

# Terms of Reference for Providing Consulting Services for Greenway Design

## 1. Introduction

Greenways are managed open spaces that offer improved mobility to pedestrians and cyclists, create new recreational space for city residents, and enhance environmental assets. Greenways are typically anchored by a waterway. A greenway project can transform a neglected creek or drainage channel into a high quality public space that becomes part of the city's open space network. Designed with accessibility and safety features in mind, greenways can become a place of enjoyment for residents of all ages and genders. Greenways can also contribute to healthy lifestyles by creating high quality facilities for active transport using non-motorised modes.

The planning process for greenways combines analysis of the hydrological features of the waterway with an assessment of the mobility needs of local residents and non-motorised transport (NMT) users in the city as a whole. The design of a greenway must be integrated with a city's transport network, especially citywide pedestrian and cycle networks. In addition, the design should take into account nearby public transport services to improve accessibility to the greenway.

## 2. Objectives

The main objectives of the greenway project are as follows:

- Increase access by providing safe, convenient mobility corridors for pedestrians and cyclists
- Mitigate the risk of flooding through improved flow and groundwater recharge systems
- Protect and enhance environmental resources by improving water and air quality
- Expand awareness about ecology and local environmental issues
- Create new recreational opportunities for city residents

## 3. Methodology overview

The scope of work includes:

- Review of existing transport, land use and development plans
- Definition of Study Area
- Survey of land uses, activities, and street network
- Topographic survey
- Survey of NMT networks
- Hydrological and environmental analysis
- NMT network proposal
- Conceptual proposal

- Draft working drawings
- Final working drawings
- Social impacts
- Management Plan
- Implementation monitoring

## **4. Detailed methodology**

### **4.1 Review of existing transport and land use plans**

The Consultant will collect and review all relevant reports, with particular attention to the Sustainable Cities through Transport strategic plan, City Development Plan (CDP), Master Plan, Comprehensive Mobility Plans, Comprehensive Traffic and Transport Studies, City Corporate plans, transport-related Detailed Project Reports, and any plans related to the greenway corridors listed in Annex 1. Based on this information, the Consultant will prepare a brief profile of the planning area including:

- Location
- Demographic information of study area
- Major linkages communicating through the study area
- Socio-economic data; and
- Environmental assets, such as natural conservation areas, heritage areas and parks or open spaces.

The Consultant will compile spatial information on plans for public transport networks, cycling networks, pedestrian networks, and pedestrian zones presented in these reports. The Consultant should compile information on drainage networks, nullahs, and natural canals passing through the city.

### **4.2 Definition of Study Area**

For each of the greenway corridors listed in Annex 1, the Consultant will define the following:

- Immediate Study Area consisting of all areas within a 200 m buffer on either side of the waterway.
- Broad Study Area consisting of all areas within a 1 km buffer on either side of the waterway.

All natural drains, rivers, canals, streets, gardens, and public spaces in the Broad Study Area should be mapped in GIS based on satellite photos/aerial photographs. Maps of the Immediate and Broad Study Areas for all greenway corridors listed in Annex 1 will be presented in the inception report with all relevant information and data collected from relevant reports (see Step 1). The Consultant will also present plans for data collection including primary survey formats and proposed locations for all surveys in this TOR. The client must approve the Inception report before the Consultant proceeds to next step.

### **4.3 Survey of land use, activities, and transport network**

The Consultant will compile information on adjacent areas to inform the design of the greenway:

The Consultant will carry out a land use survey for every building in the Immediate Study Area. In cases where the ground floor use is different from that of rest of the floors, the surveyors should make a note. Important activity generators, such as shopping areas, theatres, housing developments, and parks, should be identified. The Consultant also should record the dead spaces with little activity.

The Consultant will map all publicly accessible streets and paths in the Broad Study Area. The Consultant will also map public transport facilities, including bus stops, bus terminals, and railway stations within the Broad Study Area.

All data should be recorded using the GIS platform.

#### **4.4 Topographic Survey**

The Consultant shall conduct total station surveys to inform the preparation of conceptual plans. The topographic surveys must cover the entire Immediate Study Area. Specific elements that must be surveyed (including documentation of geocoded X, Y, and Z coordinates in a GIS platform) include:

All publicly owned areas of the waterways listed in Annex 1:

- Levels
- Type of lining (e.g. sand, concrete, rocks, etc.)
- Storm water and sewer elements, including drainage outfalls
- Bridges, including:
  - Alignment
  - Pier positions and dimensions
  - Lower and upper heights
- Main roads, sub roads, and service lanes, as applicable, including the following elements:
  - Carriageway, differentiating between paved and unpaved areas
  - Medians / bollards / permanent barricades
  - Footpaths/pathways including all kerbs and level differences
  - Intersection elements such as pedestrian islands, landscaped areas, etc.
  - Kerbs
  - Manholes
  - Drains (covered and uncovered)
  - Sign boards / markings and signals
  - Compound walls and each access point/gate
  - Front facade of existing buildings/structures
- All utility (electricity, telephone, etc.) poles, boxes, service lines, cable ducts, high tension lines, etc.
- Trees: to be indicated in 2 categories, above and below 30 cm of main trunk circumference
- Difference in levels wherever it occurs

The final survey drawings should satisfy the following requirements:

- Each map should be georeferenced with latitude, longitude, and height coordinates so that it can be combined with other maps on a GIS platform.
- Each element should be in a separate layer.

#### 4.5 Survey of NMT movements

Surveys shall be carried out to assess non-motorised transport (NMT) user flows in the Broad Study Area. The Consultant will record the number of pedestrians and cyclists moving along the road on important corridors. The survey shall be from 06:00 to 22:00 on a normal working day. The Consultant should record the pedestrian and cycle movements in the network map (see example below).

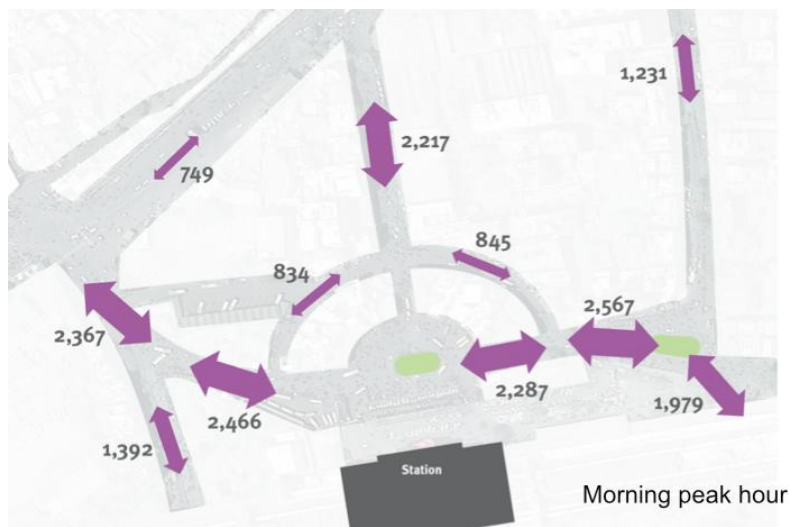


Figure 1. Sample diagram showing pedestrian volumes per hour.

The Consultant also will conduct a tracking survey of pedestrian crossing movements at important crossing points or junctions within the Immediate Study Area. The actual pedestrian movement lines should be mapped as in the example shown in Figure 1. Before conducting the surveys, the Consultant must seek approval of the survey locations from the Client.

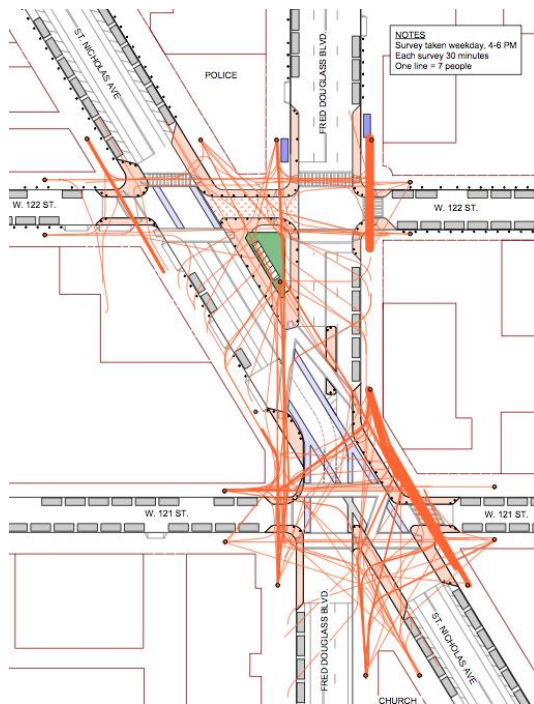


Figure 2. Example of a tracking survey diagram. The orange lines represent pedestrian movements. Thicker lines indicate higher pedestrian volumes.

#### 4.6 Hydrological and environmental analysis

As part of topographic survey, the consultant should include land area of 200 metres on both sides of the waterway so as to record for levels, vegetation, structures, services, any surface flows etc. Further the consultant shall study the water flow patterns, including flooding events and records. The consultant should determine water flow capacity of the existing waterway and identify bottlenecks that lead to flooding. The study should involve slope analysis and levels analysis of adjacent area till 200metres on both sides to understand the low-lying areas and suggest the flood prevention techniques for flood mitigation.

The consultant from the detail survey should identify the number of sewage outfalls directly into the waterway. The consultant should also be able to get the quantity and quality tests done, which will help in suggesting mechanisms to either pipe the sewage water and connect it to main drain or treat it naturally on site through bioremediation techniques.

The consultant should keep in mind that as this is a pilot project extending around 1 km and should be planned along the entire length of any one drain to be able to demonstrate the intent of the greenway design. The pilot project should display the improvement in NMT connections and the mobility benefits of the greenway. It should also demonstrate the other cleaning up mechanisms so that the dirty water does not mixes with the clean treated water and same needs to be proposed downstream.

The consultant shall study the point sources and nonpoint sources of pollution affecting water quality. The consultant shall study on various activities including dairies, agriculture, sewage systems, motor garages, cattle wallowing, open area defecation, carcass dumping, and indiscriminate dumping of garbage. The Consultant should carry out soil and groundwater tests in the waterway before completion and after one year of completion shall help determine the soil remediation treatment if needed to create bio-detention and retention facilities

The consultant shall map the entire drainage network within the broad study area and its relation to the city's overall drainage plan to identify the different catchment areas being drained out through different drains. The study of the project specific drain would need a study of the respective catchment area in order to include a storm water plan that looks at opportunities to slow, spread, and soak the storm water.

#### **4.7 NMT network proposal**

The Consultant will map existing publicly accessible streets and paths within the Broad Study Area. The consultant will create a map of these streets, identifying the smallest blocks surrounded by publicly accessible streets. All blocks less than 1 ha will be identified. The Consultant will identify new streets that are proposed in the Master Plan or other city plans. Based on the analysis of existing streets, the Consultant will identify locations where the greenway project can bridge missing links to create new connections along and perpendicular to the waterway to reduce NMT travel distances. Through the NMT paths created as part of the greenway project, the Consultant should aim to reduce block sizes wherever possible. The consultant will ensure that the NMT network proposal complements the overall transport network of the city.

The Consultant will prepare the following network plans for the Broad Study Area:

- Pedestrian network including pedestrian paths along the greenway as well as pedestrian elements on surrounding streets (i.e., wider footpaths, pedestrian zones, etc.).
- Cycle network including cycle paths along the greenway as well as cycle facilities on surrounding streets (i.e., cycle tracks, traffic calmed carriageways, etc.).

The network plans will be prepared using GIS.

#### **4.8 Conceptual proposal**

The consultant will develop conceptual landscape plans for the greenway corridor and adjoining streets including the following elements. The conceptual designs must cover the greenway and all other public rights-of-way in the Immediate Study Area.

##### **4.8.1 Greenway design**

The Consultant will design the waterway, landscaping, and mobility elements, including the following:

- Waterway elements:
  - Landform grading concept with storm water drainage, lakes, water bodies etc. The grading concept should accommodate various flood levels and reduce the impact of flooding on surrounding areas.
  - Lining elements. Should emphasise natural elements rather than concretisation of the waterway.
  - Storm water and sewage system. The design should emphasize on the natural treatment system.
- Landscape:
  - Visual and physical axes focus points, and hierarchy of open spaces.

- The landscape planting scheme should aim to preserve the natural biodiversity of the region and help regenerate it with indigenous plants. Emphasis should also be given to creating a self sustaining ecosystem that can work on its own and aid in improving the water quality
- Specific location of trees, shrubs, and ground cover. The landscaping plan should provide for continuous shade over the mobility elements and also incorporate urban farming concepts. The harvested produce could then be marketed in the street vending zone - this shall encourage people to see how their vegetables are grown and could be an education for school kids
- Mobility elements covering the length of the greenway (should be consistent with the NMT network proposals developed in the previous step):
  - Continuous pedestrian paths
  - Continuous cycle paths, physically differentiated from the pedestrian paths
  - Cycle sharing system if proposed shall be incorporated into the greenway design where ever possible.
  - New bridges (especially NMT-only facilities) and crossings (e.g. stepping stones)
  - Connections with streets adjacent to the study area
- Facilities plans:
  - Street furniture, including benches, tables, cycle parking stands, etc.
  - Lighting - use of solar panels, PV station points, e-recharge, etc. could also be incorporated in the design to aid battery operated cycle rickshaws for tourists or elderly.
  - Kiosks.
  - Street vending zones
  - Appropriate treatment of areas around religious structures, community centres, and schools.
  - Public toilets.

The pedestrian paths along the greenway should meet the following standards:

- At least 2 m wide
- Continuous
- Smooth surface without abrupt level differences
- Maximum grade of 1:12
- Integrated with landscaping plan to ensure continuous shade

The cycle paths along the greenway should meet the following standards:

- At least 2.5 m wide for two-way movement
- Continuous

- Smooth surface without abrupt level differences: concrete or bitumen surface (paver blocks are unacceptable)
- Maximum grade of 1:12
- Integrated with landscaping plan to ensure continuous shade

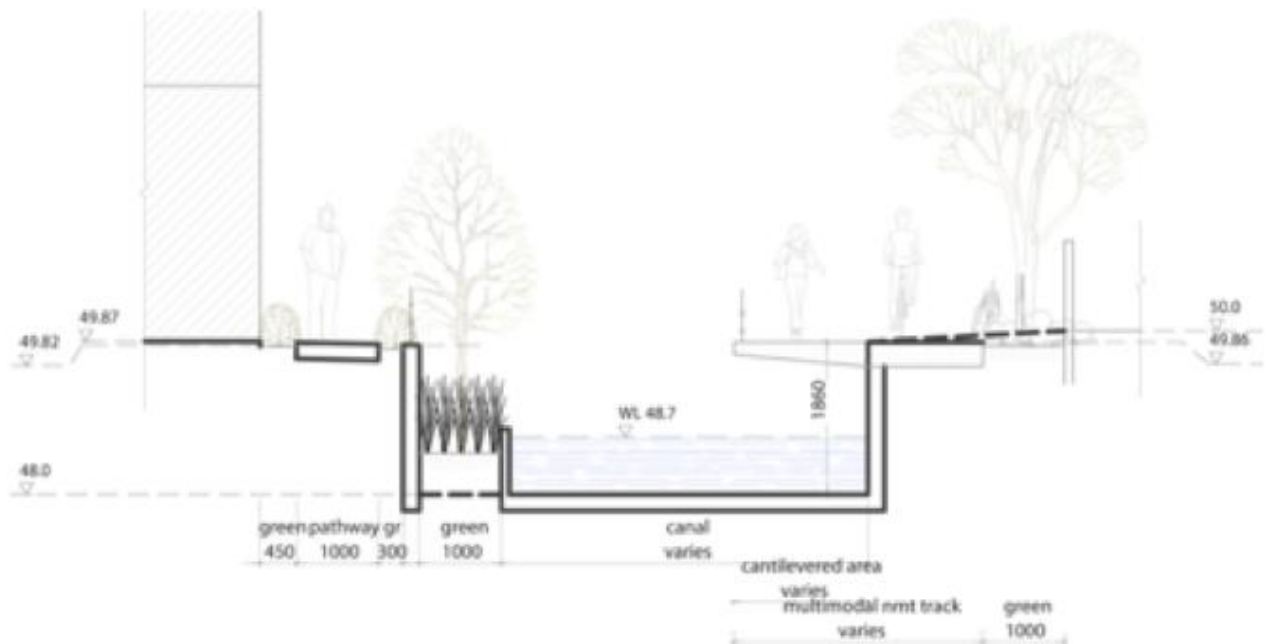


Figure 3. Example of a greenway cross section showing the alignment of waterway elements and mobility corridors for pedestrians and cyclists.

#### 4.8.2 Design of adjacent streets

In the case of any streets in the Immediate Study Area, the designs shall be prepared following the relevant Indian Roads Congress standards, especially IRC 103:2012, Guidelines for Pedestrian Facilities. The consultant should also refer to street design manuals such as Better Streets, Better Cities: A Guide to Street Design in Urban India by the Institute for Transportation and Development Policy, the Street Design Guidelines prepared by UTTIPEC, and Tender Sure: Specifications for Urban Roads Execution, written by Bangalore City Connect and the India Urban Space Foundation. Designs should include the following components (as applicable):

- Dedicated pedestrian footpaths.
- Dedicated cycle tracks (if the corridor falls on the cycle priority network).
- Dedicated bus lanes (if the corridor falls on a public transport priority network).
- Pedestrian crossings, including formal speed table crossings as well as median breaks that serve as informal crossing locations.
- Trees to provide shade for pedestrians and cyclists as well as decorative landscaping, including compensatory afforestation for the trees removed as part of the project.



- Bus stops and paratransit stops.
- Spaces for street vending.
- Medians
- Traffic calming elements, where needed to reduce vehicle speeds.
- Clear demarcation of on-street parking areas
- Street furniture, including benches, stools, tables, and other seating arrangements.
- Signage locations.
- Pedestrian refuge islands.
- Carriageways
- Street lighting
- Storm water drains.
- Utility access points.

Footpath designs should follow the standards presented in IRC: 103-2012, as shown in Figure 2.

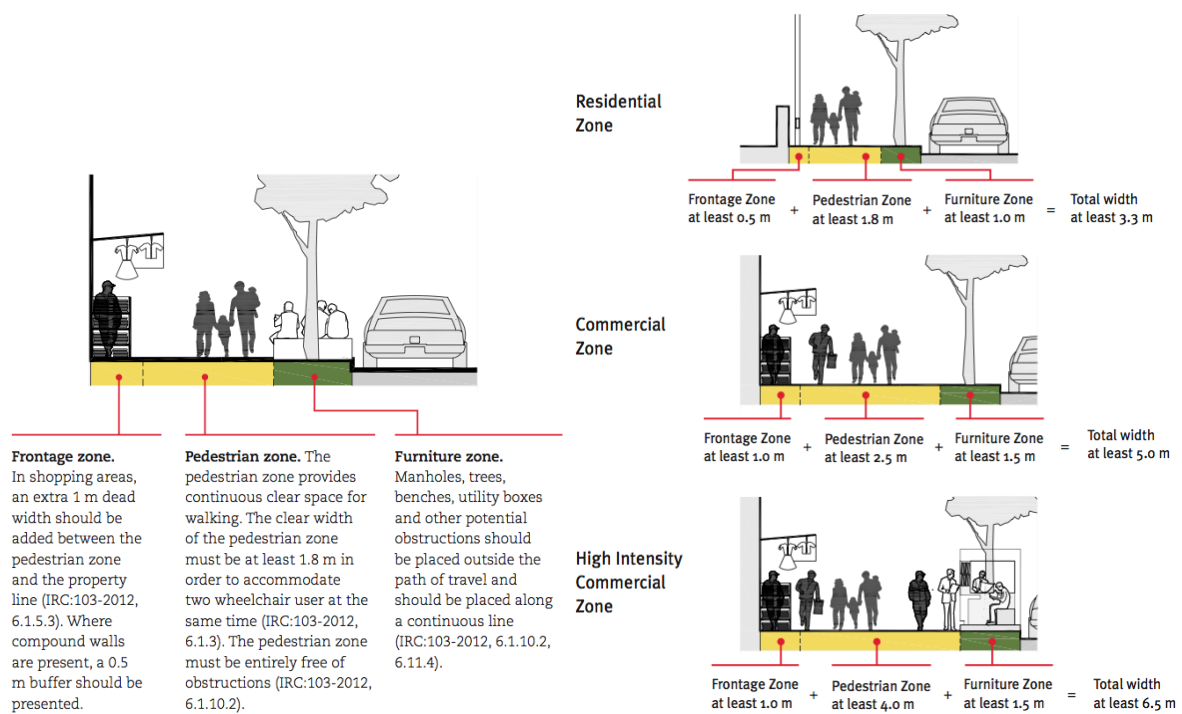


Figure 4. All footpaths should follow the zoning system (left) and should conform to minimum widths as per IRC: 103-2012, Guidelines for Pedestrian Facilities (right).

Intersection designs should promote pedestrian safety through elements such as pedestrian refuge islands, reduced angles of approach, reduced turning radii, and traffic calming. The design of pedestrian crossings at intersections and in mid-block locations should ensure that pedestrians do not need to cross more than 2 lanes (6 m) at a time. Where extra ROW is available, the consultant should

identify opportunities to expand the footpaths and improve and/or create plazas, markets, and other public spaces. The carriageway width should remain consistent between intersections.

#### **4.8.3 Output format**

The Consultant should plan diagrams, sections, and renderings to convey the following elements of the conceptual designs:

- Waterway design
- Landscape design
- Mobility elements
- Facilities

The Consultant will submit the Conceptual Designs in hard copy and electronic format.

#### **4.9 Draft working drawings**

Following approval by [ULB] of the Conceptual Designs, the consultant will prepare preparing detailed construction drawings for the Study Area. The designs should include geometric and vertical profiles and should incorporate drainage designs (see below). The designs should include the following components:

- Typical sections along various segments
- Horizontal control plan
- Grading plan showing proposed contours in relation to the adjacent levels and storm water drainage system.
- Demolition plans
- Planting layout for proposed trees, shrubs and ground cover masses.
- Utility relocation plans (wherever necessary)
- Storm water plans
- Lighting layout plan showing positioning, designing, or selection of all outdoor, lighting features, and their number.
- Facilities plan
- Material specifications
- Construction details for each element

The Consultant will also prepare a bill of quantities (BoQ) for all proposed civil works based on engineering drawings and inputs the Client on rates to be quoted. The consultant will also prepare photomontages/#D Renders showing key typologies along the corridors. The Consultant will submit the working drawings and BOQ (“Draft Working Drawings”) to [ULB] in hard copy and electronic format for review. The consultant will maintain the updated presentations on project background and outputs.

#### **4.10 Final working drawings**

The Consultant will revise the working drawings and BOQ (“Final Working Drawings”) as per the comments received from [ULB]. The Consultant will submit the Final Working Drawings to [ULB] for approval.

#### **4.11 Social impacts**

The Consultant will prepare Environmental and Social Assessment Reports in line with the Environmental and Social Framework (ESF) of the Tamil Nadu Urban Infrastructure Financial Services Limited. The Social Assessment Report will include an initial screening for social impacts, identifying type and nature of impacts, mitigations measures as per the ESF entitlement matrix, public consultation with the identified projected affected persons, public disclosure, implementation arrangements, and mechanisms for land acquisition, resettlement, and rehabilitation. The Consultant will prepare a Resettlement Action Plan (RAP), if applicable, that should take into account of policy provisions and entitlements available in the National Rehabilitation and Resettlement Policy of 2007 along with the provisions of ESF. The Consultant should explore design options to minimize social impacts.

#### **4.12 Management Plan**

The Consultant will formulate a Management Plan covering the following elements:

- Waterway maintenance guidelines.
- Landscaping maintenance, including water supply, pest control, etc.
- Conservancy plan for waste collection along the greenway.
- Interaction with adjacent communities on garbage disposal methods and defecation practices to facilitate upkeep of the greenway.
- Staffing plan for management activities.

#### **4.13 Implementation monitoring**

[ULB] will float tender(s) for construction based on the drawings and BOQ provided by the Consultant. [ULB] will appoint a project management consultant to supervise construction. The consultant will brief the project management consultant on details of the design and will visit the construction site at a weekly (or more frequent) interval during implementation to ensure that the constructed facilities conform to the designs provided by the Consultant. The Consultant will notify [ULB] and the project management consultant of any deviations from the approved designs within twenty-four (24) hours. [ULB] will issue a Completion Certificate upon successful implementation of the designs.

### **5. Review Committee**

[ULB] will form a Technical Committee in order to monitor and review the street design guideline process as well as street designing by empanelled urban designers. The Committee will have direct involvement of the member or the representative of the department as follows:

- Deputy Commissioner, [ULB]
- City Engineer, [ULB]
- Town Planning Officer, [ULB]

- Representative, District Collector
- Representative, Local Planning Authority
- Representative, Traffic Police
- Representative, Public Health Department
- Representative from Respective Pollution Control board
- Representative from the Public Works Department
- Representative from the Irrigation Department

Technical Committee meetings will be organised and hosted by [ULB]. All members except special guests will participate in monthly meetings. Decision on organising a meeting with special members for their experts' comments will be taken by the other members. From time to time, the Additional Municipal Commissioner or City Engineer, [ULB], may organise additional meetings, known as "Mentoring Meetings" with presence of the special members. The Consultant shall make presentation to the present committee members. Committee members will give their comments to the consultant. Consultant shall work upon the comments and present the revisions in the following meeting. The date, time, and agenda for the subsequent technical committee meeting as well as for mentor meeting will be discussed and finalised in every meeting.

## 6. Timeline

Table 1: Work timeline

Consultant output	Description	Deadline
Inception Report	Study area definition, analysis of existing plans, and description of all data collection activities to be carried out	30 days after signing of contract
Data analysis and NMT network proposal	Findings from physical survey, hydrological analysis, analysis of NMT movements, and NMT network proposal	30 days after approval of Inception Report
Draft conceptual proposal	Conceptual designs of greenways.	45 days after approval of data analysis and NMT network proposal.
Consultation with Review Committee	Preparation of presentation and hard copy drawings showing the Conceptual Proposal	Within 30 days of submission of Conceptual Proposal
Revised Conceptual Designs	Revisions incorporating feedback from the Client	30 days after receipt of comments from Review Committee members
Approval from Committee	Schedule meetings with committee, stakeholder, other people concern to get their comments	15 days
Draft detailed working drawings	Detailed design and engineering drawings, bill of quantities, and tender documents	45 days after approval of Revised Conceptual Designs
Final detailed working drawings	Revisions incorporating feedback from the Client	20 days after receipt of Client comments.
Implementation monitoring	On-site monitoring of construction accuracy.	On-going during construction phase

## 7. Bidding Process

## 7.1 Eligibility Criteria

The applicant shall meet the following criteria.

- Experience with designing of at least two (2) comprehensive landscape plans for Government owned parks, community gardens, riverfronts or pedestrian plazas with a combined construction cost not less than Rs 5.0 Cr. A certificate from the appropriate authority shall be enclosed to substantiate the fact. Only works performed by the applicant directly for the respective clients shall be considered.
- Successful completion of similar street design services involving the design of streets, NMT facilities (especially footpaths, pedestrian zones and cycle tracks), public spaces, and amenities for at least two (2) similar projects in India.
- Experience on waste water management, water purification by bio remediation, hydraulics, and flood management.

## 7.2 Skill requirements

The following key professionals are to be engaged by the Consultant along with required support staff. The CVs of the professionals listed in Table 2 will be reviewed as part of the technical evaluation.

Table 2: Skill requirements

Specialization	Requirement
Project Lead	Master's degree in urban design or landscape architect (M Arch or equivalent) from a reputed university. S/he shall have at least 10 years of experience in street design, public space design, and/or non-motorized transport planning.
Architect	Master's degree in urban design (M Arch or equivalent) from a reputed university. S/he shall have at least 5 years of experience in street design, public space design.
Urban Transport Planner	Masters degree in transport planning or equivalent field with at least 8 years of experience. Experience in non-motorized transport planning.
Project Manager	At least 3 years of experience in project management for surveying, design, and construction projects.
Environmental Specialist	At least five (5) years of experience in environmental evaluation and assessment processes required for the development of the infrastructure
Graphic Designer (Renderings)	Master's degree in architecture (M Arch or equivalent) from a reputed university. S/he shall have at least three (3) years of experience in architectural renderings and relevant software. Experience in the design of public transport facilities preferred.

The above team should be supported by adequate support staffs and other experts / specialists with adequate experience to ensure that the objectives of the project are achieved within the time line.

Since the greenway project will require a multidisciplinary approach where along with the main consultant, there will be a need for sub consultant helping with waste water management issue, water

purification by bio remediation method, studying the rainfall data and hydraulics of the channel to be able to design for high flood level, should have experience in solving critical issues.

### 7.3 Evaluation criteria for technical bid

Table 1 indicates the criteria for the technical scoring of applicants.

**Table 3: Scoring criteria**

	Possible score
Methodology and experience	
Approach and Methodology of work	20
Experience with comprehensive landscape plans for Government owned parks, community gardens, riverfronts or pedestrian plazas	20
Similar experience with projects involving street design services (incorporating footpaths, cycle tracks or pedestrian zones)	20
Number of public projects executed for government authorities	10
Team	
Project Lead (relevant experience and qualifications in urban design/street design/greenway design)	7
Architect/Landscape Architect (external consultant with relevance experience and qualifications)	7
Urban Transport Planner (with relevant experience and qualifications)	3
Awards for public space design or street design projects (National or International Level)	10
Total technical score	100

### 7.4 Submission of proposal

The submission envelope must be clearly marked with the following text: “Consulting Services for Greenway Proposal for the [redacted] Municipal Corporation.” The Consultant should include two separate envelopes in the main submission envelope: one containing the Technical Bid and another with the Financial Bid. The sub-envelopes must be marked with the project name and the type of bid. The Technical Bid envelope should contain the following information:

- Name, address, and contact details of the Project Lead.
- Company profile.
- List of technical staff employed full time with the applicant (part time staff shall not be considered).
- Detailed CVs of the technical staff.
- Proof of professional affiliations of staff.

- List of facilities (office space, computers, software, printers/scanners etc.) available with the firm for performing the activities of the TOR, including an indication of which facilities are available in cities in Tamil Nadu.
- Description of approach and methodology for the current TOR.
- Portfolio of previous works.

Applicants may be requested to make presentation to the Client indicating the following:

- Experience with similar type of greenway design projects
- Proposed approach and methodology for the current project

The Financial Bid envelope should include the Consultant’s monetary bid for the project. Applicants shall submit all materials before date mentioned in the notice.

### 7.5 Financial proposal

Financial Bids of applicants with a total Technical Bid score of 75 and above shall only be opened. For Consultants who do not qualify per the Technical Bid, the Financial Bids shall be returned unopened.

The score for each Financial Proposal,  $F$ , will be computed as follows:

$$F = 100 \times F_m / F_c$$

where  $F_m$  is the total price of the lowest Financial Proposal and  $F_c$  is the total price of the Financial Proposal under consideration. The lowest Financial Proposal will receive the maximum score of 100 marks.

### 7.6 Combined evaluation of technical and financial bids

The Client reserves the right to reject, at its sole discretion, any or all evaluated Financial Proposals and if necessary, calls for submission of new Financial Proposals. In order to allow comparison on a common basis, each proposal will be carefully scrutinised in accordance with the procedure outlined above and technically eligible proposals will be scored on the basis of following formula:

$$\text{Score} = 0.75 T + 0.25 F$$

where T is technical score and F is financial score. The Bidder with the highest Score will be selected.

## 8. Annex 1. Details of greenway corridors

Table 4: Details of greenway corridors

Corridor name	From	To	Length (km)

