The Odisha Gazette

EXTRAORDINARY

PUBLISHED BY AUTHORITY

No. 1358 CUTTACK, TUESDAY, JULY 16, 2024/ASADHA 25, 1946

BHUBANESWAR DEVELOPMENT AUTHORITY

AKASH SHOVA BUILDING,

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NOTIFICATION

The 6th March 2024

No. 9963—BDA-Planning(UTP)-11/15—Whereas, the draft of the Bhubaneswar Development Authority (Street Design) Regulations 2021 was published as required by sub-section(2) of section 125 of the Odisha Development Authorities Act, 1982 in the Extraordinary issue No. 193 of the *Odisha Gazette*, dated the 2nd February 2022 under the notification of the Bhubaneswar Development Authority No. 37631/BDA, dated the 9th November, 2021 inviting objections and suggestions from all persons likely to be affected thereby till the expiry of the period of thirty days from the date of publication of the said notification in the *Odisha Gazette*. Subsequently, the duration for receiving the objections and suggestions was extended to another 15 days vide BDA Notification No. 11885 Dated 31st March 2022.

And whereas, objections and suggestions received before the expiry of the period so specified in respect of the said draft have duly been considered by the Bhubaneswar Development Authority.

Now, therefore in exercise of the powers conferred by section 124 of the said Act, the Bhubaneswar Development Authority do hereby makes the following Regulation namely:-

Chapter I.

Preliminary

1. **Short title, jurisdiction and commencement –**
   (i) These regulations shall be called the BDA (Street Design) Regulations, 2024.
   (ii) They shall extend to the whole area within the jurisdiction of Bhubaneswar Development Authority as notified from time to time.
   (iii) They shall come into force on the date of their publication in the Odisha Gazette.
2. **Definition, –**
   (i) "Bus Stops" means any location where the MoBus system running in the city of Bhubaneswar halts according to its scheduled route for boarding and alighting of passengers. This term refers to bus queue shelters and bus stands also;
   (ii) "Carriageway" means the road space used for vehicular movement situated between kerb edges or between footpath edges (where there are no kerbs) on opposite sides of a street;
   (iii) "Cautionary/Warning" means signs that are used to caution and alert the users to potential danger or existence of certain hazardous conditions either on or adjacent to the roadway so that they take the desired action. They are triangular with red border and black symbol in white background;
   (iv) "Clear walking zone" means an obstacle free space for pedestrian movement;
   (v) "Cycle Lanes" means a portion of a roadway that has been designated by striping, signs, and pavement markings for the preferential or exclusive use of bicyclists;
   (vi) "Cycle stand/PBS stand" means a dedicated space for parking of cycles or for the public bicycle sharing system for users;
   (vii) "Cycle Tracks" means a dedicated path that is intended for the use of bicycles. It is physically separated from motorized vehicle traffic by a planting strip or paved surface;
   (viii) "Frontage Zone" means the space adjacent to the building or property line used for extension of the respective land use activities;
   (ix) "Information/Guide" indicates location and direction to facilities like fuel station or eating place or parking;
   (x) "Intersections" means the general area where two or more roads join or cross
   (xi) "IPT Stops" means the demarcated or signified areas where IPT modes (auto rickshaws, taxi services) would stop for pick up and drop off their passengers
   (xii) "Mandatory/Regulatory" means signs are obligatory on the traffic which uses a specific area of road that indicate what must one do, rather than must not do;
   (xiii) "Median" means the center of a street that physically separates the directional flow of traffic;
   (xiv) "Multi-utility zone" means spaces in the right of ways that are carved out to create places for people;
   (xv) "On-street parking" means the demarcated spaces where private vehicles can park their vehicles for the duration and fees as specified by the governing authority;

(xvi) "Pedestrian zone" means the space that extends from the edge of the carriageway edge or cycle zone (when the right of way is more than 12 m is width) to the property edge on both sides of the carriageway;

(xvii) "Placemaking" means a people-centred approach to the planning, design, and management of public spaces;

(xviii) "Right of Way (ROW)" means measure of the width of the road taken from compound wall/edge to compound wall/edge;

(xix) "Refuge, Pedestrian Refuge" means a space either in the middle of the carriageway or on the corners of an intersection that provide pedestrians with a place of refuge and reduce the crossing distance between safety points;

(xx) "Service Lanes" means the lanes that run parallel to a main road to provide access for local traffic;

(xxi) "Traffic calming measures" ensure pedestrian and vehicle safety by reducing at least speed and potentially also the volume of motor vehicles. Traffic calming slows down vehicles through vertical displacements, horizontal displacement, real or perceived narrowing of carriageway, material/colour changes that signal conflict point, or complete closure of a street;

(xxii) "Underground Utilities" means all the utilities that run below the road surface including but not limited to Electric cables, Cable TV line, Gas pipeline, Water pipeline, telecommunication line, Optical fibre line;

Chapter II.

Applicability

3. These regulations shall apply to -

(i) All development, widening, repair, reconstruction, and maintenance of streets within the jurisdiction of Bhubaneswar Development Authority.

(ii) All the existing roads, proposed roads and the road stretches proposed to be widened within the jurisdiction of Bhubaneswar Development Authority as well as all those within its extended and future boundaries.

(iii) The provisions under comprehensive development plan for Bhubaneswar shall be referred to amend these regulations, as and when required.

4. Scope of regulations–

(i) This regulation and the annexure to this regulation- **Street Design Guidelines for Bhubaneswar 2024**gives guidelines purely regarding the designing of streets for appropriate allocation of spaces and general specifications for various elements of the street.

(ii) The **Annexure** to this regulation - **Street Design Guidelines for Bhubaneswar 2024** would be further attached to and form a formal part of the Development Control regulations for Bhubaneswar.

(iii) All privately owned street under residential, commercial, institutional, and industrial campuses with right of way more than 12 meters in width shall adhere to these regulations.

(iv) Material specifications have been given in respective sections of each street element.

5. **Implementation of regulations–**

(1) The BDA (street design) Regulations is directed to all Government and Private Agencies who are involved in planning, design, construction, approval, and maintenance of existing and new streets and allied activities within the jurisdiction of Bhubaneswar Development Planning Area.

(2) All the Local communities, activist groups, NGOs working in any field related to traffic and transportation for Bhubaneswar city and all relevant stakeholders are to be encouraged to adhere to this regulation.

(3) It is recommended to refer to IRC guidelines for technical engineering aspects regarding technology and construction procedure along with these regulations.

(4) **Enforceability:** The below mentioned enforcement measures and penal actions under provision of Odisha Development Authority Act, 1982 will be applicable to the Government and Private Agencies who are involved in planning, design, construction, approval, and maintenance of existing and new streets and allied activities within the jurisdiction of Bhubaneswar Development Planning Area:

i. As per Section 15 – Prohibition of development without permission, of the Odisha Development Authorities Act, 1982, where the Sub Section 1 of the Section 15 states that, "no person including a department of the Central or a State Government or a Local Authority or a Body Corporate constituted under any law shall within the development area undertake any or carry out any development in or over any land without obtaining permission in writing from the concerned authority". In line with this it is mandatory for Government/Private agencies who are involved in construction of roads and allied activities in Bhubaneswar to follow these regulations to comply with the ODA Act, 1982.

ii. Hence as per the provisions of Section 15 of the ODA Act, and stated above, the Government and Private Agencies who are involved in construction of roads and allied activities in Bhubaneswar shall be responsible for incorporation of this regulation in the design stage itself and intimate the same to BDA before execution of the same and get an approval for the project in writing as per guidelines given under Section 13 of BDA (Street Design)Regulation, 2024.

iii. The approval requests by the agency or any deviations in design by the agency from these regulations due to any justifiable reason shall be placed before the DP and BP Committee of BDA, chaired by Vice Chairman, BDA held every month in BDA. Special invitees from road executing agencies/transport sector as required shall be invited to the committee by BDA for the approval decision making.

iv. In line of the above, and as per Section 90- Penalties, of the Odisha Development Authorities Act, 1982 where Sub-section (1) of Section 90 states that, "Any person who, whether at his own instance or at the instance

of any other person or anybody (including a department of Government), undertakes or carries out development of any land in contravention of the development plan or without the permission, approval or sanction referred to in Section 15 or in contravention of any condition subject to which such permission, approval or sanction has been granted, shall on conviction, be punishable with simple imprisonment for a term, which may extend to six months, or with fine which may extend to ten thousand rupees or with both and the Court shall in such order of conviction direct that if such contravention continues after the date of the order of conviction, a fine not exceeding five hundred rupees per day during the period during which the contravention continues, shall be recovered from the person so convicted", the Government/Private agencies who are involved in construction of roads and allied activities as mentioned under point i above, will be subject to bear the penalties.

v. Including above, penalties as per Sub Section (4) of the Section 90 of the Odisha Development Authorities Act, 1982, will also be applicable on the Government/Private agencies who are involved in construction of roads and allied activities, if found violating these regulations.

vi. Also, if the Government and Private Agencies who are involved in planning, design, construction, approval, and maintenance of existing and new streets and allied activities within the jurisdiction of Bhubaneswar Development Planning Area builds or construct in violation of these regulations, the construction will be considered as unauthorized and BDA will have the authority for removal of the said construction, as per Section 91 – Removal of unauthorized development, where Sub-section (1) of Section 91 states that, "Where any development has been commenced or is being carried on or has been, completed in contravention of the development plan or without the permission, approval or sanction referred to in section 15 or in contravention of any condition subject to which such permission, approval or sanction has been granted [or any development deemed to be a development undertaken, carried out of completed without a permission as referred to in Section 15 under Clause (b-1) of Sub-section (2) of Section 128] any officer of the Authority empowered by it in this behalf, may in addition to any prosecution that may be instituted under this Act, make an order directing that such development shall be removed by demolition, falling or otherwise [or secured by sealing] by the owner thereof or by the person at whose instance the development has been commenced or is being carried out or has been completed, within such period not being less than five days and more than fifteen days from the date on which a copy of the order of removal, with a brief statement of the reasons therefor, has been delivered to the owner or that person as may be specified in the order and on his failure to comply with the order, the officer of the. Authority may remove or [cause to be removed the development or seal or cause to be sealed such development and the expenses incurred therefor] s all be recovered from the owner or the person

at whose instance the development was commenced or was being carried out or was completed as arrears of land revenue".

vii. For Compounding of Offences (offences as per above), Government/Private agencies who are involved in construction of roads and allied activities can use the provisions under Section 98 – Compounding of Offences, where Sub-section (I) of Section 98 states that, "The Authority or any person authorized by it in this behalf by general or special order, may- (a) institute, defend or withdraw from any legal proceeding under this Act or any rule made thereunder, (b) either before or after the institution of the proceedings, compound any offence made punishable under this Act or any rule made thereunder, and (c) admit, compromise or withdraw any claim made under the Act or any rule made thereunder".

Chapter III.

Street Hierarchy& Design

6. **Identification of street hierarchy** –
   (i) The right of way of the streets should be according to CDP 2030 prepared by BDA.
   (ii) The identification, design & construction of new streets and retrofitting of existing streets shall follow the street typology matrix as listed in Table 1.
   (iii) The Street Hierarchy Matrix as shown in Table 1 for the RoWs as detailed in column A of the same table should be used to allocate space for the different street elements as listed in Section 11.
   (iv) The street design parameters shall not exceed the specifications under table 1 without the prior approval from the authority. The control norms are further detailed out in Chapter IV of Street Design Guidelines for Bhubaneswar, 2024.
7. **Detailing out street design components** - Any individual/organisation/government department who intend to construct/ retrofit any road shall include the following components within the street design depending upon available right of way, movement pattern & volume and land use character surrounding the street –
   (i) **Pedestrian zone**–The pedestrian zone extends from the edge of the carriageway edge or cycle zone (when the right of way is more than 12 m is width) to the property edge on both sides of the carriageway. There three primary zones in this –
      i. Frontage zone
      ii. Clear walking zone
      iii. Multi utility zone / Kerb edge zone
   (ii) **Cycle zone**–The cycle zone extends from the edge of the carriageway to the edge of the pedestrian zone. Cycleways are typically designed as cycle track that are physically separated from traffic for most of their length or as cycle lanes within the roadway delineated with markings.
   (iii) **Multi-utility zone**– Multi-utility zone is defined as spaces in the right of ways that are carved out to create places for people. However, the space should be designed after leaving 1.8m clear walkway zone for pedestrians. Multi-utility zone includes –
      i. Bus Stops

ii. IPT Stops
iii. On Street Parking
iv. Cycle Stand/ PBS Station
v. Street Furniture
vi. Street Vendors
vii. Landscape
viii. Underground Utilities
ix. Lighting
x. Signage

(iv) **Carriageway**– Carriageway is the roadbed used for vehicular movement. It is situated between kerb edges or between footpath edges (where there are no kerbs) on opposite sides of street. The optimum widths of carriageways depend on:

i. Road Classification
ii. Speed Limit
iii. Travel Lane

(v) **Median & Refuge**- A median island is the center of a street that physically separates the directional flow of traffic and can provide pedestrians with a place of refuge and reduce the crossing distance between safety points.

(vi) **Streetlights**–Lighting needs of pedestrians are different from those of vehicular traffic and therefore need to be designed and integrated within the overall lighting strategy for the street. Streetlights are broadly classified as

i. Lights for pedestrian
ii. Lights for carriageway

(vii) **Signage** – Signage is a comprehensive system of Regulatory, Informatory and Warning messages corresponding to the information for all road user groups. There are three categories for signage for roads, however a fourth category should be accommodated for the pedestrians:

i. Mandatory/ Regulatory
ii. Cautionary/ Warning
iii. Informatory/ Guide
iv. Pedestrian

(viii) **Intersections**–It is the general area where two or more roads join or cross. The intersections can be treated in any one of the following methods –

i. Roundabouts on major to minor/ minor to minor intersections,
ii. Signalisation (Traffic Signals) for major intersections,
iii. Grade separated pedestrian facilities & vehicular movement.

(ix) **Traffic calming**–Traffic calming measures have been the backbone of all the design components included in this regulation.

(x) **Storm water management**– Sustainable storm water management treats and slows runoff from impervious roadways, sidewalks, and building surfaces. In urban areas, natural drainage patterns have changed over time due to the incremental increase of impervious surface areas. Hard capes, such as concrete and asphalt, prevent rainfall from being absorbed at the source. Increased storm water flows and pollutants enter the sub-grade pipe network as a result, burdening the municipal wastewater system

(in the case of a Combined Sewer System) or discharging into surface water bodies. High-velocity discharge risks the erosion or flooding of local streams and creeks, destroying natural habitats.

TABLE 1 – STREET TYPOLOGY MATRIX:

RoW	Land Use Context	Footpath (m)	Multi-utility Zone (MUZ)/ Kerb edge(KE) (m)	Cycle Track (m)	Travel Lane (m)	Parking Lane (m)	Service Lane (m)	Median (m)
A	B	C	D	E	F	G	H	I
60m	Residential – Commercial*	5 + 5	5 + 5 (MUZ)	2 + 2	9 + 9	3 + 3	5 + 5	2
		5 + 5	2 + 2 (MUZ)	2 + 2	12 + 12	3 + 3	5 + 5	2
	Commercial* - Commercial*	7 + 7	5 + 5 (MUZ)	2 + 2	12 + 12	3 + 3	-	2
		5 + 7	5 + 5 (MUZ)	2 + 2	12 + 12	3 + 3	-	4
45m	Residential - Residential	2.5 + 2.5	2 + 2	2 + 2	12 + 12	3 + 3	-	2
	Commercial* - Commercial*	3 + 4	2 + 2	2 + 2	10 + 10	3 + 3	-	2
		4 + 6	2 + 2	2.5 + 2.5	9 + 9	3 + 3	-	2
	Residential – Commercial*	3 + 6	2 + 2	2 + 2	9 + 9	3	5	2
30m	Residential - Residential	1.8 + 1.8	0.45 + 0.45 (KE)	3 (two way)	9 + 9	2.5	-	2
	Commercial* - Commercial*	3 + 3	1 + 1 (MUZ)	2 + 2	6 + 6	2 + 2	-	2
		3 + 3	0.5 + 0.5 (KE)	3 (two way)	9 + 9	-	-	2
		3 + 3	1 + 1 (MUZ)	2 + 2	6 + 6	2 + 2	-	2
		3 + 4	1.5 + 1.5 (MUZ)	2 + 2	6 + 6	2	-	2
	Residential – Commercial*	2 + 2	1 + 1 (MUZ)	2 + 2	9 + 9	-	-	2
		1.8 + 3	0.6 + 0.6 (KE)	2 + 2	6.5 + 6.5	2.5 + 2.5	-	2
24m	Residential - Residential	1.8 + 1.8	1 + 1 (MUZ)	3 (two way)	6 + 6	2	-	1.4
		1.8 + 1.8	1 + 1 (MUZ)	-	6.5 + 6.5	2	-	1.4
		1.8 + 1.8	0.45 + 0.45	-	9 + 9	-	-	1.5

RoW	Land Use Context	Footpath (m)	Multi-utility Zone (MUZ)/ Kerb edge(KE) (m)	Cycle Track (m)	Travel Lane (m)	Parking Lane (m)	Service Lane (m)	Median (m)
			(KE)					
		1.8 + 1.8	0.45 + 0.45 (KE)	-	6 + 6	3 + 3	-	1.5
	Commercial* - Commercial*	2 + 2	0.5 + 0.5 (KE)	2 + 2	6.5 + 6.5	-	-	2
		3 + 3	1.5 + 1.5 (MUZ)		6.5 + 6.5	-	-	2
		2 + 4	1.5 + 1.5 (MUZ)		6.5 + 6.5	-	-	2
	Residential – Commercial*	2 + 2	1 + 1 (MUZ)	3 (two way)	6.5 + 6.5	-	-	2
		2 + 3	0.5 + 0.5 (KE)	-	6.5 + 6.5	3	-	2
12m	Residential - Residential	1.8 + 1.8	0.7 + 0.7 (KE)	-	5 (two way)	2	-	-
		1.8 + 1.8	1.45 + 1.45 (KE)	-	5.5 (two way)	-	-	-
	Commercial* - Commercial*	1.8 + 1.8	0.45 + 0.45 (KE)	-	5.5 (two way)	2	-	-
		1.8 + 1.8	1.2 + 1.2 (MUZ)	-	6 (two way)	-	-	-
		1.8 + 1.8	0+ 1.2 (MUZ)	-	6 (two way)	-	-	-
	Residential – Commercial*	1.8 + 3	0.45 + 0.75 (KE)	-	6 (two way)			
		1.8 + 1.8	0.45 + 0.45 (KE)	-	5.5 (two way)	2	-	-
9m	Residential - Residential	1.8	0.7 (KE)	-	6.5 (two way)	-	-	-
	Commercial* - Commercial*	1.8 + 1.8	0.45 + 0.45 (KE)	-	4.5 (two way) 4.5 (one way)	-	-	-
	Residential –	1.8	0.7 (KE)	-	6.5 (two	-	-	-

RoW	Land Use Context	Footpath (m)	Multi-utility Zone (MUZ)/ Kerb edge(KE) (m)	Cycle Track (m)	Travel Lane (m)	Parking Lane (m)	Service Lane (m)	Median (m)
	Commercial*				way)			
		3	1.5 (MUZ)	-	4.5 (two way)	-	-	-
6m	Residential – Residential	Shared street with .5m kerb edge for trees and streetlight					-	-
	Commercial* - Commercial*	Pedestrian only street with .5m kerb edge on both sides for trees and streetlight						
	Residential – Commercial*	Shared street with .5m kerb edge for trees and streetlight					-	-

**This shall also be applicable to Industrial and Institutional Land uses.*

8. **Street design components** - The details for each element of a street as listed in the following sub section from (1) to (10) with a detailed guidance for the inclusion of design elements in support of multiple travel modes is given in the respective section numbers of the **Annexure** to this regulation - **Street Design Guidelines for Bhubaneswar 2024**mentioned after each element as below –
   (i) Pedestrian zone - Refer Section 12.1
   (ii) Cycle zone - Refer Section 12.2
   (iii) Multi-utility zone - Refer Section 12.3
   (iv) Carriageway - Refer Section 12.4
   (v) Median &Refuge - Refer Section 12.5
   (vi) Streetlights - Refer Section 12.6
   (vii) Signage - Refer PgSection 12.7
   (viii) Intersections - Refer Section 12.8
   (ix) Traffic calming - Refer Section 12.9
   (x) Storm water management - Refer Section 12.10

Chapter IV.

Street Design Process

9. **Study of existing condition of street proposed for retrofitting and/ or construction** shall be based on the following criteria –
   (i) Data from secondary sources as listed below:
      i. Street width according to Comprehensive Development Plan (CDP) – 2030.
      ii. Bhubaneswar Smart City Proposal.
      iii. Accident Data indicating high risk locations from Traffic Police and Commissionerate
   (ii) Data from primary sources as listed below:
      i. Land Use survey within 100 m of site boundary or street (refer to Table 1 for street typology based on land use survey)
      ii. Classified traffic volume count (Lane configuration to be decided based on IRC 86)
      iii. Pedestrian volume &movement
      iv. Visual Survey - building use, street vendors, spill out spaces, informal markets.
   (iii) Data and perceptions obtained from stakeholder consultation including but not limited to BDA, BMC, BSCL, BPTSL, PWD, PHEO, Sewerage Board, R&B Deptt., OPTCL, BSNL, Traffic Police, all Government and Private Agencies who are involved in planning, design, construction, approval, and maintenance of existing and new streets and allied activities within the jurisdiction of Bhubaneswar Development Planning Area and as per requirements, to be finalised by BDA.
10. **Preparation of Land Use map, Street Hierarchy map, Activity mapping and mapping key developments according to**:
   (i) Data from primary sources as listed below:
      i. Topographic survey including road width, building footprints, light/telephone/electric compound walls, traffic signals, footpath, trees by circumference, manholes, surface levels, culverts, etc.
      ii. Traffic and Pedestrian Volume Counts for all arms with origin destination survey.
      iii. On-site survey to identify existing utilities such as - water lines, sewerage lines, power lines, FOC lines.
      iv. Field Surveys along the identified street for activity mapping, building use and street vendor locations.
      v. Parking survey including both on-street and off-street for peak and non-peak hours.
   (ii) Data from secondary sources as listed below:
      i. CDP 2030.
      ii. Bhubaneswar One GIS Portal.
   (iii) Data and perceptions obtained from stakeholder consultation including but not limited to BDA, BMC, BSCL, BPTSL, PWD, PHEO, Sewerage Board, R&B Deptt., OPTCL, BSNL, Traffic Police, all Government and Private Agencies who are involved in

planning, design, construction, approval, and maintenance of existing and new streets and allied activities within the jurisdiction of Bhubaneswar Development Planning Area and as per requirements, to be finalised by BDA.

11. **Select street template** based on the right of way and refer street templates in Table 1.
12. **Stakeholder Consultation** - Prepare street alignment by coordinating and collaborating with key stakeholders to develop the street template for envisioning the desired RoW allocation along streets and intersections through the following steps:
    (i) Centreline alignment, with optimum travel lanes as per street templates.
    (ii) Check availability of minimum prescribed pedestrian realm as per street template.
    (iii) Design the street with variations in parking zones/multi use zones/kerb edge treatments to achieve minimum pedestrian footpath at critical RoW.
    (iv) Identify and design placemaking opportunities in the additional or available space within the pedestrian realm.
13. **Application for approval of street design proposal** - Approval for conceptual design of the street design shall be obtained from the DP & BP Committee or Urban Transport cell, as applicable constituted by Bhubaneswar Development Authority for the city of Bhubaneswar and the Stakeholders identified in the project. The following documents need to be submitted as part of the project –
    (i) 4 hard copy prints of minimum A3 size of the streets on a scale of minimum 1:200
    (ii) A detailed report outlining the process of street design from inception and identification to design stage and outlining the implementation strategy in lines with the Street Design Guidelines for Bhubaneswar, 2024
14. **Detailed tender drawings and material specification** shall be prepared after the approval of conceptual design by the DP & BP Committee/ Urban Transport Cell formed by the Authority.
15. **Bidding Process**
    (i) Develop tender documents based on document available with the Works department for EPC, P1, Item rate Tenders & BoQ through:
        i. Available methods for estimation- Odisha Schedule of Rates, PWD.
        ii. Item rate analysis for elements not prescribed in the Standard Schedule of Rates, Odisha.
        iii. Best price quote from minimum 3 vendors for bought-out items out of Standard Schedule of Rates, Odisha.
    (ii) Coordinate to tender the approved designs to the contractor and give instructions for ensuring that the work follows the SDG recommendations
    (iii) Bid Process Management shall be carried out involving the following steps
        i. Coordinate pre-bid meeting
        ii. Preparing responses to the queries raised during the pre-bid meeting
        iii. Evaluation of bids received and preparing evaluation report for approval
        iv. Issuance of LOA/ LOI to the selected bidder
16. **Construction supervision and implementation –**
    (i) Formulate expert committee to supervise construction comprising of the following members but not limited to:

i. Public Health Engineering Organisation (PHEO), Software Technology Parks of India (STPI), Odisha Power Transmission Corporation Limited (OPTCL) & Central Electricity Supply Unit (CESU).
ii. Traffic Police.
iii. Works Department (Govt. of Odisha), Road & Bridges Department & Bhubaneswar Municipal Corporation.

(ii) Coordination strategy with the consultant for effective implementation through the following steps:

i. Site Verification:
   1. On-ground review and assessment of existing uses and utilities.
   2. Finalisation and approval of the complete material palette on-site by executing a sample of 10m x 10m.
   3. Management strategy to accommodate existing uses while construction:
      a. Debris Management.
      b. Underground utilities phasing plan.
      c. Traffic Management.
      d. Encroachment.

ii. Compliance with the approved design
   1. Review plans between stakeholders to ensure construction is supportive of street template.
   2. Ensure submission of reports at each stage of construction detailing the compliant and non-compliant areas based on the monitoring & evaluation checklist.

Chapter V. Monitoring & Evaluation Checklist

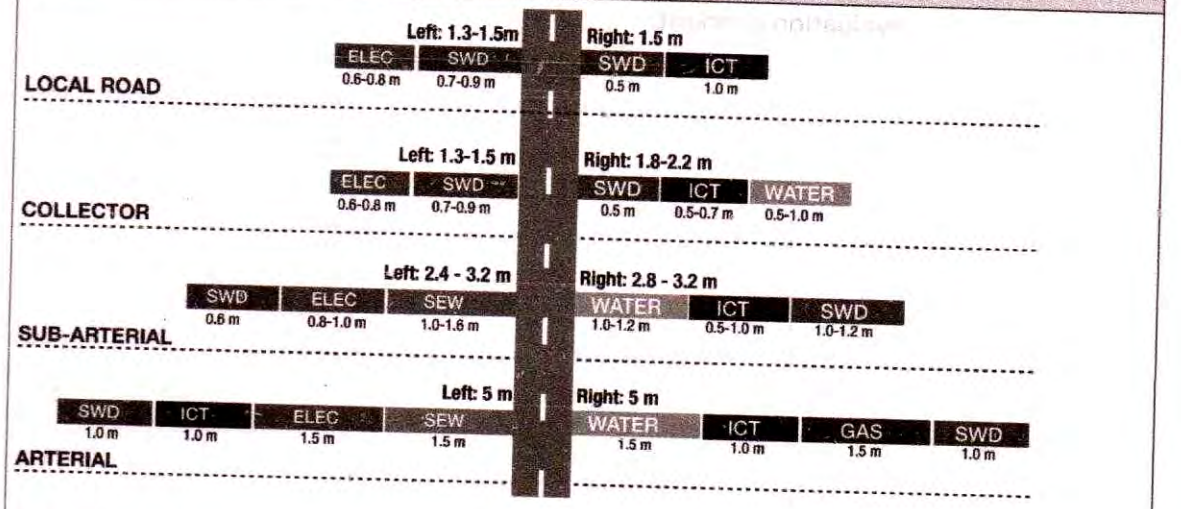
17. The following checklist should be followed to evaluate applications for street design essentially for new roads or for cases where the entire street is redeveloped/ reconstructed. It contains the minimum standards that should be followed for developing and preserving safe operations of road facility.
18. This audit checklist will be used to check the compliance to the larger objective of the Street Design Guideline by the Urban Transport Cell as and when it is formed
19. Following is a checklist categorized in five layers– A) Underground; B) Footpath; C) Cycle Tracks; D) Intersections; and E) Above-ground Utilities.

A. Underground Layer

The following section outlines the utility design requirements for the installation of underground services. To initiate a complete street design for a greenfield or retrofit development, **underground layer should be implemented as a first layer** complying with the minimum requirements outlined in the section below:

Element	Responsibility	Features	YES	NO	NA
Sewer/ Drainage Lines		Recommended depth: **2.0-6.0m for a Trunk Sewer Line**			
Water Supply Lines		Recommended depth: **0.6-1.0 m for a service line** **1.0-1.5m for a trunk line**			
Electricity Cables		Recommended depth: **0.6-1.0m for low tension cable** **1.5-2.0m for high tension cable**			
Telecommunication Cables		Recommended depth: **0.6-1.0m directly laid**			
Gas Pipelines		Recommended depth: **2.0-3.0m**			

The placement of the utilities should comply with the below schematic representation, following the depth as per the above table:



ELEC: Electricity Cable **SWD:** Sewerage/Drainage & Water Lines SEW: Sewerage

3. Implementation Checklist for footpath

Focusing on footpath networks at various scales is important in creating comfortable and attractive pedestrian linkages within the city in order to support walkability. Components of continuous footpath include the following, at a minimum:

Parameter	Design Standard	Other Details	YES	NO	NA
Width of the Footpath	Clear **width: 1.8m**	**Based on the land use**:			
		Commercial/ Mixed Use: 2.0m			
		Shopping Frontages: 2.5m			
		Bus Stops: 3m			
		High Intensity Commercial Areas: 4m			
Frontage Zone or Dead Width	Shopping area: 1m	Should be accommodated on all **Commercial and Mixed Use Streets**			
	Next to buildings: 0.5 m				
Height Clearance for Footpaths	Clear **height- 2.4m**	No obstructions like tree branches, ad panels, posts etc. should be present.			
Height of Footpaths	Maximum **height < 150mm (6")**	**Exception: 100 mm** (4") kerb height is preferable **for Arterial Roads.**			
At **corners**, Kerb Radius	Maximum **corner radius** of kerb- **12m**	**Exception:** It may be **reduced to 6m in residential areas** to slow down turning buses, trucks etc. with the provision of a corner mountable kerb for emergency vehicles.			
Footpath **Surface**	Natural stones, Cobble stones and cement concrete pavers (CC pavers).	Non-slippery materials should be used. The finished surface should not have undulations except for natural rough cut stone allowing 3-4 mm variation.			
	Paving for **large hard surfaced areas** like parking lots, driveway curb-cuts, large plazas, hawker zones, pedestrian only streets, etc. **should be permeable** to increase ground water infiltration and recharge.				
Universal Accessibility	Minimum kerb **ramp slope should be 1:12** for wheel chair users				
	Width of the kerb ramp **should not be less than 1.2m**				
	A continuous **tactile warning strip** to be provided:				
	Height: 5mm				
	Distance from the building: **0.6 - 0.8m**				
	Width: **0.3m wide**				

C.	Implementation Checklist for Cycle Tracks				
Extensions to the pedestrian network by providing cycling facilities encourage the users of NMT to expand their reach. Components of continuous cycle tracks include the following, at a minimum:					
Parameter	**Design Standard**	**Other Details**	**YES**	**NO**	**NA**
Width of the Cycle Track	**A minimum width of 2 m for one way movement**	Streets with RoW more than 12m and less than 18m or equivalent can have painted cycle lanes with minimum width of 1.5m			
	A minimum width of 3 m for two way movement				
	Cycle tracks should be separated from the main carriageway **by a verge with minimum width being 1 m**				
Height Clearance for Cycle Track	Clear **height- 2.4m**	No obstructions like tree branches, ad panels, posts etc. should be present.			
Viewing Clearance	**Not less than 25m** (82 ft)	In case of **gradients 1 in 40 or steeper- not less than 60m** (197ft)			
Height of cycle tracks	Maximum **height < 100mm (4")**				
Horizontal Curve	Radius < 10m (33ft.)	In case of **gradient 1 in 40 or steeper- not less than 15 m** (50ft)			
Vertical Curve	**At changes, minimum radius:** Summit curves- 200m (656 ft.) Valley curves- 100m (328 ft.)				
Slope of Ramp	Cycle track of 6-8 cm height: 30% gradient.				
	Cycle track of 8-10 cm height: 20% gradient.				
	Cycle track of 10-12 cm height: 15% gradient				
Verge	Min. Width - 0.5m (20 in.)				
Cycle Track **Surface**	The surface of bicycle path should be in 100 mm thick cement concrete with 150 mm thick PCC base.	**Paver blocks should be avoided.**			
	M40 concrete is recommended to be used for the cycle tracks.				
	Blue or Green colored thermoplastic paint is useful for highlighting cycle facilities.				
Lane Marking	A cycle symbol should be marked on cycle lanes as indicated in the illustration on the right.				
	Lane marking shall consist of 150mm thick solid white line in parallel to the kerb of the carriageway in case of cycle lanes.				
Parking requirements	Needs to be provided near all transit stops:	Parking for para-transport/feeder modes/ NMT is to be prioritized and subsidized and provided within multi utility zone			
	Minimum width required is 1.5 m				
	Cycle stand design: should accommodate at least the frame and ideally both wheels				

D. Implementation Checklist for Crossings

Strengthening the preference towards non-motorised modes is aimed at overcoming physical access barriers through application of a number of design components. Minimum 4 M wide pedestrian crossing and 2.5 M wide cycle crossing must be provided at all road crossings. A "Set of 3" essentials components are required at each crossing:

- Universal Accessibility Features (for persons with disabilities, reduced mobility, vision and hearing impairment.)
- Street Utilities
- Street Directional Signage

Parameter	Design Standard	Other Details	YES	NO	NA
At-grade Crossing	Minimum 4 M wide pedestrian and 2.5 M wide signalized cycle crossings at all intersections and T-junctions.	Pedestrian crossing should be shortest possible direct route to cross the street; therefore 'at grade' crossing is most preferred At grade crossings are preferable in pedestrian priority areas Crossings near intersections could be controlled or uncontrolled			
	Width of crossing should be increased where higher pedestrian/NMV volumes are expected due to abutting land uses.				
	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.				
	Way-finding Signage for Pedestrian orientation and directional guidance must be provided at street intersections. Amenities like dustbins are also needed.				
	Traffic Calming treatment starting least 25 m before the zebra/ table-top crossing is essential.				
	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.				
Mid-Block Crossing	Mid-block crossings must be provided for Blocks longer than 250 M.				
	Mid-block crossings must be provided at regular intervals as per the following standards: **Residential Areas:** Every 80 - 250m and Coordinated with entry points of complexes; location of bus/ train stops, public facilities, etc. Commercial/ Mixed Use Areas: Every 80 - 150m	Refuge Islands are must at mid block crossings for roads with ROW 18 and more or where pedestrians need to cross more than 3 lanes at a stretch Should have sufficient signage and illumination. Reflective paints, cats eye, bollards and light poles to be used for high visibility			
	High Intensity Commercial Areas: Make Pedestrian and NMT only, if possible.				
	All non-signalized mid-block crossings are to have auditory pelican signals and table top provisions.				

Grade Separated Crossing (Foot Over Bridge)	Grade separated crossings are recommended where an exclusive pedestrian phase will increase the traffic signal cycle time beyond 120 seconds and vehicular traffic demands uninterrupted flow as associated with major arterial roadways or expressways.	There should be clear view from one end to the other and a good level of lighting at least 50 lux. To enhance security, CCTV cameras should be placed. Small sops shall be encouraged to give a sense of safety to pedestrians during night time also.			
	Ideally both steps and ramps should be provided in both subways and FOB. A ramp (maximum slope 1:12) should be accompanied by a flight of easygoing steps with landing at every 750mm of vertical rise.	Handrails are to be on both sides at 760-900 mm above the walking surface Lift may be provided on both entrances/ exits and should have minimum internal dimensions of 1500mm X 1500mm			
D. Implementation Checklist for Crossings					
Parameter	**Design Standard**	**Other Details**	**YES**	**NO**	**NA**
	All Subways and Foot-overbridges must have a combination of either "Staircase + Ramp" or "Staircase + Elevator" for universal accessibility.				
Grade Separated Crossing (Humped Crossing)	Humped Crossings may be considered only on highways.				
	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.				
	Rainwater harvesting is mandatory and critical.				
E. Implementation Checklist for Public Amenities					
The following utilities need to be integrated in the footpath and cycle track designs maintaining an unobstructed through movement for the pedestrians and cyclists.					
Tree Planting	**On all streets above 6m in width** having at least **125 trees / km**				
Street Light	**For Carriageway:** Spacing-20-30m; Height-9-15m; Intensity- 30lux for wider road and 10 lux for residential roads.				
	Footpath and Cycle Track: Spacing- 20-30m; Height- max 4m; Intensity- 80Lux				
Signages	**Way-finding signage, directional signage,** and **signage identifying various activities**	Placed near intersection, entry points and should be designed in a consistent and easily identifiable manner			
Public Toilets	Public Toilets, including one for persons with disabilities - must be located every 500-800 M.				
Dustbins	Dustbins with graphic explanation of source separation, must be provided at all street intersections and bus-stops.				
Street Vendors	Should integrate space for hawker zone, minimum width for a hawker to conduct business= 4 sq.m	Placed in the Multi-Utility Zone			
Breast Feeding Cubicle	It must be located every 500-800 M with proper enclosure space for mother/car givers.	Placed in the Multi-Utility Zone with ROW more than 12 m			
Water ATM	It must be located along with public toilets at every 500-800 M (5-8 minute walk)				

By order of Bhubaneswar Development Authority

BISWARANJAN RATH
Secretary
Bhubaneswar Development Authority

Printed and Published by the Director, Directorate of Printing, Stationery and Publication, Odisha, Cuttack-10
Ex. Gaz. 598—173+10