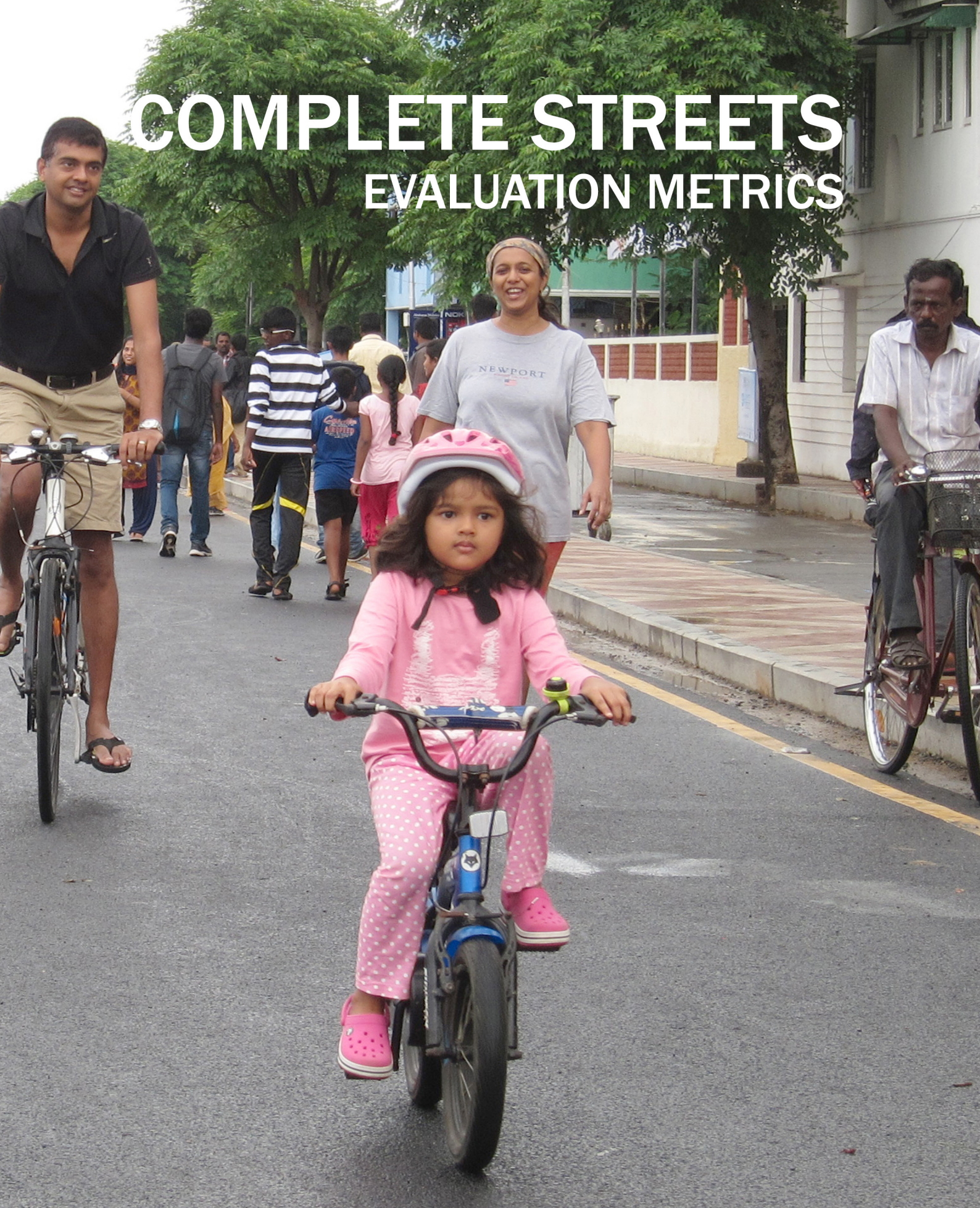


# COMPLETE STREETS

## EVALUATION METRICS



**Smart City**  
MISSION TRANSFORM-NATION



**Ministry of Housing and Urban Affairs**  
Government of India





# introduction

The Ministry of Housing and Urban Affairs presents Volume VI of the Complete Streets Toolkit — the Complete Streets Evaluation Metrics— for Smart Cities across India. This document provides a step-by-step approach for decision makers, city officials, engineers, planners, and consultants on evaluation and assessment of a city's policy goals.

The Complete Streets Monitoring and Evaluation Framework document is a collection of indicators and processes required to evaluate complete streets policy goals and acts as a tool for an objective assessment of the quality of implemented complete streets projects.

The framework document walks the evaluators through a step-by-step process for conducting evaluation through enhancing the city's internal capacity to conduct evaluations, giving the process for baseline setting, data collection and measuring the city's performance with the benchmarks.

The document has separate performance indicators for evaluating different aspects of a complete street and gives detailed explanation of the data sources, collection frequency and different service level benchmarking for each indicator.

It's important that the city conducts periodic evaluations to ensure identification of areas for improvement and help the city realize its policy goals more efficiently. Continuous evaluation over the year enables the city to demonstrate their program's success or progress and communicate in the public realm.

The document is divided into five sections:

- Introduction
- Establishing Monitoring and Evaluation Framework
- Establishing Baseline
- Expected Outcomes
- Outputs

Other volumes of this toolkit are

- i. Complete Streets Policy Framework
- ii. Complete Streets Policy Workbook
- iii. Complete Streets Planning Workbook
- iv. Complete Streets Design Workbook
- v. Complete Streets Implementation Workbook
- vi. Complete Streets Evaluation Metrics and
- vii. Complete Streets Best Practices

February 2019



The Ministry of Housing and Urban Affairs is the apex authority of Government of India to formulate policies, coordinate the activities of various Central Ministries, State Governments and other nodal authorities and monitor programmes related to issues of housing and urban affairs in the country. The Smart Cities Mission was launched by the Ministry in 2015 to promote sustainable and inclusive cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions.



The Institute for Transportation and Development Policy works around the world to design and implement high quality transport and urban development systems and policy solutions that make cities more livable, equitable, and sustainable.

This project is part of the International Climate Initiative (IKI)

Supported by:



based on a decision of the German Bundestag



# creating complete streets

**Complete Street** A street designed to cater to the needs of all users and uses, through equitable allocation of road space is referred to as a complete street.

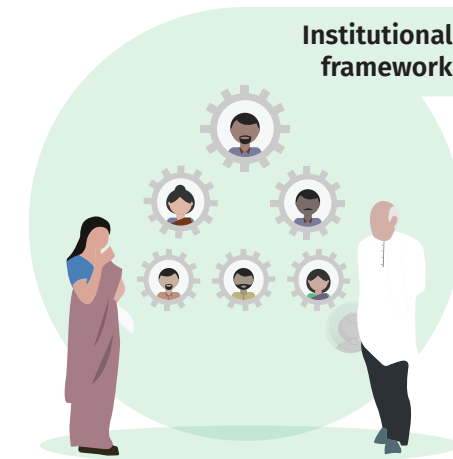
**Volume 01** of the Complete Streets Toolkit - Complete Streets Policy Framework - addresses the rationale for making improvements to streets.

Transforming successful pilots into larger city-wide networks of complete streets requires cities to embrace a progressive long-term vision. This can be achieved by adopting a Complete Streets Policy.

**Volume 02** of the Complete Streets Toolkit - the Complete Streets Policy Workbook - for Smart Cities across India, provides a step-by-step approach for developing and adopting a Complete Street Policy that is supported by a strong institutional set-up.

**Volume 03** of the Complete Streets Toolkit - Complete Streets Planning Workbook - provides a step-by-step guidance to city officials, engineers, planners and consultants on creating a city-wide walking and cycling networks.

The output created through this process includes a long-term masterplan for a Complete Streets network with proposed phasing and estimated investment. These include streets with continuous footpaths, segregated cycle tracks (where possible), safe intersections, uniform carriageways and organised parking; as well as greenways, pedestrian-only streets, non-motorised vehicle and public transport priority streets, shared-streets, and junction redesign projects.



Creation of complete streets involves cooperation and collaboration between multiple stakeholders (such as urban local bodies, traffic police, planning agencies, consultants, experts, community groups and others) at different stages, at both the city and zonal level. Setting-up a dedicated committee and cell, as elaborated in volume 02, is an essential step to ensure the successful implementation of the complete streets projects.

It is important to obtain the reviews and approval from various stakeholders at each stage of the process of creation of complete streets to ensure that the end product caters to the expectation and needs of all.

## Policy

## Planning

## Design

## Implementation

## Participatory process

More often than not, the process of creating complete streets happens in isolation without involving the end users or the other agencies pivotal to the operation of the street. This leads to a disconnect between the local context and the design, which eventually renders the redesigned street unusable.

A participatory approach to street design involves the stakeholders - government representatives, public, NGOs, etc - in the design process to ensure that the final design caters to the needs of the intended users. The result of such a process is invariably more feasible and also innovative.

Many cities have initiated work on redesigning their streets. However, owing to the lack of a single guiding document for street design, cities are currently following different methods and standards. There is thus an urgent need for a national-level document that serves as guidelines for the design of complete streets.

**Volume 04** of the Complete Streets Toolkit - the Complete Streets Design Workbook - for Smart Cities across India, elaborates on the best practice standards and guidelines as well as the process designing complete streets to city officials, engineers, urban designers, and consultants.

Apart from design execution, the mismanagement of the entire construction process can cause delays and inconvenience to residents. The diversion of traffic, dug-up roads with poor attention to on-site safety, obstruction at property entrances, and water logging add to the problems of residents.

**Volume 05** of the Complete Streets Toolkit - the Complete Streets Implementation Workbook - for Smart Cities across India, aims to highlight the typical steps of project implementation that can ensure a good final product - a truly Complete Street.



# contents

<b>1</b>	<b>introduction</b>	<b>07</b>
<b>2</b>	<b>establishing framework</b>	<b>11</b>
	phase 1: planning for monitoring	12
	phase 2: scaling to the city level	14
	phase 3: conducting evaluations	14
	phase 4: reporting on findings	15
<b>3</b>	<b>establishing baseline</b>	<b>17</b>
<b>4</b>	<b>expected outcomes</b>	<b>25</b>
	outcome, indicators and benchmarks	26
<b>5</b>	<b>outputs</b>	<b>31</b>
	output indicators and benchmarks for outcomes	32
<b>6</b>	<b>annexures</b>	<b>43</b>



# List of acronyms

BoQ	Bill of quantities
BRR	Bus Route Roads
BRT	Bus Rapid Transit
CS	Complete Streets
CSMP	Complete Streets Master Plan
DBM	Dense Bitumen Macadam
DIP	Ductile Iron Pipes
DLC	Dry Lean Concrete
DWC	Double wall corrugated
FFL	Finished Floor Level
FRP	Fibre Reinforced Plastic
GIS	Geographic Information System
HDPE	High Density Polyethylene
HRIDAY	Heritage City Development and Augmentation Yojana
IRC	The Indian Road Congress
IPT	Informal Public Transport
MEP	Mechanical, Electrical and Plumbing
MLCP	Multi-Level Car Parking

# List of acronyms

MRT	Mass Rapid Transit
MS	Mild Steel
MUZ	Multi-Utility Zone
MoRTH	The Ministry of Road Transport and Highways
NMT	Non-Motorised Transport
PCC	Plain Cement Concrete
PCU	Passenger Car Unit
PMV	Personal Motor Vehicle
PQC	Pavement Quality Concrete
PVC	Polyvinyl Chloride
RCC	Reinforced Cement Concrete
RCC NP3	Reinforced Cement Concrete - Non-Pressurised class 3
RfP	Request for Proposal
RoW	Right-of-Way
ToR	Terms of Reference
ULB	Urban Local Body
WBM	Water Based Macadam
WMM	Wet Mix Macadam



# definitions

<b>Accessibility</b>	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.
<b>Average trip length</b>	The average distance covered by a transport mode for a trip. This is commonly measured in kilometres.
<b>Bus rapid transit (BRT)</b>	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.
<b>Bulb-out</b>	Lateral extensions of the footpath into the carriageway to reduce the crossing distance for pedestrians. They reduce vehicle speeds, provide enhanced protection and visibility for pedestrians, and lower the time taken to cross the street.
<b>Complete streets</b>	Streets that are designed to cater to the needs of all users and activities, through equitable allocation of road space. Complete streets provide safe and inclusive environments that support users of all age groups, genders, and physical dispositions. They also guarantee efficient mobility by focusing on moving people, user safety, universal accessibility, vitality and liveability, sensitivity to local context, and environmental sustainability.
<b>Eyes on the street</b>	Informal surveillance of any street by the residents, shopkeepers, and other users of the street.
<b>Greenway</b>	A linear, landscaped pedestrian or bicycle route based on natural passages such as canals, rivers, or other scenic courses. It is typically for recreational use, with an emphasis on conserving and preserving vegetation.
<b>Informal Public Transport (IPT)</b>	This includes vehicles like share autos, vans, minibuses that operate on a shared or per seat basis on specific routes, in an unregulated or semi-regulated environment, and with no government support. The service may or may not have a predefined “fare structure”.
<b>Mass rapid transit (MRT)</b>	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).
<b>Mobility</b>	Conditions under which an individual is capable of traveling in the urban environment.
<b>Mode share</b>	The share of total trips carried out by different modes of urban transport including, but not limited to walking, cycling, bus, rail, share auto-rickshaws, private auto, two wheelers, and cars.
<b>Non-motorized transport (NMT)</b>	All forms of human powered transportation including, but not limited to, walking and cycling.
<b>On-street parking</b>	The space occupied by parked vehicles along the edge of the street or carriageway which otherwise could have been used by motorized or non-motorized traffic.
<b>Off-street parking</b>	The term refers to the dedicated spaces provided for parked vehicles outside the right-of-way. It includes parking lots, multi-level car parking and other off-street facilities.
<b>Public Transport (PT)</b>	Shared passenger vehicle which is publicly available for multiple users.

A mechanism to facilitate efficient use of street space to ensure additional space dedicated for pedestrians, cyclists, public transport, and motorists. In addition, over time, collecting a fee for parking can manage its demand and ensure that personal motor vehicle users compensate the city for the use of valuable land on which they park their vehicles.
Measure of the width of the road taken from compound wall/edge on one side of the street to that on the other side.
A street where formal distinctions between spaces allocated for various users, is removed. The concept of shared streets is to ensure that each street user becomes progressively more aware and considerate of the others in the street. Specific design interventions can be made to force the vehicles to slow down and match the pace of those on foot.
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 MRT systems).
Traffic calming measures ensure pedestrian and vehicle safety by reducing the speed of motor vehicles through vertical and/or horizontal displacements, real/perceived narrowing of carriageways, material/colour changes that signal conflict point, or complete closure of streets for vehicular traffic.

<b>Parking management</b>
<b>Right of Way (RoW)</b>
<b>Shared street</b>
<b>Sustainable transport modes</b>
<b>Traffic calming</b>





1

# INTRODUCTION



# 1.0 introduction

## benefits

Monitoring & evaluation helps program implementers :

- Objectively assess the extent to which the program is having or has had the desired impact, in what areas it is effective, and where corrections need to be considered;
- Make informed decisions regarding program operations and service delivery based on objective evidence;
- Ensure the most effective and efficient use of resources;
- Meet organizational reporting requirements, and convince funders and financiers that their investments have been worthwhile or that alternative approaches should be considered.

## fundamentals

### monitoring

Monitoring of a program or intervention involves the collection of routine data that measure progress toward achieving program objectives. It is used to track changes in program performance over time. In its simplest form, monitoring systems enables the collection, verification and use of high quality data in a continuous manner so as to enable its use for effective decision making. It is an ongoing process focused on present events.

### evaluation

Evaluation measures how well the program activities have met expected objectives and/or the extent to which changes in outcomes can be attributed to the program or intervention. The difference in the desired outcome between having or not having the program or intervention is known as its 'impact' and measuring this difference and is commonly referred to as 'impact evaluation'. For instance, if a bicycle sharing program is created with the goal to increase public transportation ridership through improved last mile access, impact evaluation is the tool used to identify if the bicycle share program did, in fact, contribute to increased public transport ridership and if there are additional causal linkages present that explain any changes in ridership. Evaluations are usually conducted at specific points in time to assess the effectiveness and impact of the programme.

### reporting

Reporting involves the regular communication, within defined intervals, of results and findings, it is equally important in demonstrating commitment and accountability to stakeholders and the general public. Reporting often follows pre-determined and structured formats to ensure that information gathered is more easily collated and synthesised.

### verification

Verification is one of the three aspects of the MRV (Monitoring, Reporting and Verification) framework that has been adopted by the EU to account for reduction in climate emissions. Verification can be internal or external and is primarily used to enable accountability on the emissions reduction target for projects.

## indicators

Indicators are clues, signs or markers that measure one aspect of a program and show how close a program is to its desired path and outcomes. They are used to provide benchmarks for demonstrating the achievements of a program. One of the most critical steps in designing an M&E system is selecting appropriate indicators.

An indicator is fundamentally a variable, which changes value from an initial baseline level over the course of the program. For instance, the number of operational public buses could be one of the indicators used to monitor public transport coverage in the city.

International and national frameworks tend to use programme outcomes and indicators that are 'SMART', as defined below:

**Specific** - Is the desired outcome clearly specified and defined?

**Measurable** - Can the achievement of the objective be quantified and measured?

**Appropriate** - Is the objective appropriately related to the program's goal?

**Realistic** - Can the objective realistically be achieved with available resources?

**Time-bound** - In what time period will the objective be achieved?

Baselines are a measurement of the initial conditions before the start of a project/ programme. These baselines or benchmarks are essential to understand the rate of change over time of an indicator.

## baselines

Targets represent commitments made about the level and timing of results to be achieved by a programme or project. It is considered good practice that a target should be established for each outcome indicator or indicator selected. Although targets are usually quantitative, they can be qualitative, depending on their indicators.

## targets





2

## ESTABLISHING FRAMEWORK

planning for monitoring | scaling to the city level  
conducting evaluations | reporting on findings



## 2.1 phase 1:planning for monitoring

A phased approach is proposed in this chapter to allow a city to develop such a system. In this chapter, stronger emphasis has been placed on the initial steps required in Phase 1 that would be needed in order to enable quality adaptive frameworks at the city level.

Expected time to complete phase: 1 year from initiation of effort.

In order to conduct successful monitoring and evaluations, its essential that a prerequisite supporting system is already in place. The establishment of an Apex committee and presence of a Complete Street Cell with adequately trained staff as per the recommendations of the Complete Streets Policy are vital before moving onto the first phase of monitoring.

Based on the assumptions stated earlier in this chapter, it is recommended that the cities rely on external expertise in the initial stages of building a M&E system. Within this, the early focus should be on building and establishing a monitoring system. Parallely, efforts should be taken to enhance the internal capacity of staff to enable them to include adaptive management principles into their ongoing work. This will also ensure that the staff and the system itself internalises M&E as a core concern of its work.

The city can consider the following practical steps to plan and design a functional monitoring system:

**identify staff with adequate capacity**

In terms of time and skill sets, as a point person. This staff member would be allocated job responsibilities to manage M&E for the mobility program (including overseeing appropriate financing of the program). As various departments typically handle aspects of sustainable mobility in a city, this staff member should be at a senior level and ideally be identified from a department that has the ability to work across various departments involved in mobility issues.

**budget for M&E**

A key function of planning for M&E is to estimate the costs, staffing, and other resources needed and budgeting for the same in public accounts.

There is no set formula for budget allocations; various organizations recommend that between 1 to 3 percent of a project's budget should be allocated to M&E. M&E budgets should not be so small as to compromise the accuracy and credibility of results, but neither should it divert project resources to the extent that programmatic work is impaired.

As with the step by step plan for implementing the system, it is recommended that the appropriate budget be phased in to support the scope of the established program. During Phase 1, it is imperative that the budget allocated is sufficient to cover the staff time, expert time, infrastructure needs, training allocation as well as allocations for a pilot project.

**identify external experts**

In order to establish a robust, practical data collection, validation and analytical process. This system will include guidelines developed and roles assigned for each of these functions.

While identifying data that allows better decisions to be made is a crucial part of this process, it is equally important to be careful and ensure that the tradeoffs in collecting the data are considered.

Some key questions to consider as part of the data systems development include:

**key questions**

- What are the sources of data?
- What are the data collection methods?
- Who will collect the data?
- Will repeated data collection provide consistent data?
- What are the infrastructure needs for storing, managing and retrieving this data?
- How often will the data be collected?
- What is the cost and difficulty to collect the data?
- Who will analyze the data?
- Who will report the data?
- Who will use the data?

Work across relevant identified departments to identify pilot interventions to commence monitoring, and to integrate the inputs of the M&E staff into all aspects of project and system level planning.

**identify pilot interventions**

At the pilot scale, the primary aim is to establish an overall system and identify and rectify all issues in a timely and cost-effective manner. It is recommended that the pilot project identification should be done with support from the experts so that the monitoring needs are sufficiently balanced with the capacity that has been developed till then.



## 2.2 phase 2:scaling to the city level

The process of monitoring will entail the systematic gathering, collating, inspecting, analysing and use of the information. The learnings from the first phase, especially from the rollout of pilot interventions will help cities to identify how to expand their monitoring efforts to all programs at the city level.

Additionally, as part of this phase, the city can develop criteria to help identify the scope of the monitoring effort. Some potential criteria can be the number of people impacted by the system, the monetary value of the projects being considered, its scope, and complexity.

The monitoring framework provided along with this toolkit can be used as a guiding template. This is in line with the suggested goals included in the Complete Streets Policy Workbook.

## 2.3 phase 3:conducting evaluations

Results-oriented evaluation focuses on outcomes and impacts and adds to and builds on monitoring information. These are also typically carried out by independent experts.

As with monitoring, evaluation can be conceptualised within the context of the following steps:

**Step 1** Confirmation of evaluation tools and systems - The city will identify most relevant evaluation tools or methodologies to be used, based on the purpose of the exercise. The city could engage external experts, as it did in the initial phase of monitoring, to create a framework of evaluation. As the city gains more internal capacity, this role should be transferred to staff within the local government.

**Step 2** Gathering and collation of information - Since evaluations are often undertaken by a service provider external to the project or process, the city will develop a Terms of Reference (ToR) for data collection and analysis.

**Step 3** Analysis of information - The function of evaluation is analysing data collected and understanding why any changes occur in project implementation. This crucial step will help cities to analyse the impact of the program and feed into its decision for future interventions.

Details about evaluation systems and methodologies are beyond the scope of the main intent of this document. If the phased approach is followed, the expectation is that the city will have developed and augmented its capacity to undertake an effective evaluation. For the same reason, the subsequent phase has also only been covered briefly.

## reporting on findings 2.4

The M&E framework will only be of value if findings are reported on and put into action, where necessary. In the fourth phase, the city should focus on creating an appropriate reporting framework based on the context of the city and its interventions.

The primary reason why reporting is suggested as a Phase 4 effort is because the three phases leading up to this allow for the system to mature and provide valuable outputs. This reduces the risk of incorrect, misleading or incomplete information being produced by the system.

To encourage more transparency as well as inclusion in city planning, the communication of M&E findings to the city's wider range of stakeholders can be integrated into this phase. This may require the application of a detailed, stakeholder-relevant approach. A communication strategy aligned to the M&E Plan will assist in ensuring follow-through in this regard.

While the city would take time and effort to developing a well-functioning system, the multiple benefits brought about from adaptive management and learning systems far outweigh the costs. With the right level of ambition and technical support, a transformation is possible in as little as 5 years. Strong leadership from senior officials at the city and state level will be one of the key drivers to enable this transition.





3

ESTABLISHING  
BASELINE



### 3.0 establishing baseline

The cities are required to obtain certain primary data to establish baseline information about the city to help them achieve the policy goals. Cities should review their existing streets to understand the extent of walking and cycling user mobility issues. Surveys should be conducted to identify the existing characteristic of the street. The following data will be required to assist them in monitoring and evaluation of Complete Streets projects:

#### data required for monitoring and evaluation

Aspect	Indicator	Rationale	Activities Required
Mode-share	Mode-share	Mode share is necessary to track behavioural change from usage of person motor vehicles to walking, cycling and usage of public transport as better sustainable transport infrastructure is provided in the city.	Household survey with a sample size between 0.5-1% of the total population.
	1. Mode-share disaggregated by- Walk, cycle, bus, rail, metro, informal public transport, personal 2-wheelers and personal 4-wheelers		
	2. Mode Share (disaggregated by gender, age- people above the age of 60 as elderly and children- below the age of 15, ability and income)	Disaggregated mode share data helps to understand the accessibility, comfort, safety and security of the walking and cycling environment for vulnerable user groups.	
	3. Registered vehicles data	Registered vehicle data is an important proxy indicator to assess the mode shift. It tells if fewer people are purchasing vehicles. Further, annual traffic counts at important locations give a good proxy for mode share.	
Traffic Injuries and Fatalities	1. Traffic injuries per lakh population (disaggregated by mode and cause)	Accident data will help cities to address road safety of all road users (especially pedestrians and cyclists) through geometric design and management interventions.	1. Disaggregation of injuries and fatalities by pedestrians, bicyclists, 2-wheelers and others
	2. Traffic fatalities per lakh population (disaggregated by mode and cause)		2. Identification of black spots.

Aspect	Indicator	Rationale	Activities Required
Ambient air-quality	Annual mean particulate matter concentration:	Impact parameter for measuring the environmental and health benefits from complete streets	Set-up air quality monitoring stations in the city as per CPCB standards, in coordination with CPCB/ State Pollution Control Board/ Pollution Control Committees
	PM10		
	PM2.5		
Extent and quality of walking facilities	1. Percentage of street length with -Continuous, -Barrier free clear walking zone of minimum 1.8m as per IRC:103-2012, (Also refer IRC:103 for footpath widths as per adjoining landuse and pedestrian LOS) -Maximum footpath height of 150mm	These indicators are crucial to measure the accessibility, comfort, safety and security of the walking environment	1. GIS mapping of city-wide street network up to local streets  2. Conduct city-wide accessibility audits for walking environment  3. Conduct primary survey
	2. Percentage of street length with motor vehicle design speeds of more than 15 kmph having at least 1.8m of clear footpath walking zone (does not include dead and furniture zone, as per IRC:103-2012)		
	3. Percentage of street length with motor vehicle design speeds of less than 15 kmp being traffic calmed		
	4. Percentage of intersections with universally accessible at-grade crossing and lighting of 50 lux		
	5. Percentage of signalized intersections with universally accessible at-grade crossing with adequately timed signal and lighting of 50 lux. (The time signal should be long enough for children /elderly / people with disabilities etc to cross at a speed of 1.2m/s)		
	6. Percentage of street length with universally accessible mid-block pedestrian crossings at 80 - 250 m intervals having lighting of 50 lux		
	7. Percentage of footpath with adequate lighting of 30 lux		



Aspect	Indicator	Rationale	Activities Required
Extent and quality of cycling environment	8. Percentage of a street segments (every 100m) being active	These indicators are crucial to measure the accessibility, comfort, safety and security of the cycling environment	1. GIS-mapping of: <ul style="list-style-type: none"> <li>- City-wide cycling network</li> <li>- Ground-cover from satellite imagery</li> <li>- Ward-boundaries with population</li> </ul> 2. Conduct city-wide accessibility audits on cycling network 3. Conduct primary surveys
	9. Percentage of street length with walking area shaded by trees or buildings		
	1. Percentage of people living within 500 meters walking distance from continuous and barrier-free cycling network of at least 2m (excluding 0.5m of buffer zone)		
	2. Percentage of street with bicycle parking stations at an interval of less than 300m throughout the cycling network or at all transit stations/stops		
	3. Percentage of street length with design speeds of more than 30 kmph having a segregated cycle track		
	4. Percentage streets with design speeds of less than 30 kmph being shared streets		
	5. Percentage of intersections with safe crossings for cyclists, provided with bicycle box on arterial roads		
	6. Percentage of cycle network with adequate lighting of 30 lux		
	7. Percentage of cycle network shaded by trees or building		

Aspect	Indicator	Rationale	Activities Required
Parking Management	1. Number of paid on-street and public off-street parking slots (ECS - equivalent car space numbers) per lakh population	The data helps in understanding the existing status of managed parking in the city, as well as the undervaluation of land caused by parking.	1. GIS mapping of: <ul style="list-style-type: none"> <li>- All on-street parking locations with ECS and occupancy</li> <li>- All off-street parking locations with ECS and occupancy</li> </ul> 2. Installation of IT-enabled systems at designated parking locations
	2. Share of roads with parking occupancy of more than 60% during peak hours having demarcated parking (including parking slots) and no parking areas with IT-enabled parking management system with demand-pegged pricing		
	3. Annual revenue per ECS (on-street and public off-street parking)		
Access to Public Transport	1. No. of operating buses per lakh population	The data helps in understanding the existing status of formal public transport in the city	1. GIS mapping of: <ul style="list-style-type: none"> <li>-City wards with population</li> <li>- Ground cover from satellite imageries</li> <li>- Bus Stops</li> <li>- Bus Routes with frequencies</li> <li>- Mass transit stations</li> <li>- Mass transit routes with frequencies</li> </ul> 2. Conduct accessibility audit of mass transit stations and bus stops 3. Carry-out primary surveys
	2. Percentage of population within 500m near mass transit station		
	3. Percentage of population within 500 m walk of bus stop or station with a frequency of 15 schedules / hour or better		
	4. Percentage of sheltered stations / bus stops		
	5. Percentage of stations/ stops with uniform and consistent lighting of 30 lux		
	6. Percentage of bus stops with information on functional emergency hotline numbers		
	7. Percentage of bus stops with real-time information and route maps		
	8. Percentage of a street segments (every 100m) being active		
	9. Percentage of street length with walking area shaded by trees or buildings		

Aspect	Indicator	Rationale	Activities Required
Vibrancy and Inclusivity of Streets	1. Percentage of non-walking activity like sitting, children play spaces, vending etc on streets (disaggregated by gender, age and ability)	These indicators are essential to measure the activeness and playfulness of the walking and cycling environment. An active and playful environment not only adds to the level of safety on streets but also helps in improving overall livability.	Conduct primary survey
Financing	1. Percentage of transport municipal budget allocated for planning, implementation and management of infrastructure and systems necessary to construct and maintain complete streets infrastructure  2. Per Capita spending on walking and cycling infrastructure  3. Percentage of transport municipal budget allocated for monitoring and evaluation	Indicators on financing are important to measure the financial capacity of the ULB to implement walking and cycling projects in the city	Segregation of budget for walking and cycling in the transport budget from the current practice of clubbing these under road construction or improvement programs
Monitoring and coordination	No. of monitoring and coordination meetings organized with members of a high-powered committee like Apex Committee or UMTA etc. where at least 50% of the members should be present.	Implementation of complete streets require coordination among different agencies. These indicators are an easy way of measuring if those essential interactions have taken place.	Set-up a high-powered Apex Committee or UMTA
Capacity Development	1. No. of capacity building workshops, exposure visits organized etc.  2. No. of people trained from government departments related to CS implementation	Internal capacity development of the ULB is necessary for successful implementation of city-wide complete streets projects.  The indicators given are important for measuring the internal capacity of the ULB to implement the projects and conduct monitoring and evaluation	1. Establish Complete Streets Cell  2. Installation of road-safety monitoring systems on roads

Aspect	Indicator	Rationale	Activities Required
Communication and Outreach	1. Number and frequency of open-street events like bicycle Sunday, car free Sunday, public transport days, street art festivals etc  2. Average participation per open-street events  3. Percentage of bus stops, metro stations, railway stations and other transit stations with signages and Information panels guiding pedestrians, cyclists and public transport users on shortest routes, distance and time taken to reach major landmarks	Indicators to measure the communication and outreach initiatives undertaken by the city to promote complete streets projects and increase awareness about the same among the public	1. GIS mapping of: - Bus Stops - Railway Stations - Metro Stations - Other transit stations  2. Conduct primary surveys





4

# EXPECTED OUTCOMES

outcome indicators and benchmarks



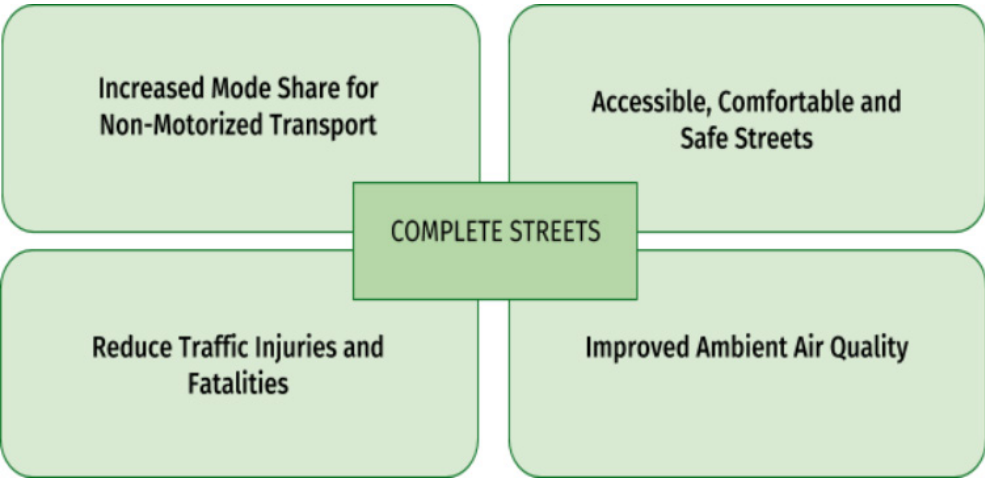
# 4.1 outcome, indicators & benchmarks

Cities should work towards evaluating and achieving the goals set in the ‘Complete Streets Policy’ to achieve the sustainable future vision. The 15-year planning horizon is long enough to ensure that all goals that are set are attainable. However, cities should aim to implement projects within the 10-year planning horizon and focus the last five years on maintaining projects, and upgrading as needed.

The outcome indicators are broader sustainable transport indicators which the city should aim to achieve to reach the city vision. The outputs are specific measurable indicators for walking and cycling infrastructure and services which will help the city in achieving the overall sustainability outcomes. Each output is connected to one or more outcomes, and collectively they all lead to fulfillment of the outcomes.

It is important to note that the outcome goals cannot be achieved unless a package of policies and programs such as Parking Management Plan, Vending Management, Public Bicycle Sharing etc. are also implemented by the city. The ULB should urge other concerned agencies to take complementary actions to realize these goals.

## Complete Streets: Outcomes



## Complete Streets: Outputs leading to Outcomes

OUTPUTS	OUTCOMES			
	Increase in Mode share of NMT	Accessible, Comfortable and Safe Streets	Reduce Traffic Injuries and Fatalities	Improved Ambient Air Quality
Extent and quality of walking environment	✓	✓	✓	✓
Extent and quality of cycling tracks	✓	✓	✓	✓
Parking management	✓	✓		✓
Access to public transportation	✓	✓	✓	✓
Vibrant and Inclusive streets	✓	✓	✓	
Monitoring and Coordination	✓	✓	✓	✓
Capacity Development	✓	✓	✓	✓
Communication and Outreach	✓	✓	✓	✓
Financing	✓	✓	✓	✓

Outcome Indicators and Benchmarks

I. Increasing the Mode Share of Non-Motorized Transport

The city will enhance its environmental-friendliness by increasing the mode share of walking and cycling by providing equitable distribution of street space				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
Mode Share - disaggregated by: Walk, Cycle, Bus, Rail, Metro, IPT, personal two-wheelers and personal four-wheelers	Household Survey	Every 5 years	<div></div>	20% or more increase in walking and cycling from baseline
Registered vehicles data for last (financial/ calendar) year and for the preceding decade	Regional Transport Office (RTO)	Every year	<div></div>	Relative percentage decrease from baseline

II. Accessible, Comfortable and Safe Streets

The city will increase the mode share of different users like children, women, elderly, disabled etc. by providing accessible, comfortable and safe streets				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
Mode Share (disaggregated by gender, age- people above the age of 60 as elderly and children- below the age of 15, ability and income)	Household Survey	Every 5 years	<div></div>	20% or more increase in walking and cycling from baseline by women, children(5-15 years), elderly (more than 60 years) and people with disabilities
Perception surveys (disaggregated by gender, age, ability and income) on: access, <ul style="list-style-type: none"><li>comfort</li><li>safety</li><li>satisfaction</li></ul>	Primary Survey	Every 5 year	<div></div>	80% of people should feel that the streets are accessible, comfortable and safe

III. Reduce Traffic Injuries and Fatalities

The city will aim to reduce the deaths and injuries from road traffic accidents				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
1. Traffic injuries per lakh population (disaggregated by mode and cause)  2. Traffic fatalities per lakh population (disaggregated by mode and cause)	Traffic Police	Every years	<div></div>	50% or more reduction in injuries and deaths from road traffic accidents

IV. Improved Ambient Air Quality

The city will improve the ambient air quality as per Central Pollution Control Board Ambient Air Quality Standards				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
Annual mean particulate matter concentration: <ul style="list-style-type: none"><li>PM10</li><li>PM2.5</li></ul>	Central Pollution Control Board / State Pollution Control Board	Every years	<div></div>	The annual mean particulate matter concentrations should be less than 60 for PM10 (µg/m3) and 40 for PM2.5 (µg/m3)





# 5 OUTPUTS

output indicators and benchmarks for outcomes



## 5.1 output indicators and benchmarks for outcomes




The output indicators have broadly been classified into 4 categories of







- Infrastructural Outputs
- Management and Monitoring Outputs
- Financial Outputs
- Communication and Outreach Outputs

The detailed indicators, along with frequency, the sources of data required, level of difficulty and service level benchmark for each indicator have been given below:


### Infrastructural outputs

#### I. Extent and Quality of walking environment





All streets have continuous, safe, accessible, secure and comfortable walking environment				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
1. Percentage of street length with -Continuous, -Barrier free clear walking zone of minimum 1.8m as per IRC:103-2012,  (Also refer IRC:103 for footpath widths as per adjoining landuse and pedestrian LOS) -Maximum footpath height of 150mm	Accessibility Audit	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
2. Accessibility: Median block length of 100-150m bounded by publicly accessible roads (for pedestrian and cyclists) on all sides (Only for new street network)	City-wide street network plan	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
3. Traffic safety: Percentage of street length design with motor vehicle design speeds of more than 15kmph having at least 1.8m of clear footpath walking zone (does not include dead and furniture zone, as per IRC:103-2012)	Accessibility Audit	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%




Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
4. Traffic Safety: Percentage of street length with motor vehicle design speeds of less than 15 kmph being traffic calmed	Observational Survey with GIS Mapping	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
5. Traffic Safety: Percentage of intersections with universally accessible at-grade crossings and adequate lighting of 50 lux	Accessibility Audit  Primary Survey between 7 - 9 pm	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
6. Traffic Safety: Percentage of signalized intersections with universally accessible at-grade crossing with adequately timed signal and lighting of 50 lux. (The time signal should be long enough for children /elderly / people with disabilities etc to cross at a speed of 0.41 m/s to 0.61m/s)	Accessibility Audit  Primary Survey between 7-9 pm	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
7. Traffic Safety: Percentage of street length with universally accessible mid-block pedestrian crossings at 80 - 250 m intervals (on streets with medians, as per IRC:103-2012) having adequate lighting of 50 lux	Accessibility Audit  Primary Survey between 7-9 pm	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
8. Personal Security: Percentage of footpath with adequate lighting of 30 lux	Accessibility Audit  Primary Survey between 7 - 9 pm	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
9. Personal Security: Percentage of a street segments (every 100m) being active	Primary Survey between 7 - 9 pm	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%





Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
10. Comfort: Percentage of street length with walking area shaded by trees or buildings	Primary Survey during afternoon hours	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%

## II. Extent and Quality of cycle tracks


The entire city is accessible through a continuous, safe, secure and comfortable cycle network with minimum detours				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
11. Percentage of people living within 500 meters walking distance from continuous and barrier-free cycling network of at least 2m (excluding 0.5m of buffer zone)	Accessibility Audit	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
12. Accessibility: Percentage of streets with bicycle parking stations at an interval of less than 300m throughout the cycling network or at all transit stations/stops	Audit	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
13. Traffic safety: Percentage of street length with design speeds of more than 30 kmph having a segregated cycle track	Primary Survey with GIS Mapping	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
14. Traffic safety: Percentage of street length with design speeds of less than 30 kmph being shared streets	Primary Survey with GIS Mapping	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%

15. Traffic Safety: Percentage of intersections with safe crossings for cyclists, provided with bicycle box on arterial roads	Primary Survey	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
16. Personal Security: Percentage of cycle network with adequate lighting of 30 lux	Accessibility Audit Primary Survey between 7 - 9 pm	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
17. Comfort: Percentage cycle network being shaded by trees or building	Primary Survey between afternoon hours	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%




## III. Parking Management





All streets that have a parking occupancy of more than 60% during peak hours shall be brought under an IT-enabled parking management system				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
18. Number of paid on-street and public off-street parking slots (ECS - equivalent car space numbers) per lakh population	ULB	Every year		Relative percentage increase in no. of paid on-street parking slots per lakh population Relative percentage decrease in no. of paid off-street parking slots per lakh population
19. Share of roads with parking occupancy of more than 60% during peak hours having demarcated parking (including parking slots) and no parking areas with IT-enabled parking management system with demand-pegged pricing	Primary Survey	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%




Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
20. Annual revenue per ECS (on-street and public off-street parking)	ULB Annual Budget Report	Every year		Relative comparison with market rent value for the same patch of land to understand the undervaluation of land caused by parking.

IV. Access to public transport

Improving access to mass transit and Intermediate Public Transit				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
21. Coverage: No. of operating buses per lakh population	State / City Transport Undertaking	Every year		1. 60 buses / lakh population or more % - 100% 2. 40 - 60 buses / lakh population 3. 20 - 39 buses / lakh population 4. 0 - 19 buses / lakh population
22. Accessibility: Percentage of population within 500m walking distance of mass transit station	ULB	Every 2 years		1. 60% or more 2. 45% - 59% 3. 30% - 44% 4. 0% - 29%
23. Accessibility: Percentage of population within 500 m walking distance of bus stop or station with a frequency of 15 schedules / hour or better	ULB	Every 2 years		1. 80% or more 2. 45% - 59% 3. 30% - 44% 4. 0% - 29%

24. Accessibility: Percentage of bus stops with real-time information and route maps	Primary Survey	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
25. Security: Percentage of stations/ stops with uniform and consistent lighting of 30 lux	Accessibility Audit  Primary Survey between 7 - 9 pm	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
26. Security: Percentage of bus stops with information on functional emergency hotline numbers	Primary Survey	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
27. Comfort: Percentage of sheltered stations / bus stops	Primary Survey	Every year		1. 60% or more 2. 45% - 59% 3. 30% - 44% 4. 15% - 30%


V. Vibrant and Inclusive Streets

All streets are more vibrant and attractive through increase in non-transport activities				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
28. Percentage of non-walking activity like sitting, children play spaces, vending etc on streets (disaggregated by gender, age and ability)	Primary Survey in the evening hours from 7-9 pm	Every year		Relative increase in percentage from baseline





## management and monitoring outputs





### VI. Monitoring

The city will ensure coordination among the different street-related stakeholders/ departments				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
29. Organize monitoring and coordination meetings with members of a high-powered committee like Apex Committee or UMTA etc. where at least 50% of the members should be present.	ULB / Apex Committee etc.	Every year		Once every quarter or more




## financial outputs

### VII. Financing

The city will ensure that adequate financial capital is allocated for implementation and monitoring of the projects.				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
30. Percentage of transport municipal budget allocated for planning, implementation and management of infrastructure and systems necessary to construct and maintain complete streets infrastructure	ULB Annual Budget Report	Every year		1. 30% or more 2. 25% - 29% 3. 15% - 24% 4. 10% - 14%
31. Per Capita spending on walking and cycling infrastructure	ULB Annual Budget Report	Every years		1. >₹5 per person per year 2. ₹2-₹5 per person per year 3. ₹1-₹2 per person per year 4. < ₹1 per person per year

32. Percentage of transport municipal budget allocated for monitoring and evaluation	ULB	Every 2 years		1. 2% or more 2. 1% - 2% 3. 0.1% - 1% 4. 0%
25. Security: Percentage of stations/ stops with uniform and consistent lighting of 30 lux	Accessibility Audit Primary Survey between 7 - 9 pm	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
26. Security: Percentage of bus stops with information on functional emergency hotline numbers	Primary Survey	Every year		1. 75% - 100% 2. 50% - 74% 3. 25% - 49% 4. 0% - 24%
27. Comfort: Percentage of sheltered stations / bus stops	Primary Survey	Every year		1. 60% or more 2. 45% - 59% 3. 30% - 44% 4. 15% - 30%

### VIII. Capacity Development

The city will ensure that the ULB has the capacity to implement and monitor the projects				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
33. Establishing Complete Streets Cell - Number of capacity building workshops, exposure visits organized etc.	ULB	Every year		Bi-annually or more
34. No. of people trained from government departments related to CS implementation	ULB	Every year		Relative increase in number from baseline
35. Number of air quality monitoring stations in the city	Primary Survey	Every year		As per Central Pollution Control Board Recommendations

## Communication and Outreach Outputs



## IX. Communication and Outreach

The city will take initiatives to communicate the benefits of Complete Streets projects, increase awareness and get support of the public.				
Indicator	Data Source	Frequency	Level of difficulty	Benchmark / Level of service
36. Number and frequency of open-street events like bicycle Sunday, car free Sunday, public transport days, street art festivals etc.	ULB	Every year	●	Relative increase in percentage from baseline
37. Average number of participants per open-street events	ULB	Every year	●	Relative increase in percentage from baseline
38. Percentage of bus stops, metro stations, railway stations and other transit stations with signages and Information panels guiding pedestrians, cyclists and public transport users on shortest routes, distance and time taken to reach major landmarks	Primary Survey	Every Year	●	<ol style="list-style-type: none"> <li>75% - 100%</li> <li>50% - 74%</li> <li>25% - 49%</li> <li>0% - 24%</li> </ol>





# ANNEXURES

list of references



# list of references

Following are some of the acts, laws and initiatives undertaken until now by Central, State Governments and other organizations in the road and transportation sector prominently related to vehicles, road construction, road users. The Complete Streets framework toolkit has taken into consideration the information and suggestions as mentioned in these studies.

## Indian Road Congress Guidelines

The Indian Roads Congress (IRC) was set up by the Government of India in consultation with the State Governments in December, 1934 and is a registered society under the Registration of Society Act. It is the premier body of Highways Engineers in India. The Principal objectives of the India Roads Congress are to provide a national forum for regular pooling of experience and ideas on all matters concerned with the construction and maintenance of highways, to recommend standard specifications and to provide a platform for the expression of professional opinion on matters relating to roads and road transport including those of organizations and administration. It also publishes Journals, monthly magazines and research bulletins.

Few of such journals regarding design of urban roads have been considered in the study for the framework documents. The documents recommend to follow the given IRC for the technical specifications and details for construction of street elements:

1. IRC: 35-2015 Code of Practice for Road Markings
2. IRC: 36-2010 Recommended Practice for Construction of Earth Embankments and Subgrade for Road Works
3. IRC: 37-2012 Guidelines for the Design of Flexible pavements
4. IRC: 67-2012 Code of practice for Road Signs
5. IRC: 70-2017 Guidelines on Regulation and Control of Mixed Traffic in Urban Areas
6. IRC: 98-2011 Guidelines on Accommodation of Utility Services on Roads in Urban Areas
7. IRC: 99-2018 Guidelines for Traffic Calming Measures in Urban and Rural Areas
8. IRC: 103-2012 Guidelines for Pedestrian Facilities
9. IRC:SP: 50-2013 Guidelines on Urban Drainage
10. IRC:SP: 055 Guidelines on Traffic Management in Work Zones
11. IRC:SP: 057 Guidelines for Quality Systems for Road Construction
12. IRC:SP: 112-2017 Manual for Quality Control in Road and Bridge Works
13. IRC:SP: 117-2018 Manual on Universal Accessibility for Urban Roads and Streets
14. IRC:SP:119-2018 Manual of Planting and Landscaping of Urban Roads

## MoRTH Specifications

The Ministry of Road Transport and Highways is a ministry of the Government of India, is the apex body for formulation and administration of the rules, regulations and laws relating to road transport, and transport research in India. Some of the MoRTH regulations and specifications referred in the Complete Streets framework documents have been listed below:

1. MoRTH Section 300: Earthwork, Erosion Control and Drainage
2. MoRTH Section 400: Sub-Base, Bases Not-Bituminous and Shoulders
3. MoRTH Section 500: Base and Surface Courses (Bituminous)
4. MoRTH Section 800: Traffic Signs, Markings and Other Road Appurtenances

## Design of Urban Roads-Code of Practice, 2012<sup>1</sup>

The code of practice for designing of urban roads has been prepared by the Transportation Research and Injury Prevention Programme (TRIPP) for the Institute of Urban Transport (IUT), Ministry of Urban Development. The primary purpose of this document is to provide a code of practice for various Urban Road Components. It has been developed in five parts:

- Part I : Urban road cross section design
- Part II : Intersection design
- Part III: Road markings
- Part IV : Signages
- Part V : Traffic Calming methods

Among other recommended codes, the document has two major variations from IRC codes in terms of road design for intended speed limit and linking of lane width with speed limit.

## Motor vehicles Act<sup>2</sup>

The Motor Vehicles Act, 1988 is an Act of the Parliament of India which regulates all aspects of road transport vehicles. The Act came into force from 1 July 1989. It replaced Motor Vehicles Act, 1939 which earlier replaced the first such enactment Motor Vehicles Act, 1914. The Act provides in detail the legislative provisions regarding licensing of drivers/ conductors, registration of motor vehicles, control of motor vehicles through permits, special provisions relating to state transport undertakings, traffic regulation, insurance, liability, offences and penalties, etc.

## Disabilities Act<sup>3</sup>

The Rights of Persons with Disabilities act replaces the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995. It fulfills the obligations to the United National Convention on the Rights of Persons with Disabilities (UNCRPD), to which India is a signatory. The Act came into force during December 2016.

Accessibility is one of the rights that is given importance under this act which makes it mandatory to provide for disabled friendly design of public places including roads and streets. The Rules under this Act have specified the Standards for Accessibility through Harmonised Guidelines and Space Standards for Barrier Free Built Environment for Persons With Disabilities and Elderly Persons.<sup>4</sup> The guidelines prepared by Ministry of Urban Development are comprehensive guidelines inclusive of all provisions updated and harmonized to act as an easy reference Practitioner's Guide for Barrier Free Designs with universal access, responding to the varying needs of the persons with disabilities.

## The Guidelines and Toolkits for Urban Transport Development

The Guidelines and Toolkits for Urban Transport Development were prepared by a Technical Assistance on Urban Transport Strategy (TA 4836-IND) funded by the Asian Development Bank for the Ministry of Urban Development (MoUD), Government of India.

<sup>1</sup> <http://mohua.gov.in/cms/Design-of-Urban.php>

<sup>2</sup> <http://www.tn.gov.in/sta/Mvact1988.pdf>

[http://164.100.47.4/BillsTexts/LSBillTexts/PassedLoksabha/214C\\_2016\\_LS\\_Eng.pdf](http://164.100.47.4/BillsTexts/LSBillTexts/PassedLoksabha/214C_2016_LS_Eng.pdf)

<sup>3</sup> <http://disabilityaffairs.gov.in/upload/uploadfiles/files/RPWD%20ACT%202016.pdf>

<sup>4</sup> <https://cpwd.gov.in/Publication/Harmonisedguidelinesreleasedon23rdMarch2016.pdf>



These documents are designed to help decision makers and practitioners in states and municipal governments who are concerned with urban transport development in medium-sized cities in India.

It consists of 5 modules addressing topics like -

- Comprehensive mobility plans<sup>5</sup>
- Bus Rapid Transit Systems (BRTS)
- Guidelines for Bus service improvement
- Guidelines for parking measure
- Guidelines for NMT measures.

## The National Urban Transport Policy (April 2006)<sup>6</sup>

It was approved by GOI to tackle urban mobility issues to ensure a safe and sustainable urban mobility in the coming decades. It provides for integrated land use and transport plans in cities, coordinated planning for urban transport, people oriented equitable allocation of road space, capital support in the form of equity participation and or viability gap funding, innovative financing, dedicated urban transport funds, non-motorised transport, car restraint measures, clean fuel and vehicle technology, private sector participation and pilot projects in cities to establish models of best practices.

## Recommendations of working group on 12th FYP<sup>7</sup>

The Working Group on Urban Transport for the 12th Five Year Plan has made recommendations on investments and plans on 9 broad themes in urban transport which were identified in line with the National Urban Transport Policy (NUTP) developed by the Government of India.

## Study on traffic and transportation policies and strategies in Urban Areas in India, MOUD, 2008<sup>8</sup>

The study aimed at updating the transportation information and projections made from the previous study 'Traffic and transportation policies and strategies in Urban Areas in India 1994' in order to review the National Urban Transport Policy in light of the new and comprehensive data provided within this report.

## Service Level Benchmarking, 2009<sup>9</sup>

Since 2009, the Ministry of Housing and Urban Affairs (then titled Ministry of Urban Development) has adopted the practice of service level benchmarking. Through the SLB initiative, the Ministry hoped to create a robust set of indicators across sectors for which data would be collected at the city levels and collated and published at the National level. This would then help create a ranking for cities, aided by a positive competitive spirit. At the same time, cities were also expected to set targets for themselves and better their performances over time.

<sup>5</sup> [https://smartnet.niua.org/sites/default/files/resources/file\\_1016201405372097.pdf](https://smartnet.niua.org/sites/default/files/resources/file_1016201405372097.pdf)

<sup>6</sup> <http://www.iutindia.org/downloads/Documents.aspx>

<sup>7</sup> [http://planningcommission.gov.in/aboutus/committee/wrkgrp12/hud/wg\\_%20urban%20Transport.pdf](http://planningcommission.gov.in/aboutus/committee/wrkgrp12/hud/wg_%20urban%20Transport.pdf)

<sup>8</sup> [http://mohua.gov.in/upload/uploadfiles/files/final\\_Report.pdf](http://mohua.gov.in/upload/uploadfiles/files/final_Report.pdf)

<sup>9</sup> [http://mohua.gov.in/upload/uploadfiles/files/Service\\_level.pdf](http://mohua.gov.in/upload/uploadfiles/files/Service_level.pdf)

Within urban transport, pedestrian and non-motorized transport facilities were assigned indicators -such as the share of city roads with footpaths and the coverage and efficiency of street lighting etc.

## National Mission on sustainable habitats: Report of the Sub-Committee on Urban Transport

Under the National Action Plan for Climate Change, the National Mission on Sustainable Habitat has been launched to cover various aspects which include better urban planning and modal shift to public transport. Regarding Urban Transport, the objectives of the National Mission on Sustainable Habitat (NMSH) are "To address the issue of mitigating climate change by taking appropriate action with respect to the transport sector such as evolving integrated land use and transportation plans, achieving a modal shift from private to public mode of transportation, encouraging the use of non-motorised transport, improving fuel efficiency, and encouraging use of alternative fuels etc.

## UTTIPEC Guidelines for street design<sup>10</sup>

As per the recommendations of National Urban Transport Policy, DDA, Delhi has notified Unified Traffic and Transportation Infrastructure (Plg. & Engg.) Centre (UTTIPEC) to enhance mobility, reduce congestion and to promote traffic safety by adopting standard transport planning practices.

Recently UTIPEC has published street design guidelines to promote sustainable transportation system in the city of Delhi.

## The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014<sup>11</sup>

Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014 is an Act of the Parliament of India. This Act was drafted with the legislative intent of protecting the livelihood rights of street vendors as well as regulating street vending through demarcation of vending zones, conditions for and restrictions on street vending. The Act now governs over all matters in regards to the rights and duties of the street vendors in India.

## Chennai Non-Motorised Transport Policy, 2014<sup>12</sup>

The Chennai Municipal Corporation adopted a progressive non-motorised policy in October 2014 to make walking and cycling its priority. The policy aims to arrest the current decline in walking and cycling in the city by creating safe and pleasant network of footpaths, cycle tracks, greenways and other NMT facilities.

<sup>10</sup> [http://smartcities.gov.in/upload/uploadfiles/files/StreetGuidelines\\_DDA.pdf](http://smartcities.gov.in/upload/uploadfiles/files/StreetGuidelines_DDA.pdf)

<sup>11</sup> <http://legislative.gov.in/sites/default/files/A2014-7.pdf>

<sup>12</sup> <https://www.itdp.in/wp-content/uploads/2014/10/NMT-Policy.pdf>



## Urban Street Design Guidelines, Pune 2016<sup>13</sup>

In accordance with the key principles of moving people before vehicles in National urban Transport Policy, the Municipal Corporation of Pune adopted the 'Urban Street Design Guidelines' as a new policy document aimed at 'equitable allocation of street space'. The guidelines give an overview of various elements that go into designing streets, making them universally accessible and also provide standard templates for different sizes and uses of streets.

## Policy for Pedestrian Facilities and Safety, Pune 2016<sup>14</sup>

The Municipal Corporation of Pune, in 2016 adopted a Pedestrian Facilities and Safety Policy, keeping in view the focus set in NUTP and CMP for Pune. The Policy establishes good quality public transport system as well as safe, adequate and usable facilities for pedestrians and cyclists as the solutions to city's traffic problems and aims at providing consistent, high quality pedestrian infrastructure with equitable allocation of road space.

## Public Parking Policy, Pune 2016<sup>15</sup>

The policy on Public Parking adopted by Pune Municipal Corporation in 2016, is expected to help the city in becoming more 'people friendly' than 'vehicle friendly'. The Policy aspires to discourage usage of private modes, encourages efficient use of available parking spaces, aids in evolving a better transportation system, builds a strategy to reduce congestion, pollution, and also helps the public transport system to grow.

## NMT Guidance document, 2016<sup>16</sup>

The Guidance Documents for preparing Non-Motorised Transport (NMT) plans has been undertaken by the Sustainable Urban Transport Project, Ministry of Urban Development (MoUD), Government of India (GOI) with support from Global Environment Facility (GEF), UNDP and World Bank. The focus of the Guidance Document is to establish a systematic process for plan preparation, serving more as an implementation manual with checklists of potential alternatives, rather than providing technical standards for development of detailed specifications.

## Coimbatore Street Design & Management Policy, 2017<sup>17</sup>

Keeping with the approach set-out in NUTP-2006, the Coimbatore City Municipal Corporation (CCMC) adopted a Street Design & Management Policy to ensure the implementation of high-quality transport systems. The Policy seeks to achieve an environment that supports more equitable allocation of road space by incorporating a focus on non-motorised transport (NMT) and public transport (PT) in the planning, design, managing, and budgeting stages.

<sup>13</sup> [https://pmc.gov.in/sites/default/files/road\\_img/USDG\\_Final\\_July2016.pdf](https://pmc.gov.in/sites/default/files/road_img/USDG_Final_July2016.pdf)

<sup>14</sup> <http://smartcities.gov.in/upload/development/5a9009c9843cdPolicy%20for%20Pedestrian%20Facilities%20and%20Safety%20in%20Pune%20City.pdf>

<sup>15</sup> <https://pmc.gov.in/sites/default/files/project-glimpses/PMC-public-parking-policy-English-revised-March2016-Final.pdf>

<sup>16</sup> <https://smartnet.niua.org/sites/default/files/resources/nmtguidancefinal.pdf>

<sup>17</sup> [https://www.itdp.in/wp-content/uploads/2018/01/CoimbatoreStreetDesignandManagementPolicy\\_ITDP\\_170218.pdf](https://www.itdp.in/wp-content/uploads/2018/01/CoimbatoreStreetDesignandManagementPolicy_ITDP_170218.pdf)

## Ease of Living Index, 2018<sup>18</sup>

The SLB initiative has been reimagined and expanded into the Ease of Living Index, covering more sectors and aspects of citizen lives. Within transport however, the larger set of indicators remain largely similar to the earlier SLBs.

## Specifications for Urban Road Execution, Tender SURE

Bangalore City Connect Foundation (BCCF) in conjunction with Indian Urban Space Foundation (IUSF) approached the state government of Karnataka to build an Urban road and tender manual in 2010. The publication contains guidelines on designs, specification and procurement of contract for urban roads execution with the priority on the comfort and safety of pedestrians and cyclists, as well as recognizing the needs of street vendors and hawkers.

## Urban Street Design Guide, NACTO

NACTO's (a non-profit organization) 'Urban Street Design Guide' gives guidance through toolbox and tactics that cities can use to make streets safer, more liveable, and more economically vibrant. The Guide outlines both a clear vision for complete streets and a basic road map for how to bring them to fruition.

## Better Streets, Better Cities, ITDP<sup>19</sup>

A street design manual for Indian cities prepared by ITDP, (a not for profit organization) that discusses design details of various street elements and street sections on 'complete streets' principle.

## Parking Basics, ITDP<sup>20</sup>

Parking Basics a guiding document by ITDP, outlines the key principles and steps involved in managing on-street parking and regulating off-street parking.

## Footpath Design: A guide to creating footpaths, ITDP<sup>21</sup>

The footpath design guide prepared by ITDP is a quick reference guide which highlights key concepts from the IRC Guidelines, including footpath design standards. The guide also draws from local and international best practice for some themes not covered in the IRC publication.

<sup>18</sup> <https://easeofliving.niua.org/assets/upload/pdfs/ease-of-living-national-report.pdf>

<sup>19</sup> <https://www.itdp.org/wp-content/uploads/2011/12/Better-Streets-Better-Cities-ITDP-2011.pdf>

<sup>20</sup> <https://www.itdp.org/wp-content/uploads/2015/10/Parking-Basics.pdf>

<sup>21</sup> [https://www.itdp.in/wp-content/uploads/2014/04/05-Footpath-Design\\_Handout.pdf](https://www.itdp.in/wp-content/uploads/2014/04/05-Footpath-Design_Handout.pdf)



## Footpath Fix, ITDP<sup>22</sup>

Footpath Fix the second volume after Footpath Design is a step-by-step guide on footpath construction detailing for urban designers, municipal engineers, and contractors. The guide aims to highlight the steps of footpath construction in a chronological order, from pre-excavation to above-ground construction. It also features necessary precautions, drawing from experience on-ground, that must be taken into consideration at each stage of construction.

The work is licensed under a Creative Commons Attribution BY 4.0 License. Feel free to copy, distribute and transmit, as long as you attribute the work.



### Prepared by



**team**  
Achuthan T D  
Ganesh Babu R P  
Nashwa Naushad  
Naveena Munuswamy  
Parin Visariya  
Pranjal Kulkarni  
Sruti Venkatakrishnan  
Vaishali Singh  
Venugopal A V  
Vishnu M J

**editors**  
Ravi Gadepalli  
Shreya Gadepalli

**manager**  
Aswathy Dilip

All photographs and graphics by ITDP, unless otherwise mentioned.

<sup>22</sup> <https://www.itdp.in/wp-content/uploads/2018/07/Footpath-Fix.pdf>



