

Naya Raipur Development Authority
Terms of Reference
for Traffic Safety Audit of BRT and NMT Corridors in Raipur and Naya Raipur under
India-SUTP-Naya Raipur Project

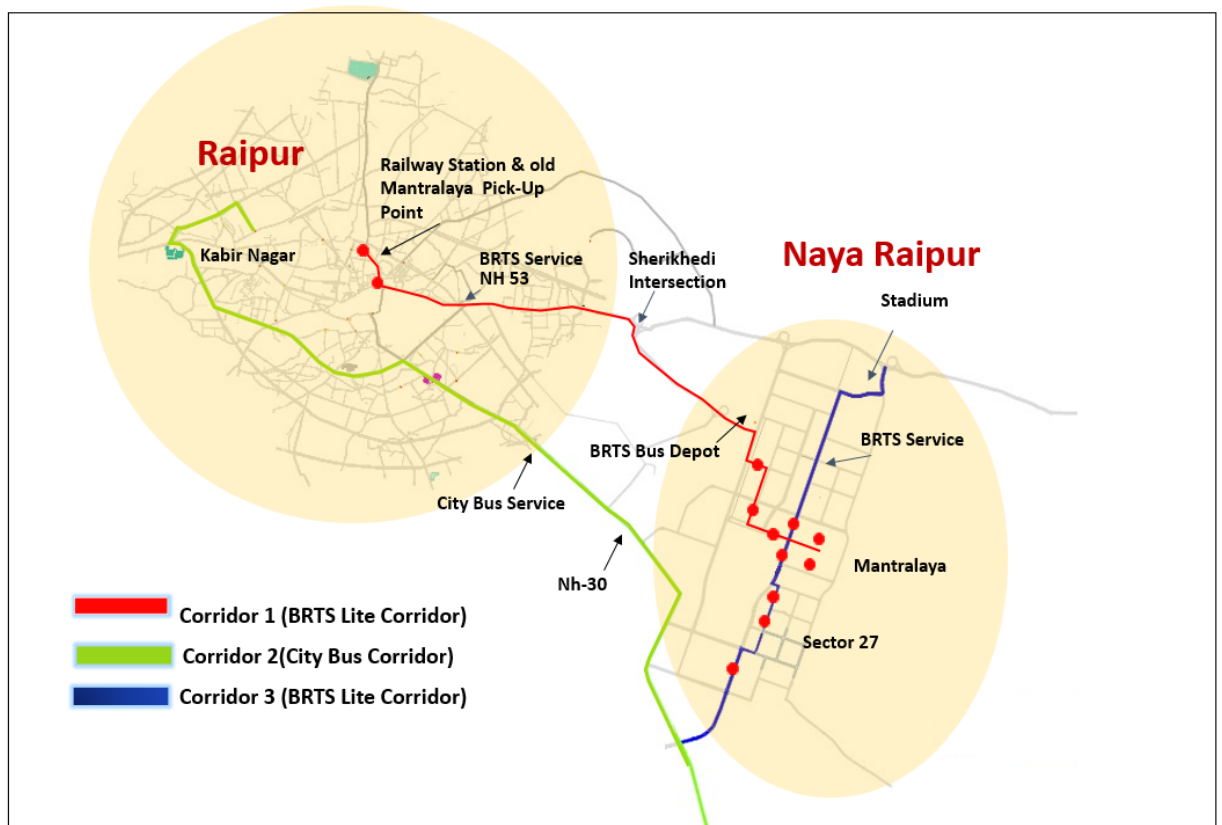
(Eol Notice No.: 1619/102/CPM/NRDA/2015, Naya Raipur, Dated 21/03/2016)

1.0 Background

1.1 Naya Raipur Development Authority (NRDA) is implementing a demonstration project under GEF-UNDP-World Bank supported Sustainable Urban Transport Project (SUTP) promoted by Ministry of Urban Development, Government of India. Under this project, BRT Lite Services shall be facilitated by developing physical infrastructure for connectivity between Raipur and Naya Raipur and within Naya Raipur on the following three corridors.

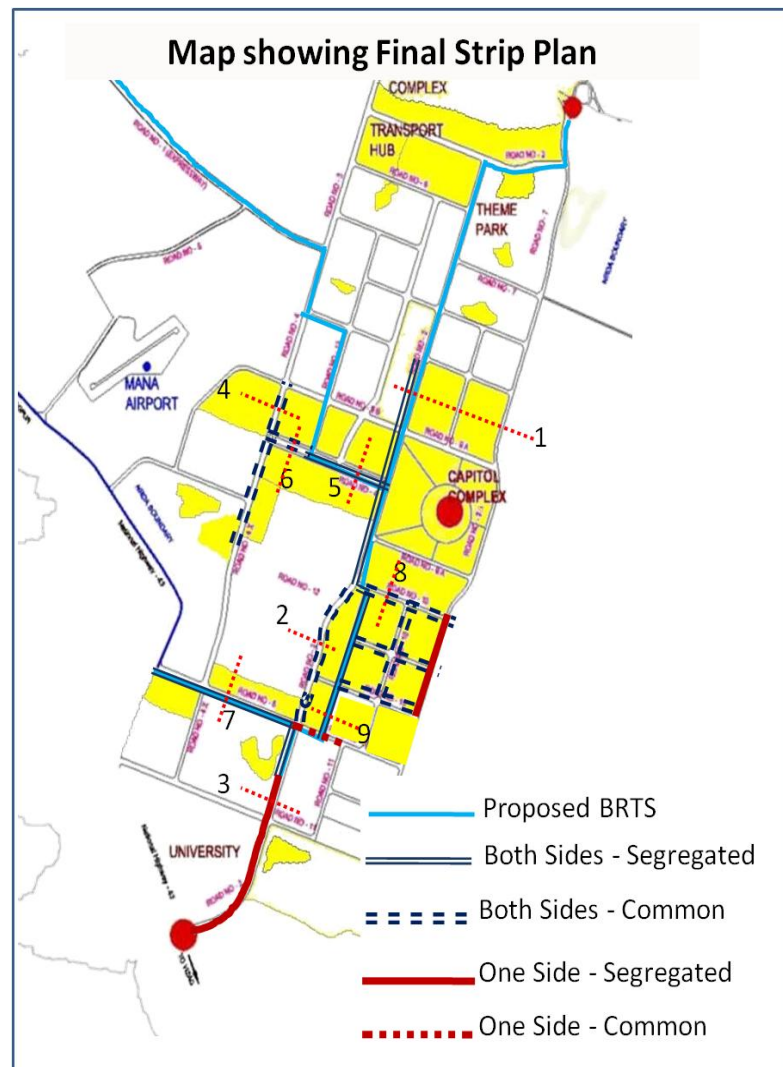
- a. Corridor-1 BRTS Lite Services (25km) from Raipur Railway Station to Capitol Complex in Naya Raipur, Via NH-53
- b. Corridor-3 BRTS Lite Services (18km) Within Naya Raipur
- c. Corridor-2 City Bus Services (35km), from Kabir Nagar to Capitol Complex in Naya Raipur Via NH-30

The indicative plan is given below -



BRT services between Raipur and Naya Raipur, on corridor-1, the BRT buses shall run in mixed traffic from Raipur railway station to the sherikhedi intersection and from there the buses shall run on a segregated (by lane marking) lane to the Capitol Complex. On corridor-3, the BRT buses shall run on a segregated (by lane marking) lane within Naya Raipur. In the corridor-2, the City Bus Services shall ply from Kabir Nagar to Capitol Complex on the normal lane

- 1.2 NRDA is also developing Cycle Track and Pedestrian Walkways in Naya Raipur to facilitate and promote Non-Motorized Transport (NMT), under the above funding. The indicative strip plan of the Cycle Track and Pedestrian Walkways is shown in the map below -



- 1.3 The funding has also assisted in Transit Oriented Development Study following which ToD policies have been formulated and the same are being implemented.

- 1.4 A broad gauge Railway Line is proposed from proposed Naya Raipur Railway Station (near Mandirhasaud) on Raipur-Vishakhapatnam Railway Line which will have 4 Stations within Naya Raipur. Thus it will provide connectivity with Raipur Junction and also serve as a sub urban Railway System.
- 1.5 Along National Highways 53 (NH 53), within Raipur the road traffic is heterogeneous. In Raipur, near the two BRT Pick-up Points, Drop-off Point and Bus Shelter, pedestrians and general traffic intermingles with each other whereas in Naya Raipur, roads are wide and traffic density is low and vehicular speeds are high. These areas may pose safety hazards.
- List of BRTS facilitates at Raipur:
- i) Railway Station (Pick-up Point)
 - ii) Old Mantralaya (Pick-up Point)
 - iii) Ghadhi Chowk (Drop-off Point)
 - iv) Near Telibandha Chowk (Bus Shelter)
 - v) Any other point/s identified during inception.
- 1.6 In this above background, NRDA intends to appoint a consultant to conduct a Traffic Safety Audit of BRT Lite corridor 1 and BRT Lite corridor 3 and submit a report on the potential safety hazards and recommendations for their mitigation.

2.0 Broad Scope

The Scope of the Traffic Safety Audit is -

- (1) To identify potential conflict points, spots where risk is accentuated and recommend appropriate interventions supported by drawings and costs. The study shall be carried out for the following areas of Raipur and Naya Raipur.
 - a. City Arterial Roads(100m/60m) and Intra- Sector Roads (24m/18m/12m) with in Naya Raipur
 - b. All the intersections in Naya Raipur.
 - c. Near all the BRTS Bus Shelter and Pick-up Points (should cover the pedestrian access ways and street crossings within a 200 – 250 m distance).
- (2) Safety requirements shall apply to the current phase which is under implementation and also in respect to the projects to be implemented in the near future with emphasis on identification of factors associated with accidents, consideration of the same, and recommendation for the appropriate remedial measures.
- (3) Safety Requirements shall include measures associated with traffic management and regulation such as road signs, pavement marking, traffic control devices,

roadside furniture, highway design elements, illumination, warnings, enforcement and emergency response.

- (4) To identify and suggest adequate locations and designs for traffic signage such as Mandatory/Regulatory Signs, Cautionary/Warning Signs and Informatory/Guide Signs as per IRC within Naya Raipur.

3.0 Scope of Services

The scope of services covers activities in following five stages –

I. Inception stage

- (1) Collect from Feasibility Report/Detailed Project Report base line data from NRDA or its consultants on
 - a. BRTS detailed project report and Good for construction drawings (GFC)
 - b. NMT detailed project report and Good for construction drawings (GFC)
 - c. Monitoring and Evaluation report
 - d. Regional Mobility Plan Report
 - e. Service and financial plan for BRTS
- (2) Study the present public transport system, study of proposed rail network and its connectivity to Naya Raipur, study of location of the stations, study of BRTS Lite Pick – up Points and Shelters developed at Raipur and Naya Raipur. Visit BRT, NMT Corridors and feeder roads, ongoing development works.
- (3) Observe existing traffic and pedestrian flows in the vicinity of the Pick-up Point, Drop-off Point and shelter within the city of Raipur, during both peak and off-peak periods.
- (4) Prepare and submit inception report which should include inventory and rapid assessment of potential hazard and safety requirements, methodology for conducting audit and audit questionnaire

Deliverable: Inception report

II. Data Collection and Analysis stage

- (1) Collect design details from NRDA including horizontal and vertical alignment; sightline; layout of intersections; road crossings; culverts; side drain; provision for parked vehicle; pedestrian; bus bays and other traffic central devices, crash barriers and other incidental or consequent initial information;
- (2) Review various safety provisions already made/proposed in the corridors. This should include an appreciation and understanding of the safety provisions as given in various acts, rules and regulations of Gol/State Government where project is situated including MoRTH/Indian Roads congress (IRC), MoUD specifications/codes/manuals.

- (3) Collect traffic data, for 3 years relevant period from secondary sources. Collect FIR data of all road accidents, including fatal and grievously injured accidents for preceding two years from police stations and other secondary sources. Do analysis of fatal and grievously injured accidents as “Crash Analysis” and relate to location of roads with traffic volume as per IRC: 53-2012 guidelines. The scope of work will also include Classified Traffic Volume Count Survey, Speed and Delay Survey, Accident Data Collection and Collation, and Road Inventory Survey
- (4) Black Spots to be statistically identified based on the analysis of accident data and Accidents Severity Index (ASI) on fatal and grievous injury accidents (minor injury and non-injury not to be considered). Threshold value (average severity+1.5 times standard deviation). Any spot with more than threshold value will be treated as Black spots. For estimation of ASI, the weight age to fatal accident will be assigned as 7 (Seven) and to grievous injury accident as 3 (three).
- (5) Identify the black spots or accident prone locations and Prepare cluster collision diagram including location details of physical features at accident spots shall be prepared for analysis for probable causes of accidents for evolving proactive and reactive measures.

Deliverable: Traffic and Accident Analysis Report

III. Draft Final Safety Audit Report Stage

- (1) Review the design details of ongoing projects of BRT and NMT Infrastructure and submit draft Safety Audit Report with recommendations of safety related measures supported by drawings. The said report shall also include modification of the designs, if required.

Deliverable: Draft Safety Audit Report

- (2) Revise Draft Safety Audit Report, on the basis of comments/suggestions received.
- (3) Submit Draft Final Safety Audit Report from which will inter-alia include cost to carry out such measure as per recommendation of Safety related matters.

Deliverable: Draft Final Safety Audit Report

IV. Organising Workshop and inviting comments on Final Safety Report

Organize Workshop at Naya Raipur to discuss the Draft Final Safety Audit Report. The consultant shall be required to provide the experts, resources for the video and power point presentations, printed matter for perusal by participants expected to be 45 in number, and drawings for the workshop at cost which will be borne by the consultant. All other costs viz. venue, hospitality and transport of participants shall be borne by NRDA.

V. Submission of Final Safety Report

Submit Final Safety Audit Report based on the comments received

4.0 Key Personnel

4.1 Qualifications and Skill Requirements

The qualification and experience requirement of these experts which will be evaluated to arrive technical score are given below:

S.No.	Position	No.	
1	Road Safety Auditor-Cum-Team Leader - The candidate should be a graduate in Civil Engineering/Architecture and post-graduate in traffic/Transportation/ Safety Engineering/Planning. He should have at least 12 years of experience in the relevant field. The candidate should have undertaken at least 2 projects of roads safety audits, including at least one in design stage.	1	
2	Traffic Planner/Engineer - Traffic planner-Graduate and master in transport planning and/or post-graduation in traffic & transportation engineering. The minimum period of professional experience is 8 years the candidate should have enough knowledge on road safety engineering aspects.	1	

Man month provisions for the above key experts and any other staff shall be determined by the consultant at his/her end.

5.0 Deliverables, Timelines & Payment Terms:

(1) The deliverables, timeline and payment schedule is as below -

S.N.	Deliverable	Submission Deadline	Payment (as percentage of fee)
1	Inception report	2 weeks from Notice to Proceed	15%
2	Traffic and Accident Analysis Report	3 weeks from approval of Inception Report	20%
3	Draft Final Safety Audit Report	3 weeks from approval of Draft Safety Audit Report	25%
4	Organization of Workshop	Within 2 weeks of approval of Draft Final Safety Audit Report Deliverables - Report	15%

5	Final Safety Audit Report	Within 2 weeks of Organization of Workshop	25%
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(Note: Payment schedule is combined for all the activities required for preparation of the deliverable. Also after submission of reports, 50% of the fee payable at each milestone shall be made, the balance fee shall be payable after approval of the deliverable.)

- (2) Service Tax as applicable shall be reimbursed by NRDA in addition to the fees.
- (3) Payment shall be made against invoice raised for each deliverable that is accepted by the NRDA.
- (4) All reports submitted to client will be supplied in six hard Copies, along with a CD comprising relevant electronic copies of all data, maps & reports.
- (5) Copyright for all the manuals, plans and reports and other intellectual property created as a part of this project will vest exclusively with NRDA which would be free to use all such material, without restrictions.

6.0 Remuneration

- (i) The consultant will prepare his proposal to perform the services on the basis of the ToR given above. The fee shall be inclusive of all costs including cost of travel, lodging boarding, communication, out of pocket expenses etc.
- (ii) Expenditure towards venue costs and organizing the workshop for this assignment will be borne by the NRDA. The consultant shall be required to provide expert resources, power point presentations and drawings for the workshop at its own cost.

7.0 Consultants Identification

- (1) The consultant should have demonstrated experience in undertaking Urban Road Safety Audit.
- (2) The selection shall be based on the Consultant's Qualifications (CQS) set out in the Guidelines for Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers May, 2004, revised October 2006, revised May 2010.

8.0 Supervision

The study will be supervised by NRDA. They will be supported by the PMC to the National PMU, the PMU and the World Bank.