4.2.3.13 Road /Bus Transport

1.0Subject Matter

(Present a brief historical background on the growth of bus transport – a bird's eye view picture and analysis of the bus transport using the information/ tables) provided in the annexure.

GIS based map depicting location of all the Bus Depots and Inter-State Bus Terminals (ISBTs) District level
Number of passengers from Bus Depots/ISBTs in the State. (Refer Annexure- Table-1).
Time trend of the number (growth) of Bus Depots/ISBTs. (Refer Annexure- Table-2).

2.0Details of Water Availability, Supply, Demand, Withdrawal & Consumption for the Bus Transport

Water Supply & Demand for Bus Transport in the State

Time trend of total water demand and actual current water supplied to the Bus Depots & ISBTs along with growth of Bus Depots & ISBTs in the state. *(Annexures- Tables-2, 3)*

Total Freshwater Withdrawal and Actual Water Consumption by Bus Transport Sector in the State

Comparative trend of Total Freshwater Withdrawal Vs Actual Water Consumption by Bus Transport Sector in a State.

State Water Budgeting: *(Refer Annexure- Table 3).*

Bus Depots/ISBTs (district wise)	Previous Year / Average Annual Demand (MCM)	Previous Year/ Average Annual Supply & Consumptive Use (MCM)		Demand for the present Water Year (MCM)
		Supply	Consumptive Use	
District 1				
District 2				
GRAND TOTAL	Xxx	xxx	xxx	xxx

3.0Issues and Challenges

Illustrative issues and challenges may include matters of waste water disposal and associated surface and ground water contamination, water demand and supply issues in the Bus transport sector in the state, issues related to water pricing in bus depots/ISBTs, etc.

4.0Problem Tree / Root cause Analysis: Cause, Effect and Interventions

5.0Governance / Management:

Statute / Law / Policy/ Regulations if any

- State level laws, policy and governance for the Bus Transport sector in the state on water access, consumption and wastewater discharge.
- Any specific fresh and waste water regulation/ guidelines in state, provide details.
- Has the state notified any regulations including for zero liquid discharge for the Bus Depot/ISBT in state? Provide details.

Institutions governing / managing / monitoring the resources and Institutional structure.

- Institutions governing / managing / monitoring the water consumption and supply.

Governing body for Bus Transport	Water allocation & Monitoring authority	Waste water discharge monitoring
E.g. Department of Transportation (Bus)	*E.g. CGWA/ Water resource department/ Urban or Rural body*	*e.g. State pollution Control Board*

Areas of Peoples/Private Participation if any

- Water Projects set up by Bus Transport sector for the benefit of neighborhood/ local community/ Environment.

Bus Depot/ ISBT	Any OE[18] or critical block within the watershed	Water Conservation / Waste Water Treatment initiatives if any	Partnership			Sustainability of initiative
			Community Participation	PPP	Others	

Bus Depot/ ISBT	Any OE or critical block within the watershed	Water Reuse/ Recycle initiatives under PPP	PPP Yes/No	Sustainability of initiative

Schemes, Economics & Financing-

Existing schemes and programs along with financial allocations, expenditure etc.

- Water Tariff and procurement cost *(Refer Annexure 6(a) & 6(b))*
- Expenditure on Water management *(Refer Annexure 6(c) & 6(d))*

6.0Measurement, Monitoring and Data Constraints/ Management

- **Water & Wastewater Measurement:**

  Shall specify measurement methods and technologies at Raw water source, process and Waste Water (generation, recycle/reuse & discharge) and Water Quality as per CPCB / SPCB

- **Monitoring** at State Government: Institution/ Agency/ Official responsible for Sustainable Water Management comprehensively for this Sector.

- **Data Management**: Should specify - Frequency of measurement, Frequency of Reporting to centralized agency, Water Quality Parameters monitored, how data is being used to improve Water Use Efficiency and ensure water quality parameters within the prescribed norms etc.
- **Constraints** with respect to the measurement & monitoring.

7.0Performance Indicators:

a. Benchmarks on water use *(Refer Annexure- table-13)*

b. Status of various Performance Indicators– for comparison across Districts

Category	**Indicator**	**Bench Mark** *(as applicable)*	**District- 1**	**District- 2**
Water Quantity Measurement	**Water Quantity**			
	% of bus depots/ISBTs with water flow meters			
	% of water sources of bus depots/ISBTs geotagged			
	% of bus depots/ISBTs undertaken internal water audit in the last year			
	% of bus depots/ISBTs undertaken external water audit in the last year			
	% of bus depots/ISBTs Undertaken Third party Water Audit in the last Year			
Water Conservation	% of bus depots/ISBTs with water harvesting structures?			
	% reduction of total water demand compared to the previous year.			
Water Use Efficiency *(Annexure- Table 7)*	Specific Water Consumption in **Water consumption per passenger (L/passenger)** *(refer Annexure Table-7(a),(b) & (c))*			

[18]Overexploited block of groundwater

	Have specific water consumption norms/benchmarks established	Yes/No		
	% of bus depots/ISBTs with specific water consumption within the norms/bench marks/standards			
Waste Water *(Annexure-Table 8)*	% reduction in wastewater generation as compared to previous year			
Water Quality *(Annexure-Table 9)*	% of bus depots/ISBTs with online water quality monitoring systems installed.			
	% of bus depots/ISBTs having compliance with the wastewater quality discharge norms.			
	% of bus depots/ISBTs discharging wastewater into open area/ earthen nallah /open drain/ municipal sewer?			
	% of bus depots/ISBTs notified for violating effluent discharge norms for discharge in natural resources (surface/ground)?			
Economics	Whether economic incentives are in place to encourage water efficiency & conservation?	Yes/No		
	Whether economic disincentive mechanisms like penalties etc. are in place to discourage water wastage & inefficient use?	Yes/No		
	Whether water use charges & tariff are revised regularly and are reflective of rational pricing mechanisms?	Yes/No		

8.0Reforms undertaken/ being undertaken/ proposed if any

9.0Road map of activities / tasks proposed for

Better governance
Better source / supply management
Better demand management /improved Water Use Efficiency
Water Quality
Water Economics and Financing
Sustainable Water budgeting with timelines and agencies responsible for each task/activity.

ANNEXURE

1Total number, types & capacity of Bus Depots/ISBTs in the State

Total Production from Bus Depots/ISBTs in the State			
Type	**No of Bus Depots/ISBTs**	**Total Capacity of all the Bus Depots/ ISBTs (Million Passengers per Annum)**	**Daily Average passengers at all the Bus Depots/ISBTs**
Bus Depots			
ISBTs			
Others			
Total			

2Growth Trend of Bus Depots/ISBTs over a period and Water Demand and Supply position

bus depots/ISBTs	**Years**					
	1990	**1995**	**2000**	**2005**	**2010**	**2017**
Bus Depots						

ISBTs							
Others							
Total							
Water Demand and Supply							
Total Water Demand (MCM)							
Total Water Supply (MCM)	***GW***						
	SW						
	Municipal Supply						
	Total						
Demand-Supply Gap							

3Water Budgeting

3(a) Demand, Supply (Withdrawals) & Consumptive Use:

Bus Depots: (MCM) Present Water Year: 1st June to 31st May next year									
INDUSTRY (within the Basin/ Sub-basin A)	Previous Year/ Average Annual Demand	Demand for Present Water Year	Previous Year/ Average Annual Supply				Previous Year/ Average Annual Waste Water Generated	Previous Year/ Average Annual Consumptive Use	Remarks
			Rain Water	Surface Water	Ground Water*	**TOTAL SUPPLY**			
Unit 1									
Unit 2									
GRAND TOTAL									

*GW Draft can be calculated from the number of GW abstraction structures & corresponding draft for each Industrial Use/ Process.

3(b) Source Wise: Previous Year/ Average Annual Water Supply

Bus Depots: (MCM)											
Source	Sub Source	**Unit 1**	**Unit 2**	**Unit 3**	**Unit 4**						**TOTAL**
Rain Water	Directly Harvested Rain Water										
Total											
Surface Water	Springs, Nallahs										
	Major Projects										
	Medium Projects										
	Minor Projects										
	Ponds, Tanks										
	Wetlands										
	Sea Water /Desalinated Water										
	Inter Basin Transfer										
Total											
Ground Water*	Dug wells (Total No. x Draft)										

(Dynamic / Static)	Dug cum Bore well (Total No. x Draft)										
	Bore/Tube wells (Total No. x Draft)										
	Others etc										
Total											
Treated Waste Water											
GRAND TOTAL											

*GW Draft can be calculated from the number of GW abstraction structures & corresponding draft for each Industrial Use/ Process.

3(c) Previous Year/ Average Annual Demand, Supply (Source wise) and Consumption for Basin/ Sub-basin A:

Source of Water	Demand of all Units in Basin/ Sub-basin A	Supply/ Withdrawal for all Units	Consumptive Use of all Units	Gap/Remarks
Rain Water (Directly Harvested)				
Springs, Nallahs				
Major Projects				
Medium Projects				
Minor Projects				
Ponds, Tanks				
Wetlands				
Desalinated Water/ Sea water				
Inter-Basin Transfer				
Ground Water (Dynamic)				
Treated Waste Water				
TOTAL (MCM)				

3(d) Previous Year/ Average Annual Demand, Supply (Source wise) and Consumption for Whole State:

Source of Water	Demand of all Units in the State	Supply/ Withdrawal for all Units	Consumptive Use of all Units	Gap/Remarks
Rain Water (Directly Harvested)				
Springs, Nallahs				
Major Projects				
Medium Projects				
Minor Projects				
Ponds, Tanks				
Wetlands				
Desalinated Water/ Sea water				
Inter-Basin Transfer				
Ground Water (Dynamic)				
Treated Waste Water				
TOTAL (MCM)				

3(e) Summary State Water Budget for Bus depots/ISBTs

Bus Depots/ISBTs in State (district-wise)	Previous Year / Average Annual Demand (MCM)	Previous Year/ Average Annual Supply & Consumptive Use (MCM)		Demand for the present Water Year (MCM)
		Supply	Consumptive Use	
All Districts	xxx	xxx	xxx	xxx

4Proportion of Water withdrawal and consumption by Bus Depots/ISBTs against total industries in the State

Bus depots/ISBTs – Based on capacity	Total Water Withdrawal by all bus depots/ISBTs (%) *(Refer Annexure-4(a))*	Total water withdrawal by all the Industries in state	Total Water Consumption by all bus depots/ISBTs (%) *(Refer Annexure-4(b))*	Total water Consumption by all the Industries in state
Bus Depots				
ISBTs				
Others				
Total				

4(a) Total Water Withdrawal/Abstraction by **bus depots/ISBTs** in the State as percentage of Total water withdrawal by all the industries in the State

Total water withdrawal by Bus Transport Sector (%)

$$= \frac{\text{(Total water withdrawal by all the bus depots/ISBTs in the State) x 100}}{\text{(Total water withdrawal by all the industries in the state)}}$$

4(b) Total Actual Water Consumption by **bus depots/ISBTs** in the state as percentage of Total water consumption by all the industries in the State

Total water consumption by Bus Transport Sector (%)

$$= \frac{\text{(Total actual water consumption by all bus depots/ISBTs in State) x 100}}{\text{(Total water consumption by all the industries in the state)}}$$

4(c) Total Freshwater Withdrawal by all bus depots/ISBTs and Total Actual Water Consumption by all bus depots/ISBTs in the State

	CY -11	**CY -10**	**CY -9**	**CY -8**	**CY -7**	**CY -6**	**CY -5**	**CY -4**	**CY -3**	**CY -2**	**CY -1**	**CY / 2017**
Total Fresh Water Withdrawal by all bus depots/ISBTs (MCM)												
Total Actual Water Consumption by all bus depots/ISBTs (MCM)												

5Total Water Withdrawal (Abstraction) and Actual Water Consumption as percentage of total renewable freshwater resources

	CY-5	**CY-4**	**CY-3**	**CY-2**	**CY-1**	**CY/ 2017**

Total Fresh Water Withdrawal by all bus depots/ISBTs (%) *(Refer Annexure-5(a))*						
Total Actual Water Consumption by all bus depots/ISBTs (%) *(Refer Annexure-5(b)*						

5(a) Total Water Withdrawal/Abstraction by **bus depots/ISBTs** in the State as percentage of Total available freshwater resources of the State

Total water withdrawal by Bus Transport Sector (%)

$$= \frac{\text{(Total water withdrawal by all the bus depots/ISBTs in the State) x 100}}{\text{(Total available freshwater resources of the state)}}$$

5(b) Total Actual Water Consumption by **bus depots/ISBTs** in the state as percentage of Total available freshwater resources of the State

Total water consumption by Bus Transport Sector (%)

$$= \frac{\text{(Total actual water consumption by all bus depots/ISBTs in State) x 100}}{\text{(Total available freshwater resources of the state)}}$$

6Water Economics & Financing:

6(a) Water Tariff *(Rs./m³)*

Source	CY-5	CY-4	CY-3	CY-2	CY-1	CY/ 2017
GW						
Urban body						
Treated Waste Water for reuse						
Others						

6(b) Procurement Cost of Water (in Rs)

Year wise cost of procurement of Water				
CY-5	**CY-4**	**CY-3**	**CY-2**	**CY-1**

6(c) Expenditure on Water including Treatment and Management-Time trend at State level

	CY-5	CY-4	CY-3	CY-2	CY-1	CY/ 2017
Total Capex by bus depots/ISBTs on water treatment and management (Lakhs)						
Total O&M Expenditure by bus depots/ISBTs on water treatment and management (Lakhs)						
Total						
O&M Expense (%)						

6(d) Expenditure at district level for the Current Year- CY

District	Capital Expenditure (Lakhs)	O&M Expenditure (Lakhs)	Total	O&M Expense (%)
District 1				
District 2				
District 3				

Total				

7Water Use Efficiency:

Water use efficiency in terms of Specific Water Consumption (SWC) viz. amount of water used/consumed per unit. In case of Bus transport it can be represented as the total volume of water used/consumed (m^3) per passenger.

Specific Water Consumption (SWC) of bus depots/ISBTs:

Specific Water Consumption (SWC); (**Litre/ passenger**)

$$= \frac{\text{Volume of water consumed by the bus depots/ISBTs, (Litre)}}{\text{(Total No. of Passengers), (passenger)}}$$

7(a) Specific Water Consumption in **Litre/passenger** for Current Year

	Vol. of Water Consumed(m^3)	Total no. of passengers (passenger)	SWC (**m^3/passenger**)
District 1			
District 2			
District 3			

7(b) Average Water Consumption per passenger at bus depots/ISBTs for the State – time trend (also represent through Graph)

	CY-5	**CY-4**	**CY-3**	**CY-2**	**CY-1**	**CY/ 2017**
Average Water Consumption per passenger at bus depots/ISBTs in State						

7(c) Specific Water Consumption (**Water Consumption per Passenger**)

Trend of Water Consumption per Passenger at bus depots/ISBTs at district level

Percentage of bus depots/ISBTs having specific water consumption (Water Consumption per passenger) within the norms/bench marks/standards (**if applicable**)

8Waste Water

	Bench Mark *(as applicable)*	**District 1**	**District 2**	**District 3**
Total Waste Water Generated from bus depots/ISBTs (m^3/annum)				
% Total quantum of wastewater discharged after recycling				

9Water Quality

		Bench Mark *(as applicable)*	**District 1**	**District 2**	**District 3**
Water Quality	% of bus depots/ISBTs with online water quality monitoring systems installed.				
	% of bus depots/ISBTs with compliance of wastewater regulatory quality discharge norms.				

Water Quality Time trend- Graphs: Compliance to Waste water discharge Quality norms (E.g. BOD / PH /COD / TSS etc.)

10Bench Marks/ Norms/ Standards and deviation from the norms/bench marks/standards currently for bus depots/ISBTs in state.

10(a) Benchmark for Water Consumption, Waste Water Generation etc.

	Parameters	Unit	Indian Bench Mark	International Bench Mark
1	Specific Water Consumption	m^3/passenger		
2	Waste Water generation	m^3/passenger		
3	Waste Water discharged	m^3/ passenger		