursue all means to free up space for footpaths such as removing or realigning vehicle parking, junction boxes and other obstructions and will prioritise street amenities such as street furniture, landscaping, and trees over vehicle parking.
- 1.4. The ULB shall ensure that all rail overbridges and rail underpasses have pedestrian access. The ULB will also seek opportunities to provide pedestrian access on flyovers where such access provides a mobility or safety benefit for pedestrians.
- 1.5. Footpath shall be continuous even at property entrances for uninterrupted pedestrian movement. The height of the footpath shall remain the same. To provide access to private properties, vehicle ramps shall be provided in the furniture zone with a 1:6 gradient (Figure 2).

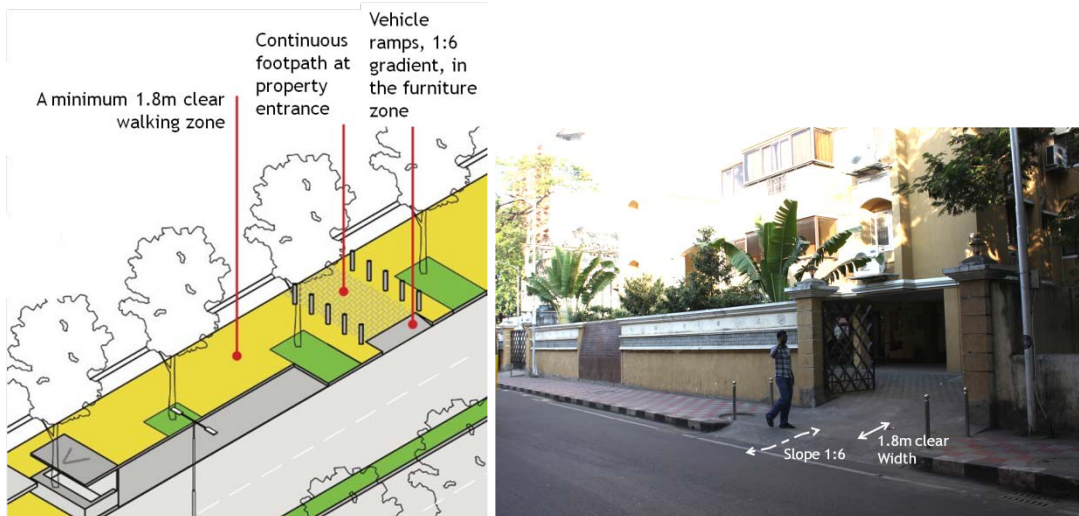


Figure 2. Footpaths shall continue at property entrances, and vehicle ramps at 1:6 gradient will be provided in the furniture zone.

- 1.6. Bollards shall be installed to prevent vehicles from parking on the footpaths, leaving a clear width of at least 1.2m (IRC:103 - 2012, 6.1.12) for wheelchair access.

## 2. Pedestrian Crossings: Midblock

- 2.1. Pedestrian crossings will be constructed as raised crosswalks, or painted zebra crossings. Zebra crossing will comply with IRC 103:2012, 6.7.3.1.
- 2.2. All pedestrian crossings will be at-grade. Authorities may create skywalks to link railway or public transport terminal pedestrian bridges with key destinations, provided that doing so does not compromise at-grade NMT infrastructure.
- 2.3. Pedestrian crossings will be located every 80- 250m in residential areas, and every 80-150m in commercial and mixed use area.
- 2.4. At unsignalised crossings, raised crosswalks shall be constructed. Raised crosswalks shall have a minimum width of 3 m, elevated to the level of the adjacent footpath, with ramps for motor vehicles with a slope of 1:8 (IRC 103:2012, 6.7.4.1) (Figure 3).

- 2.5. Medians shall be designed as surmountable pedestrian refuge to enhance pedestrian safety. Streets with 4 or more traffic lanes shall have medians with pedestrian refuges of minimum 2m depth, and 3m width (IRC 103: 2012, 6.7.3.3), with bollards located in the refuge space to enhance pedestrian safety.

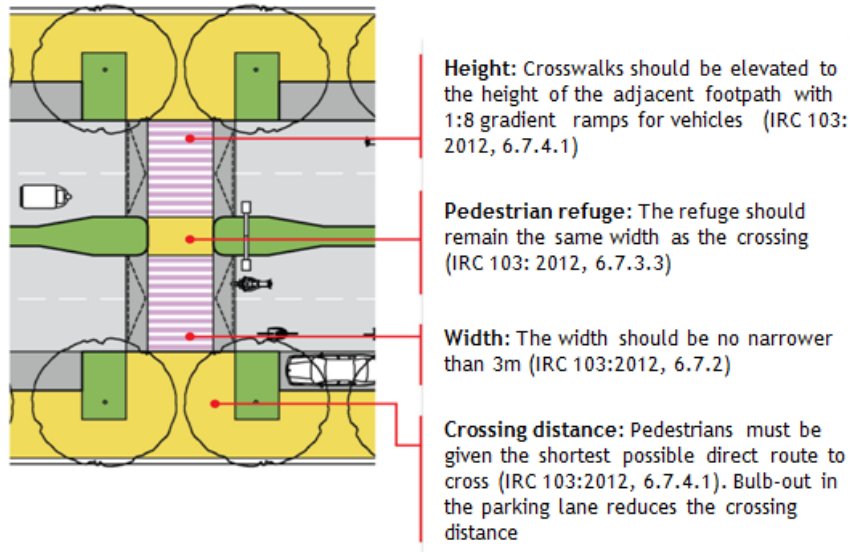


Figure 3. Raised pedestrian crossing reduces vehicle speed, thereby increasing pedestrian safety

- 2.6. Grade separated facilities such as foot overbridges and subways are often unsafe and inaccessible to many users, and inconvenient for all pedestrians. Therefore, facilities that involve a significant vertical displacement of pedestrians will not be permitted on urban streets. Such facilities will only be considered in the context of limited access expressways.

### 3. Pedestrian Crossings: Intersection

- 3.1. At unsignalised intersections, raised crossings shall be provided to ensure pedestrians can cross safely. They shall be elevated to the level of the adjacent footpath, with ramps for motor vehicles with a slope of 1:8 (Figure 4).
- 3.2. Smaller turning radii increase pedestrian safety by reducing vehicle speeds. Turning radii at intersections shall not exceed 3m on non bus-route roads, and 6m on bus-route roads.

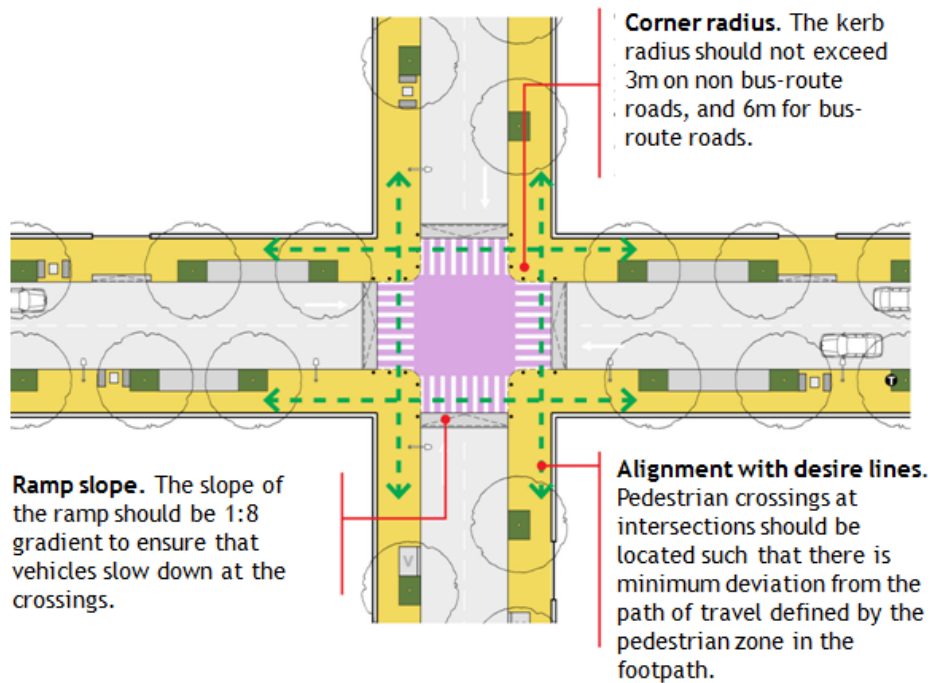


Figure 4. Raised pedestrian crossing at intersection

- 3.3. Pedestrian crossings will be located in alignment with pedestrian desire line - pedestrian travel path.

## 4. Landscaping

- 4.1. All footpaths shall have a continuous tree line to provide shade and improve the aesthetic of the streetscape.
- 4.2. Placement of landscaping shall be coordinated with other street amenities (especially advertising panels and utility boxes) to maintain a clear path of travel for pedestrians and cyclists so as to not obstruct their through movement.
- 4.3. Height of trees shall be maintained so that it does not hinder the visibility of all road users. Canopy of trees shall have a minimum clearance of 3m from the surface of the footpath to ensure better visibility for pedestrians (Figure 5).
- 4.4. Native trees shall be planted to minimise irrigation and maintenance requirements, and for a prolonged tree life.
- 4.5. All trees will be protected with tree pits that allow maximum soil exposure enabling water and air to get to the roots.
- 4.6. Tree pits, with a minimum dimension of 1m x 1m, shall be provided to accommodate the growth of root structures as tree matures.



Figure 5. Placement of trees shall allow for a clear walking and cycling path. A 3m canopy height ensures better visibility for pedestrians (left). Tree will be protected with tree pits that allow unobstructed pedestrian movement (right).

## 5. Bus Stops

- 5.1. Bus stops shall provide safety and comfort for passengers while waiting, and shall be conveniently placed. Placement of bus stops will allow for continuous footpaths and cycle tracks. This may imply diverting the footpath, cycle track, or service lane behind the stop (Figure 6).
- 5.2. Bus-bays shall be avoided at all times. This is because bus drivers generally stop in their linear path of travel, thus, forcing passengers to walk into the carriageway to board the bus. Also, vehicles behind the bus sometimes attempt to pass on the left, compromising passenger safety.
- 5.3. Bus stops shall be placed adjacent to the bus linear line of travel so that the bus does not need to pull over to the left (IRC: 103:2012, 6.10). If there is a parking space between the footpath and the carriageway, bus stops shall be located on the bulb-out of the parking lane.
- 5.4. Bus stops shall ideally be placed at 200-400m intervals so that passengers can easily access the stop by walk.
- 5.5. The length and width of a bus stop will vary depending upon passenger demand. However, it is recommended that stations be at least 2.5m wide which is adequate for a seating arrangement.
- 5.6. Seating shall not be more than 450 mm above finish floor level. The finish floor level shall not exceed 150 mm above the carriageway.



Figure 6. Bus stops shall be placed adjacent to the bus linear line of travel, and shall allow for

continuous footpath and cycle tracks.

## 6. Street Lighting

- 6.1. Street lighting shall be provided such that the longitudinal dimension is equivalent to three times the pole height, and horizontal dimension is slightly longer than the pole.
- 6.2. The table below indicated pole height and spacing option. The spacing between two light poles shall be approximately three times the height of the pole.

Table 6. Pole height and spacing metrics

Street Type	Pole height (m)	Spacing (m)
Footpath or cycle track (< 5m width)	4.5-6.0	12-16
Streets with ROW of 9m or less	8-10	25-27
Streets with ROW of more than 9m	10-12	30-33

- 6.3. Poles shall be no higher than 12m to reduce undesirable illumination of private properties.
- 6.4. Additional lighting shall be provided particularly at black spots, areas of sexual harassment and/or violence, areas of personal crime, and areas of isolation.
- 6.5. The placement of street lighting shall be coordinated with other street elements so that they do not impede proper illumination.
- 6.6. A single row of light posts is generally sufficient for streets up to 12m wide.
- 6.7. On wider streets, dual lights can be mounted on a single central post.

## 7. Street Vending

- 7.1. Street vending shall be accommodated where there is demand for their goods and services. Well-planned vending zones allow formal and informal vending to coexist together without compromising pedestrians and cyclists mobility (Figure 7).
- 7.2. Vending areas shall be positioned in the furniture zone, to ensure the continuity of footpaths and cycle tracks.
- 7.3. Concerned authorities shall refer to their city-specific Street Vending Act/state level rules for permitted dimensions of street vending stalls.



Figure 7. Street vendors shall be accommodated to enliven public spaces, without compromising the continuity of cycle tracks and footpaths.

## 8. Street Furniture and Amenities

- 8.1. Street furniture and amenities shall be located where they are likely to be used. Furniture is required in larger quantities in commercial hubs, market areas, junctions, bus stops, railway stations, and public buildings, and on streets with high pedestrian activity.
- 8.2. Most street furniture, especially benches and tables, shall be placed where it receives shade and does not obstruct pedestrian through movement (Figure 8).
- 8.3. Street furniture can be installed in bulbouts of parking lanes. Similarly, a landscaping strip can be discontinued with street furniture on hardscaped spaces.
- 8.4. In high commercial areas, trash bins shall be provided at every 20m and public toilets shall be placed at every 500-800 m.



Figure 8. Street furniture shall be located where it does not obstruct pedestrian movement, such as in parking bulb-outs (left) or in the furniture zone (right)

## 9. On-street Parking

- 9.1. On-street parking shall be clearly designated, managed, charged and restricted in volume. Parking areas shall be allocated after providing adequate space for pedestrians, cyclists, trees and landscaping, and street vending.
- 9.2. Parallel parking is the preferred parking layout in terms of the area occupied per car. The same parking layout can be used as perpendicular parking for two-wheelers. Parking bays shall have a maximum width of 2.5m (Figure 9).
- 9.3. Each parking slot shall be no more than 5.0m x 2.5m for a four-wheeler. The same area can be used to park five two-wheelers. Additional buffer may have to be provided at either ends of the parking bay for safe entry and exit of vehicles from these parking bays.
- 9.4. Unlike footpaths and cycle tracks, parking lanes need not be continuous. On-street parking may be provided where space is available in the public right-of-way, after providing necessary NMT infrastructure.
- 9.5. Parking signages shall be erected that clearly communicate parking rules to the public, and shall be in compliance with IRC: 67. All signages will be located so as to not hinder pedestrian and cyclist movement, preferably in the furniture zone of the

street.

- 9.6. Designated parking is often laid with similar material used on the adjacent carriageway - asphalt or concrete. Differentiated surface material such as paver blocks may also be used to distinguish space allocated for parking.
- 9.7. Bicycle parking spaces will be equipped with supporting infrastructure (Sheffield Stands, guard rails, cycle lockers) to lock the cycles.



Figure 9. Parallel parking for cars is the most efficient parking layout, as compared to perpendicular and angular parking.

## 10. Stormwater Drainage

- 10.1. The ULB shall develop a city-wide stormwater management master plan to address potential flooding and nonpoint source pollution. The master plan shall consider the increasing demand for additional stormwater capacity, the topography of an area, and study of waterbody outlets.
- 10.2. Decisions regarding street designs will utilise techniques that reduce the impacts on the stormwater system and increase the permeable surface area, through the planting of street trees and landscaping, and minimising unnecessary pavement. Design treatments will reduce storm water overflow and support the health and maintenance of street trees and landscaping.
- 10.3. Stormwater lines shall not be located under the carriageway since it needs frequent access for repairs and maintenance.
- 10.4. Stormwater pipe sizes shall be designed based on local hydrology data. The size of the pipe begin at 300 mm at the start point and then varies based on the capacity at the outflow point. The depth of the catchpit can vary from 450-600 mm, with a width of approximately 300 mm.
- 10.5. Access point for stormwater shall be in the buffer zone and designed in such a way that it does not conflict with NMT user movements.
- 10.6. Catchpits shall be located in the buffer at regular intervals, depending on their size and the catchment area, and at the lowest point of the street cross section. The lowest point in the cross section shall occur on the carriageway; and, footpath, cycle track, bus stops, and street vending areas shall be at a higher level.



- 10.7. Manholes are generally located on footpath and its cover shall be flushed for smooth through movement of pedestrians. They shall be avoided on cycle tracks and if unavoidable, shall be in level with the surrounding surface.

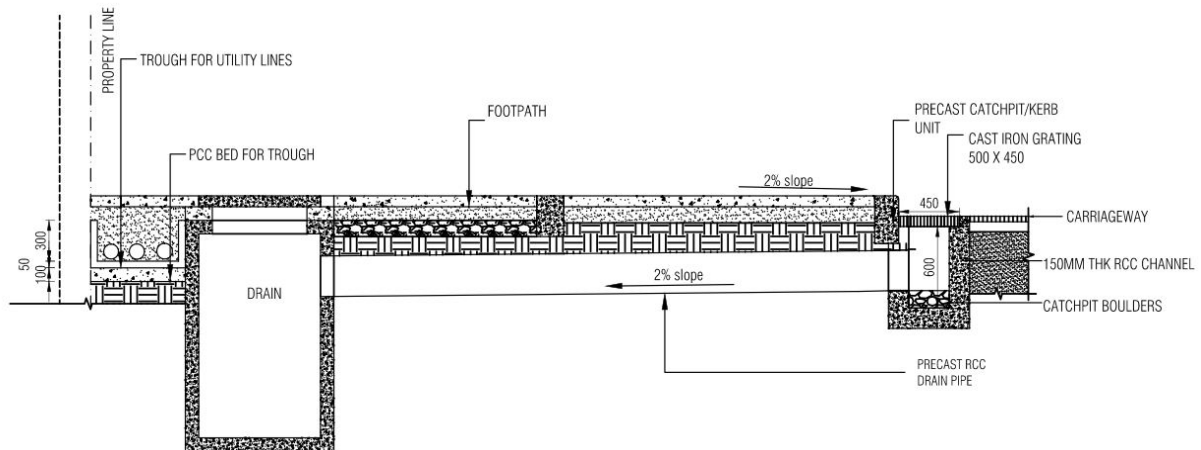


Figure 10. Typical stormwater drain layout under a footpath

- 10.8. Drain lines shall be laid at an approximate 2% incline to encourage gravitational flow of water. Incline of roads also serves as a channel for stormwater, directing it into catchpits that are protected with grating to prevent solid waste from entering the chambers.
- 10.9. Catchpits are designed such that silt collection happens in the chamber trough before the water flows through RCC pipes into the main stormwater drain, and it can be periodically cleared.

## 11. Other Utilities

- 11.1. The ULB will work with service utility providers to ensure that access points for stormwater, sewage, electricity, telecommunications, and other services meet standards.<sup>19</sup>
- 11.2. The ULB will ensure that access points for storm water, sewage, electricity, telecommunications, and other services are designed in such a way that they do not conflict with NMT user movement. Manhole covers shall be in level with footpaths, cycle tracks, and the surfaces of other NMT facilities; and, utility access points shall be designed to minimise disruption during maintenance.

## 12. Cycle Tracks

- 12.1. The ULB shall develop a city-wide cycling plan to ensure that all streets are safe for cycling.

<sup>19</sup> Institute for Transportation and Development Policy, *Better streets, better cities*. [www.itdp.org/betterstreets](http://www.itdp.org/betterstreets), section 2.15 and 2.16

- 12.2. Cycle tracks will have at least 2m of clear space per direction for one-way movement and 3m for two-way movement, and have a smooth surface -- asphalt or concrete. Paver blocks will be avoided (Figure 11).
- 12.3. Painting cycle tracks, without segregation, shall be discouraged as they are likely to be encroached by parked vehicles. They shall be elevated 100-150 mm above the carriageway.
- 12.4. A buffer of 0.5m between the cycle track and parking areas or the carriageway shall be constructed.
- 12.5. In compliance with IRC 11: 1962, cycle tracks shall be provided on streets that have more than 100 motor vehicles and 400 cyclists during peak hour. On routes with more than 200 motor vehicles per hour, cycle tracks shall be provided even if the cycle traffic is less than 100 per hour.

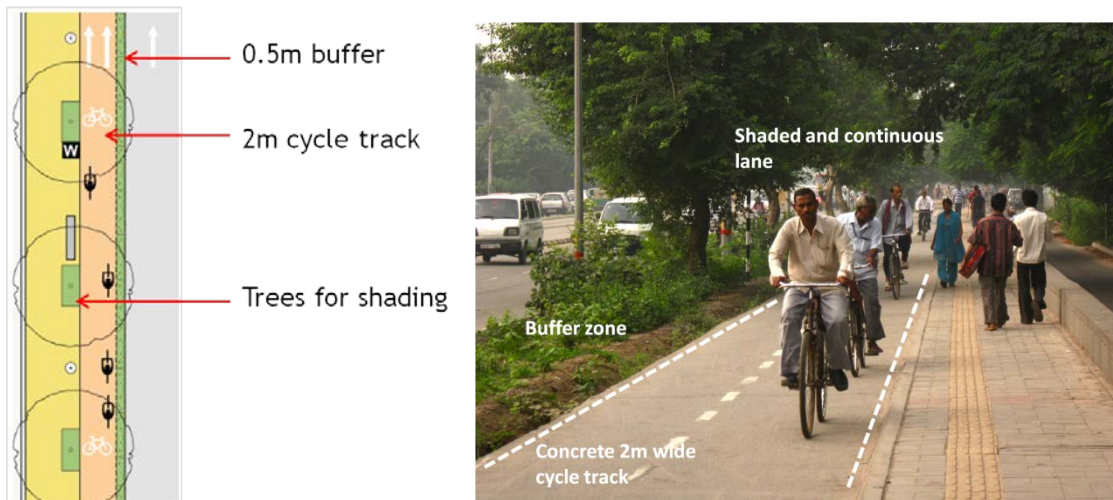


Figure 11. Cycle tracks shall have a minimum width of 2m with a buffer of 0.5m from the carriageway. Trees along the cycle track provide shade and comfort for cyclists.

### 13. Traffic Calming Elements

- 13.1. Traffic calming elements ensure pedestrian and vehicle safety by reducing at least speed and potentially also the volume of motor vehicles. Traffic calming slows down vehicles through vertical displacements, horizontal displacement, real or perceived narrowing of carriageway, material/colour changes that signal conflict point, or complete closure of a street.
- 13.2. Raised crossing serves as a traffic calming element - they shall have a minimum width of 3m, elevated to the level of the adjacent footpath, with ramps for motor vehicles with a slope of 1:8 (IRC 103:2012, 6.7.4.1).
- 13.3. Pedestrian islands of varying shapes, sizes, and located, shall be located within the right-of-way in shared spaces. Pedestrian islands require vehicles to navigate around them, thus, reducing vehicle speeds.
- 13.4. Parallel parking lanes can alternate between the two sides of a street to prevent vehicles from speeding. The alternating obstacles are also known as chicanes. Parking lanes shall have a maximum 2.5m width. Each parking slot shall be no more than 5.0m x 2.5m for a four-wheeler. The same area can be used by two-wheelers to park perpendicularly.

## 14. Carriageway

- 14.1. The primary purpose of a carriageway is vehicle mobility. A carriageway provides dedicated space for motorised vehicles separated from walking, cycling, and stationary activities.
- 14.2. Carriageways are located in the middle of the street right-of-way. Street space shall be allocated to the carriageway after adequate usable space has been reserved for walking, cycling, street vending, and trees. If not, such activities will spill over onto the carriageway, compromising the motor vehicle throughput as well as safety and comfort of all users.
- 14.3. The ULB will design vehicle carriageways that maintain a constant width to ensure a smooth flow of vehicles.
- 14.4. The ULB will employ street designs that define clear boundaries through curbs and material differences.
- 14.5. The ULB will employ a wide variety of traffic calming techniques, including reduced carriageway widths and speed breakers at frequent intervals to reduce motor vehicle speeds.
- 14.6. On local streets, less than 12m right-of-way, carriageways shall be designed as shared spaces where motor vehicles, pedestrians and cyclists coexist. Speeds in shared spaces will be controlled to <20 kmph by installing traffic calming elements to ensure safety of pedestrians and cyclists.
- 14.7. On minor collector streets, the carriageway shall have a maximum width of 6.5m for two-way movement, with adequate traffic calming elements to maintain vehicle speeds at <30 kmph.
- 14.8. On major collector streets, the carriageway shall have a width of 6.5-11 m, including a 1m median that has frequent cuts for vehicle movement. Vehicle speed should be maintained at <40 kmph.
- 14.9. On arterial streets, the carriageway shall be 12-18m wide, including a 1-2m median, and no cuts for vehicle movement except at intersections. Vehicle speed should be maintained at <50 kmph.
- 14.10. The ULB will review one-way carriageways, unless they are necessary to accommodate rapid transit (such as BRT) corridors or pedestrian zones. Where one-way streets are sanctioned, the ULB will provide for two-way movement for NMT modes.

## 15. Bus Rapid Transit

- 15.1. The ULB shall develop a city-wide mass rapid transit network plan, such as a Bus Rapid Transit (BRT) to offer high-capacity and high-quality public transport by providing an exclusive right-of-way for BRT buses.
- 15.2. A BRT should be sited on street with moderate to high demand for public transport, that is over 2000 pphpd<sup>20</sup>. A well designed BRT system can carry up to 45,000 pphpd.
- 15.3. BRT corridors will have dedicated median bus lanes that are physically separated from mixed traffic lanes. Dedicated lanes are crucial for ensuring the buses can move

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<sup>20</sup> Passengers per hour per direction

quickly and avoid congestion. The width of a BRT lane shall be 3.5 m, plus 0.3-0.5 buffer space next to mixed traffic.

- 15.4. The BRT system shall have high quality stations with platforms that match the level of the bus so that passengers can enter and exit quickly and easily without climbing steps. Centrally located BRT station require 3-4m in the cross section. Larger widths may be required if the demand is high
- 15.5. Stations shall be equipped with smart off-board fare collection to enhance passenger convenience and improve efficiency.
- 15.6. Footpaths, that meet IRC standards, shall be constructed on BRT corridors.
- 15.7. At-grade pedestrian crossing will be provided at reasonable intervals to ensure safety of pedestrians. Pedestrian crossings at stations must be elevated to the height of the adjacent footpath, with a slope of 1:10 gradient for buses.
- 15.8. Where space permits, cycle tracks, that meet IRC standards, shall also be constructed on BRT corridors.



*Figure 12. A BRT system provides high-quality and high-frequency mass transit system for the city. The system must have exclusive right-of-way for BRT buses, supported with high quality stations with IT based off-board fare collection system.*

## 16. Summary

16.1. A summary of various street elements and their specifications is presented below. The ULB shall use these guidelines to inform the SDM.

*Table 7. Street element standards*

Street element	Specifications	Minimum width (m)	Maximum width (m)
<b>Footpath</b>	Clear walking space	1.8	*
	Residential area, including furniture zone and frontage zone	3.3	*
	Commercial area, including furniture zone and frontage zone	5.0	*
	High-intensity commercial area, including furniture zone and frontage zone	6.5	*
<b>Tree pit</b>		1.0	*
<b>Bus shelter</b>		2.5	*
<b>Cycle track</b>	One-way	2.0	*
	Two-way	3.0	*
<b>Buffer</b>		0.5	*
<b>Parking</b>	Parallel parking	2.00	2.5
<b>Carriageway</b>	Local street	3.5	4.5
	Minor collector	4.5	6.5
	Major collector	6.5	11.0
	Arterial	12.0	18.0

\* width as per requirement

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