

## Decision of Governing Body Meeting held under the Chairmanship of Hon'ble LG on 18.03.2010:

For the Roads (already) taken up for development, (or to be taken up subsequently), the adherence to UTTIPEC Pedestrian Design Guidelines is to be checked by the E-in-C/ C.E. concerned. All projects are to adhere to and follow the following Checklist provided.

Note: The Street Design CHECKLIST is to be read in combination with the Pedestrian Design Guidelines, downloadable from the UTTIPEC Website.

Street Design Guidelines - UTTIPEC				
S.No.	Component	Sub-Component	Non-negotiable Requirement	Street Type
1	Walking Zone: Clear Walking Zone should be 1.8 M x 2.4 M High			All
	01A	Minimum Clear Walking Zone	1.8 M clear width 2.4 M Clear height (No obstructions allowable within this clear height; Tree branches within this height to be pruned with due permissions; All Advertisement panels, posts, poles, junction boxes, public utility structures etc. to be removed.)	All
	01B	Walking Zone Width is provided as per landuse	2.0 M for Residential Areas 2.5 M minimum for Commercial/Mixed Use Streets 4.0 M for Commercial Nodes	All Commercial and Mixed-use Streets
	01C	Maximum Kerb Height	Maximum height of a pavement (including kerb, walking surface, top-of-paving) shall not exceed 150 MM (6"). 100 mm (4") kerb height is preferable for Arterial Roads. <ul style="list-style-type: none"> <li>All walking surfaces should be very rough/ matt-finish/ anti-skid.</li> <li>Medians should be maximum 150mm high or be replaced by crash barriers.</li> <li>In case the carriageway finished level is expected to rise during future re-carpeting, reduction in footpath level to 100 mm or less is acceptable. But under no circumstances is the height of footpath to exceed 150 mm.</li> <li><b>Finished top level and kerb height for all bus-stops to be 150 mm.</b></li> <li>Only along Segregated Busways/ BRT corridors, the kerb height of the Bus Stop could match the height of the bus floor.</li> </ul>	All
	01D	Kerb Radius and Slip Road Treatment	<ul style="list-style-type: none"> <li><b>Maximum corner radius of Kerb = 12 M</b></li> <li>It may be reduced to 6 M in residential areas to slow down turning buses, trucks etc. with the provision of a corner mountable kerb for emergency vehicles.</li> <li><b>Slip roads or Free Left Turns should be avoided.</b> For intersections of R/Ws of 30m-30m or lesser, Slip Roads should be removed/ not considered. In cases where they already exist for intersections for intersection of 30m-45m and higher R/Ws, the following Strategies may be employed:</li> <li><b>Option 1:</b> Slip Road can be removed wherever Pedestrian and NMV volumes are high.</li> <li><b>Option 2:</b> Reduce Corner Radius of kerb to calm traffic, and signalize the Slip road crossing (full or pelican signal), in order to make them safe for all users.</li> <li><b>Option 3:</b> Introduce raised table top crossings at slip roads and minimum 20-second pedestrians signals – to allow pedestrians, cyclists and physically challenged people to cross the road comfortably at the same level.</li> <li><b>Option 4:</b> Signalized Turning Pockets may be provided where left-turning volumes are high.</li> </ul>	As specified.
	01E	Continuous Pavement	Continuous barrier free movement corridor for NMTs and Persons with Disabilities. <ul style="list-style-type: none"> <li>Avoid sidewalk interruptions by minimizing kerb cuts i.e. Minimize the number of driveways that cross the sidewalk – in order to support pedestrian safety and a continuous sidewalk.</li> <li>Maintain an even surface and elevation of the pavement at 150 MM or less from surrounding road level.</li> <li>At entry points of properties – introduce "raised driveway" or "table-top" details – where pedestrian and cycle lanes continue at their same level, but the motorized vehicles have to move over a gentle ramp to enter the property.</li> <li>Remove all obstructions from the sidewalks.</li> <li>Consistency of design elements, color and texture, help provide visual continuity and calm traffic, even at crossings.</li> </ul>	All
	01F	High Albedo Materials	If paving with asphalt, applying a white aggregate as a chip seal layer, or a light-colored surface coating such as a zinc-oxide slurry mix.	All
	01G	Permeable Pavement	Paving for large hard surfaced areas like parking lots, driveway curb-cuts, large plazas, hawker zones, pedestrian only streets, etc. should be permeable in order to reduce runoff and heat island effect, and increase ground water infiltration and recharge.	Wherever large paved areas exist;
		Guard-Rail	<b>Not desirable in most instances on urban roads, except near intersections.</b>	

2	<b>Frontage Zone or "Dead Width"</b>	<ul style="list-style-type: none"> <li>· For sidewalks in shopping areas, an extra <b>1M</b> should be added to the stipulated 4.00 M width. This extra width is called "Dead Width".</li> <li>· In other situations where sidewalks pass next to buildings and fences, a dead width of <b>0.5 M</b> can be added.</li> <li>· In busy areas like bus stops, railway stations, recreational areas, the width of sidewalk should be suitably increased to account for accumulation of pedestrians.</li> </ul>	All Commercial and Mixed-use Streets	
3	<b>Universal Accessibility Features/ Barrier Free Design</b>	<p><b>Universal Accessibility is required for all sidewalks, crossings, parks, public spaces and amenities.</b></p> <p><b>Please see Guidelines Document for Details.</b>  <a href="http://uttipeec.nic.in/StreetGuidelines-R1-Feb2011-UTTPEC-DDA.pdf">http://uttipeec.nic.in/StreetGuidelines-R1-Feb2011-UTTPEC-DDA.pdf</a></p>		
	03A	<b>Kerb Ramps</b>	1:12 Minimum Slope at all level change points; 1.2 M Width of Ramp; Tactile warning strip to be provided at curbside edge of the slope..	All
	03B	<b>Raised Table-Top Crossings</b>	All slip road pedestrian crossings; all non-signalized intersections and mid-block intersections should be raised to match the level of the connected footpaths (150 MM top of Kerb)	All
	03C	<b>Tactile Paving</b>	All walking surfaces should have Tactile pavers (Guiding and warning path) to guide people with vision impairment	All
			Tactile pavers should be provided to lead persons with vision impairments to the lifts, crossings, toilets, bus stops, i.e. all public and road facilities.	All
	03D	<b>Auditory Signals</b>	All traffic signals should have red & green man symbols and auditory signals.	All
	03E	<b>Accessible Infrastructure</b>	All Signage should be graphic or symbol based, rather than text based.	All
			Lifts should be minimum 1400 x 1400 MM in size.	Wherever applicable
			All Lifts to have Braille buttons and audio announcement systems.	Wherever applicable
4	<b>Multi-Functional Zone with Planting</b>	<p>Multi-Functional Zones on a Street should be a minimum of 1.8 M Wide, and may locate any or all of the following functions within them:            Tree Planting; Planting for Storm Water Management; Auto-rickshaw Stands; Cycle-rickshaw Stands; Hawker Zones; Car Parking; Street Furniture; Bus Stops, Street lights/ pedestrian lights.</p> <p>Provision of MFZ is most critical otherwise the above uses/ components of streets would encroach upon pedestrian, cyclist or carriageway space.</p> <p>Common Utility Ducts and Duct Banks should not be located under the MFZ as there may be interference due to trees.</p>		
	04A	<b>Essential Planting</b>	Deciduous Trees a must for shading and comfort of all road users in different seasons.	All Streets above 6 M width
			Tree Planting and Lighting Plan must be prepared in conjunction so as to not obstruct each other.	All
			Trees must be pruned up in order to maintain visual clearance for pedestrians (2.4 M clear vertical zone).	All
			Under no circumstances should trees be placed within the 1.8 M clear horizontal Walking zone.	All
	04B	<b>Tree Pits and Tree Grates</b>	1.8 M x 1.8 M Tree Pit should be left for Tree roots to breathe; Permeable Pavers or Tree Grates should be placed over the pit in busy pedestrian streets so people can walk over the tree pit.	All
	04C	<b>Planting with Storm Water Management</b>	Rain water harvesting is a must on all roads, and all road retrofitting projects.	All
	04D	<b>Aesthetic Planting</b>	Trees themes by color of flowers, foliage, fruit-type, smells, and other aesthetic qualities in order to give a unique experience to road users	As feasible and suitable.

5	<b>Bicycle and NMT Infrastructure</b>	<b>Minimum 2.5 M NMT Path made in Cement Concrete and physically separated from MV Lanes.</b>	
	<b>05A</b>	Segregated Cycle + NMT Paths	Cycle and NMT Path in cement concrete, physically separated from Motorized vehicle traffic by an open space or barrier within the existing Right-of-Way.
	<b>05B</b>	Bicycle Parking and Other Infrastructure	<p>Secure Cycle Parking must be provided at all MRTS/ BRTS Stations.</p> <p>Designated cycle-rickshaw parking is to be provided near all local and mass transit stops.</p> <p>Cycle parking and cycle rickshaw parking should be accommodated within the Multi-Functional Zone; minimum width required is 1.5 M.</p> <p>The stands should allow at least the frame and ideally both wheels, to be secured to them.</p>
		<p><b>Cycle Track - Capacity</b></p> <p>Capacity in number of cycles per day</p> <p><b>For One way Traffic</b></p> <p>Two Lane - 2.5 to 5.0 M Three Lane - Over 5.0 M Four Lane - -----</p> <p><b>For Two Way Traffic</b></p> <p>Two Lane - 2.5 MINIMUM Three Lane - 2000 to 5000 Four Lane - Over 5.0 M</p> <p><b>Cycle Track - Types</b></p> <p>Two types of cycle tracks:</p> <p>1 Which run parallel to or along a main carriage way. A. Adjoining Cycle Tracks B. Raised Cycle Tracks C. Free Cycle Tracks</p> <p>2 Which are constructed independent of any carriage way.</p> <p><b>Cycle Track - Horizontal Curves</b></p> <p>It should be so aligned that the radii of the horizontal curves are <b>not less than 10 M (33 ft).</b></p> <p><b>Where the track has a gradient steeper than 1 in 40, the radii of the horizontal curves should not be less than 15 M (50 ft).</b></p> <p>The radii of horizontal curves for <b>independent cycle tracks should be as large as practicable.</b></p> <p><b>Cycle Track - Vertical Curves</b></p> <p>Vertical curves at changes in grade should have a <b>minimum radius of 200 M (656 ft) for summit curves and 100 M (328 ft) for valley curves.</b></p> <p><b>Cycle Track - Gradients</b></p> <p>The length of grade should not exceed <b>from 90 M (295 ft) to 500 M (1640 ft) for the gradient of 1 in 30 to 1 in 70, respectively.</b></p> <p>Gradients steeper than <b>1 in 30 should generally be avoided.</b> Only in exceptional cases, gradients of 1 in 20 and 1 in 25 may be allowed for lengths not exceeding 20 M (65 ft) and 50 M (164 ft) respectively.</p> <p>Where the gradient of a carriage way is too steep for a parallel cycle track the latter may have to be taken along a detour to satisfy the requirements of this standard.</p> <p><b>Cycle Track - Sight Distances</b></p> <p>Cyclist should have a clear view of <b>not less than 25 M (82 ft).</b></p> <p>In the case of cycle tracks at <b>gradients of 1 in 40 or steeper</b>, cyclist should have a clear view of <b>not less than 60 M (197 ft).</b></p> <p><b>Cycle Track - Lane width</b></p> <p>The total <b>width of pavement</b> required for the movement of <b>one cycle is 1.0 M (3 ft 3 in.).</b></p> <p><b>Cycle Track - Width of Pavement</b></p> <p>The minimum width of pavement for a cycle track should <b>not be less than 2 lanes, i.e., 2.0 M (6 ft 6 in.).</b></p> <p>If <b>overtaking</b> is to be provided for, the width should be made <b>3.0 M (9.8 ft).</b></p> <p>Each <b>additional lane</b> where required should be <b>1.0 M (3 ft 3 in.) wide.</b></p>	<p>All two-way Streets above 24 M</p> <p>All</p> <p>All</p> <p>All</p>

		Cycle Track - <b>Clearance</b>	Vertical clearance - The minimum head-room provided should be <b>2.25 M (7.38 ft)</b> .	
			Horizontal clearance - At underpass and similar other situations a side clearance of <b>25 cm should be allowed on each side</b> .	
			The <b>minimum width of an underpass for a two-lane cycle track would, therefore, be 2.5 M (8.2 ft)</b> . In such situations it would be desirable to increase the head-room by another 25 cm so as to provide a total <b>vertical clearance of 2.5 M (8.2 ft)</b> .	
		Cycle Track - <b>Cycle tracks on bridges</b>	Full width cycle tracks should be provided over the bridge.	
			The <b>height of the railing or parapet should be kept 15cm</b> higher than required otherwise, when cycle track is located immediately next to bridge railing or parapet.	
		Cycle Track - <b>General</b>	Provided on both sides of a road and should be separated from main carriage way by a verge or a berm.	
			<b>Minimum width of the verge - 1.0M (3ft 3in.)</b>  <b>Width of verge may reduced to 50cm (20 in.)</b>  For a width of 50cm (20 in.) from the edge of the pavement of the cycle track, the verge or berms should be maintained so as to be usable by cyclists in an emergency.  Cycle tracks should be located beyond the hedge, tree, or footpath.  Kerbs should be avoided as far as possible. <b>A clearance of at least 50 cm should be provided near hedges and of 1.0 M from trees or ditches.</b>	
	Cycle Track - <b>Road crossings</b>	Where a cycle track crosses a road, the carriage way should be marked with appropriate road markings.		
	Cycle Track - <b>Riding surface and lighting</b>	Cycle tracks should have riding qualities and lighting standards equal to or better than those of the main carriage way, to attract the cyclists.		
6	<b>Crossings</b>			
		Minimum 3 M wide pedestrian crossing and 2.5 M wide cycle crossing must be provided at all road crossings. <b>A "Set of 3" essentials components are required at each crossing:</b>		All
		1) Universal Accessibility Features (for persons with disabilities, reduced mobility, vision and hearing impairment.)		
		2) Dustbin		
		3) Street Directional Signage		
	<b>06A At-grade Crossing</b>	Minimum 3 M wide signalized crossings at all intersections and T-junctions.		All
		Width of crossing should be increased where higher pedestrian/NMV volumes are expected due to <b>abutting landuses</b> .		
		Advance stop and yield lines should be considered at stop- or signal-controlled marked crossings with limited crossing visibility, poor driver compliance, or non-standard geometrics.		
		Stop and yield lines can be used from 1 to 15 M in advance of crossings, depending upon location, roadway configuration, vehicle speeds, and traffic control.		
		Traffic Calming Treatment starting least 25 m before the zebra/ table-top crossing is essential in Delhi due to unruly traffic.		
		Wayfinding Signage for Pedestrian orientation and directional guidance must be provided at street intersections. Amenities like dustbins are also needed. (Section 10)		
	<b>06B Mid-Block Crossing</b>	Mid-block crossings must be provided for Blocks longer than 250 M. See Guideline Document for Details.		All, except highways
		Mid-block crossings must be provided at regular intervals as per the following standards: <b>Residential Areas:</b> Every 80 - 250m and Coordinated with entry points of complexes; location of bus/ train stops, public facilities, etc. <b>Commercial/ Mixed Use Areas:</b> Every 80 - 150m <b>High Intensity Commercial Areas:</b> Make Pedestrian and NMT only, if possible.		
		All non-signalized mid-block crossings are to have auditory pelican signals and table top provisions.		

	06C	Raised Crossings	(see 03B)	All, except highways
	06D	Grade Separated Crossing (Foot Over Bridge)	<p>Foot Over-bridges may be considered only on highways and in Special Conditions where no other solutions for Crossing are possible.</p> <p>All Subways and Foot-overbridges must have a combination of either "Staircase + Ramp" or "StairCase + Elevator" for universal accessibility.</p>	See "FOB Consideration & Design Checklist" on UTTIPEC Website.
	06E	Grade Separated Crossing (Humped Crossing)	<p>Humped Crossings may be considered only on highways.</p> <p>Clear height of Humped crossing is 2.7 M - the road above is raised by 1.5 M and the pedestrian walkway is sunk by 1.2 M.</p> <p>Rainwater harvesting is mandatory and critical.</p>	Only Highways or Special Conditions.
7		Medians, Refuge Islands - see SF	<b>Medians and Pedestrian Resuge Islands are a must on streets wider than 24 M.</b>	All Streets above 24 M
	07A	Landscaped Median	<p>Instead of fences, Medians should be landscaped and used for stormwater management wherever possible.</p> <p>When street trees are desired, a median should be min. 1.5 M wide, including kerbs.</p>	All Streets above 24 M
	07B	Pedestrian Refuge Island at Median	<p>At-grade Median Refuges allow pedestrians to wait safely for crossing wide streets with long signal rotations.</p> <p>Minimum Width of a Pedestrian Refuge Island at a Crossing is 1.2 M, enough to accommodate a wheelchair or strolley. Bollards must be used to prevent vehicular U-turns.</p>	All Streets above 24 M
8		Pedestrian Scale Lighting	<b>Mid-Mast Lighting (10-12 M tall) – are appropriate for most Arterial and Sub-Arterial Streets. For Wide Streets with high pedestrian/ commercial activity, Mid-Mast lighting may be combined with Pedestrian Scale lighting to create additional security and comfort.</b>	
	08A	Pedestrian Scale Low-Mast Street Lighting	<p>Height of Light Pole is a function of Street Width. Narrower the Street Width, lower can be the Lamp Height.</p> <p>The lux level for the street lighting may be applied as per NBC/IRC standards.</p> <p>Lighting Plan must be prepared in conjunction with Tree Planting Plan.</p>	All
	08B	Full Cut-off Fixtures	Full cut off fixtures which focus light downwards and allow no light towards the night sky, and also do not cause glare – are required for all public streets.	All
10		Public Amenities (Toilets, etc), Hawker Zones, Signage		All
	10A	Local Bus Stop	Bus Stop must be Universally Accessible and located Clear of the 1.8 M Walking Zone; they can be located within the Multi-Functional Zones (See 04)	All
	10B	Public Toilets	Public Toilets, including one for persons with disabilities - must be located every 500 800 M.	All
	10C	Street-Direction Signage	Vector Wayfining Signage is essential at every street corner.	All; as feasible
	10D	Pelican Signals	Auditory Pelican Signals coupled with raised table top crossings must be provided at all T-junctions and non-fully signalized mid-block crossings.	All
	10E	Dustbins	Dustbins with graphic explanation of source separation, must be provided at all street intersections and bus-stops.	All
	10F	Hawker Zones	Hawker Zones must be provided within the Multi-functional Zone or other incidental spaces along a pedestrian pathway - within the overall RoW - but must be clear of all minimum walking and cycling rights-of-way.	All