



Designing facilities for NMT users

Workshop report

Institute for Transportation and Development Policy
for the Institute of Urban Transport
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Workshop overview

“Designing Facilities for Non-Motorised Transport Users,” a national-level workshop for municipal officials, was developed by the Institute for Transportation and Development Policy (ITDP) with support from the Institute of Urban Transport (IUT). The workshop is part of a series of trainings organized by IUT under the auspices of the Sustainable Urban Transport Project (SUTP). Trips by walking and cycling account for over a third of all trips in many Indian cities. While there is wide consensus that street design should place greater emphasis on accommodating pedestrians and cyclists, there is limited understanding of the design requirements of these users.

Objective

The main objective of the workshop was to highlight and share innovative methods and approaches for creating better NMT facilities. The workshop sought to present a synopsis of the design process, from observation and data collection on to the selection of a final design alternative. Through a combination of site visits and design exercises, participants gained first-hand experience in designing facilities for pedestrians and cyclists.

Audience

The workshop was attended by 36 participants, including town planners, engineers, a municipal commissioner, and senior state government officials. Participants hailed from numerous states, including Andhra Pradesh, Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh, and West Bengal.

Agenda

The workshop was held from May 23-25, 2012, at the Parkland Hotel, Green Park in Delhi. Representatives from IUT and ITDP facilitated the workshop. The workshop included a combination of presentations from Nelson Nygaard and ITDP experts, a site audit and training exercise, walking tours, observation and analysis of NMT facilities at the Chirag Delhi intersection, and group work to re-imagine the area around Laxmi Nagar in east Delhi.

Presentations from the workshop

<i>Title</i>	<i>Presenter</i>
Street Users Part I: Presentation: Principles of Street Design and NMT Safety	Michael King, Nelson Nygaard
Methods of Observation in Street Audits	Michael King
Bicycle Facility Design	Michael King
ITDP and EPC’s Better Streets, Better Cities	Nitin Warriar, ITDP
On-Street Parking Management	Anumita Roychowdhury, Centre for Science and Environment
A Pedestrian’s Experience in the National Capital Region of Delhi	Raka Choudhury, Urban Planner

Low Carbon Mobility Planning in Vishakhapatnam	B. Ramanjaneyulu, Municipal Commissioner, Vishakhapatnam
Street Design and Storm Water Management	Akash Hingorani, Oasis Designs

Green Park site audit

The first day of the training workshop began with a street audit exercise near the Green Park metro station. Participants were randomly divided into five different teams and were allocated five sites in the Green Park area. Participants were asked to observe and analyse physical conditions and user behaviour on the streets in their study area. Specific observations from each area are presented in the tables below.



Team site visit locations in Green Park

Team A

<i>Site description</i>	<ul style="list-style-type: none"> • On one side of the street is the planned market area of Green Park. There is a large pedestrian plaza in front of the shops. On the other side, formerly residential properties have converted to commercial uses.
<i>Main issues</i>	<ul style="list-style-type: none"> • There is an apparent shortage of parking • Lack of continuous and free pedestrian pathway on one side • No traffic management at intersections • No separate cycle lanes and stands • No public transport and shelters • No pedestrian crossings • No access for disaster management operations



In the Green Park market area, pedestrian facilities are inadequate (left). At junctions, there are no formal pedestrian crossings (right).

Team B

<i>Site description</i>	<ul style="list-style-type: none"> • The street functions as a local artery, connecting Aurobindo Marg and the interior Green Park locales.
<i>Main issues</i>	<ul style="list-style-type: none"> • Management of land use changes from residential to commercial, resulting in higher parking demand • Congested walkways • No marked pedestrian crossings, resulting in haphazard crossing behaviour



Team B observed that many residential buildings are now used as office and retail spaces (left). Footpaths are discontinuous and compromised by parking encroachments (right).

Team C

<i>Site description</i>	<ul style="list-style-type: none"> • Narrow internal lanes of Green Park. As with the other sites, residential buildings are now used as commercial spaces.
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<i>Main issues</i>	<ul style="list-style-type: none"> • Private entities have restricted access to portions of the public right-of-way • Dirt instead of a walkway. Main carriageway used for pedestrian movement • Parking on both sides of the road • Cycling is safe due to low speeds • Unutilized and vacant properties make the street unsafe at night • Shaded street (good mature trees) • Commerce spills onto the street
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Team C observed heavy parking demand on Green Park’s interior streets. The narrow width allows the street to function as a safe shared space, and the mature tree canopy creates a comfortable environment for pedestrians and cyclists.

Team D

<i>Site description</i>	<ul style="list-style-type: none"> • Major arterial corridor with large-scale commercial and institutional uses, anchored by the Green Park metro station.
<i>Main issues</i>	<ul style="list-style-type: none"> • No defined parking areas. Haphazard parking obstructs traffic flow • Footpath is not user friendly. Service lane and footpaths are used for parking • No defined bus stops location and shelter • No separate lanes for public transport or non-motorised vehicles • No amenities along with road for users



Utility boxes and parked cars prevent pedestrians from using the footpaths along Aurobindo Marg (left). The bus stop at the Green Park metro station (right) has neither a shelter nor identifying signage, forcing passengers to wait under the hot afternoon sun.

Team E

<i>Site description</i>	<ul style="list-style-type: none"> • Sub-arterial with institutional, residential, and some commercial uses.
<i>Main issues</i>	<ul style="list-style-type: none"> • Lot of unused spaces with the potential to be converted into public spaces with good design intervention. • Risky pedestrian crossings with lot of conflict points • No bus route or bus stop observed in the inner street of the stretch • High Parking demand, at metro station parking as well as inner streets. • Some direct property openings on walkways, some through service lanes.



While some land uses in the study area have blank edges, street vendors serve as “eyes on the street” (left). Footpaths are poorly maintained (right).

Summary

The following table indicates common elements observed by the teams.

<i>Item</i>	<i>Condition</i>	<i>Group</i>				
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>

Land use	Changing		X	X		
Building frontage	Vacant			X		
Alleys and internal streets	Gated	X	X	X		
Walkways and footpaths	Blocked/obstructed/broken/absent	X	X	X	X	X
On-street parking	Mismanaged	X			X	X
Trees	Many			X		
Street furniture	Minimal				X	
Roadway	No signs, marking, signals	X	X	X		X
Roadway	Excess asphalt		X			
Roadway	Lanes not efficient				X	
Vehicle speed	Low			X		
Public transport	No stops or routes	X	X			
Vendors	Mismanaged			X		X
Public space	Minimal					X

Connaught Place walking tour

On the evening of day 1, participants visited a recent public space project on Baba Kharak Singh Marg in central Delhi. Stretching from Regal Cinema to Connaught Place Police Station, the area is anchored by the Hanuman Mandir, a popular gathering point for Delhi residents. The tour was led by urban designer Akash Hingorani, who designed the whole stretch. Mr Hingorani explained the design process and challenges encountered by the team. Mr Hingorani pointed out key design features, including safe pedestrian walkways, dedicated cycle tracks, parking areas, the integration of the street elements with metro station access routes and recreational and cultural amenities. The tour showcased how design interventions can help organize public spaces and make streets safer, more people friendly, and attractive for users.



Participants on an evening site visit to a pedestrian subway on Baba Kharak Singh Marg.

Findings

Specific observations during the walking tour included the following:

- **Continuous pedestrian pathways.** Pedestrian footpaths remain at the same level throughout the stretch. At property access points, vehicles must mount a ramp to enter a property but pedestrians and cyclists remain at grade. This helps reduce the speed of vehicles when they cross the pedestrian and cyclist realm. Though the levels were designed well, participants observed that the footpath material changed at vehicle access points. Maintaining the same material could provide a better sense of continuity for pedestrians and signal to motor vehicle users that they are entering a pedestrian zone.
- **Formalized vending areas.** Earlier, vending was chaotic and there were no formal facilities. The design provided formal platforms for curio vendors and a kiosk for flower salespersons.
- **Conversion of surface parking into public spaces.** A large area in the precinct was converted from a surface parking lot into a public space. The parking was shifted to a nearby multilevel parking facility.
- **Dedicated cycle tracks.** Physically segregated cycle tracks were built to provide safety from fast-moving vehicles. The cycle tracks were paved in reinforced cement concrete to provide a smooth riding surface.
- **Landscaping.** The design provided a plantation strip between the carriageway and the NMT areas, creating a buffer between motor vehicles and pedestrians and cyclists. The design also incorporated existing heritage trees by re-arranging the order of the footpath and cycle track in certain locations.
- **Open-air theatres.** Amphitheatres were introduced to facilitate cultural activities and also to make the public spaces more attractive even after working hours. Earlier, parked vehicles occupied the same spaces.
- **Pedestrian crossings.** Participants visited intersection and midblock pedestrian crossings with different treatments. Near the Hanuman Mandir, a pedestrian subway was upgraded with the aim of improving safety and bringing more activity to the lower level. However, participants observed that the subway was poorly lit and that lower spaces were not being maintained. Elsewhere in Connaught Place, participants observed pedestrian crossings that were raised to the level of the footpath, forming a speed breaker for vehicles.

Laxmi Nagar design exercise

Laxmi Nagar in East Delhi is one of the busiest intersections in the Delhi metropolitan region. The intersection is an intermodal hub with a metro station, bus stops, paratransit facilities, and a heavy inflow of pedestrians from near by residential localities. There is competition for scarce road space among different road users, including pedestrians, auto rickshaws, cycle rickshaws, cyclists, vendors, motor vehicles, and vendors. The nearby localities have a good dense mix of residential and commercial units. The intersection has quite different traffic pattern during morning and evening hours. These attributes made the site an appropriate case study for the workshop.



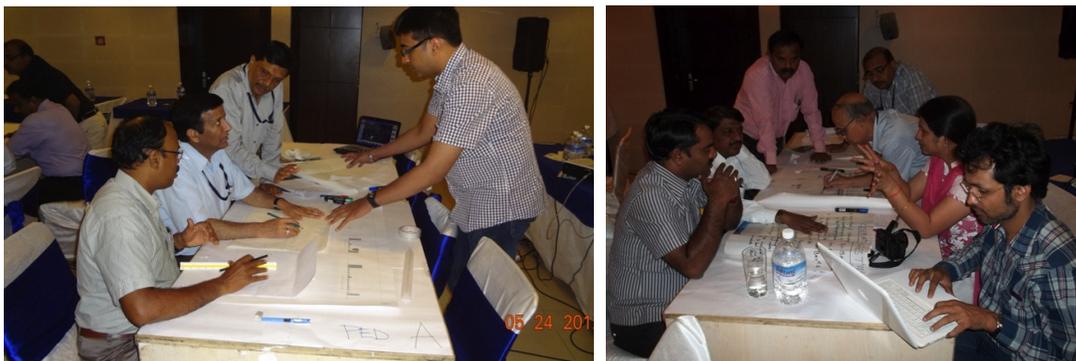
Heavy evening traffic at Laxmi Nagar intersection (left). In the absence of safe and convenient formal crossings, the intersection sees chaotic pedestrian movements in all directions (right).

Design process

Workshop participants were divided into five teams, with each team tasked with developing a design proposal for the intersection. Each team was asked to focus improving conditions for a specific user group:

- Team A: pedestrians
- Team B: public transport
- Team C: land use, buildings, and public space
- Team D: cyclists and cycle rickshaws
- Team E: motor vehicles

The teams visited the study area in the morning and evening to observe peak hour traffic. Team members observed movements of pedestrians, cyclists, auto rickshaws, motor vehicle drivers, and bus passengers. They worked together, discussing and analysing their observations and findings to develop a plan to re-configure the intersection. The goal was to solve existing issues related to NMT users to improve the overall safety and mobility.



Teams A (left) and B (right) discussing design solutions for Laxmi Nagar.

Street design expert Michael King, Principal at Nelson Nygaard, outlined a three-pronged strategy for designing pedestrian-friendly streets at Laxmi Nagar intersection:

- First, observe physical conditions and street user behavior

- Second, test design solutions through an iterative process, and
- Third, set a direction for policies that are supportive of non-motorized transport.

The exercise emphasized the need to identify and understand the existing problem rather than jumping to solutions. The teams prepared two different sketches: one showcasing movement patterns and site issues; and a second showing possible interventions.



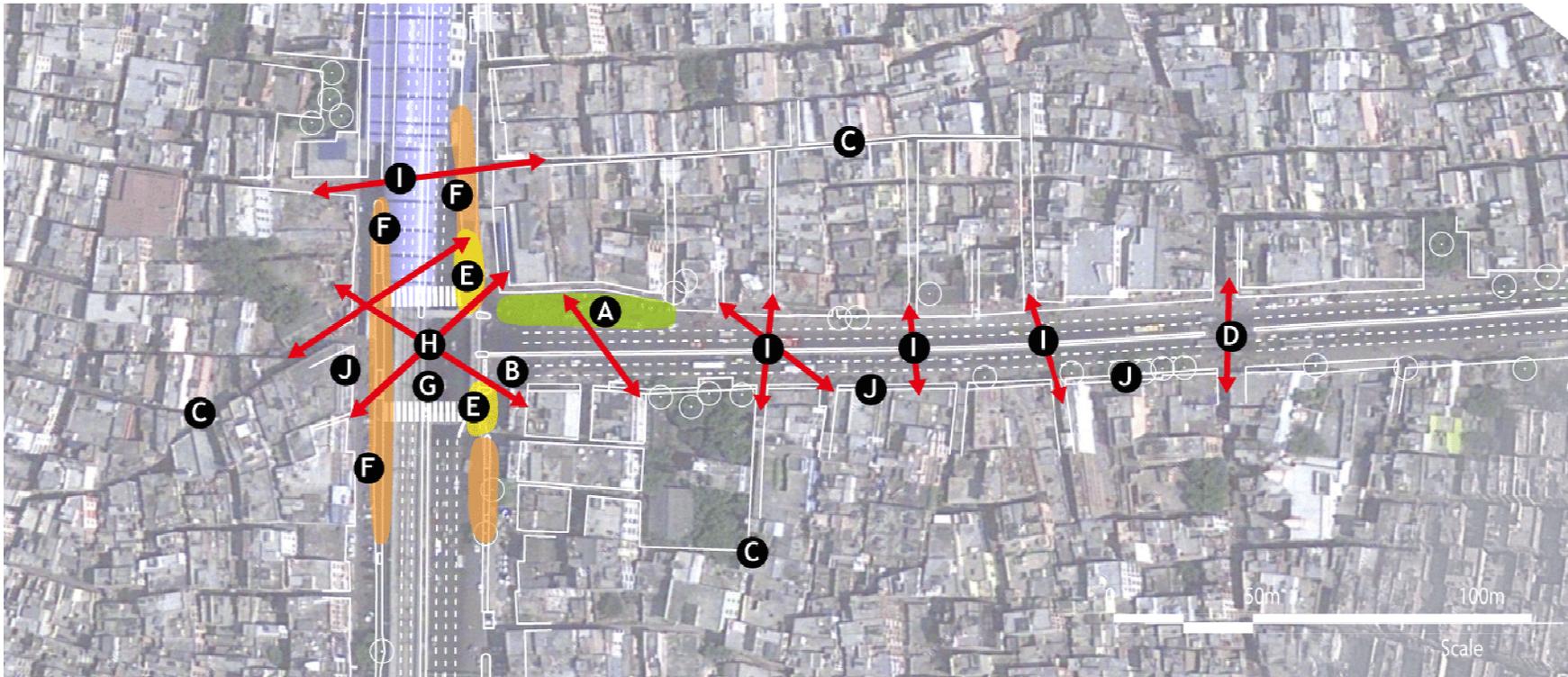
Teams C (left), D (middle), and E (right) engaged in the design exercise.

General observations

The teams observed poor pedestrian facilities at the intersection, with no pedestrian signals and uneven, obstructed, and poorly maintained footpaths. They also noticed that the foot overbridge did not see much use by pedestrians, who instead crossed at the surface level. Also, the central media is too high and prevents pedestrians from crossing the road safely. Pedestrians were observed walking along the median, in the midst of heavy vehicle traffic, looking for a break where they could cross.

The buses plying on the route have no dedicated bus stops and stop arbitrarily on the main carriageway, leading to traffic jams near the intersection. Queues caused by bus boarding are particularly acute during the evening hours, when they compromise the operation of the Laxmi Nagar junction. In the absence of proper bus stops, passengers were observed waiting on the road to catch. Similarly, auto rickshaw drivers who parked their vehicles close to the intersection, adding to the traffic chaos. Blocked turn lanes caused significant queuing.

Finally, participants observe a serious problem of unorganized on-street parking throughout the study area. Footpaths were compromised by blatantly illegal parking, and no parking enforcement officials were observed during the site visit.

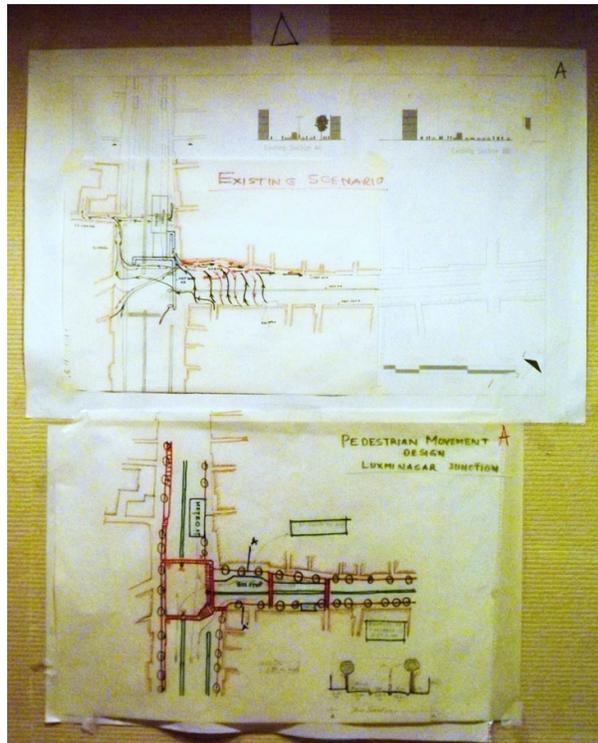


- A. Street space is poorly defined at the bus stop, with bus passengers and vendors jostling for space. There is an opportunity for a public plaza where the right-of-way broadens.
- B. The lack of a right turn from New Patpar Ganj Rd onto Vikas Marg impacts drivers and cyclists. Drivers have the option of using Old Patparganj Rd, but for cyclists and rickshaws making shot trips, the left turn is needed.
- C. The network of smaller streets should be integrated with street operations, especially for crossings.
- D. Pedestrian crossings at this junction need safety enhancements. The distance between this intersection and the main T-junction is over 200 m, which is too far for this location. At least one more formal pedestrian crossing should be added.
- E. Corners are ill-defined and allow drivers to make fast turns and block traffic.
- F. In several locations, the carriageway and service lane widen to provide space for parking, but this space is poorly managed and simply conflicts with other uses.
- G. Lanes at the junction need to be aligned and reduced to reflect permitted movements.
- H. Numerous diagonal pedestrian crossings need to be accommodated or eliminated.
- I. Midblock crossings, especially at smaller roads, need to be allowed and enhanced. Medians need to be widened to properly protect pedestrians crossing.
- J. Space along buildings is ill-defined and could be cleaned up.

Mode-wise recommendations

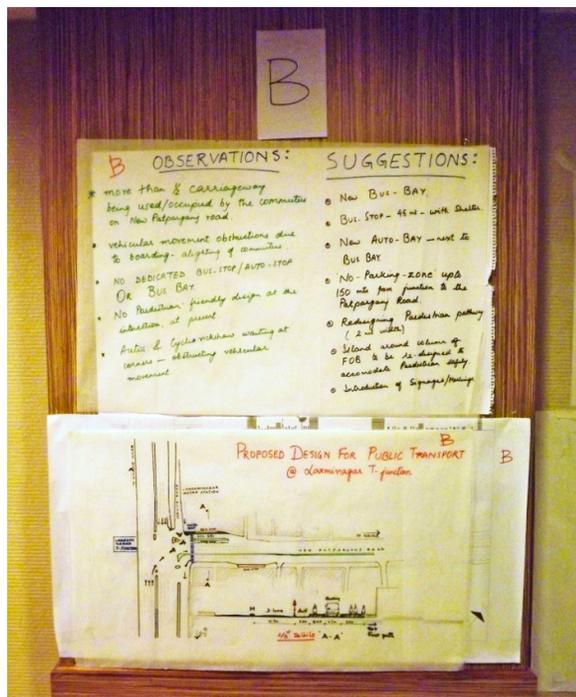
Team A (focusing on pedestrians)

- Existing traffic signals should be properly synchronized and a separate pedestrian slot should be added to have a dedicated signal for pedestrians on all the legs.
- Existing footpaths should be widened to standards and made obstruction-free.
- Islands around the column of foot overbridge should be redesigned to accommodate pedestrians safely.
- Aesthetic improvement for access to the metro stations.



Team B (focusing on public transport)

- Provision of an integrated public transport stop with proper amenities for passengers including dedicated waiting space and shelter from the sun and rain
- Provision of separate designated pick-up points for buses, autos, and cycle rickshaws



Team E (focusing on motor vehicles)

- Advanced signal phasing for easy movement of vehicular movement
- Vehicle underpass for vehicles turning right from Vikas Marg onto New Patpar Ganj Rd

