RETOFITTING PLAN

TO PROMOTE

NON MOTORISED TRANSPORT AND PEDESTRIANISATION

JASOLA – SARITA VIHAR

TOWN AND COUNTRY PLANNING ORGANISATION
MINISTRY OF URBAN DEVELOPMENT,
GOVERNMENT OF INDIA

K.K. JOADDER
J. K. KAPOOR
JASMINE B. MALLICK
Sustainable transport relies on efficient use of resources. NMT modes like walking and cycling are energy and resource efficient.

**NATIONAL URBAN TRANSPORT POLICY (NUTP), 2006**
Recognizes non-motorised transport such as bicycle / cycle rickshaw and pedestrianisation as an integral part of urban transport and mobility.

**NMT BENEFITS**
- Economical
- Inclusive – all classes, gender, age
- Low carbon footprint – no fossil fuels
- Community building – provides opportunity for social interaction
- Increased employment avenues due to greater accessibility
- Decreased demand for parking space, congestion
- City image improvement - increased experience due to reduced speed
- Improved physical and psychological health of population
LAST MILE CONNECTIVITY TO PUBLIC TRANSPORT NETWORKS (BUS/ TRAIN/ METRO) IS PROVIDED BY NMT MODES.

Most trips are short (within 5 KMS) and can be converted to NMT modes like walk / cycle / cycle rickshaw.

PUBLIC TRANSPORT

AFFORDABLE TRANSPORT OPTIONS

TRAVEL DISTANCE

LAST MILE CONNECTIVITY

PARK/ GYMS; NURSERY AND PRE PRIMARY SCHOOLS

TAILOR/ LAUNDERY/ OTHER SERVICES

VEGETABLES/ FRUITS/ POULTRY/ EGGS/ MILK/ GROCERIES

SENIOR SECONDARY SCHOOL/ COLLEGE

WORK; SPECIAL MARKETS (FURNITURE/ CLOTHES; OCCASIONAL RECREATION)
DELHI AS THE CITY FOR NMT BECAUSE:
• Planned City
• Developed Transport Networks include Bus, Local Train and Metro
• Strong presence of NMT modes – Walk, Cycle and Cycle Rickshaw

NMT modes are ideal for short trips and as feeders for public transport

60% short trips 1-4KMS

35% dedicated walk trips

38% Public Transport

73% Delhites walk

35% Delhites own cycles

Cycle trips: 4%

Feeder

Metro: 3%

Bus: 27%

Rail: 2%

61% walk to metro &

78% walk from metro

12% hail a cycle ricksha to metro &

9% hail a cycle ricksha from metro

*Percentage share of trips in the specific mode for Delhi
National Urban Transport Policy 2006 recommends:
- Safe
- Affordable
- Quick
- Comfortable
- Reliable
- Sustainable

Sought to be achieved by (Relevant points):
- **Integrated land use and transport planning** to minimize travel distances and improve access, especially for the marginal urban segments
- **Equitable allocation of road space with people, rather than vehicles, as its main focus.**
- Encourage greater **use of public transport and non-motorized modes by offering Central finance**
- Establishment of **multi-modal public transport systems** with seamless travel across modes
- Ensuring enhanced **safety and trauma** response
- Reducing **pollution levels** and promoting the use of cleaner technologies
- Raising finances that tap land as a resource, **involve the private sector**
- Taking up **pilot projects that demonstrate the potential of possible best practices** in sustainable urban transport
National Mission on Sustainable Habitat

The parameters addressed through NMSH are:
- Public health
- Vehicle emissions
- Vulnerability of walkers and cyclists to roadside exposure
- Transport and climate
- Equity and access for the poor

The National Mission for Sustainable Habitat on urban transport addresses 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 the use of alternate fuels
- Evolving strategies for adaptation in terms of realignment and relocation, design standards and planning for roads, rail and other infrastructure to cope with warming and climate change.
Indian Penal Code (sec 283), sec 34 of Delhi Police Act -- Obstruction in public space punishable. Danger or obstruction in public way or line of navigation: Whoever, by doing any act, or by omitting to take order with any property in his possession or under his charge, causes danger, obstruction or injury to any person in any public way or public line of navigation, shall be punished with fine which may extend to two hundred rupees.

Central Motor Vehicles rules (CMVR) 1989 Safety Rules provide passive protection for pedestrians, stating that motorists cannot enter pedestrian way and are liable to penalty.

Urban Street Vendor policy, 2007, to protect livelihood rights – recommend Guidelines for proper vending zones, as they are service providers on sidewalks...

The National Policy on Urban Street Vendors, 2009, The national policy gives street vendors a legal status and aims at providing legitimate vending/hawking zones in city/town master or development plans.”

Police Act provides for penalty for jaywalking.

Persons with Disabilities Act 1995 (Sec 44) recommends guidelines for the disabled persons.
IRC Guidelines for Pedestrian and Cycle track design provide basis standards for pedestrian and cycle oriented design

**IUT Manuals:** inclusive mobility is reflected in the proposed design standards with special attention to the details required in infrastructure and its various design components.

**Street Design Guidelines, UTTIPEC, DDA** - A set of 10 non-negotiable Street Design Components as well as additional guidelines for world class streets.

**Supreme Court directive on increased use of Public Transport in Delhi.**

“Over the years, it has become clear that each city is fighting a losing battle against air pollution and growing congestion — because of the growing numbers of vehicles. Economic progress of our cities will depend on their environmental health. A turnaround is only possible when cities recognize the need for a transition to public transport and adopt it.”

**Delhi High Court directives on lanes for NMV (29th May 2014)**

Delhi High Court directed Delhi Government to submit plan for NMV. “*You have hundreds of areas where you can have pilot projects....... Road space is democratic everybody must have a share. If you can address BRT, you can take care of NMV also*”
Master Plan of Delhi 2021 provisions:

- All roads should be made pedestrian, disabled and bicycle friendly.
- Provision of adequate pedestrian facilities.
- Removal of encroachments from sidewalks.
- Provision for introducing cycle tracks, pedestrian and disabled friendly features in arterial and sub-arterial roads.
- In urban extension, cycle tracks should be provided at the sub-arterial and local level roads and streets.
- In specific areas, like the Walled City / Chandni Chowk / Sadar Bazar / Karol Bagh / Lajpat Nagar and Trans Yamuna Area, the use of cycles/rickshaw as a non-motorised mode of transport should be consciously planned along with pedestrianisation.
Responsibility and Multiplicity of Organisations

DDA:
- RoW defined by Master Plan of Delhi as per site conditions

MCD:
- Built Form controls as per building bye laws

MCD/DDA:
- Building plans sanctioned by MCD and DDA

Jal Board:
- Positions of Manholes

NGO/MCD:
- Street Lights

Telephone Ex:
- Telephone Box

DDA/MCD/PWD:
- Maintenance and execution of new works

Traffic Police:
- Traffic Regulation, Signals

MCD:
- Hawkers as per Street Vendor Policy

PWD:
- Speed Breaker

Police:
- Cars as per Motor Vehicle Act

XXX:
- Cyclists, Bullock Carts, other NMT modes

Jal Board:
- Drainage and Sewerage line laying, maintenance

DDA/DUAC:
- Redesign and planning

DISCOMS:
- Electric Poles

DDA/MCD:
- Public Toilet

MPLAD Fund:
- Foot Path with paved surface
- Trees and soft scapes

Horticulture Deptt:
- Trees and soft scapes

DTC:
- Bus Stop

Jal Board:
- Jal Board

PWL:
- Paved surface

NGO:
- Dance

MCD:
- Colour

DISCOMS:
- Power lines

DDA:
- Work in progress

Telephone Exchange:
- Telephone EX

Horticulture Deptt:
- Trees and soft scapes

TCPO, MoUD

Refitting for Non Motorised Transport
SITE SELECTION: JASOLA AND SARITA VIHAR CRITERIA

- ENVIRONMENTALLY ACTIVE: RIVER YAMUNA BORDERS THE SITE, AGRA CANAL CUTS ACROSS THE SITE, STP IN THE VICINITY AND DISTRICT PARK IN THE SITE
- OKHLA BIRD SANCTUARY BORDERS THE SITE
- DIVERSE LAND USES AND DEVELOPMENT TYPOLOGIES: JASOLA DISTRICT CENTRE, MOHAN CO-OP INDUSTRIAL AREA, APOLLO HOSPITAL, PLOTTED AND FLATTED RESIDENTIAL COLONIES OF HIG, MIG, LIG, EWS AND SFS FLATS AS WELL AS VILLAGES AND AN UNAUTHORISED COLONY
**STREET AUDIT:** Questionnaire developed on basis of UTTPEC Guidelines, IUT Manuals and International Case Studies

**FEATURES:**
- Footpath
- Median
- Carraigeway
- Speed regulating mechanisms
- Signages and road markings
- Lighting
- JUNCTIONS
- PEDESTRIAN CROSSINGS (FOB/SUBWAY)
- STREET FURNITURE
- TREES
- TRAFFIC NODES – BUS/METRO/RICK PARKING

**CHARACTERISTICS**
- Location / Stretch
- Dimensions: Width/Height with variations
- Material: Colour and Texture
- Functional Integrity
- Condition of maintenance
  Supported by photographs

**URBAN DESIGN ANALYSIS**
- Land use
- Activity patterns
- Built form
- Density
- Master plan and zonal plan

**TRAFFIC IMPACT ASSESSMENT**
- Travel characteristics
- Public transport nodes
- Activity patterns

**EXISTING NMT INFRASTRUCTURE PLAN**
- Network design
- Row and junction design
- Component features
- Footpaths, FOB FUB

**RETROFITTING PLAN FOR NMT**
- Row design
- Junction design
- Traffic redirection
- Component design
- Segregated lanes

**IMPLEMENTATION AND ACTION PLANS**
- Policy and Legal Revisions
- People Participation Model
- Financial Structuring
- Institutional Responsibilities
STREET AUDIT TEAMS

- 3 TEAMS: 4 PERSONNEL EACH
- STREETS FOR AUDIT IDENTIFIED AND ASSIGNED TO EACH TEAM
- INTENSIVE SURVEY SCHEDULE OF 4 WEEKS
- PHOTOGRAPHIC AND VIDEOGRAPHIC RECORDING OF ACTIVITIES ALONG ROADS
- PARTIALLY COMPLETED QUESTIONNAIRES CARRIED TO SITE
- EQUIPMENTS USED: SAFETY JACKETS, TRAFFIC CONES, STOPPING TAPE, LASER MEASURING INSTRUMENT AND OTHERS...

STREETS AUDITED:
- 13 STREETS
SITE ANALYSIS: LAND USE AND TRAFFIC FLOW

BUILT UP AREA AND LAND USE PLAN OF THE SITE GENERATED ON AUTO CADD

This identifies areas that attract traffic and those that generate traffic.

Residential areas generate traffic towards the local shopping areas, parks and industrial area in the morning.

Traffic flow is reversed in the evening and is directed towards residential areas through traffic of Faridabad, Delhi and Noida currently flows along NH2, GD Birla Marg and Road No. 3, 6.
THE BUILT FORM IS GENERALLY G+3/4 WITH THE EXCEPTIONS OF JASOLA DISTRICT CENTRE
JASOLA VIHAR: G+7
THE BUILT FORM IS GENERALLY G+3/4 WITH THE EXCEPTIONS OF JASOLA DISTRICT CENTRE
JASOLA VIHAR: G+7
GENERAL ISSUES IDENTIFIED ON SITE

FOOTPATHS – POOR MAINTENANCE, DESIGN

- BROKEN FOOTPATH
- RAISED SLAB OBSTRUCTION
- RAISED MANHOLE
- MISSING PAVERS
- OPEN DRAIN
- PARKING MAKES FOOTPATH PEDESTRIAN UNFRIENDLY

TCPO, MoUD
GENERAL ISSUES IDENTIFIED ON SITE

OBSTRUCTIONS ON FOOTPATHS

- BUS STOP
- HT PYLON
- ELECTRICITY BOX AND TREE
- ELECTRICITY BOXES
- SIGNAGE
- PRIVATE PLOT LANDSCAPE
GENERAL ISSUES IDENTIFIED ON SITE

CONDITION OF FOOTPATH AND PUBLIC TOILETS

- Foot over bridge – elevated entry on ramp
- Unpaved footpath
- Unpaved footpath obstructed by public toilet (non-functional)
- Undeveloped footpath
- Debris on walkway
- Negative space behind public toilet

TCPO, MoUD
GENERAL ISSUES IDENTIFIED ON SITE

DISCONTINUITY OF FOOTPATH

TREE ON WALKWAY

JUNCTION DESIGN

MISSING FOOTPATH

SHOPS ON FOOTPATH

POLICE CHOWKI

GATE OBSTRUCTION
GENERAL ISSUES IDENTIFIED ON SITE

FAULTY LANE MARKINGS, MISSING COMPONENTS OF NMT INFRASTRUCTURE

- No lane markings
- No traffic calming measures at junction
- Wide lane markings
- No cycling infrastructure
- Only carraigeway developed, maintained
- Single lane: more than six meters

>6 M

TCPO, MHD

RETROFITTING FOR NON MOTORISED TRANSPORT
NMT TRACK HAS BEEN DESIGNED ALONG ALL ARTERIAL AND COLLECTOR ROADS

NMT TRACKS RUN ON BOTH SIDES OF THE ROADS OR ON JUST ONE SIDE (DOUBLE LINE INDICATES TRACK ON BOTH SIDES)

TWO WAY TRACKS ARE INDICATED IN BLACK
UIDIRECTIONAL TRACKS ARE INDICATED IN RED

STRETCHES HIGHLIGHTED IN WHITE ARE EXCLUSIVELY FOR NMT TRAFFIC

FOOT PATHS RUN ON BOTH SIDES OF THE ROADS OTHER THAN THE STRETCHES IN BLACK DOTS (SINGLE SIDE)
JUNCTIONS ON NH2 ARE SIGNALISED WITH TABLE TOP SPEED REGULATION MECHANISMS COUPLED WITH A RUMBLE STRIP.

JUNCTIONS ON G D BIRLA MARG ARE SIGNALISED WITH TABLE TOP SPEED REGULATION MECHANISMS COUPLED WITH A RUMBLE STRIP. SOME INTERSECTIONS HAVE BEEN RESTRICTED FOR MOTOR VEHICLES OR DIRECTIONAL CONTROLS.

COLLECTOR ROADS HAVE INTERSECTIONS WHICH ONLY HAVE A TABLE TOP AND NO SIGNAL OR RUMBLE STRIP. ROUNDABOUT IS RETAINED NEAR JASOLA DISTRICT CENTRE.
ROAD NUMBER 1 (NH 2): EXISTING ROW DETAILS

ROAD 1

TCPO, MoUD
NH 2 LINKS DELHI TO ITS SATELLITE TOWN OF FARIDABAD AND IS A BUSY ARTERIAL ROAD WITHIN THE CITY.

IT HAS EVOLVED FROM BEING A HIGHWAY TO ITS STATUS AS AN ARTERIAL ROAD POST 1990S AFTER DDA STARTED DEVELOPING THE AREA TOWARDS THE NORTH EASTERN STRETCH OF NH2, LIES APOLLO HOSPITAL AND A FEW GOVERNMENT OFFICES, THE JASOLA DISTRICT PARK AND THE JASOLA DISTRICT CENTRE.
NH 2 is flanked by the erstwhile industrial area of Mohan Cooperative to its west.

This currently has numerous offices, restaurants, banquet halls and automobile showrooms with top brands like Lamborghini, Honda, Volkswagen, Skoda and Hyundai, Maruti, etc. . . .

Beyond this commercial strip runs the broad gauge railway line from Delhi to Mumbai. Okhla industrial estate is located beyond the railway land to the west.

Towards the south eastern stretch of NH2, lies the residential colony of Sarita Vihar, its local markets and at the very extreme south, an institutional area – the Shanti Bhavan and a DDA park.
THE DRAIN FLOWING UNDER NH2 FROM WEST TO EAST TOWARDS THE YAMUNA MARKS THE END OF THE NMT SITE. A SEWERAGE TREATMENT PLANT IS LOCATED ALONG NH2 TO ITS EAST AND NORTH OF THE DRAIN.

THE SOUTHERN END OF MOHAN COOPERATIVE HAS THE OFFICES OF SAMSUNG, ANCHOR, SHWARZ, SIMON AND OTHER PROMINENT BRANDS IN THE IT SECTOR.

SOUTH OF THE DRAIN AND TO THE EAST OF NH2 LIES THE DMRC METRO YARD.
ROAD NUMBER 1 (NH 2):

PROPOSALS

TCPO, MoUD

RoW 70.65 METERS

A EXISTING

UNSAFE FOR PEDESTRIANS DUE TO REGULAR OBSTRUCTIONS AND TRAFFIC FROM BOTH SIDES

WIDE MOTOR VEHICLE LANES ENCOURAGE RASH, SPEEDY DRIVING; NOT DESIGNED AS PER PRESCRIBED SPEED LIMITS

A PROPOSED

LANDSCAPING IN FRONT OF APOLLO HOSPITAL RETAINED

EXISTING TREE LINE RETAINED

6.4M MUZ (DISTRIBUTIONS, BENCHES, SIGNAGES, STALLS)
ROAD NUMBER 1 (NH 2): PROPOSALS

TCPO, MoUD

RoW 73.05 METERS

EXISTING

TEMPLE IN THE PATH OF WAY - OBSTRUCTION AND ACTIVITY GENERATOR

TEMPLE CONSTRUCTED IN THE ROW

DISCONTINUOUS FOOTPATH

12.75 M PARKING

6.2 M SIDE ROAD

7 M GREEN

15 M WIDE CARRIAGE WAY

18 M WIDE CARRIAGE WAY

6.5 M GREEN

PROPOSED

MAHINDRA MOTORS

2.0 M FOOT PATH

2.6 M WIDE FOOTPATH

7.0 M SERVICE ROAD

3.0 M MEDIAN

10.5 M CARRIAGE WAY (3.5+3.0+3.0)

3.0 M FOOT PATH

3.0 M MMV TRACK

5.5 M MUZ

6.5 M MUZ:
PROPOSED STREET MARKET AFTER 7 PM TO ENSURE SAFETY IN DEAD OFFICE AREAS

2.0 M FOOT PATH

EXISTING BUS STOP SHIFTED TO THE SOUTH BY A FEW METRES
ROAD NUMBER 1 (NH 2): PROPOSALS

EXISTING

- Large area for car parking and poor road condition leading to compromised NMT infrastructure, poor access to plots, unsafe, negative spaces
- Narrow, obstructed foot paths serve only as temporary refuge areas
- High tension line electricity pole with overhead wires is a potential hazard on the footpath
- Foot over bridge for Sarita Vihar metro station block 3 the footpath

PROPOSED

- 2.0M footpath
- 16M width for industrial estate: paid parking to discourage use of motor vehicles and as revenue generator
- 16M wide space for informal hawker's haat to maintain 24x7 eyes on the road
- 0.5M for bollards
- 3.0M for median
- 2.0M for footpath
- 2.0M for footpath
- 3.0M for median
- 2.5M footpath
- 2.5M footpath

RoW 111.60 METERS

ROAD NUMBER 1 (NH 2): PROPOSALS

TCPO, MoUD

RoW 111.60 METERS
ROAD NUMBER 1 (NH 2):

**EXISTING**
- UNDEVELOPED RIGHT OF WAY
- METRO COLUMNS BLOCK THE FOOT PATH
- SIGNAGES BLOCK THE POORLY MAINTAINED FOOT PATH
- 2 M COVERED DRAIN
- 1.8 M FOOT PATH
- 2.6 M FOOT PATH

**PROPOSED**
- 2.0 M FOOT PATH
- 3.5 M MUZ FOR METRO COLUMNS
- 3.0 M MUZ
- 3.0 M MEDIAN
- 2.0 M FOOT PATH
- 0.5 M FOR BOLLARDS
- 2.0 M FOOT PATH

TCPO, MoUD
ROAD NUMBER 1 (NH 2): PROPOSALS

EXISTING

11M TO BUILDING LINE
10M SIDE ROAD
11.0 M CARRIAGE WAY
11.0 M CARRIAGE WAY

PROPOSED

11M TO BUILDING LINE
7.0 M SERVICE ROAD
9.5 M CARRIAGE WAY
9.5 M CARRIAGE WAY
7.0 M SERVICE ROAD

ROW 51.75 METERS

OBSTRUCTED FOOTPATH
3.5 M UNDEVELOPED STRETCH AS A NEGATIVE SPACE
POLE OF SIGNAGE OBSTRUCTS FOOTPATH
FOOTPATH IN POOR CONDITION - BROKEN PAVING, LEVEL DIFFERENCES
6.0 M UNDEVELOPED STRETCH AS A NEGATIVE SPACE

2.0 M FOOTPATH
2.0 M FOOTPATH
2.75 M MEDIAN
1 M MEDIAN
2.0 M FOOTPATH

3.0 M NMV TRACK
3.0 M NMV TRACK
3.0 M NMV TRACK
3.0 M NMV TRACK
2.5 M NMV TRACK

3.0 M MUZ FOR METRO COLUMNS
3.0 M MUZ FOR STALLS
3.0 M MUZ
2.5 M BOLLARDS
0.5 M FOR BOLLARDS
2.0 M FOOTPATH
ROAD NUMBER 5:
EXISTING LAND USE

THE ROAD RUNS SOUTH EAST – NORTH WEST, CONNECTING THE SARITA VIHAR RESIDENTIAL COLONY & ITS ALLIED ACTIVITIES, INTERNALLY THE NATURE OF THE ROAD VARIES IN FOUR DISTINCT PHASES IN TANDEM WITH THE ACTIVITY ALONG THE ROAD CARRIES THROUGH TRAFFIC OF NOIDA-DELHI-FARIDABAD DUE TO ROUTE DIVERSION EFFECTED DURING NH2 JUNCTION CONSTRUCTION.
ROAD NUMBER 5:
PROPOSALS

C EXISTING

MAHANAGAR TELEPHONE NGAM LIMITED (MTNL) OFFICE
1.8M FOOT PAVED PATH
4.5M FOOT PAVED PATH
5.5M PAVED PATH
0.7M OPEN DRAIN
1.8M FOOT PATH
4.5M FOOT PATH
5.5M PAVED PATH
0.7M OPEN DRAIN

HAWKERS AND PARKING ON PAVED PATH: NO DESIGNATED SPACE, NO FOOT PATH
HAWKERS AND PARKING ON PAVED PATH: NO DESIGNATED SPACE

CENTRAL GOVT HEALTH SCHEME (CGHS) BUILDING
1.8M FOOT PAVED PATH
4.5M FOOT PAVED PATH
5.5M PAVED PATH
0.7M OPEN DRAIN
1.8M FOOT PATH
4.5M FOOT PATH
5.5M PAVED PATH
0.7M OPEN DRAIN

RoW 21.50 METERS
RoW 21.60 METERS

C PROPOSED

MAHANAGAR TELEPHONE NGAM LIMITED (MTNL) OFFICE
1.8M FOOT PAVED PATH
4.5M FOOT PAVED PATH
5.5M PAVED PATH
0.7M OPEN DRAIN
1.8M FOOT PATH
4.5M FOOT PATH
5.5M PAVED PATH
0.7M OPEN DRAIN

CENTRAL GOVT HEALTH SCHEME (CGHS) BUILDING
1.8M FOOT PAVED PATH
4.5M FOOT PAVED PATH
5.5M PAVED PATH
0.7M OPEN DRAIN
1.8M FOOT PATH
4.5M FOOT PATH
5.5M PAVED PATH
0.7M OPEN DRAIN

RoW 21.50 METERS
RoW 21.60 METERS

B EXISTING

HAWKERS AND PARKING ON PAVED PATH: NO DESIGNATED SPACE
HAWKERS AND PARKING ON PAVED PATH: NO DESIGNATED SPACE

CENTRAL GOVT HEALTH SCHEME (CGHS) BUILDING
1.8M FOOT PAVED PATH
4.5M FOOT PAVED PATH
5.5M PAVED PATH
0.7M OPEN DRAIN
1.8M FOOT PATH
4.5M FOOT PATH
5.5M PAVED PATH
0.7M OPEN DRAIN

RoW 21.50 METERS
RoW 21.60 METERS

B PROPOSED

CENTRAL GOVT HEALTH SCHEME (CGHS) BUILDING
1.8M FOOT PAVED PATH
4.5M FOOT PAVED PATH
5.5M PAVED PATH
0.7M OPEN DRAIN
1.8M FOOT PATH
4.5M FOOT PATH
5.5M PAVED PATH
0.7M OPEN DRAIN

RoW 21.50 METERS
RoW 21.60 METERS
ROAD NUMBER 5: PROPOSED H BLOCK MARKET

- 0.5 M WIDE PAINTED STRIP AS BUFFER BETWEEN NMT TRACK AND CARRIAGEWAY
- ZEBRA CROSSING WITH STOP LINE AT SIGNALISED ‘T’ INTERSECTION FOR PEDESTRIANS
- PAY BY THE HOUR CAR PARKING FOR H BLOCK MARKET AND PROPOSED SCHOOL
- COLOURED TRACK TO WARN OF CAR PARK
- BENCH UNDER EXISTING TREE NEAR CAR PARKING
- PUBLIC TOILET
- PAINTED BOXES DEMARCATING HAWKER AREAS WITH UID NUMBERS
- COLOURED TRACK TO WARN OF CAR PARK
- PICK UP AND DROP OFF POINT FOR MARKET
- CYCLE RICKSHAW STAND
- CYCLE STAND
- 4M FOOT PATH
- 2.5M NMT TRACK
- 3.5M C/W
- 3.5M C/W
- 2.5M NMT TRACK
- 4M FOOT PATH
- PAINTED STRIP AS MEDIAN
ROAD NUMBER 5:
PROPOSED ENTRY FOR COLONIES

- Ramp up by 10 CMS to match with level of footpath for ease of access.
- Benches at pick/drop points.
- Ramp up from C/W to footpath for entry/exit of vehicles at the gate.
- Existing trees retained with provision of special pavers around them.
- 0.5 M wide painted strip as buffer between NMT track and carriageway.

4M Foot Path
2.5M NMT Track
3.5M C/W
3.5M C/W
2.5M NMT Track
4M Foot Path

Painted strip as median.

Retrofitting for Non Motorised Transport

TCPO, MoUD
ROAD NUMBER 5:
PROPOSED JUNCTION OF ROADS 5, 6

- CARRIAGeway ELEVATED BY 10CMS FLUSH WITH THE FOOT PATH FOR TABLE TOP JUNCTION WITH ROAD NUMBER 6
- NMT TRACK ELEVATED BY 10CMS FLUSH WITH THE FOOT PATH FOR TABLE TOP JUNCTION WITH ROAD NUMBER 6

- CONTINUOUS FOOT PATH AND NMT TRACK ALONG ROAD 6
- RAMP DOWN FOR ENTRY TO LOCAL ROADS
- LOCAL ROAD WITH MIXED TRAFFIC DUE TO LOW TRAFFIC VOLUME. (INSTITUTIONAL ACTIVITY ALONG A DEAD END ROAD.)

2M FOOT PATH
2.5M NMT TRACK
3.5M C/W
3.5M C/W
2.5M NMT TRACK
2M FOOT PATH

PAINTED STRIP AS MEDIAN

3.5M FOOT PATH
3.5M C/W
3.5M C/W
3.5M FOOT PATH

TCPO, MoUD
LIGHTING, RAMPS

[Diagram of lighting and ramps]

- Street Light
- Pedestrian Light

[Details of lighting and ramp design]

RETROFITTING FOR NON-MOTORISED TRANSPORT
Hawker's along 'dead' boundary walls provide "eyes on the street" making it active and safe.

Setback removes "eyes on the street"
## Tentative Per Kilometer Costing

Source: Planning and Design Guideline for Cycle Infrastructure, TRIPP, IIT-D

### Table: Sample cost calculation for segregated cycle track

<table>
<thead>
<tr>
<th>Component</th>
<th>Independent Track</th>
<th>New Road Development</th>
<th>Upgradation of existing road</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dismantling of existing surface and structures</td>
<td>0.00</td>
<td>0.00</td>
<td>1.79</td>
</tr>
<tr>
<td>Excavation</td>
<td>0.67</td>
<td>0.67</td>
<td>0.67</td>
</tr>
<tr>
<td>Base courses (GSB+DLC)</td>
<td>57.72</td>
<td>57.72</td>
<td>57.72</td>
</tr>
<tr>
<td>M40 CC pavement+pavement marking</td>
<td>81.55</td>
<td>81.55</td>
<td>81.55</td>
</tr>
<tr>
<td>CC Kerb stone segregator</td>
<td>0.00</td>
<td>3.60</td>
<td>3.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>139.94</td>
<td>143.54</td>
<td>145.33</td>
</tr>
</tbody>
</table>

### Table: Sample cost calculation for footpath

<table>
<thead>
<tr>
<th>Component</th>
<th>Independent Track</th>
<th>New Road Development</th>
<th>Upgradation of existing road</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dismantling of existing surface and structures</td>
<td>0.00</td>
<td>0.00</td>
<td>4.13</td>
</tr>
<tr>
<td>Excavation</td>
<td>0.78</td>
<td>0.78</td>
<td>0.00</td>
</tr>
<tr>
<td>Base courses (GSB+DLC)</td>
<td>25.03</td>
<td>25.03</td>
<td>25.03</td>
</tr>
<tr>
<td>60mm thick CC paver blocks on sand bed</td>
<td>29.70</td>
<td>29.70</td>
<td>29.70</td>
</tr>
<tr>
<td>CC Kerb stone edges</td>
<td>7.20</td>
<td>7.20</td>
<td>7.20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>62.70</td>
<td>62.70</td>
<td>66.06</td>
</tr>
</tbody>
</table>

Source: Planning and Design Guideline for Cycle Infrastructure, TRIPP, IIT-D
### Sample costing for provision of functional lighting

<table>
<thead>
<tr>
<th>Component</th>
<th>Independent Track</th>
<th>New Road Development</th>
<th>Upgradation of existing road</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundations, including excavation</td>
<td>4.26</td>
<td>0.11</td>
<td>0.11</td>
</tr>
<tr>
<td>Provision of new light poles, with fittings, wires, etc.</td>
<td>24.75</td>
<td>74.50</td>
<td>74.50</td>
</tr>
<tr>
<td>Dismantling of existing light poles</td>
<td>0.00</td>
<td>0.00</td>
<td>6.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29.01</strong></td>
<td><strong>74.61</strong></td>
<td><strong>80.61</strong></td>
</tr>
</tbody>
</table>

### Sample costing for Storm water drainage

<table>
<thead>
<tr>
<th>Component</th>
<th>Independent Track</th>
<th>New Road Development</th>
<th>Upgradation of existing road</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation, filling and preperation base for pipes</td>
<td>20.34</td>
<td>20.34</td>
<td>20.83</td>
</tr>
<tr>
<td>Laying of pipes</td>
<td>8.00</td>
<td>8.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Development of Manholes</td>
<td>85.07</td>
<td>85.07</td>
<td>85.07</td>
</tr>
<tr>
<td>Provision of Gully chambers, including connection to Manholes, using 300mm dia., NP2 pipes</td>
<td>40.25</td>
<td>40.25</td>
<td>40.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>153.66</strong></td>
<td><strong>153.66</strong></td>
<td><strong>154.15</strong></td>
</tr>
</tbody>
</table>

Source: Planning and Design Guideline for Cycle Infrastructure, TRIPP, IIT-D
### Table: Sample costing for Electrical & Telephone services

<table>
<thead>
<tr>
<th>Component</th>
<th>Independent Track</th>
<th>New Road Development</th>
<th>Upgradation of existing road</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shifting of Existing overground services</td>
<td>0.00</td>
<td>0.00</td>
<td>8.80</td>
</tr>
<tr>
<td>Provision of new overground services</td>
<td>0.00</td>
<td>40.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Provision of new underground electrical cables (both HT and LT)</td>
<td>0.00</td>
<td>261.20</td>
<td>261.20</td>
</tr>
<tr>
<td>Total</td>
<td>0.00</td>
<td>301.20</td>
<td>270.00</td>
</tr>
</tbody>
</table>

Source: Planning and Design Guideline for Cycle Infrastructure, TRIPP, IIT-D
TENTATIVE COSTING

TENTATIVE PROJECT COST PER KILOMETER (AT CURRENT PRICE) = INR 9.34 CR.

TENTATIVE PROJECT COST (ALL 13 ROADS: 17.60 KM) = INR 164.41 CR.

TENTATIVE COST ROAD 1 (2.64 KM) = INR 24.53 CR.

TENTATIVE COST ROAD 5 (1.1 KM) = INR 9.16 CR.

COMPONENTS CONSIDERED FOR COSTING:
FOOTPATH
NMT TRACK
STORM WATER DRAINAGE
LIGHTING
SERVICES

COMPONENTS NOT CONSIDERED FOR PRESENT COSTING:
SIGNAGES, ROAD MARKINGS, REFLECTORS
TOILET BLOCKS, BUS STOPS
PARKING, HAWKERS’ ZONE, KIOSKS, SIGNALS

Source: Planning and Design Guideline for Cycle Infrastructure, TRIPP, IIT-D
THANK YOU