GOVERONMENT OF PUNJAB
ENVIRONMENTAL PROTECTION AGENCY

Environmental Assessment Checklists and Guidelines

Construction or Expansion of Bus Terminals

1. Introduction

1.1 Background

Increased urbanization and population growth in Punjab have led to a significant rise in the demand for public transportation services. Consequently, the capacity of many existing bus terminals has become inadequate to accommodate the growing number of buses and passengers. This has resulted in overcrowded terminals, parking of buses on adjacent roads and traffic congestions. Moreover, the establishment of unauthorized or informal bus terminals within urban areas have found adversely affecting traffic flow and public safety.

These guidelines are intended to assist in the environmental assessment and management of bus terminal projects with a total project cost of **less than Rs. 100 million**, in accordance with the applicable environmental regulatory requirements.

1.2 Purpose of the Guidelines

These guidelines have been prepared to assist project proponents, environmental consultants, and regulatory authorities in identifying, assessing, and managing the potential environmental impacts associated with the planning, design, construction, operation, and maintenance of bus terminal projects. The guidelines provide practical guidance for the preparation of Initial Environmental Examination (IEE) reports, implementation of appropriate mitigation measures, environmental monitoring, and preparation of Environmental Management Plans (EMPs). They are intended to facilitate compliance with the applicable environmental legislation, regulations, and standards in Punjab while promoting environmentally sustainable development of bus terminal infrastructure.

1.3 Scope of the Guidelines

These guidelines are applicable to the development, construction, or expansion of bus terminals within the territorial jurisdiction of the Province of Punjab having a total project cost of **less than Rs. 100 million**, in accordance with the applicable environmental regulatory requirements.

1.4 How to Use These Guidelines

The project proponent (the local government, municipal corporation/committee, city district government, the cantonment board, or private association/organization) is obliged to use these guidelines. The project proponent must fill in an environmental impact assessment form.

The following steps are to be taken in this regard:

Step 1: Provide information on project [use Section I].

Step 2: Determine Applicability (Confirm if an Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) is required under Punjab Environmental Protection (Review of IEE and EIA) Regulations) [use Section II].

Step 3: Describe the physical, biological and social environment [use Section III].

Step 4: Assess potential impacts and applicable mitigation measures [use Section IV].

Step 5: Provide undertaking to the Punjab EPA on mitigation measures and compliance [use Section V].

The completed form is to be submitted to the Punjab Environmental Protection Agency for evaluation. The Punjab EPA may request additional information or decide to undertake a visit to the proposed project site to assess the environmental impact.

1.5 Glossary

Act: means the Punjab Environmental Protection Act, 1997 (Amended 2012).

Air Pollution: means gaseous and dust emissions into air.

Aesthetic Value/Aesthetic Quality: means the beauty or landscape of an area.

Arid area: means an area receiving no rain or less rain.

Dust Pollution: means dust emissions into the surroundings.

Envir5nment: means (a) air, water and land; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d) the ecosystem and ecological relationships; (e) buildings, structures, roads, facilities and works; (f) all social and economic conditions affecting community life; and (g) the inter-relationships between any of these factors.

Environmental Assessment: is a process by which information about the environmental effects of a project is collected and taken into account by the planning authority.

Environmental Management: means carrying out developmental activities in a sustainable manner.

Impact on Environment: means any effect on land, water, air, or any other component of the environment, including social, cultural, or heritage resources.

Mitigation Measure: means a measure for the control, reduction, or elimination of an adverse impact, including restorative measures.

Noise Pollution: means the generation of excessive or harmful noise.

Regulations: means the Punjab Environmental Protection Agency Review of Initial Environmental Examination and Environment Impact Assessment Regulations.

2. Project Profile

2.1 Project Description

The proponent, after consulting Annexures should provide a concise description of the proposed project, including:

- Name of the project
- Project location (district, tehsil, mouza, and coordinates)
- Nature of the project (new or expansion)
- Government's designate nature of proposed area

- Total project area.
- Estimated water demand during construction and operation phases
- Covered and open areas
- Land ownership status
- Estimated project cost
- Detail of different categories of houses and others structures
- Number of employees during construction phase.

3. Environmental Impacts

Various environmental aspects are associated with the design, construction, and operation of bus terminals:

3.1 Land Acquisition and Land Use Change

Construction of a bus terminal may require acquisition of land, which can result in the conversion of agricultural, commercial, or vacant land to transportation use. The project may also alter existing land use patterns and affect nearby properties and economic activities. Improper siting resulting in inconvenience to the surrounding population. Conflict with existing land-use (e.g., proximity to hospitals, schools, or residential areas) can give rise to objections by neighbouring community.

3.2 Loss of Vegetation and Landscape Alteration

Site clearing and construction activities may require removal of trees, shrubs, and other vegetation. This can reduce green cover, affect the visual landscape, and diminish habitat available for urban wildlife.

3.3 Soil Erosion and Land Disturbance

Excavation, grading, and foundation works may disturb soil surfaces and increase the risk of soil erosion, particularly during rainfall. Improper handling of excavated material may also degrade surrounding land.

3.4 Dust, Air Emissions and Noise

Construction activities, movement of vehicles, and operation of heavy machinery may generate dust, exhaust emissions, and elevated noise levels, temporarily affecting nearby residents, businesses, and other sensitive receptors.

3.5 Surface Water Pollution

Construction runoff carrying sediments, cement slurry, oils, and other contaminants may pollute nearby drains, canals, or water bodies if appropriate control measures are not implemented.

3.6 Groundwater Contamination

Improper storage and handling of fuels, lubricants, and chemicals, as well as accidental spills during construction, may contaminate groundwater resources, particularly where groundwater occurs at shallow depths.

3.7 Wastewater Generation

Construction camps and terminal facilities generate wastewater that, if not properly collected and treated, may pollute nearby land and water resources.

3.8 Solid Waste Generation

Construction activities generate excavated material, concrete waste, packaging materials, scrap metal, and domestic waste from workers. During operation, passengers and commercial activities within the terminal generate municipal solid waste requiring proper management.

3.9 Traffic Disruption and Access Restrictions

Construction activities may temporarily obstruct roads, restrict access to nearby properties, and increase traffic congestion. During operation, inadequate traffic management within the terminal may result in congestion, unsafe vehicle movement, and delays.

3.10 Occupational Health and Safety

Construction workers may be exposed to risks associated with excavation, heavy equipment, electrical installations, and working at heights. Failure to implement appropriate safety measures may result in accidents and injuries.

3.11 Community Health and Safety

Construction activities may expose nearby residents and road users to hazards such as open excavations, moving equipment, dust, and noise. During operation, poor traffic management may increase the risk of pedestrian and vehicle accidents.

3.12 Air Pollution During Operation

Operation of the bus terminal may increase emissions of particulate matter, carbon monoxide, nitrogen oxides, and other pollutants due to frequent movement and idling of buses and other vehicles, potentially affecting local air quality.

3.13 Noise and Vibration During Operation

Continuous movement of buses, vehicle horns, passenger announcements, and commercial activities may increase ambient noise levels, causing disturbance to nearby residential, educational, and healthcare facilities.

3.14 Stormwater Drainage and Flooding

Oil and grease stains and workshop waste from on-site repairs can find way to sewers and ultimately to water bodies. Large paved areas within the terminal may increase stormwater runoff and reduce groundwater recharge. Inadequate drainage systems may result in localized flooding during heavy rainfall.

3.15 Energy Consumption and Greenhouse Gas Emissions

Operation of lighting systems, terminal buildings, air-conditioning, fuel stations, and other facilities increases energy consumption. Vehicle operations also contribute to greenhouse gas emissions and climate change.

3.16 Lack of provision of sanitation facilities

Lack of provision of sanitation facilities and unhygienic conditions at bus terminal during operation phase may lead to stench and disease vectors.

3.17 Visual Impacts

Large terminal buildings, parking areas, outdoor advertising, and lighting may alter the surrounding urban landscape and affect the visual character of the area.

3.18 Positive Environmental and Socio-economic Impacts

Development of a properly planned bus terminal can improve traffic management, reduce roadside parking, enhance passenger safety and convenience, create employment opportunities, support economic development, improve public transport services, and reduce congestion caused by informal bus stands. It can also contribute to more efficient transport operations and improved urban mobility.

4. Environmental Mitigation Measures

4.1 Land Acquisition and Land Use Change

The project proponent shall:

- Select sites that are compatible with approved land use plans.
- Prefer government land where feasible to minimize land acquisition.
- Avoid acquisition of fertile agricultural land where practicable.
- Avoid environmentally sensitive and culturally significant areas.
- Minimize displacement of people and disruption of existing businesses.
- Complete land acquisition in accordance with applicable laws and regulations.

4.2 Loss of Vegetation and Landscape Alteration

The project proponent shall:

- Restrict vegetation clearance to the minimum area required for construction.
- Preserve mature trees wherever practicable.
- Compensate for tree removal through plantation of indigenous species in accordance with applicable regulations.
- Develop landscaped areas and green belts within the terminal premises.
- Restore disturbed areas immediately after construction.

4.3 Soil Erosion and Land Disturbance

The project proponent shall:

- Limit excavation to designated construction areas.
- Stockpile excavated soil away from drains and watercourses.
- Reuse excavated material for backfilling wherever practicable.
- Install temporary erosion and sediment control measures.
- Restore disturbed surfaces immediately after construction.

4.4 Dust, Air Emissions and Noise

The project proponent shall:

- Sprinkle water regularly on construction areas and access roads.
- Cover vehicles transporting soil and construction materials.
- Maintain construction machinery in good operating condition.
- Restrict construction activities to daytime hours.
- Fit construction equipment with effective silencers.
- Provide workers with appropriate personal protective equipment (PPE).

4.5 Surface Water Pollution

The project proponent shall:

- Prevent construction runoff from entering nearby drains and watercourses.
- Store fuels, lubricants, and chemicals in designated areas with spill containment.
- Prohibit disposal of construction waste into drains or natural water bodies.
- Immediately clean up accidental spills.
- Construct and maintain proper stormwater drainage systems.
- Ensure wastewater generated during construction is properly managed.

4.6 Groundwater Contamination

The project proponent shall:

- Store fuels and chemicals on impermeable surfaces with secondary containment.

- Prevent leakage from fuel storage and maintenance areas.
- Inspect and maintain underground utilities regularly.
- Avoid disposal of hazardous materials directly onto the ground.
- Monitor groundwater quality where there is potential for contamination.

4.7 Wastewater Generation

The project proponent shall:

- Provide adequate sanitary facilities for construction workers.
- Connect terminal wastewater to the municipal sewerage system where available.
- Install an appropriate wastewater treatment or septic system where municipal sewerage is unavailable.
- Ensure wastewater is treated before discharge.
- Regularly maintain wastewater collection and treatment facilities.

4.8 Solid Waste Generation

The project proponent shall:

- Segregate waste at the source into recyclable and non-recyclable categories.
- Provide sufficient waste collection bins throughout the terminal.
- Dispose of waste through authorized municipal services.
- Recycle construction materials wherever practicable.
- Maintain good housekeeping throughout construction and operation.

4.9 Traffic Disruption and Access Restrictions

The project proponent shall:

- Prepare and implement a Traffic Management Plan.
- Schedule construction activities to minimize disruption during peak traffic hours.
- Install warning signs, barricades, and traffic diversion routes.
- Maintain safe access to adjacent properties throughout construction.
- Provide adequate internal circulation, parking, and passenger drop-off areas during operation.

4.10 Occupational Health and Safety

The project proponent shall:

- Prepare and implement an Occupational Health and Safety Plan.
- Provide appropriate PPE to all workers.

- Conduct regular safety training and toolbox meetings.
- Fence hazardous work areas and display warning signs.
- Provide first-aid facilities and emergency response equipment.
- Ensure safe electrical installations and excavation practices.

4.11 Community Health and Safety

The project proponent shall:

- Restrict unauthorized public access to construction areas.
- Maintain safe pedestrian pathways around construction sites.
- Control dust, noise, and traffic impacts affecting nearby communities.
- Install adequate lighting and warning signage.
- Establish a grievance redress mechanism to address public complaints.

4.12 Air Pollution During Operation

The project proponent shall:

- Promote orderly movement of buses to reduce idling time.
- Design adequate bus parking and waiting areas.
- Encourage regular maintenance of buses using the terminal.
- Promote the use of cleaner fuels and low-emission vehicles where feasible.
- Plant trees and develop green belts around the terminal to improve local air quality.

4.13 Noise and Vibration During Operation

The project proponent shall:

- Restrict unnecessary use of vehicle horns within the terminal.
- Maintain terminal pavements to reduce vehicle vibration and noise.
- Locate public announcement systems to minimize off-site noise impacts.
- Develop green buffer zones around the terminal.
- Schedule maintenance activities to minimize disturbance to nearby receptors.

4.14 Stormwater Drainage and Flooding

The project proponent shall:

- Design an adequate stormwater drainage system for the terminal.
- Regularly inspect and clean drainage channels.
- Avoid obstruction of natural drainage paths.

- Incorporate permeable paving and rainwater infiltration measures where feasible.
- Install oil and grease traps in vehicle maintenance and washing areas.

4.15 Energy Consumption and Greenhouse Gas Emissions

The project proponent shall:

- Install energy-efficient lighting and electrical equipment.
- Maximize natural lighting and ventilation in terminal buildings.
- Use solar-powered lighting where technically and economically feasible.
- Regularly maintain electrical and mechanical equipment to improve efficiency.
- Promote energy conservation practices among terminal operators and users.

4.16 Visual Impacts

The project proponent shall:

- Incorporate landscaping into the terminal design.
- Maintain terminal buildings, pavements, and parking areas in good condition.
- Control outdoor advertising and signage to avoid visual clutter.
- Ensure proper maintenance of lighting to minimize glare.
- Keep the terminal free of litter and abandoned vehicles.

4.17 Positive Environmental and Socio-economic Impacts

To maximize project benefits, the project proponent shall:

- Ensure efficient operation and maintenance of terminal facilities.
- Promote organized public transport operations to reduce roadside congestion.
- Maintain clean and hygienic passenger facilities.
- Provide adequate waste management and sanitation services.
- Encourage plantation and maintenance of green spaces.
- Promote environmental awareness among terminal operators, transport companies, and passengers.
- Monitor environmental performance and implement continuous improvements where required.

ENVIRONMENTAL ASSESSMENT CHECKLIST

PART B

ENVIRONMENTAL ASSESSMENT CHECKLIST

Section I: Project Description

File No: _____

Date: _____

General Information

1. **Project Name or Title:**
2. **Project Proponent** (Punjab Govt Department, Organization, or Owner):
3. **Address:**
4. **Telephone:**
5. **Fax:**
6. **E-mail:**
7. **Representative of the Proponent:**
8. **Designation:**
9. **Name of the person who conducted this assessment:**
10. **Designation:**
11. **Qualification:**

Project Information

12. **Project Location:**
13. **Cost of the Project:**
14. **Period of construction (start and end dates):**

Proposed Activity

(To be filled by Punjab EPA) 15. **Design Capacity of the Terminal** (Passengers per day and buses per day): 16. **Brief Project Description** (Please attach a map of the proposed project area): 17. **Proposed areas (m^2):** * Land of the proposed terminal: _____ * Covered area: _____ * Bus parking:

_____ * Temporary parking (drop-off): _____ * Taxis and minibuses: _____ * Passenger facilities: _____

+4

18. **Total construction material to be utilized:**
19. **Land Acquisition:**
    - Total area: _____
    - Present ownership of land: _____
    - Present use of land: _____
    - Acquisition Method (Land Acquisition Act, 1894 or Direct Purchase): _____
    - Compensation payment schedule: _____
20. **State Land/Squatters:**
    - Are there squatter settlements on the land? _____
    - Number of settlements: _____
    - Compensation/Resettlement plan: _____
21. **Is construction work during the night planned?**
22. **Number of trees to be removed:**
23. **Structure removal/Demolition:**
    - Will any structure be removed?
    - Disposal site for debris:

Section II: Screening

- Will the cost of the proposed bus terminal exceed **Rupees 100 million**?
- **Note:** If the answer is **YES**, the project requires a formal **Initial Environmental Examination (IEE)** or **Environmental Impact Assessment (EIA)** as per the **Punjab Environmental Protection (Review of IEE and EIA) Regulations**.

Section III: Environmental Profile

1. **Terrain of the proposed site:**
    - Flat or Level (Slope < 3%)
    - Level to moderately steep (Slope 3%-30%)
    - Moderately steep to mountainous (Slope > 30%)
2. **Surface water bodies within 1,000 m** (River, canal, stream, lake, wetland):
    - If yes, describe name, dimensions, and status/uses (e.g., agriculture, washing).
3. **Existing trees/vegetation on site:**
4. **Cultural/Religious sites within 1,000 m** (Graveyard, shrine, mosque, archeological site):
5. **Sensitive receptors within 1,000 m** (Schools, colleges, hospitals, clinics):
6. **Soil erosion/Landslide signs within 500 m:**
7. **Groundwater wells within 250 m:**
    - Describe type (Dug well, tube well, hand pump), location, depth, and yield.
8. **Present land use within 500 m radius:**
    - Categorize by Residential, Commercial, Open Land (Parks/Barren), or Industrial.
9. **Traffic Count:** Provide 3-day count data for adjacent roads (6:00 AM to 9:00 PM) for Large, Medium, Small, and Slow vehicles.

Section IV: Impact Assessment

Environmental Impact	Mitigation Measures	Monitoring Plan
Land Acquisition and Land Use Change	• Select sites compatible with approved land use plans. • Prefer government land where feasible. • Avoid fertile agricultural land and environmentally sensitive areas. • Minimize land acquisition and displacement. • Complete land acquisition in accordance with applicable laws and regulations.	
Loss of Vegetation and Landscape Alteration	• Restrict vegetation clearing to the minimum required area. • Preserve mature trees wherever practicable. • Compensatory plantation using indigenous species. • Develop landscaped areas and green belts. • Restore disturbed areas after construction.	Environment officer
Soil Erosion and Land Disturbance	• Limit excavation to designated areas. • Install erosion and sediment control measures. • Stockpile excavated soil away from drains. • Reuse excavated material where feasible • Restore disturbed surfaces immediately after construction.	Environment officer
Dust, Air Emissions and Noise	• Sprinkle water to suppress dust. • Cover trucks transporting loose materials. • Maintain construction equipment properly. • Restrict noisy activities to daytime. • Provide PPE to workers exposed to dust and noise.	Air quality measurement and Noise meter data
Surface Water Pollution	• Prevent discharge of construction waste into drains or water bodies. • Control runoff using temporary drainage and sediment barriers. • Store fuels and chemicals away from watercourses. • Clean accidental spills immediately. • Ensure proper wastewater disposal during construction.	Environment officer
Groundwater Contamination	• Prevent leakage from fuel and chemical storage. • Use impermeable surfaces for storage areas. • Regularly inspect underground utilities. • Properly maintain sewerage and drainage systems. • Monitor groundwater quality where required.	Ground water quality checks

Wastewater Generation	• Provide sanitary facilities for workers. • Connect to municipal sewerage where available. • Install septic tanks or treatment systems where necessary. • Treat wastewater before discharge. • Regularly maintain wastewater facilities.	Designated Environment officer and site engineer
Solid Waste Generation	• Segregate waste at source. • Reuse and recycle construction materials where possible. • Provide adequate waste bins. • Dispose of waste through authorized agencies. • Maintain good housekeeping practices.	Environment officer with dedicated staff
Traffic Disruption and Access Restrictions	• Prepare a Traffic Management Plan. • Schedule construction to minimize traffic disruption. • Install traffic signs and barricades • Maintain pedestrian and vehicle access. • Restore roads after completion of works.	Management and Environment officer through Trained staff
Occupational Health and Safety	• Implement an Occupational Health and Safety Plan. • Provide PPE to all workers. • Conduct regular safety training. • Install warning signs and barricades. • Maintain first-aid and emergency response facilities.	Management and Environment officer
Community Health and Safety	• Restrict unauthorized access to construction sites. • Minimize dust and noise affecting nearby communities. • Maintain safe pedestrian routes. • Install adequate lighting and warning signs. • Establish a grievance redress mechanism.	Management and Environment officer
Air Pollution During Operation	• Reduce bus idling time. • Encourage regular vehicle maintenance. • Promote cleaner fuels where feasible. • Develop green belts around the terminal. • Ensure smooth traffic circulation within the terminal.	Biannually monitoring of air quality through certified laboratory arranged by Environment officer
Noise and Vibration During Operation	• Restrict unnecessary horn use .• Maintain pavements to reduce vibration. • Install green buffers around the terminal. • Properly locate loudspeakers and announcement systems. • Regularly maintain buses and terminal facilities.	Biannually monitoring of air quality through certified laboratory arranged by Environment officer
Stormwater Drainage and Flooding	• Design an adequate stormwater drainage system • Keep drains clean and unobstructed. • Incorporate permeable paving where feasible.	Site engineer and environment officer

	• Install oil and grease traps in maintenance areas. • Prevent blockage of natural drainage channels.	
Energy Consumption and Greenhouse Gas Emissions	• Install energy-efficient lighting and equipment. • Maximize natural lighting and ventilation. • Consider solar-powered lighting where feasible. • Maintain electrical equipment regularly. • Promote energy conservation practices.	Management and Environment officer through trained staff
Visual Impacts	• Develop landscaped areas and green spaces. • Maintain buildings and infrastructure properly. • Control outdoor advertising and signage. • Keep terminal premises clean. • Maintain adequate lighting without excessive glare.	
Positive Environmental and Socio-economic Impacts	• Maintain terminal facilities properly • Promote organized public transport operations. • Ensure effective waste management and sanitation. • Enhance green spaces within the terminal. • Conduct environmental awareness programmes for terminal staff and users.	

Section V: Undertaking

I, _____ (full name and address), as proponent for _____ (project name and location), do hereby solemnly affirm and declare:

1. The information provided in Sections I, II, and III is correct to the best of my knowledge.
2. I accept the conditions contained in the **Punjab EPA Guidelines for Bus Terminals (Version B)**.
3. I undertake to design, construct, and operate the project strictly in accordance with the description in Section I.
4. I undertake to implement all mitigation measures and monitoring stated in Section IV.

Signature of Proponent: _____

Name/Designation: _____ (with official stamp)

Date: _____

Witnesses:

1. _____
2. _____