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वि.सं. १९५८ देखि
निरन्तर प्रकाशित, बहुभाषी राष्ट्रिय दैनिक

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सिंहदरबार, काठमाडौँ

Project on Kathmandu Valley Urban Transport System Master Plan को मस्यौदा रणनीतिक वातावरणीय मूल्याङ्कन (SEA) प्रतिवेदन सम्बन्धी

सार्वजनिक सूचना

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नेपाल सरकार, पूर्वाधार विकास मन्त्रालय, सिंहदरबार, काठमाडौँद्वारा "जीवन्त र सांस्कृतिक काठमाडौँ उपत्यकाका लागि दिगो, सुरक्षित र समावेशी यातायात" को उद्देश्य आत्मसात् गर्दै Japan International Cooperation Agency (JICA) को प्राविधिक सहयोगमा JICA Expert Team मार्फत Project on Kathmandu Valley Urban Transport System Master Plan को रणनीतिक वातावरणीय मूल्याङ्कन (SEA) प्रतिवेदन तयार भइरहेको छ ।

यस गुरुयोजनाले काठमाडौँ उपत्यकाको विद्यमान जनसङ्ख्या वृद्धि दर, शहरी संरचना तथा ट्राफिक चाप सम्बन्धी विवरणलाई आधार मानी भविष्यमा आवश्यक उपाय, योजना तथा नीतिहरू निर्माण गरी अवलम्बन गर्न मार्गदर्शन प्रदान गर्ने अपेक्षा गरिएको छ । यसबाट काठमाडौँ उपत्यकाको ट्राफिक चाप व्यवस्थापन, सार्वजनिक यातायात प्रणालीको सुदृढीकरण तथा दिगो शहरी यातायात प्रणालीको विकासमा सहयोग पुग्ने अपेक्षा गरिएको छ ।

यस सार्वजनिक सूचनामार्फत मन्त्रालयको आधिकारिक वेबसाइटमा अपलोड गरिएको यस गुरुयोजनाको रणनीतिक वातावरणीय मूल्याङ्कन (SEA) को मस्यौदा प्रतिवेदन सम्बन्धमा सरोकारवालाहरूबाट राय सुझाव प्राप्त गर्न यो सूचना प्रकाशन गरिएको छ । तसर्थ, यो सूचना प्रकाशित भएको मितिले ३० (तीस) दिनभित्र देहायको ठेगानामा प्राप्त हुने गरी राय सुझाव उपलब्ध गराइदिनुहुन यसै सूचनामार्फत अनुरोध गरिन्छ ।

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प्रस्तावकको नाम र ठेगाना	परामर्शदाताको नाम र ठेगाना
नेपाल सरकार पूर्वाधार विकास मन्त्रालय सिंहदरबार, काठमाडौँ । फोन नं.: +९७७-१-४२११७३२ ईमेल : info@moid.gov.np mopitenv@gmail.com वेबसाइट : https://mopit.gov.np	JICA Expert Team मध्य-बानेश्वर, काठमाडौँ । फोन नं. ९७७-९८५१०७७४४६ ईमेल : abhishekbc@hotmail.com

Strategic Environmental Assessment

Project on

Kathmandu Valley Urban Transport System

Master Plan (KVUTSMP)

Draft SEA Report

Submitted to:

Ministry of Infrastructure Development

Singhadurbar, Kathmandu

Prepared by:

JICA Expert Team

September 2026

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Abbreviation

Abbreviation	Definition
ADB	Asian Development Bank
AFC	Automatic Fare Collection
AGT	Automated Guideway Transit
AIDS	Acquired Immunodeficiency Syndrome
A.M	Ante Meridiem
AMPA	Ancient Monument Preservation Act
ANPR	Automatic Number Plate Recognition
ARI	Acute Respiratory Infection
BDLS	Banchare Danda Landfill Site
BES	Brief Environmental Study
BEVs	Battery Electric Vehicles
BHSCs	Basic Health Service Centers
BM	Bhaktapur Municipality
BRT	Bus Rapid Transit
BT	Bus Terminal
BOD	Biochemical Oxygen Demand
BoQ	Bill of Quantities
CATV	Cable Television
CBD	Central Business District
CCTV	Closed Circuit Television
CDC	Compensation Determination Committee
CFU	Colony Forming Unit
COVID-19	Coronavirus Disease 2019
CO	Carbon monoxide
CO_2	Carbon dioxide
COD	Chemical Oxygen Demand
COPD	Chronic Obstructive Pulmonary Disease
CP	Counterpart
CSR	Corporate Social Responsibility
dBA	A-weighted decibels
DHM	Department of Hydrology and Meteorology
DFO	Division Forest Office

Abbreviation	Definition
DOA	Department of Archaeology
DOE	Department of Environment
DOR	Department of Roads
DORW	Department of Railways
DOTM	Department of Transport Management
DMG	Department of Mines and Geology
DMP	Department of Medicinal Plants
DNPWC	Department of National Park and Wildlife Conservation
DUDBC	Department of Urban Development and Building Construction
DX	Digital Transformation
EC	Electrical Conductivity
E. coli	*Escherichia* coli
EDSI	Equity, Diversity, and Social Inclusion
EIA	Environmental Impact Assessment
EID	Environmental Information Document
EMP	Environmental Management Plan
EPA	Environment Protection Act
EPR	Environment Protection Rule
ES	Environment and Social
ESS	Environmental and Social Standards
ESC	Environmental and Social Considerations
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMoP	Environmental and Social Monitoring Plan
ETRN	Emergency Transport Road Network
EVs	Electric Vehicles
FCCPTA	Federal Capital City Public Transport Authority
FEDO	Feminist Dalit Organization
FNNTE	Federation of Nepalese National Transport Entrepreneurs
FS	Feasibility Study
FPIC	Free, Prior, and Informed Consent
GBV	Gender-Based Violence
GEDSI	Gender Equality, Disability and Social Inclusion
GESI	Gender Equality and Social Inclusion
GESU	Geo-Environment and Social Unit

Abbreviation	Definition
GHG	Greenhouse Gas
GIS	Geographic Information System
GL	Guidelines
GoN	Government of Nepal
GPS	Global Positioning System
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
GTFS	General Transit Feeding Specification
GUE	Geo-Environmental Unit
Ha	Hectare
HIA	Heritage Impact Assessment
HIS	Household Interview Survey
HIV	Human Immunodeficiency Virus
HPCIDBC	High Powered Committee for Integrated Development of Bagmati Civilization
IC	Integrated Circuit
ICCROM	International Centre for the Study of the Preservation and Restoration of Cultural Property
ICT	Information and Communication Technology
ICOMOS	International Council on Monuments and Sites
ID	Identification Number
IEE	Initial Environmental Examination
IFDP	Indigenous Peoples Development Plan
ILO	International Labour Organization
IP	Indigenous People
IPDP	Indigenous Peoples Development Plan
IPLC	Indigenous Peoples and Local Communities
IPP	Indigenous Peoples Plan
IPPF	Indigenous Peoples Planning Framework
ISO	International Organization for Standardization
ITS	Intelligent Transportation System
IUCN	International Union for Conservation of Nature.
JCC	Joint Coordination Committee
JET	JICA Expert Team
JICA	Japan International Cooperation Agency

Abbreviation	Definition
Kg/m^3	Kilogram per cubic meter
Km	Kilometer
Km^2	Square Kilometer
KMC	Kathmandu Metropolitan City
KSUTP	Kathmandu Sustainable Urban Transport Project
KUKL	Kathmandu Upatyaka Khanepani Limited
KV	Kathmandu Valley
KVDA	Kathmandu Valley Development Authority
KVTDC	Kathmandu Valley Town Development Commission
KVTPO	Kathmandu Valley Traffic Police Office
KVUTS	Kathmandu Valley Urban Transport System
KVUTS MP	Kathmandu Valley Urban Transport System Master Plan
LAR	Land Acquisition and Resettlement.
LGU	Local Government Unit
LMC	Lalitpur Metropolitan City
LRN	Local Road Network
LRT	Light Rail Transit
LSMC	Lalitpur Sub-Metropolitan City
LST	Land Surface Temperature
LOS	Level of Service
LP	Land Pooling
Ltd.	Limited
LUP	Land Use Policy
LUPs	Land Use Plans
lux	Minimum light of illumination
m	meter
MaaS	Mobility as a Service
MCA	Multi Criteria Analysis
mg/ L	milligrams per liter
MHT	Main Himalayan Thrust
ml	milliliter
MOAFE	Ministry of Agriculture, Forests and Environment
MOF	Ministry of Finance
MOFE	Ministry of Forests and Environment
MOID	Ministry of Infrastructure Development

Abbreviation	Definition
MOLRM	Ministry of Land Reform and Management
MOPIT	Ministry of Physical Infrastructure and Transport
MOUD	Ministry of Urban Development
MP	Master Plan
MPS	Mechanical Parking Systems
MRT	Mass Rapid Transit
NAAQS	National Ambient Air Quality Standard
NDC	Nationally Determined Contribution
NDRRMA	National Disaster Risk Reduction and Management Authority
NDVI	Normalized Difference Vegetation Index
NEFEJ	Nepal Forum of Environmental Journalists
NFDN	National Federation of the Disabled Nepal
NGO	Non-Governmental Organization
NH	National Highway
NHRC	National Human Rights Commission
No.	Number
NOx	Nitrogen Oxides
NPHC	National Population and Housing Census
NPR	Nepali Rupees
NRSC	National Road Safety Council
NSO	National Statistics Office
NTU	Nephelometric Turbidity Unit
NUDS	National Urban Development Strategy
NWC	National Women Commission
O_3	Ozone
OD	Origin–Destination
O&M	Operation and Management
ORR	Outer Ring Road
PAPs	Project Affected Peoples
Pax	Passenger
PCU	Passenger Car Unit
PEL	Permissible Exposure Levels
PID	Project Implementation Directorate
PHCCs	Primary Health Care Centres
Ph.D.	Doctor of Philosophy

Abbreviation	Definition
PM	Particulate Matter
P.M	Post Meridiem
PN	Primary Node
PPHPD	Passenger per Hour per Direction
PPP	Policy, Program or Project
PTPS	Public Transportation Priority Systems
Pvt.	Private
PWDs	Persons with Disabilities
QOL	Quality of Life
QR	Quick Response
RAP	Resettlement Action Plan
RA-IMS	Road Accident Information Management System
RCP	Representative Concentration Pathway
RMs	Rural Municipalities
ROW	Right-of-Way
RPF	Resettlement Policy Framework
RSS	Rastriya Samachar Samiti
RT	Real Time
SD	Standard Deviation
SDMP	Strategic Development Master Plan
SE	Standard Error
SEA	Strategic Environmental Assessment
SEE	Secondary Education Examination
SHM	Stakeholder Meeting
SLC	School Leaving Certificate
SN	Secondary Node
SNNP	Shivapuri Nagarjun National Park
SOx	Sulphur Oxides
SPT	Standard Penetration Test
SRN	Strategic Road Network
TBD	To be determined
TBM	Tunnel Boring Machine
TCU	True Color Unit
TDS	Total Dissolved Solids
TMC	Traffic Management Center

Abbreviation	Definition
TMOSLV	Transport Management Office Small and Large Vehicle
TN	Tertiary Node
TOD	Transit Oriented Development
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
TU	Tribhuvan University
TWG	Technical Working Group
UHI	Urban Heat Island
UM	Urban Mobility
UNDRIP	United Nations Declaration of Rights of Indigenous People
UNESCO	United Nations Educational, Scientific and Cultural Organization
UD	Universal Design
USD	United States Dollar
Vmax	Maximum Vehicle Speed
VCDP	Vulnerable Community Development Plan
VMS	Video Management System
VOC	Volatile Organic Compounds
v/c	Volume to capacity ratio
WB	World Bank
WHO	World Health Organization
%	percentage
µg/ m^3	microgram per meter cube

Executive Summary

CHAPTER 1: INTRODUCTION

The previous Urban Transport Master Plan prepared by Japan International Cooperation Assistance (JICA) in 2017 no longer reflects present conditions. It does not sufficiently capture post-earthquake population shifts or changes in mobility patterns caused by the COVID-19 pandemic, and its traffic data have become outdated. Moreover, Nepal's transition to a federal governance structure has divided urban transport responsibilities across central, provincial, and local governments, creating coordination challenges. These factors necessitated a comprehensive update of the master planning framework.

In response to the request of the Government of Nepal, the Project aims to develop an updated, integrated, and sustainable urban transport master plan that supports sustainable economic growth and reduces environmental burdens such as congestion and air pollution. The master plan places particular emphasis on identifying priority mass transit modes and corridors, and on establishing effective coordination mechanisms among relevant agencies for implementation.

The target area covers the three districts of Kathmandu Valley-Kathmandu, Lalitpur, and Bhaktapur. The Project is led by the Ministry of Infrastructure Development (MoID), formerly the Ministry of Physical Infrastructure and Transport (MoPIT) and implemented in collaboration with related ministries, transport agencies, provincial authorities, and local levels.

The Strategic Environmental Assessment (SEA) is applied to the formulation of the Master Plan (MP) to ensure that environmental and social considerations are integrated at an early planning stage. The SEA process supports informed decision-making through the evaluation of alternatives, stakeholder consultation, scoping, and development of mitigation and monitoring measures. In the scoping process of SEA, potential environmental and social impact items are identified based on the characteristics of the proposed plan and the project area, and after that priority issues are examined in the SEA for formulating the MP, as well as items to be excluded from further assessment, are determined.

CHAPTER 2: LEGAL, POLICY, AND INSTITUTIONAL FRAMEWORK

The Constitution of Nepal ensures the right of every citizen to a clean and healthy environment. Nepal's core environmental assessment system is defined by the Environment Protection Act (2019) and Environment Protection Rules (2020), which require BES/IEE/EIA for designated projects and introduce Strategic Environmental Analysis for policy, program or project. The National Environment Policy (2019) reinforces sustainability, pollution control, climate action, and governance priorities. Although SEA application to master plans is still limited in practice, the SEA for KVUTSMP is conducted in line with

1) The spirit of Nepalese environmental legislation;

2) International good practices; and

3) JICA Guidelines for Environmental and Social Considerations (2022).

The MP and SEA must also align with national policies such as Gender Equality and Social Inclusion (GESI) operational guidelines of MoPIT (2017), which promote inclusive transport access and safety for women, the poor, persons with disabilities, and marginalized groups. Climate policies-including the National Climate Change Policy (2019) and Nepal's NDC 3.0-emphasize electric mobility and low-emission transit development in the Kathmandu Valley.

Transport- and urban-sector policies, including the National Transport Policy, the Sixteenth Plan, Land Use Policy, and the National Urban Development Strategy, further shape planning

directions. Valley-specific plans, such as the Kathmandu Valley Strategic Development Master Plan and Urban Development Master Plan, guide land use and infrastructure development.

CHAPTER 3: DESCRIPTION OF THE MASTER PLAN

The Kathmandu Valley Urban Transport System Master Plan (KVUTSMP) provides a long term, integrated strategy to address severe traffic congestion, declining road safety, air pollution, and inadequate public transport services in Nepal's primary economic and administrative hub. Rapid urbanization, high motorization, and physical constraints within the historic urban core have made incremental road expansion insufficient. The Master Plan therefore prioritizes a shift toward efficient public transport, strategic road improvements, and institutional reform, with a planning horizon to 2050.

3.1 Future Urban Structure and Transport Strategy

The KVUTSMP aims to establish a safe, inclusive, climate responsive, and resilient transport system that supports economic growth while improving quality of life. The strategy focuses on:

- Strengthening east–west connectivity between Kathmandu, Lalitpur, and Bhaktapur;
- Improving the functionality of the Ring Road and Inner Ring Road system;
- Enhancing connectivity in congested northeastern corridors; and
- Promoting a modal shift from private vehicles to high-capacity public transport, recognizing that large scale surface road widening in central areas is infeasible.

3.2 Overview of the Master Plan Components

Based on the future urban structure and the transport strategy mentioned above, KVUTSMP is comprising of the following main components.

(1) Road and Traffic Management Project for the Kathmandu Valley

- Improvement of the road capacity at congested route
- Manage traffic flow inside Ring Road

(2) Strengthening Public Transport

- Improvement of the Service level of Bus Operation.

(3) Mass Transit Development

- Mass Transport is needed by 2050 at latest for mitigation of the traffic congestion in KV.

3.3 Target Year

- Short term (Phase 1): up to 2032
- Medium term (Phase 2): up to 2040
- Long term (Phase 3): up to 2050

3.4 Components of the Master Plan

(1) Road and Traffic Management

Targeted infrastructure and operational measures are proposed to relieve bottlenecks and improve safety, including:

- Intersection improvements and coordinated traffic signal systems supported by a central traffic management and monitoring center;
- Construction of new river crossings and selective use of elevated or semi underground roads in highly constrained corridors;
- Completion of Inner Ring Road links and upgrading of riverside corridors;
- Development of a hierarchical Emergency Road Network to ensure post disaster access; and
- Introduction of car free pedestrian zones in heritage and tourism areas such as Thamel and Durbar Squares.

A dedicated Kathmandu Road Safety Project complements these measures through improved crash data analysis, black spot treatment, enforcement, and public awareness.

(2) Public Transport Improvement

Recognizing that buses will remain the backbone of urban transport for the foreseeable future, the Master Plan emphasizes:

- Bus industry reform and consolidation to improve operational efficiency and accountability;
- Route restructuring to reduce over concentration in the city center and improve network connectivity;
- Upgrading of bus parks, terminals, and stops with clearer operational zoning and passenger information;
- Introduction of bus priority measures (PTPS, priority lanes, BRT type treatments) on high demand corridors;
- Systematic fleet renewal, enhanced maintenance standards, and expanded driver training; and
- Gradual adoption of ICT solutions, including GPS based fleet management, real time passenger information, and preparation for integrated Mobility as a Service (MaaS).

(3) Mass Transit Development

Traffic demand forecasts indicate that bus based systems alone will be insufficient by 2040–2050. The Master Plan therefore identifies candidate mass transit corridors, particularly in the east–west direction, for further feasibility analysis. Alternative modes such as BRT, MRT, or AGT will be evaluated based on demand, land availability, heritage constraints, and financial viability.

3.5 Alternative Study of Urban Transport system

As a result of the multi-criteria evaluation, compared with other alternatives, the Scenario 3 (Integrated Transport Strategy Scenario) provides the most balanced performance across the environmental, social, technical, economic, and financial dimensions in consideration with implementation feasibility and long-term sustainability.

The proposed Scenario 3 introduces the East–West Mass Transit corridor as the first priority project while simultaneously improving the bus network, traffic management, and strategic road infrastructure. This approach achieves significant improvements in mobility and environmental performance while remaining consistent with the financial, institutional, and implementation capacity expected by 2050. While the Scenario 1 (Comprehensive Public Transport Network scenario) offers the greatest long-term benefits, its implementation is

constrained by the scale of investment required and institutional feasibility. In contrast, the Scenario 2 (Road-Oriented Improvement scenario) can deliver short-term traffic improvements but lacks long-term sustainability due to the likelihood of induced traffic demand. The Scenario 0 (Do Nothing scenario) fails to accommodate future transport demand and is therefore the least desirable option.

CHAPTER 4: ENVIRONMENTAL AND SOCIAL BASELINE

The Kathmandu Valley experiences a monsoon-dominated climate with rising temperatures, increasing rainfall variability, and growing climate-change impacts including urban heat island effects, declining groundwater recharge, floods, and landslides.

Air quality is critically degraded, with $PM_{2.5}$ and PM_{10} concentrations exceeding national standards across all monitoring stations, particularly in winter and pre-monsoon seasons. Transport emissions are a major contributor, and vehicular emission inspections show high failure rates among diesel vehicles. Noise pollution similarly exceeds national and WHO limits in most commercial, residential, and silent zones.

Surface water quality in major rivers such as Bagmati, Bishnumati, and Manohara is severely degraded due to untreated sewage, industrial effluents, and solid waste discharge, while urban ponds show widespread organic and fecal contamination. Solid waste management remains a major challenge, with the valley generating over 235 tons per day, heavy reliance on the overburdened Sisdol landfill, and limited source segregation. Wastewater treatment capacity is inadequate, with only the Guheshwori plant currently operational.

Environmentally, the valley contains sensitive ecosystems including Shivapuri Nagarjun National Park, extensive community-managed forests, and diverse flora and fauna. Geologically, Kathmandu Valley is a high-risk seismic zone characterized by thick fluvio-lacustrine sediments that amplify earthquake shaking and liquefaction risk. Landslides and riverbank erosion threaten peripheral settlements, particularly during the monsoon.

Socially, the valley has a rapidly growing and youthful population of nearly 3.0 million, with extremely high densities in core urban areas. It is characterized by high ethnic, linguistic, and cultural diversity, with the Newar community forming the largest group, alongside significant Hill Brahmin, Kshetri, and Tamang populations. Economic activity is concentrated in trade, services, construction, and transport, while vulnerable groups-including women, children, persons with disabilities, low-income households, and ethnic minorities-face disproportionate exposure to pollution, safety risks, and limited access to services.

Gender inequality remains significant, reflected in lower female labor participation, limited asset ownership, under-representation in political leadership, and elevated risks of harassment, violence, and mobility constraints. The valley also contains globally significant cultural heritage assets, including seven UNESCO World Heritage sites, dense archaeological zones, and living Newar cultural traditions, which are sensitive to infrastructure development.

CHAPTER 5: SCOPING OF KEY ENVIRONMENTAL AND SOCIAL ISSUES

In the scoping process, considering the characteristic of environmental and social condition in the study area and the urban transport project factors, key environmental and social issues that may arise potentially, and to determine which items require further detailed assessment.

Environmental issues identified during scoping include air and water pollution, waste generation, noise and vibration, ecosystem disturbance, hydrological change, and impacts on topography. While construction activities may temporarily deteriorate environmental conditions, operational impacts are expected to be mixed, with long-term improvements in air quality and greenhouse gas reduction anticipated due to modal shift toward public transport.

Social issues requiring further assessment include land acquisition and involuntary resettlement, impacts on livelihoods, ethnic minorities, vulnerable and low-income groups, access to social infrastructure, cultural heritage, landscape, gender equality, children's rights, labor conditions, traffic safety, and community cohesion. In particular, land acquisition in dense urban areas and areas with informal settlers is identified as one of the most critical risks.

CHAPTER 6: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

During the construction stage, several adverse environmental and social impacts are expected. These include deterioration of air quality due to dust and emissions from construction equipment, water pollution from runoff and wastewater discharge, generation of construction waste, and increased noise and vibration levels. Land acquisition and resettlement are also anticipated, particularly in densely populated urban areas where land values are high. Potential impacts on ecosystems, landscapes, cultural heritage, vulnerable communities, ethnic minorities, and public health have likewise been identified as key concerns requiring further study and mitigation measures.

On the other hand, the operation stage is expected to generate substantial benefits. The proposed road improvements and mass transit systems are anticipated to reduce traffic congestion, improve travel speeds, enhance road safety, and increase access to employment, education, and public services. Improved transport efficiency is also expected to stimulate economic development and promote more effective land use throughout the Kathmandu Valley.

Through improvements in traffic conditions and the introduction of an efficient public transportation system, greenhouse gas (GHG) emissions under this project implementation scenario in 2050 will be reduced by 159,244 t-CO_2e/year, which is equivalent to approximately 20.6% of the total emissions under the no-action scenario. Furthermore, because Kathmandu Valley contains seven UNESCO World Heritage Sites and many other important cultural assets, Heritage Impact Assessment (HIA) is considered essential for projects located within or near heritage areas.

CHAPTER 7: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) AND ENVIRONMENTAL AND SOCIAL MONITORING PLAN (ESMOP)

(1) Environmental and Social Management Plan (ESMP)

The ESMP is designed to preserve positive impacts and address adverse concerns across all project phases. It emphasizes impact response, compliance with international and national standards, and budgetary integration to ensure mitigation measures are actionable. Air Quality and Noise: Implementing water sprinkling for dust control, using low-noise construction machinery, and installing temporary noise barriers or fences near residential areas. Water and Hydrology Installing sedimentation and septic tanks to prevent pollution and conducting geological investigations to manage groundwater discharge during tunnel excavation. Ecosystem and Landscape: Minimizing tree cutting through careful design, replanting vegetation, and ensuring new structures like flyovers harmonize with the historic urban landscape. Social and Cultural Safeguards: Using a Resettlement Action Plan (RAP) to manage land acquisition and livelihood restoration and conducting Heritage Impact Assessments (HIA) for work near UNESCO-listed sites. Health and Safety: Implementing disease prevention programs (e.g., for HIV/AIDS) for workers and local communities and establishing Occupational Health and Safety (OHS) management plans.

(2) Environmental and Social Monitoring Plan (ESMoP)

Reporting Frequency: Nepal's EPR 2020 requires self-monitoring reports every six months. International donors also request the periodical monitoring report as condition of loan agreement. Environmental Parameters: Air Quality: Monitoring PM10, PM2.5, SO2, CO, and NO2 monthly during construction and operation. Noise and Vibration: Monitoring 24-hour

sound and vibration level conducted monthly during construction and operation. Water Quality: Testing for parameters like BOD, COD, and pH every three months. Social Monitoring: Tracking land acquisition, grievance records, and the effectiveness of livelihood restoration programs according to the RAP.

CHAPTER 8: LAND ACQUISITION AND RESETTLEMENT

Involuntary resettlement poses significant social and economic challenges, particularly for vulnerable groups such as Dalits, female-headed households, Indigenous Peoples, and informal settlers, who may experience disproportionate impacts. In addition, gaps between Nepal's legal framework and international safeguard standards can complicate compensation and assistance for people without formal land titles. Therefore, it is recommended to make the Resettlement Action Plans (RAPs) to comply with national and international safeguard policy requirements to be addressed through fair compensation, livelihood restoration programs, inclusive planning, grievance redress mechanisms, and continuous monitoring.

CHAPTER 9: GENDER EQUALITY DISABILITY AND SOCIAL INCLUSION (GEDSI)

Risks related to GEDSI in urban transport include exclusionary infrastructure design for Persons with Disabilities (PWDs) and the elderly, safety concerns regarding Gender-Based Violence (GBV), and economic exclusion due to high fares. It specifically notes that women often face disproportionate impacts from land acquisition due to a lack of formal titles. Conversely, the Master Plan presents an opportunity to increase female participation in the transport workforce and ensure that marginalized groups share in the project's financial and employment benefits

CHAPTER 10: GRIEVANCE REDRESS MECHANISM (GRM)

GRM should be designed to allow stakeholders to raise concerns and seek remedies. It is proposed that a multi-tier Grievance Redress Committee (GRC) be established to handle both oral and written complaints through a transparent, seven-step process: publicity, reception, acknowledgment, investigation, resolution, satisfaction verification, and documentation. The mechanism is intended to be accessible, gender-responsive, and culturally appropriate, providing a path for both community members and project workers to report issues without fear of retaliation.

CHAPTER 11: IMPLEMENTATION STRUCTURE

It identifies MoID and various project offices as primary responsible bodies, supported by consultants, contractors, and local levels. Several challenges to effective implementation are highlighted, including limited institutional capacity, shortages of qualified personnel, and the complexities of coordinating across multiple government agencies and development partners.

CHAPTER 12: STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE

Key stakeholders are identified across federal, provincial, and local levels, including MoID, MoAFE, DOR, DOTM, KVDA, Bagmati Province, metropolitan cities, and traffic police, alongside private transport operators, cooperatives, ride-hailing platforms, NGOs, academia, etc.

Three stakeholder meetings on the SEA for MP were conducted at Hotel Himalaya on August 3, 2025, and February 4, 2026, and July 31, 2026, to collect opinions and suggestions from various stakeholders regarding environmental and social aspects. In the first stakeholder meeting, it was proposed and agreed that the study would follow the JICA Guidelines for Environmental and Social Considerations (2022) while adhering to the spirit of Nepal's Environment Protection Act, 2019. In the second stakeholder meeting, stakeholders provided comments on Draft Scoping Report, while stakeholders provided comments on the Draft SEA Report during the third stakeholder meeting.

CHAPTER 13: OVERVIEW OF COMMENTS FROM STAKEHOLDERS ON SEA REPORT

Key comments from stakeholders during the scoping stage included improving environmental data and trend analysis, ensuring policy and institutional consistency, safeguarding Kathmandu Valley's cultural heritage, maintaining flexibility in transport alternatives, and addressing implementation risks, public acceptance, and governance challenges.

Primary comments received during the Draft SEA Report stage cover the social safeguards for vulnerable populations, the physical protection of cultural heritage in sensitive corridors, legal alignment and co-decision roles for local authorities and the management of major construction-phase environmental risks.

CHAPTER 14: CONCLUSION AND RECOMMENDATION

Climate Change & Air Quality, Cultural Heritage Safeguards, Land Acquisition and Resettlement Risks, Social Vulnerability and GEDSI, Urban Flooding & Hydrology, and Construction in Narrow Streets area are Identified as key environmental and social risks and opportunities. These items were selected based on high stakeholder concern and the potential magnitude of their impact. The key challenges regarding KVUTSMP and the proposed countermeasures are outlined below:

Items	Key Challenges	Proposed Countermeasures
Implementation Structure	Overlapping responsibilities and stakeholder conflicts	Strengthen coordination through Technical Working Groups (TWGs).
Institutional Capacity	Limited technical and financial resources	Provide training on Universal Design and GBV-responsive measures.
Operator Resistance	Opposition from existing transport operators	Introduce phased integration and strengthen the GRM.
Data Gaps	Insufficient environmental baseline data	Require comprehensive environmental monitoring during feasibility studies.
Heritage Impact	Risks to cultural heritage sites	Conduct HIA in consultation with the Department of Archaeology (DoA).
Flooding and Submergence Impact	Potential flooding and submergence of proposed transport structures, resulting in damage to infrastructure, disruption of transport services, risks to transport users, economic losses, and community displacement	Determine appropriate transport structures and alignments based on a proper hydrological and flood-risk assessment, incorporating climate-resilient design measures to reduce vulnerability to flooding and submergence.

UPCOMING ACTIVITIES FOR FINALIZATION OF THE SEA REPORT:

The Draft SEA Report will be uploaded on the MoID's website to collect the suggestion and concerns from stakeholders on the Draft SEA report for 30 days from the date of the first publication of the public notice in National level Newspaper. Final feedback on the Draft SEA Report from stakeholders through web disclosure would be gathered, analysed, and reflected into the Final SEA report. Final SEA Report will be attached with Master Plan, which will be submitted to the Council of Ministers for formal approval.

कार्यकारी सारांश

परिच्छेद १: परिचय

जाइका (JICA) द्वारा सन २०१७ मा तयार गरिएको अघिल्लो शहरी यातायात गुरुयोजनाले हालको अवस्थालाई प्रतिबिम्बित गर्दैन। उक्त गुरुयोजनाले भूकम्पपछिका जनसंख्या स्थानान्तरण, कोभिड-१९ महामारीका कारण उत्पन्न गतिशीलता परिवर्तन, र साथै यसमा रहेको यातायात सम्बन्धी डेटा पर्याप्त रूपमा समेट्न सकेको छैन। यसका अतिरिक्त, नेपाल संघीय शासन प्रणालीमा प्रवेश गरेपछि शहरी यातायातको जिम्मेवारी संघ, प्रदेश र स्थानीय तहमा विभाजित भएका छन्, जसका कारण समन्वयसम्बन्धी चुनौतीहरू सिर्जना भएका छन्। यी कारणहरूले गर्दा गुरुयोजनाको ढाँचालाई व्यापक रूपमा अद्यावधिक गर्नुपर्ने आवश्यकता रहेको छ।

नेपाल सरकारबाट प्राप्त अनुरोध अनुरूप, यस आयोजनाले शहरी यातायातको अद्यावधिक, एकीकृत तथा दिगो गुरुयोजना तयार गर्ने उद्देश्य राखेको छ, जसले दिगो आर्थिक वृद्धि प्रवर्द्धन गर्नुका साथै भीडभाड र वायु प्रदूषणजस्ता वातावरणीय दबाबहरू न्यूनीकरण गर्न सहयोग गर्नेछ। साथै, यस योजना महत्त्वपूर्ण सामूहिक यातायातका माध्यम तथा मार्गहरूको पहिचानमा विशेष जोड दिँदै, कार्यान्वयनका लागि सम्बन्धित निकायहरूबीच प्रभावकारी समन्वय संयन्त्र स्थापना गर्ने विषयमा केन्द्रित रहनेछ।

यस योजनाको कार्य क्षेत्र काठमाडौँ उपत्यका अन्तर्गतका तीन जिल्ला काठमाडौँ, ललितपुर र भक्तपुरमा रहेको छ। यस योजना पूर्वाधार विकास मन्त्रालय साबिकको भौतिक पूर्वाधार तथा यातायात मन्त्रालयद्वारा नेतृत्व गरिएको छ र सम्बन्धित मन्त्रालयहरू, यातायातका निकायहरू, प्रदेशस्तरीय कार्यकारी निकायहरू तथा स्थानीय तहहरूको सहकार्यमा कार्यान्वयन हुनेछ।

रणनीतिक वातावरणीय मूल्याङ्कन (SEA) गुरुयोजनाको तयारीमा प्रयोग गरिन्छ, जसले वातावरणीय तथा सामाजिक पक्षहरूलाई योजनाको प्रारम्भिक चरणमै समावेश गरि सुनिश्चित गर्दछ। SEA प्रक्रियाले वैकल्पिक विकल्पहरूको मूल्याङ्कन, सरोकारवालासँगको परामर्श, क्षेत्र निर्धारण, तथा न्यूनीकरण र अनुगमन उपायहरूको सृजनामार्फत सूचित निर्णय लिन सहयोग पुऱ्याउँछ। त्यसैगरी, SEA को क्षेत्र निर्धारण प्रक्रियामा प्रस्तावित योजना तथा आयोजना क्षेत्रका विशेषताहरूका आधारमा सम्भावित वातावरणीय र सामाजिक प्रभावका बुँदाहरू पहिचान गरिन्छ, र गुरुयोजना तयार गर्दा विश्लेषण गर्नुपर्ने प्राथमिक सवालहरू तथा मूल्याङ्कनबाट बाहिर राखिने बुँदाहरू निर्धारण गरिन्छ।

परिच्छेद २: कानूनी, नीतिगत तथा संस्थागत संरचना

नेपालको संविधानले प्रत्येक नागरिकलाई स्वच्छ र स्वस्थ वातावरणमा बाँच्ने अधिकार सुनिश्चित गरेको छ। वातावरण संरक्षण ऐन (२०७६) र नियमावली (२०७७) अनुसार, तोकिएका आयोजनाका लागि संक्षिप्त वातावरणीय अध्ययन (BES), प्रारम्भिक वातावरणीय परीक्षण (IEE) र वातावरणीय प्रभाव मूल्याङ्कन (EIA) अनिवार्य छन् भने नीति, कार्यक्रम वा आयोजना अनुसार रणनीतिक वातावरणीय मूल्याङ्कन (SEA) को प्रावधान गरिएको छ।यसै गरी, राष्ट्रिय वातावरण नीति (२०७६) ले दिगोपना, प्रदूषण नियन्त्रण, जलवायु सम्बन्धी कदमहरू, र शासन सम्बन्धी प्राथमिकताहरूलाई अझ सुदृढ बनाएको छ। यद्यपि गुरुयोजनामा रणनीतिक वातावरणीय मूल्याङ्कन (SEA) को प्रयोग व्यवहारमा अझै सीमित रहेको छ। यस काठमाडौँ उपत्यका शहरी यातायात गुरुयोजनाको रणनीतिक वातावरणीय मूल्याङ्कन (SEA) निम्नानुसार सञ्चालन गरिएको छ:

(क) नेपालको वातावरणीय कानुनको मर्म अनुसार,

(ख) अन्तर्राष्ट्रिय स्तरका सान्दर्भिक अभ्यास अनुसार, र

(ग) JICA को वातावरणीय तथा सामाजिक मापदण्ड (२०२२) अनुसार।

गुरुयोजना (MP) तथा रणनीतिक वातावरणीय मूल्याङ्कन (SEA) नेपालको राष्ट्रिय नीतिहरूसँग अनुरूप हुनुपर्ने आवश्यक छ। जस्तै, भौतिक पूर्वाधार तथा यातायात मन्त्रालयको लैङ्गिक समानता र सामाजिक समावेशीकरण (GESI) निर्देशनहरूले महिला, गरिब, अपाङ्गता भएका व्यक्ति तथा सीमान्तकृत समूहका व्यक्तिहरूको लागि समान र सुरक्षित यातायात पहुँच प्रवर्द्धन गरेको छ। साथै, जलवायु नीतिहरूमा राष्ट्रिय जलवायु परिवर्तन नीति (२०७६) र नेपालको राष्ट्रिय रूपमा निर्धारण गरिएका योगदान, तेस्रो संस्करण (NDC 3.0) समावेश छन्, जसले काठमाडौँ उपत्यकामा विद्युतबाट चल्ने यातायात र कम प्रदूषण उत्सर्जन गर्ने ट्रान्जिट विकासमा जोड दिएको छ।

यातायात र शहरी क्षेत्रका नीतिहरूमा राष्ट्रिय यातायात नीति, सोह्रौं योजना, भू-उपयोग नीति, र राष्ट्रिय शहरी विकास रणनीति समावेश रहेको छ जसले योजना निर्माणका लागि निर्देशनहरू तय गर्नेछ। साथै, उपत्यकाभित्रका विशेष योजनाहरू, (जस्तै काठमाडौँ उपत्यका रणनीतिक विकास गुरुयोजना र शहरी विकास गुरुयोजना)ले भूमिको प्रयोग र पूर्वाधार विकासमा मार्गदर्शन प्रदान गर्छन्।

परिच्छेद ३: गुरुयोजना सम्बन्धी विवरण

काठमाडौँ उपत्यका शहरी यातायात प्रणाली गुरुयोजना (KVUTS MP) ले नेपालको मुख्य आर्थिक र प्रशासनिक केन्द्रमा भएको भारी ट्राफिक जाम, घट्दो सडक सुरक्षा, वायु प्रदूषण, र अपर्याप्त सार्वजनिक यातायात सेवाहरू जस्ता समस्याहरू समाधान गर्न दीर्घकालीन र एकीकृत रणनीति प्रदान गर्दछ। तीव्र शहरीकरण, बढ्दो सवारी साधन संख्या, र ऐतिहासिक शहरी केन्द्रमा भौतिक सीमितताका कारण सडकको क्रमिक विस्तार पर्याप्त हुन सकेको छैन। त्यसैले, यस गुरुयोजनाले दक्ष सार्वजनिक यातायाततर्फको रूपान्तरण, रणनीतिक सडक सुधार, र संस्थागत सुधारलाई प्राथमिकता दिएको छ, र यो योजना सन २०५० सम्मको समयसीमामा तयार गरिएको हो।

३.१: भविष्यको शहरी संरचना तथा यातायातको रणनीति

काठमाडौँ उपत्यका शहरी यातायात प्रणाली गुरुयोजनाले सुरक्षित, समावेशी, जलवायु अनुकूल, र मजबुत यातायात प्रणाली स्थापना गर्ने लक्ष्य राखेको छ, जसले आर्थिक वृद्धि सँगै जीवनस्तर सुधारमा पनि योगदान पुऱ्याउँनेछ। यस रणनीतिले मुख्यतय तलका पक्षमा ध्यान दिनेछ:

- काठमाडौँ, ललितपुर र भक्तपुरबीच पूर्व-पश्चिम सञ्जाल मजबुत पार्ने;
- रिङ रोड र भित्रि रिङ रोड प्रणालीको कार्यक्षमता सुधार गर्ने;
- भीडभाड भएका उत्तरपूर्वी मार्गहरूमा सञ्जाल सुधार गर्ने;
- केन्द्रीय क्षेत्रमा ठूला सडक विस्तार सम्भव नभएकोले निजी सवारीसाधनबाट उच्च क्षमता सार्वजनिक यातायाततर्फ मोडल परिवर्तनलाई प्रवर्द्धन गर्ने।

३.२: गुरुयोजनाका मुख्य अवयवहरूको संक्षिप्त विवरण

माथि उल्लिखित भविष्यको शहरी संरचना र यातायात रणनीतिको आधारमा, काठमाडौँ उपत्यका शहरी यातायात प्रणाली गुरुयोजनाले निम्न मुख्य अवयवहरू समावेश गर्दछ:

(क) काठमाडौँ उपत्यकाको सडक तथा ट्राफिक व्यवस्थापन आयोजना

- भीडभाड भएका मार्गमा सडक क्षमता सुधार गर्ने
- रिङ रोड भित्रको ट्राफिक प्रवाह व्यवस्थापन गर्ने

(ख) सार्वजनिक यातायात सुदृढीकरण

- बस सञ्चालनको सेवा स्तरमा सुधार गर्ने

(ग) सामूहिक यातायात विकास (Mass Transit Development)

- काठमाडौं उपत्यकामा बढ्दो यातायातको चाप कम गर्न सन २०५० सम्ममा सामूहिक यातायात प्रणालीको विकास आवश्यक हुनेछ।

३.३: लक्षित वर्ष

- छोटो अवधि (पहिलो चरण): सन २०३२ सम्म
- मध्यम अवधि (दोस्रो चरण): सन २०४० सम्म
- दीर्घकालिन अवधि (तेस्रो चरण): सन २०५० सम्म

३.४: गुरुयोजनाका अवयवहरू

(क) सडक तथा ट्राफिक व्यवस्थापन

बोटलनेक (अवरोध) न्यूनीकरण तथा सडक सुरक्षामा सुधार गर्न लक्षित पूर्वाधार र सञ्चालनसम्बन्धी उपायहरू प्रस्ताव गरिएको छ, जसमा निम्न समावेश छन

- केन्द्रिय यातायात व्यवस्थापन तथा अनुगमन केन्द्रको सहयोगमा चौक सुधार र समन्वित यातायात संकेत प्रणालीको स्थापना गर्ने;
- नयाँ नदी क्रसिङ्गको निर्माण र अत्यधिक सीमित कोरिडोरहरूमा elevated वा semi underground सडक चयन गरेर प्रयोग गर्ने;
- भित्रि रिङ रोडको लिङ्कहरू पूरा गर्ने र नदी किनारका कोरिडिरहरूको स्तरोन्नति गर्ने;
- आपतकालीन सडक सञ्जालको विकास गर्ने, जसवाट विपद् पश्चातको पहुँच सुनिश्चित हुने;
- ठमेल र दरबार स्क्वायर जस्ता ऐतिहासिक तथा पर्यटकिय क्षेत्रहरूलाई सवारी-रहित पैदल यात्री क्षेत्रको रूपमा परिचित गर्ने।

काठमाडौँ सडक सुरक्षा आयोजनाले सुधार गरिएका दुर्घटना तथ्यांक विश्लेषण, दुर्घटना सम्भावित स्थल (ब्ल्याक स्पट) सुधार कार्य, कानुनको कार्यान्वयन, र सार्वजनिक चेतनामार्फत यी उपायहरूलाई पूरक बनाउनेछ।

(ख) सार्वजनिक यातायात सुदृढीकरण

यातायातका साधन जस्तै, बसहरू भविष्यको समयसम्म शहरी यातायातको मुख्य आधार रहने भएकाले, गुरुयोजनाले निम्न विषयमा जोड दिएको छः

- सञ्चालनको दक्षता र जवाफदेहिता बढाउन बस व्यवसायको सुधार तथा एकीकरण गर्ने;
- शहरको केन्द्रमा अत्यधिक भीड घटाउन र सञ्जाल सम्पर्क सुधार गर्न रुट पुनर्संरचना गर्ने;
- बसपार्क, टर्मिनल र बसस्टपहरूको स्तरोन्नति गरी स्पष्ट परिचालन क्षेत्र व्यवस्था गर्ने र यात्रुहरूको लागि स्पष्ट जानकारी उपलब्ध गराउने;
- उच्च माग भएका कोरिडोरहरूमा बस परिचालनलाई प्राथमिकता दिने उपायहरू (जस्तै: बस लेन, द्रुतगति बस यातायात (BRT), सार्वजनिक यातायात प्राथमिकता प्रणाली (PTPS)) लागू गर्ने;
- सवारी साधनको क्रमिक नवीनीकरण, मर्मत मर्मत मापदण्ड सुधार, र चालक तालिम विस्तार गर्ने; र
- GPS सहितको सवारी साधन व्यवस्थापन, रियल-टाइम यात्रु सूचना प्रणाली, र एकीकृत यातायात सेवा (MaaS) का लागि सूचना तथा सञ्चार प्रविधि (ICT) को क्रमिक प्रयोग गर्ने।

(ग) सार्वजनिक द्रुत यातायात विकास

ट्राफिक माग पूर्वानुमान अनुसार सन २०४०-२०५० सम्म केवल बसमा आधारित प्रणाली पर्याप्त नहुने देखिन्छ। त्यसैले यस गुरुयोजनाले थप सम्भाव्यता अध्ययनका लागि विशेषगरी पूर्व-पश्चिम दिशामा सार्वजनिक द्रुत यातायात कोरिडिर पहिचान गरेको छ। ती कोरिडोररूमा Bus Rapid Transit (BRT), Mass Rapid Transit (MRT) वा Automated Guideway Transit (AGT) जस्ता वैकल्पिक यातायात प्रणालीहरू प्रयोग गरी यात्रुको माग, उपलब्ध जमिन, सांस्कृतिक सम्पदा सम्बन्धित सीमितता तथा आर्थिक व्यवहार्यताको आधारमा मूल्याङ्कन गरिनेछ।

३.५ शहरी यातायात प्रणालीका विकल्पहरूको अध्ययन

बहु-मापदण्डीय मूल्याङ्कनको नतिजाअनुसार, अन्य विकल्पहरूको तुलनामा परिदृश्य ३ (एकीकृत यातायात रणनीति परिदृश्य) वातावरणीय, सामाजिक, प्राविधिक, आर्थिक तथा वित्तीय पक्षका साथै कार्यान्वयनको सम्भाव्यता र दीर्घकालीन दिगोपनका दृष्टिले सबैभन्दा सन्तुलित विकल्पका रूपमा देखिएको छ।

प्रस्तावित परिदृश्य ३ मा पूर्व-पश्चिम सामूहिक यातायात कोरिडोरलाई पहिलो प्राथमिकताको आयोजनाका रूपमा समावेश गरिएको छ, र साथै, बस सेवा सञ्जाल, ट्राफिक व्यवस्थापन तथा रणनीतिक सडक पूर्वाधारमा एकैसाथ सुधार गरिनेछ।यस दृष्टिकोणले आवागमन तथा वातावरणीय कार्यसम्पादनमा उल्लेखनीय सुधार ल्याउनुका साथै सन २०५० सम्म अपेक्षित वित्तीय, संस्थागत तथा कार्यान्वयन क्षमतासँग पनि सामञ्जस्य कायम गर्दछ।

यसै गरी, परिदृश्य १ (समग्र सार्वजनिक यातायात सञ्जाल परिदृश्य) ले दीर्घकालीन रूपमा सबैभन्दा बढी लाभ प्रदान गर्ने भए पनि आवश्यक पर्ने ठूलो लगानी र उच्च संस्थागत क्षमताका कारण यसको कार्यान्वयनमा सीमितता देखिन्छ। यसको विपरीत, परिदृश्य २ (सडक-केन्द्रित सुधार परिदृश्य) ले छोटो अवधिमा यातायात व्यवस्थापनमा सुधार ल्याउन सक्ने भए पनि थप यातायात माग सिर्जना हुने सम्भावनाका कारण यसको दीर्घकालीन दिगोपन सीमित रहने देखिन्छ। परिदृश्य ० (केही नगर्ने वा यथास्थिति कायम राख्ने परिदृश्य) ले भविष्यको यातायात मागलाई सम्बोधन गर्न नसक्ने भएकाले सबैभन्दा कम उपयुक्त विकल्पका रूपमा मूल्याङ्कन गरिएको छ।

परिच्छेद ४: विद्यमान वातावरणीय तथा सामाजिक अवस्था

काठमाडौं उपत्यकामा मनसुन-प्रधान जलवायु रहेको छ, जहाँ तापक्रममा वृद्धि, वर्षाको अनियमितता, तथा जलवायु परिवर्तनका प्रभावहरू तीव्र रूपमा देखिन थालेका छन। यी प्रभावहरूमा शहरी ताप द्वीप (Urban Heat Island) प्रभाव, भूमिगत जलको पुनर्भरण (recharge) घट्नु, बाढी तथा पहिरो जस्ता समस्याहरू समावेश छन।

काठमाडौं उपत्यकामा वायुको गुणस्तर गम्भीर रूपमा प्रदूषित रहेको छ। यहाँ $PM_{2.5}$ र PM_{10} को एकाग्रता सबै मापन केन्द्रहरूमा, विशेष गरी जाडो तथा मनसुन अघिको मौसममा, राष्ट्रिय मापदण्डभन्दा बढी रहेको छ। वायु प्रदूषणको प्रमुख कारण सवारी साधनबाट निस्किने उत्सर्जन हो, र सवारी उत्सर्जन परीक्षणमा डीजेल सवारी साधनहरूको मापदण्ड नपुगेको दर उच्च रहेको पाइएको छ। साथै, ध्वनि प्रदूषण पनि अधिकांश व्यावसायिक, आवासीय तथा शान्त क्षेत्रहरूमा राष्ट्रिय तथा विश्व स्वास्थ्य संगठन (WHO) का मापदण्डभन्दा बढी रहेको छ।

काठमाडौं उपत्यकामा रहेका बागमती, विष्णुमती र मनोहरा जस्ता मुख्य नदीहरूको सतही पानीको गुणस्तरमा गम्भीर ह्रास आएको छ, जसको मुख्य कारण प्रशोधन नगरिएको ढल, उद्योगबाट निस्किने फोहोरपानी तथा ठोस फोहोरको निष्कासन हो। साथै, शहरी पोखरीहरूमा पनि जैविक तथा दिशाजन्य प्रदूषण व्यापक रूपमा देखिएको छ। यसैगरी, ठोस फोहोर व्यवस्थापन अझै पनि एक प्रमुख चुनौतीको रूपमा रहेको छ। उपत्यकामा दैनिक २३५ टनभन्दा बढी ठोस फोहोर उत्पादन हुने गर्दछ। उपत्यकामा ठोस फोहोर व्यवस्थापनको लागि अधिकतम क्षमता भन्दा बढीमा संचालन भइरहेको सिस्डोल डम्पिङ साइटमा निर्भर हुनु परेको छ र स्रोतमा फोहोर छुट्याउने अभ्यास पनि सीमित रहेको छ। फोहोरपानी प्रशोधन क्षमता पनि अपर्याप्त रहेको छ, र हाल केवल गुहेश्वरी प्रशोधन केन्द्र मात्र सञ्चालनमा रहेको छ।

वातावरणीय दृष्टिकोणले, काठमाडौं उपत्यकामा शिवपुरी-नागार्जुन राष्ट्रिय निकुञ्ज, व्यापक रूपमा समुदाय-व्यवस्थापित वन क्षेत्रहरू, तथा विविध वनस्पति र जीवजन्तु सहितका संवेदनशील पारिस्थितिक प्रणालीहरू रहेका छन। भूगर्भीय सन्दर्भमा, काठमाडौं उपत्यका उच्च जोखिमयुक्त भूकम्पीय क्षेत्रमा पर्दछ, जहाँको thick fluvio-lacustrine sediments ले भूकम्पीय कम्पन बढाउँछ र liquefaction को जोखिम पनि उच्च बनाउँछ। विशेषगरी मनसुनको समयमा पहिरो तथा नदीकिनार कटानका कारण उपत्यकाका परिधीय तथा नदी नजिकका बस्तीहरू उच्च जोखिममा पर्ने गर्दछन।

सामाजिक परिपक्षमा, उपत्यकामा करिब ३० लाखको द्रुतवृद्धि हुने सहित युवा जनसंख्या रहेको छ, जसको घनत्व विशेष गरी शहरी क्षेत्रमा अत्यधिक रहेको छ। यस क्षेत्रमा उच्च जातीय, भाषिक र सांस्कृतिक विविधता रहेको छ, जहाँ नेवार समुदायको सर्वाधिक प्रतिनिधित्व रहेको छ, साथै अन्य उल्लेखनीय समूहहरूमा पहाडी ब्राह्मण,

क्षेत्री र तामाङ समुदाय रहेका छन। आर्थिक गतिविधिहरू मुख्य रूपमा व्यापार, सेवा, निर्माण र यातायातमा केन्द्रित रहेका छन।भने संवेदनशील समूहहरू जस्तै महिला, बालबालिका, अपाङ्ग व्यक्ति, कम आम्दानी भएका घरपरिवार र जातीय अल्पसंख्यकले प्रदूषण, सुरक्षा जोखिम तथा सेवा र सुविधामा सीमित पहुँचको सामना गरेका छन।

लैङ्गिक असमानता अझै प्रभावकारी रूपमा रहेको छ, जसको कारण महिलाको श्रम सहभागितामा कम हुनु, सम्पत्तिको स्वामित्व सीमित हुनु, राजनीतिक नेतृत्वमा कम प्रतिनिधित्व हुनु, र यसबाट उत्पीडन, हिंसा तथा गतिशीलतामा सीमित हुने जस्ता जोखिम बढ्दछ।उपत्यकामा विश्वव्यापी महत्वका सांस्कृतिक सम्पदा पनि

रहेका छन्, जसमा सातवटा युनेस्को विश्व सम्पदा स्थल, घना पुरातात्त्विक क्षेत्रहरू, र नेवार सांस्कृतिक जीवनशैली समावेश छन्, र यी पूर्वाधार विकासको सन्दर्भमा संवेदनशील छन्।

परिच्छेद ५: मुख्य वातावरणीय तथा सामाजिक सवालहरुको क्षेत्र निर्धारण

क्षेत्र निर्धारण प्रक्रिया अन्तर्गत, अध्ययन क्षेत्रको वातावरणीय तथा सामाजिक अवस्था र शहरी यातायात आयोजनाका तत्वहरूलाई ध्यानमा राख्दै, सम्भावित रूपमा देखा पर्न सक्ने मुख्य वातावरणीय र सामाजिक सवालहरू पहिचान गरिनेछ र थप विस्तृत रूपमा मूल्याङ्कन आवश्यक पर्ने विषयहरूको निर्धारण गरिनेछ।

क्षेत्र निर्धारण को क्रममा पहिचान गरिएका वातावरणीय सवालहरूमा वायु र पानीको प्रदूषण, फोहोरको उत्पादन, ध्वनि र कम्पन, पारिस्थितिकी प्रणालीमा अवरोध, जलविज्ञानीय परिवर्तन, र भू-आकृतिमा हुने प्रभावहरू समावेश रहेका छन्। आयोजनाको निर्माण गतिविधिहरूले अस्थायी रूपमा वातावरणीय अवस्थामा क्षति पुऱ्याउन सक्दछ, तर सञ्चालन चरणमा यस्ता प्रभाव मिश्रित हुने अपेक्षा गरिएको छ। साथै, सार्वजनिक यातायाततर्फ यातायातको माध्यम परिवर्तन भएमा दीर्घकालीन समयमा वायुको गुणस्तर सुधार हुने र हरितगृह ग्यास उत्सर्जन कम हुने अनुमान गरिएको छ।

थप मूल्याङ्कन आवश्यक पर्ने सामाजिक विषयहरूमा जमिन अधिग्रहण, अनैच्छिक पुनर्वास, जीविकोपार्जनमा पर्ने प्रभाव, जातीय अल्पसंख्यक, संवेदनशील तथा कम आम्दानी भएका समूह, सामाजिक पूर्वाधारमा पहुँच, सांस्कृतिक सम्पदा, भू-दृश्य, लैङ्गिक समानता, बालअधिकार, श्रमिकको अवस्था, यातायात सुरक्षा, र समुदायको सहकार्य समावेश छन्। विशेष गरी, घना शहरी क्षेत्र र अनौपचारिक बस्ती भएका क्षेत्रहरूमा जग्गा अधिग्रहण सबैभन्दा महत्वपूर्ण जोखिमको रूपमा पहिचान गरिएको छ।

परिच्छेद ६: वातावरणीय तथा सामाजिक प्रभाव मूल्याङ्कन

निर्माण चरणमा विभिन्न वातावरणीय तथा सामाजिक प्रतिकूल प्रभावहरू पर्न सक्ने अपेक्षा गरिएको छ। जस अन्तर्गत निर्माणको क्रममा सिर्जित हुने धुलो तथा निर्माण उपकरणबाट उत्सर्जन भएको धुवाँ र ग्यासका कारण वायु प्रदूषण, निर्माणस्थलबाट बग्ने पानी तथा फोहोर पानीका कारण जल प्रदूषण, निर्माणजन्य फोहोरको उत्पादन र ध्वनिको स्तर तथा कम्पन वृद्धि हुने सम्भावना रहेको छ। यसैगरी, जग्गा अधिग्रहण तथा पुनर्वासको आवश्यकता विशेषगरी घना बस्ती भएका र उच्च जग्गा मूल्य भएका शहरी क्षेत्रमा पर्न सक्ने सम्भावना रहेको छ।यसका साथै, पारिस्थितिक प्रणाली, प्राकृतिक दृश्य (भू-दृश्य), सांस्कृतिक सम्पदा, जोखिममा रहेका समुदायहरू, जातीय अल्पसंख्यकहरू तथा जनस्वास्थ्यमा पनि प्रभाव पर्न सक्ने सम्भावना रहेको छ। त्यसैले, यी सम्भावित सरोकारहरूको विस्तृत अध्ययन गरी आवश्यक न्यूनीकरणका उपायहरू अवलम्बन गर्न आवश्यक रहेको छ।

अर्कोतर्फ, सञ्चालन चरणबाट उल्लेखनीय प्रतिफलहरू प्राप्त हुने अपेक्षा गरिएको छ। प्रस्तावित सडक सुधार तथा सामूहिक यातायात प्रणालीले यातायातको चाप कम गर्नुका साथै यात्रा गति बढाउने, सडक सुरक्षामा सुधार गर्ने तथा रोजगारी, शिक्षा र सार्वजनिक सेवामा पहुँच वृद्धि गर्ने अपेक्षा गरिएको छ। यातायातको दक्षतामा हुने सुधारले काठमाडौं उपत्यकाभर आर्थिक विकासलाई टेवा पुग्नुका साथै काठमाडौं उपत्यकाको भू-उपयोगलाई पनि थप प्रभावकारी तुल्याउन योगदान पुऱ्याउने अपेक्षा गरिएको छ।

यातायातको अवस्थाको सुधार तथा प्रभावकारी सार्वजनिक यातायात प्रणालीको सुरुवातका माध्यमबाट, यस आयोजना कार्यान्वयन परिदृश्यअन्तर्गत सन २०५० मा हरितगृह ग्यास (GHG) उत्सर्जन १५९,२४४ टन-CO_2e/वर्षले घट्नेछ, जुन कुनै कार्य नगर्ने परिदृश्य (Do Nothing Scenario) अन्तर्गतको कुल उत्सर्जनको

करिब २०.६% बराबर हो। यसका साथै, काठमाडौं उपत्यकामा UNESCO का सात वटा विश्व सम्पदा स्थलहरू तथा अन्य धेरै महत्वपूर्ण सांस्कृतिक सम्पदाहरू रहेका कारण, सम्पदा क्षेत्रभित्र वा त्यसको नजिक अवस्थित आयोजनाहरूका लागि सम्पदा प्रभाव मूल्याङ्कन (HIA) आवश्यक मानिएको छ।

परिच्छेद ७: वातावरणीय तथा सामाजिक व्यवस्थापन योजना (ESMP) र वातावरणीय तथा सामाजिक अनुगमन योजना (ESMOP)

(क) वातावरणीय तथा सामाजिक व्यवस्थापन योजना (Environmental and Social Management Plan–ESMP)

वातावरणीय तथा सामाजिक व्यवस्थापन योजना (ESMP) आयोजनाका सबै चरणहरूमा सकारात्मक प्रभावलाई संरक्षण गर्ने तथा नकारात्मक प्रभावहरूलाई न्यूनीकरण गर्ने उद्देश्यले तयार गरिएको हो। यस योजनाले सम्भावित प्रभावहरूको सम्बोधन, राष्ट्रिय तथा अन्तर्राष्ट्रिय मापदण्डहरूको पालना तथा न्यूनीकरणका उपायहरू प्रभावकारी रूपमा कार्यान्वयन गर्न आवश्यक बजेट व्यवस्थामा जोड दिएको छ। **वायु गुणस्तर तथा ध्वनि:** धुलो नियन्त्रणका लागि नियमित पानी छर्कने, कम ध्वनि उत्सर्जन गर्ने निर्माण उपकरण प्रयोग गर्ने तथा आवासीय क्षेत्र नजिक अस्थायी ध्वनि अवरोधक (Noise Barrier) वा बार लगाउने। **जल तथा जलप्रणाली :** प्रदूषण रोक्न सेडिमेन्टेसन ट्याङ्की (Sedimentation Tank) र सेप्टिक ट्याङ्की स्थापना गर्ने तथा सुरुङ निर्माणका क्रममा भू-गर्भीय अध्ययन गरी भूमिगत पानीको व्यवस्थापन गर्ने। **पारिस्थितिक प्रणाली तथा भू-दृश्य:** सावधानीपूर्वक डिजाइन गरी रूख कटान न्यून गर्ने, पुनःवृक्षारोपण गर्ने तथा फ्लाइओभरजस्ता नयाँ संरचनाहरू ऐतिहासिक शहरी भू-दृश्यसँग सामञ्जस्यपूर्ण हुने सुनिश्चित गरी निर्माण गर्ने। **सामाजिक तथा सांस्कृतिक संरक्षण:** जग्गा अधिग्रहण तथा जीविकोपार्जन पुनर्स्थापनालाई व्यवस्थापन गर्न पुनर्स्थापना कार्ययोजना अवलम्बन गरिने तथा युनेस्को (UNESCO) विश्व सम्पदा मा सूचीकृत सम्पदा स्थलनजिक गरिने कार्यहरूका लागि सम्पदा प्रभाव मूल्याङ्कन सञ्चालन गर्ने। **स्वास्थ्य तथा सुरक्षा:** कामदार तथा स्थानीय समुदायका लागि एचआईभी/एड्स लगायत रोग रोकथाम कार्यक्रम सञ्चालन गर्ने तथा व्यावसायिक स्वास्थ्य तथा सुरक्षा (OHS) व्यवस्थापन योजना लागू गर्ने।

(ख) वातावरणीय तथा सामाजिक अनुगमन योजना (Environmental and Social Monitoring Plan–ESMoP)

प्रतिवेदन पेस गर्ने आवधिकता: नेपाल सरकारको वातावरण संरक्षण नियमावली, २०७७ अनुसार प्रत्येक छ महिनामा स्व-अनुगमन प्रतिवेदन पेस गर्नुपर्ने व्यवस्था छ। साथै, अन्तर्राष्ट्रिय दातृ निकायहरूले पनि ऋण सम्झौताको सर्तका रूपमा नियमित रूपमा अनुगमन प्रतिवेदन पेस गर्नुपर्ने व्यवस्था गरेका छन।**वातावरणीय मापदण्डहरू:**

वायु गुणस्तर अन्तर्गत निर्माण तथा सञ्चालन चरणमा PM_{10}, $PM_{2.5}$, SO_2, CO तथा NO_2 को मासिक रूपमा अनुगमन गर्ने। **ध्वनि तथा कम्पन** अन्तर्गत निर्माण तथा सञ्चालन चरणमा २४ घण्टाको ध्वनि तथा कम्पनको स्तरको मासिक रूपमा अनुगमन गर्ने। **पानीको गुणस्तर** अन्तर्गत BOD, COD तथा pH जस्ता मापदण्डहरूको प्रत्येक तीन महिनामा परीक्षण गर्ने। **सामाजिक अनुगमन:** पुनर्स्थापना कार्ययोजना (RAP) अनुसार जग्गा अधिग्रहण, गुनासो अभिलेखन तथा जीविकोपार्जन पुनःस्थापना कार्यक्रमको प्रभावकारिताको अनुगमन गर्ने ।

परिच्छेद ८: जग्गा अधिग्रहण तथा पुनर्वास

अनैच्छिक पुनर्वासले विशेषगरी दलित, महिला-प्रमुख घरधुरी, आदिवासी-जनजाति तथा अनौपचारिक रूपमा बसोबास गर्ने व्यक्तिहरूजस्ता संवेदनशील समूहहरूमा महत्वपूर्ण सामाजिक तथा आर्थिक चुनौतीहरू सिर्जना गर्न सक्छ, जसका कारण उनीहरूले असमानुपातिक प्रभाव भोग्नुपर्ने हुन सक्छ। यसका साथै, नेपालको कानुनी संरचना र अन्तर्राष्ट्रिय सुरक्षात्मक मापदण्डहरूबीच रहेका अन्तरका कारण औपचारिक जग्गा स्वामित्व प्रमाणपत्र नभएका व्यक्तिहरूका लागि क्षतिपूर्ति तथा सहायता उपलब्ध गराउन जटिलता उत्पन्न हुन सक्छ। त्यसैले, पुनर्स्थापना कार्ययोजनाहरू राष्ट्रिय तथा अन्तर्राष्ट्रिय सुरक्षात्मक नीतिका आवश्यकताहरूसँग अनुरूप हुने गरी तयार गरी निष्पक्ष क्षतिपूर्ति, जीविकोपार्जन पुनर्स्थापना कार्यक्रम, समावेशी योजना तर्जुमा, गुनासो सुनुवाइ संयन्त्र तथा निरन्तर अनुगमनमार्फत यी समस्याहरूलाई सम्बोधन गर्न सिफारिस गरिन्छ।

परिच्छेद ९: लैङ्गिक समानता, अपाङ्गता तथा सामाजिक समावेशीकरण

शहरी यातायात क्षेत्रमा लैङ्गिक समानता, अपाङ्गता तथा सामाजिक समावेशीकरणसँग सम्बन्धित जोखिमहरूमा अपाङ्गता भएका व्यक्तिहरू तथा ज्येष्ठ नागरिकमैत्री पूर्वाधारको अभाव, लैङ्गिक हिंसासम्बन्धी सुरक्षा चुनौतीहरू तथा उच्च भाडादरका कारण हुने आर्थिक बहिष्करण समावेश छन। साथै, जग्गाको औपचारिक स्वामित्व प्रमाणपत्र (लालपुर्जा) प्रायः महिलाको नाममा नहुने भएकाले जग्गा अधिग्रहणबाट महिलाहरू असमान रूपमा बढी प्रभावित हुन सक्ने उल्लेख गरिएको छ। साथै, जग्गाको औपचारिक स्वामित्व प्रमाणपत्र (लालपुर्जा) प्रायः महिलाहरूको नाममा नहुने भएकाले जग्गा अधिग्रहणबाट महिलाहरू असमानुपातिक रूपमा बढी प्रभावित हुन सक्ने विशेष रूपमा उल्लेख गरिएको छ। अर्कोतर्फ, यस गुरुयोजनाले यातायात क्षेत्रमा महिलाहरूको सहभागिता बढाउने तथा सीमान्तकृत समूहहरूका लागि आयोजनाबाट प्राप्त हुने वित्तीय तथा रोजगारीका अवसरहरूमा समान पहुँच सुनिश्चित गर्ने महत्वपूर्ण अवसर प्रदान गर्दछ।

परिच्छेद १०: गुनासो सुनुवाइ संयन्त्र

गुनासो सुनुवाइ संयन्त्र सरोकारवालाहरूले आफ्ना गुनासा तथा चासोहरू प्रस्तुत गर्न र उपयुक्त समाधान प्राप्त गर्न सक्ने गरी तयार गरिनुपर्छ। यसका लागि बहु-तहको गुनासो सुनुवाइ समिति गठन गर्न प्रस्ताव गरिएको छ, जसले मौखिक तथा लिखित दुवै प्रकारका गुनासाहरूलाई पारदर्शी रूपमा सात चरणको प्रक्रियामार्फत व्यवस्थापन गर्नेछ। यस सात चरणको प्रक्रियामा सूचना प्रवाह, गुनासो दर्ता, प्राप्तिको स्वीकृति, छानबिन, समाधान, सन्तुष्टि प्रमाणीकरण तथा अभिलेखीकरण समावेश छन। यो संयन्त्र सहज पहुँचयोग्य, लैङ्गिक उत्तरदायी तथा सांस्कृतिक रूपमा उपयुक्त हुने गरी तयार गरिनेछ, जसले समुदायका सदस्यहरू तथा आयोजनाका कामदारहरूलाई प्रतिशोधको भयबिना आफ्ना समस्या तथा गुनासाहरू प्रस्तुत गर्ने अवसर प्रदान गर्नेछ।

परिच्छेद ११: कार्यान्वयन संरचना

यसमा पूर्वाधार विकास मन्त्रालय तथा विभिन्न आयोजना कार्यालयहरूलाई प्रमुख जिम्मेवार निकायका रूपमा पहिचान गरिएको छ, जसलाई परामर्शदाता, निर्माण व्यवसायी तथा स्थानीय तहहरूले सहयोग गर्नेछन। साथै, प्रभावकारी कार्यान्वयनमा विभिन्न चुनौतीहरू रहेको उल्लेख गरिएको छ, जसमा सीमित संस्थागत क्षमता, योग्य जनशक्तिको अभाव तथा विभिन्न सरकारी निकायहरू र विकास साझेदारहरूबीच समन्वय गर्नुपर्ने जटिलता समावेश छन।

परिच्छेद १२: सरोकारवालाको सहभागिता तथा सूचना सार्वजनिककरण

यसअन्तर्गत संघीय, प्रादेशिक तथा स्थानीय तहका प्रमुख सरोकारवालाहरूको पहिचान गरिएको छ, जसमा पूर्वाधार विकास मन्त्रालय, कृषि, वन तथा वातावरण मन्त्रालय, सडक विभाग, यातायात व्यवस्था विभाग, काठमाडौं उपत्यका विकास प्राधिकरण, बागमती प्रदेश सरकार, महानगरपालिकाहरू तथा ट्राफिक प्रहरीलगायत निजी यातायात सञ्चालकहरू, सहकारी संस्थाहरू, सवारीसाधन बुकिङ सेवा प्रदायकहरू, गैरसरकारी संस्थाहरू तथा शैक्षिक एवं प्राज्ञिक संस्थाहरू समावेश छन।

यस गुरुयोजनाका लागि गरिएको रणनीतिक वातावरणीय मूल्याङ्कन सम्बन्धमा वातावरणीय तथा सामाजिक पक्षका बारेमा विभिन्न सरोकारवालाहरूको राय तथा सुझाव सङ्कलन गर्न होटल हिमालयमा मिति २०८२ साल श्रावण १८ गते, २०८२ साल माघ २१ गते र २०८३ साल श्रावण १५ गते तीनवटा सरोकारवाला बैठकहरू आयोजना गरिएको थियो। पहिलो सरोकारवाला बैठकमा रणनीतिक वातावरणीय मूल्याङ्कन अध्ययनले नेपालको वातावरण संरक्षण ऐन, २०७६ को मर्मलाई आत्मसात गर्दै JICA को वातावरणीय तथा सामाजिक विचारसम्बन्धी निर्देशिका (Guidelines for Environmental and Social Considerations, 2022) अनुरूप अघि बढ्ने प्रस्ताव गरिएको र सो विषयमा सहमति भएको थियो। दोस्रो सरोकारवाला बैठकमा सरोकारवालाहरूबाट मस्यौदा क्षेत्र निर्धारण प्रतिवेदन (Draft Scoping Report) माथि टिप्पणी तथा सुझावहरू प्रस्तुत गरिएका थिए भने, तेस्रो सरोकारवाला बैठकमा रणनीतिक वातावरणीय मूल्याङ्कन (SEA) को मस्यौदा प्रतिवेदन (Draft SEA Report) माथि टिप्पणी तथा सुझावहरू प्रस्तुत गरिएका थिए।

परिच्छेद १३: सुझावहरूको सिंहावलोकन

क्षेत्र निर्धारण चरणमा सरोकारवालाहरूबाट प्राप्त प्रमुख राय–सुझावहरूमा वातावरणीय तथ्याङ्क तथा प्रवृत्ति विश्लेषणमा सुधार गर्ने, नीतिगत तथा संस्थागत एकरूपता सुनिश्चित गर्ने, काठमाडौं उपत्यकाको सांस्कृतिक सम्पदाको संरक्षण गर्ने, यातायातका वैकल्पिक उपायहरूमा लचकता कायम राख्ने तथा कार्यान्वयनसम्बन्धी जोखिम, सार्वजनिक स्वीकृति र सुशासनसम्बन्धी चुनौतीहरूलाई सम्बोधन गर्ने विषयहरू समावेश छन।

यस रणनीतिक वातावरणीय मूल्याङ्कनको मस्यौदा प्रतिवेदनको चरणमा प्राप्त प्रमुख सुझावहरूमा जोखिममा रहेका जनसंख्याका लागि सामाजिक सुरक्षा उपायहरू, संवेदनशील करिडोरहरूमा सांस्कृतिक सम्पदाको भौतिक संरक्षण, स्थानीय तहको कानुनी समन्वय तथा सह-निर्णयसम्बन्धी भूमिका, साथै निर्माण चरणमा उत्पन्न हुने प्रमुख वातावरणीय जोखिमहरूको व्यवस्थापनसम्बन्धी विषयहरू समावेश छन।

परिच्छेद १४: निष्कर्ष तथा सिफारिस

यस प्रतिवेदनमा जलवायु परिवर्तन तथा वायु गुणस्तर, सांस्कृतिक सम्पदाको संरक्षण, जग्गा अधिग्रहण तथा पुनर्स्थापना सम्बन्धी जोखिम, सामाजिक संवेदनशीलता तथा लैङ्गिक समानता, अपाङ्गता र सामाजिक समावेशीकरण, शहरी बाढी तथा जलप्रणाली, तथा साँघुरा सडक क्षेत्रमा गरिने निर्माण कार्यलाई प्रमुख वातावरणीय तथा सामाजिक जोखिम तथा अवसरका रूपमा पहिचान गरिएको छ। यी विषयहरू सरोकारवालाहरूको उच्च चासो तथा तिनबाट पर्न सक्ने सम्भावित प्रभावको गम्भीरतालाई आधार मानी छनोट गरिएको हो। काठमाडौं उपत्यका शहरी

यातायात प्रणाली गुरुयोजना (KVUTSMP) कार्यान्वयनका प्रमुख चुनौतीहरू तथा तिनको समाधानका लागि प्रस्तावित प्रतिकारात्मक उपायहरू यस अध्यायमा प्रस्तुत गरिएका छन।

विषयहरू	प्रमुख चुनौतीहरू	प्रस्तावित प्रतिकारात्मक उपायहरू
कार्यान्वयन संरचना	जिम्मेवारीको दोहोरोपन तथा सरोकारवालाहरूबीचका परस्पर बाझिने स्वार्थ।	प्राविधिक कार्य समूहहरू मार्फत समन्वय सुदृढ गर्ने।
संस्थागत क्षमता	प्राविधिक तथा वित्तीय स्रोतसाधनको सीमितता	सार्वभौमिक डिजाइन (Universal Design) तथा लैङ्गिक हिंसाप्रति उत्तरदायी उपायसम्बन्धी तालिम प्रदान गर्ने।
सञ्चालकहरूको प्रतिरोध	विद्यमान यातायात सञ्चालकहरूको विरोध	चरणबद्ध एकीकरणको व्यवस्था गर्ने र गुनासो सुनुवाइ संयन्त्रलाई सुदृढ बनाउने।
तथ्याङ्कको अभाव	वातावरणीय आधारभूत तथ्याङ्कको अपर्याप्तता	सम्भाव्यता अध्ययनका क्रममा समग्र वातावरणीय अनुगमन गर्ने।
सम्पदामा पर्ने प्रभाव	सांस्कृतिक सम्पदा स्थलहरूमा पर्न सक्ने जोखिम	पुरातत्व विभागसँग समन्वय गरी सम्पदा प्रभाव मूल्याङ्कन सञ्चालन गर्ने।
बाढी तथा डुबानको प्रभाव	प्रस्तावित यातायात संरचनामा बाढी तथा डुबानका कारण पूर्वाधार क्षति, यातायात सेवा अवरोध, यातायात प्रयोगकर्ताको सुरक्षामा जोखिम, आर्थिक क्षति तथा समुदाय विस्थापन हुन सक्ने।	जलविज्ञान तथा बाढी जोखिम मूल्याङ्कनका आधारमा उपयुक्त संरचना तथा अलाइनमेन्ट निर्धारण गर्ने, जलवायु उत्थानशील डिजाइनका उपायहरू समावेश गर्ने, तथा बाढी तथा डुबानको जोखिम न्यूनीकरण गर्ने।

रणनीतिक वातावरणीय मूल्याङ्कन प्रतिवेदनको अन्तिम तयारीका लागि आगामी गतिविधिहरू

यस रणनीतिक वातावरणीय मूल्याङ्कन (SEA) को मस्यौदा प्रतिवेदन राष्ट्रियस्तरको दैनिक पत्रिकामा सार्वजनिक सूचना पहिलो पटक प्रकाशन भएको मितिदेखि ३० दिनसम्म सरोकारवालाहरूबाट मस्यौदा SEA प्रतिवेदनसम्बन्धी राय तथा सुझाव सङ्कलन गर्न पूर्वाधार विकास मन्त्रालयको वेबसाइटमा राखी सार्वजनिक गरिनेछ।यसै गरी, वेबसाइटमा सार्वजनिक गरिए पश्चात सरोकारवालाहरूबाट SEA को मस्यौदा प्रतिवेदनमा प्राप्त अन्तिम सुझाव तथा टिप्पणीहरूलाई सङ्कलन, विश्लेषण तथा मूल्याङ्कन गरी अन्तिम SEA प्रतिवेदनमा समावेश गरिनेछ। तत्पश्चात,अन्तिम SEA प्रतिवेदनलाई गुरुयोजनासँग संलग्न गरी औपचारिक स्वीकृतिका लागि मन्त्रिपरिषद्समक्ष पेश गरिनेछ।

Chapter 1: Introduction

1.1 Background

The Kathmandu Valley is Nepal's largest political, economic, and social center, with its population increasing rapidly and expected to reach about 3.53 million by 2032, particularly due to urban development around Bhaktapur. However, expansion of the road network is difficult because of historical and geographical constraints, and the existing bus-based public transport system cannot adequately meet growing traffic demand, resulting in severe congestion.

JICA formulated an Urban Transport Master Plan (target year 2030) in 2017, but it was mainly based on traffic data from 2011 and does not fully reflect recent population inflows after the 2015 earthquake or changes in travel behavior caused by COVID-19. Other donor studies have also proposed various public transport options without sufficient traffic surveys or demand forecasts, highlighting the need for reassessment.

Moreover, under the federal system introduced in 2015, responsibilities for urban transport are shared among multiple organizations, and insufficient coordination has led to inconsistencies with central urban planning.

In response, the Government of Nepal requested Japan's assistance to formulate a new comprehensive and sustainable urban transport master plan for the Kathmandu Valley. The Project on Kathmandu Valley Urban Transport System Master Plan (the Project on KVUTS MP) aims to support sustainable economic growth and reduce environmental burdens by developing a new master plan, identifying priority mass transit modes and routes, and establishing effective coordination mechanisms among stakeholders.

1.2 Objectives and Output of the Project

1.2.1 Objective of the Project

The objectives of the Project are to promote various project implementations based on the Master Plan in the Kathmandu Valley, and to support sustainable economic growth and reduced environmental burdens such as traffic congestion and air pollution. These objectives are to be achieved by: a) developing a new urban transportation master plan; b) identifying priority mass transit modes and routes; and c) establishing a coordination mechanism among stakeholders to realize the master plan.

1.2.2 Outputs of the Project

The expected impacts by Project are that sustainable economic growth and reduction of environmental impacts such as traffic congestion and air pollution in the Kathmandu Valley will be promoted through the implementation and realization of projects based on the master plan. The output of the Project is shown in Table 1.2-1.

Table 1.2-1 Outputs of the Project

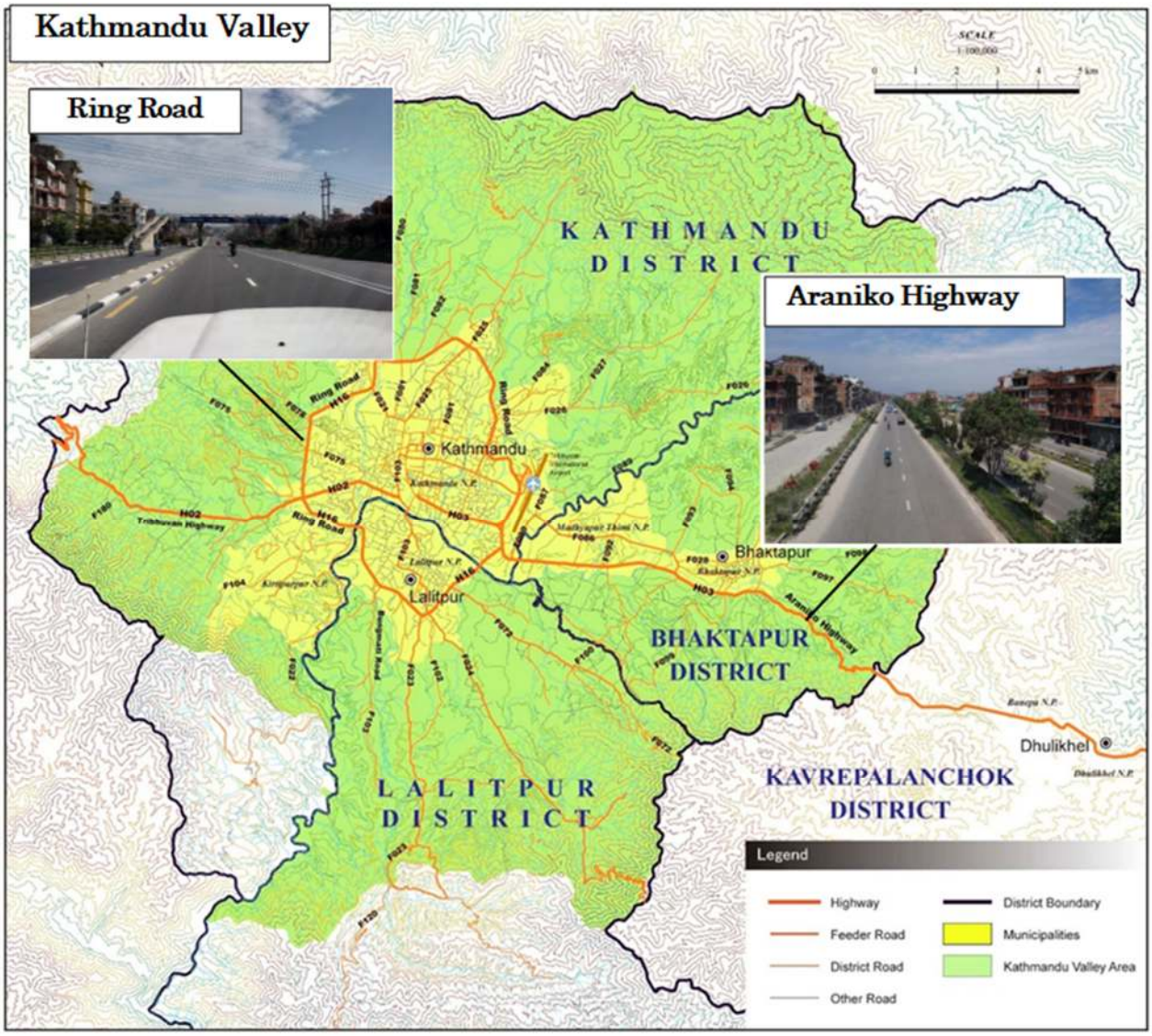
S.No.	Main Outputs
1	The comprehensive, sustainable, and updated Urban Transport Master Plan in the Kathmandu Valley focusing on mass transit (hereinafter referred to as "the MP") is prepared for approval.
2	The high-priority mass transit routes and modes are identified through the pre-feasibility

S.No.	Main Outputs
	study.
3	An appropriate coordination mechanism is provisionally developed for the comprehensive urban transport planning and management and for realization of the MP.

Source: JICA Expert Team

1.3 Project Target Area

The project area is inside the Kathmandu Valley, which consists of the Kathmandu, Lalitpur, and Bhaktapur districts.



Source: JICA Expert Team

Figure 1.3-1: Project Target Area

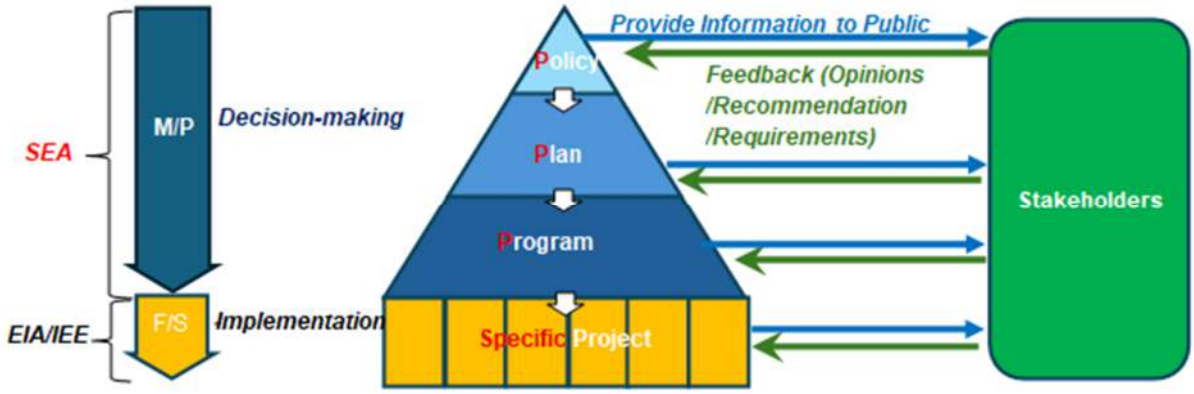
1.4 Related Authorities and Agencies

The Ministry of Infrastructure Development (MOID), formerly the Ministry of Physical Infrastructure and Transport (MOPIT) manages the overall project, and the agencies listed below cooperate and collaborate in each activity for the project implementation. If necessary, the participation of relevant agencies will be requested to carry out specific activities.

- Department of Roads (DOR)
- Department of Transport Management (DOTM)
- Department of Railways (DORW)
- Ministry of Urban Development (MOUD)
- Kathmandu Valley Development Authority (KVDA)
- Ministry of Agriculture, Forests and Environment (MOAFE), formerly Ministry of Forests and Environment (MOFE)
- Federal Capital City Public Transport Authority (FCCPTA)
- Bagmati Province
- Municipalities (Kathmandu Metropolitan City, Lalitpur Metropolitan City, Bhaktapur Municipality)
- Kathmandu Valley Traffic Police Office (KVTPO)

1.5 Objective of the Strategic Environmental Assessment (SEA)

The objective of the Strategic Environmental Assessment (SEA) is to incorporate environmental and social considerations into the decision-making process at the policy, plan, and program levels at an early stage, to avoid and minimize significant environmental and social impacts through the examination of alternatives, to promote sustainable development, and to enhance the quality of subsequent Environmental Impact Assessments (EIAs). The study stage of SEA and EIA/IEE are shown in Figure 1.5-1. Through the implementation of the SEA, the opinions of relevant authorities and stakeholders are incorporated from the planning stage, thereby enhancing transparency and accountability in the decision-making process. The SEA is applied at the earliest stages/higher levels of decision-making (Policy, Plan and Program.), The EIA/IEE is applied with the Specific Project for implementation (Feasibility Study).



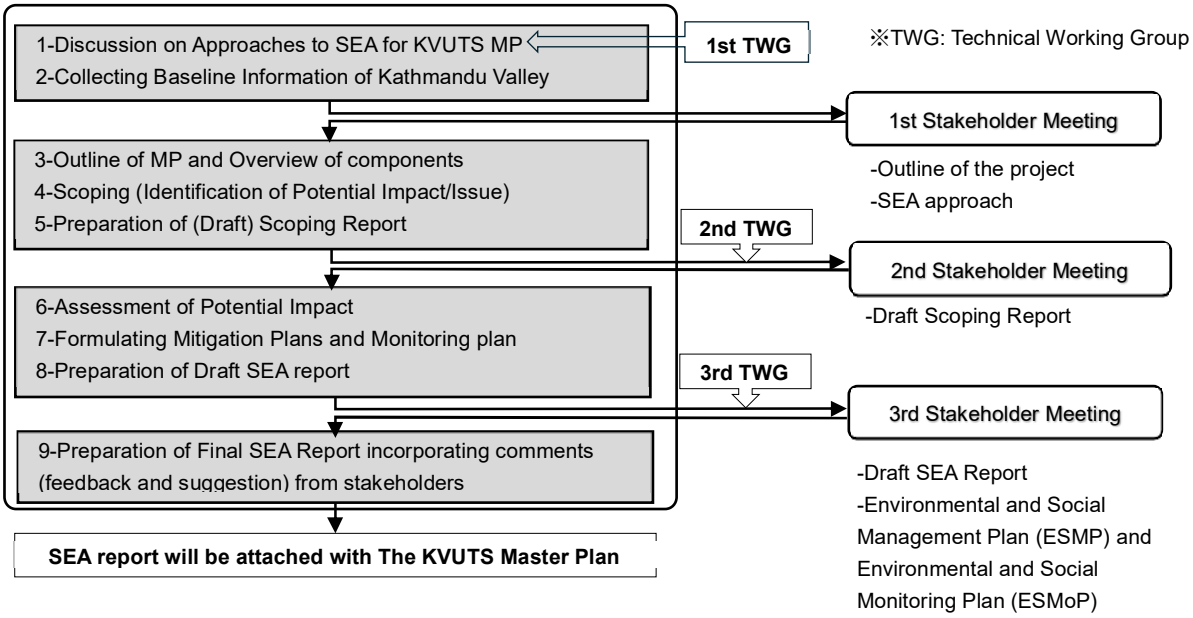
Source: JICA Expert Team

Figure 1.5-1: Conceptual Diagram of SEA and EIA/IEE

Since the Project includes preparing the MP in Kathmandu Valley as shown in Table 1.2-1, SEA is adapted to formulation of the MP.

1.6 Process of the SEA Study

The process of the SEA study on the KVUTSMP is divided into nine tasks and includes three times stakeholder meetings, as shown in Figure 1.6-1. The main contents of each task and output of stakeholder meetings are shown in Table 1.6-1.



Source: JICA Expert Team

Figure 1.6-1: Process of the SEA for KVUTSMP

Table 1.6-1 Main activities in each task of SEA

No.	Main Activities	Description
Task 1	Discussion on Approaches to SEA for KVUTS MP	Review the Nepal Regulations and JICA Guidelines regarding SEA approaches and reach consensus among relevant Nepal Governments agencies the policy of SEA approach for KVUTS MP. The result of discussion is disclosed in the 1st SHM.
Task 2	Collecting Baseline Information of Kathmandu Valley	To grasp the characteristics of environmental and social baseline conditions, collect the secondary data in Kathmandu Valley.
Task 3	Outline of MP and Overview of components	Summarize the result/progress of MP Study including the future urban structure and transport strategy, and the road and traffic management.
Task 4	Scoping	Identification of Potential Impact/Issue which are expected based on the environmental and social secondary data and the project activities.
Task 5	Preparation of Scoping Report	Compile the information above into one report. The Draft Scoping Report is disclosed in the 2nd SHM.
Task 6	Assessment of Potential Impact	Based on the regional environmental and social characteristics and project factors of components, negative impacts are forecasted.
Task 7	Formulating Mitigation Plans and Monitoring plan	Propose the framework of environmental and social management plan and environmental and social monitoring plan.
Task 8	Preparation of Draft SEA Report	Compile the information above into one report. The draft SEA Report is disclosed in the 3rd SHM.
Task 9	Preparation of Final SEA Report	Reflect consultation meetings into the Final SEA Report.

Source: JICA Expert Team

1.7 Organization of Project Team

To provide technical assistance to MOID (then MOPIT) for the development KVUTSMP, including conducting the SEA and studies for completing tasks listed in Table 1.6-1, JICA dispatches the "JICA Expert Team" consisting of selected experts in the following expertise areas for a total of 66 person-months over three years:

- Team Leader/Urban Transport Planning
- Public Urban Transport Planning
- Traffic Survey/Demand Forecast
- ICT/DX/Data Utilization
- Urban Planning
- Land Use/GIS
- Organization Structure for Urban Transport Operation and Maintenance
- Financial arrangements and business implementation planning
- Socio Economic Analysis
- Environmental and Social Considerations
- Gender Mainstreaming and Inclusive Approach
- Public relations/ Training Plan/ Cross- Division Collaboration
- Road and Traffic Management
- Other Experts

1.8 Contents of SEA Report

The outline of SEA Report is presented below.

Table 1.8-1 Table of Contents of SEA Report

Chapter	Title	Description
1	Introduction	•Provides the background of Kathmandu Valley as Nepal's economic center, the objectives to promote sustainable economic growth
		•Explanation of the SEA study process for KVUTS-MP.
2	Legal, Policy, and Institutional Framework	•Reviews/clarifications of Nepal's environmental laws and regulations (e.g., EPA 2019, EPR 2020) and Ministries/agencies related to the environmental and social considerations, and Gaps analysis comparing with JICA Guidelines.
3	Description of Master Plan	•Analyzes future urban structures, traffic demand forecasts, and evaluates four scenarios.
		•Description of proposed road projects, public transportation improvement projects, and mass transport project in direction for transportation system master plan toward 2050
		•As a result of Mult criteria alternative study of urban transport system, Integrated transport strategy scenario, focusing on mass transit while improving the bus network and road efficiency, is recommended.
4	Environmental and Social Baseline of KV	•Collecting the secondary data and summarizing the current status of air quality (significant PM2.5 exceedance), water pollution, biodiversity, cultural heritage (7 UNESCO sites), social vulnerability, etc..
5	Scoping of Key Environmental and Social Issues	•Identifies potential impacts through a scoping matrix, evaluating 30 items such as air pollution, noise, land acquisition, and impacts on heritage during construction and operation.
6	Environmental and Social Impact Assessment	•Qualitatively impact assessment was conducted on 30 items
		•Estimation of reduction in GHG emissions by 2050 due to the implementation of projects proposed in MP,
		•Clarification of procedures for Heritage Impact Assessments (HIA) for sensitive infrastructure.

Chapter	Title	Description
7	ESMP and ESMoP	•Proposes Environmental and Social Management Plan (ESMP) including mitigation measures and Environmental and Social Monitoring Plan (ESMoP) for construction and operation
8	Resettlement	•Outlines the framework for land acquisition and resettlement system in Nepal and provides challenged and mitigation measures.
9	GEDSI (Gender Equality Disability, and Social Inclusion)	•Assesses risks like Gender-Based Violence (GBV) on public transport and opportunities to improve accessibility through universal design and inclusive hiring.
10	Grievance Redress Mechanism (GRM)	•Provide the proposed flow of Grievance Redress Mechanism (GRM).
11	Implementation Structure	•Proposes the roles and responsibilities of MOID, project offices, and consultants to ensure effective implementation of the environmental and social management framework.
12	Stakeholder Engagement and Information Disclosure	•Summarizes mapping of key actors (government, private operators, NGOs) and records outcomes from the three rounds of Stakeholder Meetings (SHMs) and Technical Working Group (TWG) sessions.
13	Overview of Comments on SEA Report	•Analyzes feedback from stakeholders categorized by themes such as environmental baseline, policy consistency, and cultural heritage protection received during the scoping and Draft SEA stage.
14	Conclusion and Recommendation	•Identified the key environmental and social items that require sustained attention during the implementation of KVUTS MP.
		•Based on the finding through SEA, Key challenges and proposed counter measures are proposed.
	Appendix	•Minutes of Meeting, Feedback comments from stakeholders

Source: JICA Expert Team

Chapter 2: Legal, Policy, and Institutional Framework

2.1 Nepal's Legal Framework for Environmental Assessment

The following table provides a list of the constitution, national plans, policies, acts, rules, and standards on environmental assessment for the transport sector in Nepal.

Table 2.1-1 Constitution, Plan, Policy, Act, Rule and Standard on Environmental Assessment

Category	Description
Constitution	・ Constitution of Nepal
Plan	・ Sixteenth 5-Year Plan 2025-2030 ・ Air Quality Management Action Plan for Kathmandu Valley, 2020
Policy	・ National Employment Policy, 2015 ・ Land Acquisition, Resettlement and Rehabilitation Policy for infrastructure Development Project, 2015 ・ Land Use Policy, 2015 ・ National Environment Policy, 2019 ・ National Climate Change Policy, 2019 ・ National Land Policy, 2019 ・ National Forest Policy, 2019 ・ National Policy for Disaster Risk Reduction, 2018 ・ National Wetland Policy, 2012 ・ National Transport Policy, 2026 ional Policy, 2022 ・ Policy Document, Environmental Assessment in Road Sector of Nepal, GUE/DOR, 2000 ・ Public-Private Partnership Policy, 2015
Act	・ Forests Act, 2019 ・ Land Use Act, 2019 ・ Disaster Risk Reduction and Management Act, 2017 ・ National Parks and Wildlife Conservation Act, 1973 ・ Public Roads Act, 1974 ・ Roads Board Act, 2002 ・ Right to Information Act, 2007 ・ Vehicles and Transport Management Act, 1993 ・ Land Revenue Act, 1978 ・ Land Acquisition Act, 1977 ・ National Trust for Nature Conservation Act1982 ・ Soil and Watershed Conservation Act, 1982 ・ Solid Waste Management Act, 2011 ・ Labor Act, 2017 ・ Local Government Operation Act, 2017 ・ Control of International Trade of Endangered Wild Fauna and Flora Act, 2017 ・ Environment Protection Act (EPA), 2019 ・ Child Labor (Prohibition and Regulation) Act, 2000 ・ Ancient Monument Preservation Act, 1956 ・ Pashupati Area Development Trust Act, 1987 ・ Urban Area Public Transport (Management) Authority Act, 2022
Rule	・ Environment Protection Rules (EPR), 2020 ・ Forest Rules, 2022 ・ National Trust for Nature Conservation Rules,1984 ・ Solid Waste Management Rule, 2013 ・ Soil and Watershed Conservation Rule, 1986 ・ Child Labor (Prohibition and Regulation) Rules, 2006 ・ Labor Rule, 2018 ・ Ancient Monuments Preservation Rules, 1990 ・ Vehicles and Transport Management Rules, 1997 ・ Land Rules, 2064 ・ International Trade Control Regulations on Endangered Wildlife and Flora Rule, 2019 ・ National Parks and Wildlife Conservation Rules, 1974

Standard	・ Nepal Road Standard, 1970 ・ National Sound Quality Standard, 2012 ・ National Ambient Air Quality Standard, 2026 ・ National Drinking Water Quality Standard, 2022 ・ Permissible Exposure Limit (Standard) of Noise for Workplace, 2017 ・ Permissible Exposure Limit (Standard) of Light Illumination for Workplace, 2017 ・ Standards for excavation, sale, and management of stones, gravel, and sand (First Amendment), 2022
Others	・ Relevant Local Level-laws (Kathmandu Metropolitan City, Lalitpur Metropolitan City, Bhaktapur Municipality, Madhyapur Thimi Municipality, and Suryabinayak Municipality)

Source: JICA Expert Team

The detailed assessment of the relevant legislation, based on the projects proposed in the Master Plan, has been carried out as follows:

2.1.1 Constitution of Nepal

Article 25 stipulates the Right relating to property. Under Article 25 (1), every citizen shall, subject to law, have the right to acquire, own, sell, dispose of, acquire business profits from, and otherwise deal with, property. Article 25 (2) provides that the State shall not, except for public interest, requisition, acquire, or otherwise create any encumbrance on, property of a person. Article 25 (3) further provides that the basis of compensation to be provided and procedures to be followed in the requisition by the State of property of any person for public interest pursuant to clause (2) shall be as provided for in the Act.

Article 30 stipulates the Right to clean environment. Under Article 30 (1), every citizen shall have the right to live in a clean and healthy environment. Article 30 (2) provides that the victim shall have the right to obtain compensation, in accordance with law, for any damage caused by environmental pollution or degradation. Article 30 (3) further states that this Article shall not be deemed to prevent the making of necessary legal provisions for a proper balance between environment and development in development works of the nation.

2.1.2 Plan

2.1.2.1 Sixteenth 5-Year Plan (2025-2030)

This Plan has been formulated to provide guidelines for the economic, social, and environmental aspects of national development. The Plan emphasizes rapid development through structural economic transformation, inclusive governance, and equitable service delivery. In the transport sector, it focuses on developing sustainable, resilient, and environmentally friendly infrastructure without causing harm to natural resources such as water, land, and forests, while expanding highways and strategic roads, ensuring compliance with standards, strengthening maintenance, enhancing capacity development, promoting resource mobilization, implementing Road Board reforms, and improving road safety enforcement.

The main challenges identified in the transport sector include providing a citizen-friendly, sustainable, safe, affordable, decent, inclusive, and reliable public transport system; ensuring fully digitalized services such as driving license issuance and vehicle regulation; and upgrading old fossil fuel-based vehicles to environmentally friendly and technologically advanced alternatives. The strategy of the Plan focuses on building sustainable, resilient, and environmentally friendly infrastructure, ensuring compliance with standards, expanding highways and strategic roads, and strengthening maintenance, capacity development, resource mobilization, Road Board reforms, and road safety enforcement. The Major Program on Transport Expansion includes policies for a multimodal transport system, constructing and

expanding highways linking cities and economic centers, and developing the Mid-Hill and North-South Highways, as well as industrial corridors.

2.1.2.2 Air Quality Management Action Plan for Kathmandu Valley, 2020

This was prepared to address increasing air pollution resulting from rapid urbanization, population growth, and various human activities. Kathmandu Valley, comprising Kathmandu, Lalitpur, and Bhaktapur districts, is facing deteriorating air quality due to its geographical condition, which restricts pollutant dispersion. Air quality monitoring and studies have identified major pollution sources, including vehicle emissions, road dust, industrial activities such as brick kilns and diesel generators, construction activities, household energy use, agricultural waste burning, open waste burning, and fire-related activities. The action plan is guided by existing environmental policies and legal provisions, including the constitutional right to a clean and healthy environment, the Fifteenth Plan, National Environment Policy, 2019, Environment Protection Act, 2019, and National Ambient Air Quality Standards. It recognizes the increasing impacts of air pollution on public health and the environment and emphasizes the need for coordinated implementation by relevant stakeholders.

The long-term vision of the action plan is to achieve a “Kathmandu Valley with clean and fresh air” by preventing and controlling air pollution and ensuring citizens’ right to live in a clean and healthy environment. The goal and objectives focus on reducing pollution from transport, construction, and industrial sectors; promoting environmentally friendly waste management; reducing indoor air pollution; increasing public awareness on air pollution status, causes, impacts, and prevention measures; developing air quality management decision support systems; managing pollution during emergencies; and strengthening policy, legal, institutional, and financial mechanisms for effective implementation.

The strategic areas of the action plan include controlling vehicle emissions, promoting environmentally sustainable transportation systems, managing construction-related pollution, reducing industrial emissions, ensuring environmentally friendly management of industrial, hospital, household, and agricultural waste, addressing indoor air pollution, conducting public awareness activities, strengthening air quality monitoring and decision support systems, improving emergency air pollution management, enhancing policy and legal frameworks, and ensuring adequate resources for implementation. The action plan aims to improve air quality management in Kathmandu Valley and reduce the adverse impacts of air pollution on human health and the environment

2.1.3 Policy

2.1.3.1 National Employment Policy, 2015

This policy has been formulated to address the challenges in the country’s changing socio-economic environment. It targets special employment priorities and aims to bring improvements through coordinated and harmonious methods by scaling up policy formulation efforts. The policy focuses on women, youth, indigenous nationalities, Dalit, Madhesi, and other marginalized communities/regions to address existing inequalities and discrimination and incorporates their concerns. The long-term vision of the policy is to contribute to poverty alleviation by strengthening the national economy and engaging the country’s labor force in productive, decent, and safe employment through a capable and competitive labor market.

The main objectives of the National Employment Policy are to create productive and output-oriented employment opportunities for all citizens by promoting the national economy to orient various sectoral policies towards employment generation by harmonizing them with this policy; to improve the quality of employment by gradually transforming informal employment into

formal employment; to create suitable opportunities for preparing a knowledge- and skill-based labor force as per the needs of the labor market; to appropriately manage migrant and immigrant workers; to prioritize the creation of employment opportunities targeting youth; and to strengthen the labor market through modern research-based information technology.

Policies related to achieving the objective of productive and output-oriented employment opportunities in the Construction Sector focus on developing a skilled workforce and creating productive employment opportunities through improved training in both quality and quantity. Private sector construction entrepreneurs will be encouraged to employ skilled returnees from abroad. Skill development programmes will be a key component of employment initiatives to promote sustainable jobs. In rural road construction, the use of labor-intensive technology will be encouraged through private sector participation. In road infrastructure construction, repair, maintenance, and expansion, priority will be given based on employment impact, with emphasis on maximizing job creation through the use of local skills and resources.

2.1.3.2 Land Acquisition, Resettlement and Rehabilitation Policy for infrastructure Development Project, 2015

This policy has been formulated for the provision of facilities such as compensation, indemnity, resettlement, or rehabilitation assistance to affected families and communities, according to the nature of the impact from the project, in order to maintain their economic and social conditions prior to project implementation or elevate them to a higher level while ensuring uniformity, since it is necessary to facilitate project management by mitigating the adverse impacts of development construction. This policy provides guidance for coordination between various bodies regarding land acquisition and project implementation.

The policies include screening projects in the early stages, prioritizing project alternatives with lesser impacts, and ensuring adequate resources for restoring the livelihoods of affected persons. Additionally, the policies include conducting social impact assessments; developing resettlement and rehabilitation plans to restore livelihoods; ensuring that compensation and assistance are provided prior to displacement; relocating people to the vicinity of the affected area as far as feasible during mass displacement; providing an option for land-for-land compensation to affected persons who lose their entire land; developing a social inclusion program with additional assistance for vulnerable groups; ensuring an environment for providing compensation for non-land assets to non-title holders; and establishing a mechanism for benefit-sharing in revenue-generating projects. Moreover, the policies include ensuring meaningful consultations with affected persons, communities, and vulnerable groups; ensuring timely compensation based on no less than current market value; establishing a responsive grievance redress mechanism; and establishing an effective monitoring and evaluation system to determine the fulfilment of land acquisition, compensation, resettlement, and rehabilitation plans, as well as the project's impacts on displaced people.

As per the Strategy and Working Policy, and on the basis of preliminary economic and social analysis, the projects will be classified into three categories. *High-risk projects* are those that physically or economically displace 50 or more families in the Himalayan (mountainous) region, 75 or more families in the hilly region, and 100 or more families in the Terai region. *Medium-risk projects* are those that physically or economically displace less than 50 families in the Himalayan region, less than 75 families in the hilly region, and less than 100 families in the Terai region. *Low-risk projects* are those that involve only economic displacement without causing physical displacement or a loss of more than 10 percent of the productive assets of the affected people (i.e., none of the affected persons lose more than 10% of their productive assets).

2.1.3.3 Land Use Policy, 2015

This policy outlines the protection, optimum use, and effective management of land and land resources. It establishes legal and institutional mechanisms for overseeing land use and ensures that land is utilized efficiently to support social, economic, and ecological development. The vision of the Policy is to ensure optimal use of available land and resources for the country's sustainable development and prosperity. Its mission is to promote sustainable land management through the creation of specific Land Use Plans (LUPs). The objectives include classifying all land in the country into various land use zones, devising land use plans at federal, provincial, and local levels, ensuring land and resource use in accordance with these plans, protecting agricultural land, and promoting hygienic, aesthetically pleasing, and well-facilitated settlements in support of sustainable development. All land in the country shall be classified into Land Use Zones, which may be further subdivided as needed: agricultural, Residential, Commercial, Industrial, Mines and Minerals, Cultural and Archaeological, River and Lake-Reservoir, Forest, Public Use and Open Space, Building Materials Excavation (Stone, Sand, Concrete), and other zones as required. In devising Land Use Plans, the development of green belts and open spaces along rivers, roads, and canals shall be considered.

2.1.3.4 National Environment Policy, 2019

This policy has been formulated in line with the concept of sustainable development and aims to ensure equitable access to environmental resources and their wise use for current and intergenerational equity. It emphasizes mutual coordination and cooperation among the three levels of government, civil society, communities, the private sector, and individuals for effective environmental management. The policy seeks to ensure the right of citizens to live in a clean and healthy environment by controlling pollution, managing waste, and promoting greenery. It focuses on preventing, controlling, and reducing all types of pollution, managing waste from domestic, industrial, and service sectors, developing parks and expanding greenery in urban areas, mainstreaming environmental concerns in development, ensuring environmental justice for pollution victims, encouraging public participation, promoting research and capacity building, ensuring equitable use of resources between present and future generations, and promoting the reuse and recycling of available resources.

2.1.3.5 National Climate Change Policy, 2019

This policy has been introduced with the objective of providing policy guidance to various levels and thematic areas towards developing a resilient society by reducing the risk of climate change impacts. This policy is based on the goal to contribute to socio-economic prosperity by building a climate-resilient society. The goal of the policy is to contribute to socio-economic prosperity of the nation by building a climate resilient society.

The strategies and policies for industry, transport, and physical infrastructure include developing and implementing mitigation standards by identifying key emission sources in the industry and transport sectors, promoting energy-efficient technologies and the use of electrical energy, selecting environment-friendly sites and adopting climate-friendly technologies, incorporating measures to mitigate climate-induced risks in the design and construction of physical infrastructure, encouraging the use of electric vehicles, mobilizing the private sector through Corporate Social Responsibility (CSR) to reduce emissions, particularly in the air transport sector, and gradually phasing out high-polluting vehicles that have exceeded their operational lifespan according to established standards.

Under Gender Equality and Social Inclusion, Livelihoods and Good Governance, the policy focuses on mainstreaming good governance and gender equality and social inclusion (GESI) into climate-related policies, institutional frameworks and programs and addresses the concerns of women, Dalit, indigenous people, Madheshi, Tharu, Muslim, oppressed groups,

backward class, minorities, marginalized groups, farmers, laborers, youths, children, senior citizens, persons with disabilities, pregnant women, incapacitated and disadvantaged persons.

2.1.3.6 National Land Policy, 2019

This policy has been implemented to integrate scattered policy provisions and establish a practical land policy, aiming to secure land rights and ownership, provide safe and organized housing, facilitate access of farmers to agricultural land, promote sustainable infrastructure development, ensure an orderly land market, safeguard the right to food, protect the environment, mitigate climate change impacts, and address poverty reduction and gender equality. Its vision is to achieve "Sustainable Land Management" for development and prosperity, with the long-term goal of improving economic prosperity and living standards through equitable land distribution, optimal use, and good governance.

The objectives include ensuring security of land tenure and ownership, conserving land rights, ensuring access of citizens to land, optimal land use and management for environmental balance, food security, systematic infrastructure development, and safe living, improving house and land valuation and tax determination systems, regulating the land market, and maintaining good governance in land administration and management through a modern land information system. The strategies and working policy include providing families displaced by projects with priority services such as roads, electricity, and water at resettlement sites, while land used for public infrastructure like roads, highways, and airports will be officially recorded and maintained in the name of the Government of Nepal.

2.1.3.7 National Forest Policy, 2019

This policy has been formulated to ensure continuous coordination and cooperation among federal, provincial, and local governments in managing resources such as forests, protected areas, water bodies, biological diversity, and carbon storage, aiming to achieve equitable distribution of the benefits derived from these resources. Its vision is to contribute to economic, social, and cultural prosperity of Nepal through managed forests and a balanced environment. The goal of this policy is to enhance the production and value of forest products and services through the sustainable and participatory management of forests, protected areas, watersheds, biodiversity, wildlife and vegetation, and to ensure their equitable distribution.

The objectives of the policy include enhancing productivity, production, and environmental services of the forest sector; achieving self-sufficiency in forest products and promoting value-added exports; contributing to tourism promotion through protected areas, wetlands, and forest management practices; conserving, restoring, and sustaining forests, flora, fauna, and biodiversity; utilizing forest areas in multiple ways; developing agricultural forests, including fruit cultivation, as an economic resource; restoring degraded forests without reducing existing forest areas; protecting water and land through integrated watershed management; contributing to carbon emission reduction through the forest sector; distributing benefits obtained through governance reforms in the forest sector; and strengthening research, education, and capacity in the forest sector.

2.1.3.8 National Policy for Disaster Risk Reduction, 2018

This policy has been formulated to develop a safer, adaptive, and resilient nation against disaster risks, drawing on lessons from the National Strategy for Disaster Risk Management 2009, the Gorkha earthquake 2015, and recent disasters. The vision of the policy is to contribute to sustainable development by making the nation safer, climate-adaptive, and resilient to disaster risks. Its mission is to substantially reduce disaster risks and losses in lives, livelihoods, health, economic, social, and physical infrastructure, as well as cultural and environmental assets, while increasing resilience through balanced disaster risk reduction and

management activities. The goal of this policy is to substantially reduce disaster mortality and the number of affected people, minimize damage to means of livelihoods, critical infrastructure, and basic services such as agriculture, industry, roads, communication, water supply and sanitation, education, and health facilities, and reduce direct economic losses, thereby increasing overall resilience

The main objective of this policy is to substantially reduce natural and non-natural disaster losses in lives, property, health, means of livelihood and production, physical and social infrastructure, and cultural and environmental assets. Other objectives include increasing understanding of disaster risk and ensuring access to information related to disaster risk at all levels, strengthening disaster governance for disaster risk reduction and management, mainstreaming disaster risk reduction in all development processes by integrating it with climate change adaptation activities, enhancing resilience through public and private investment, making disaster preparedness and response effective by improving the disaster information management system and developing and expanding multi-hazard early warning systems, and ensuring a "Build Back Better" approach for post-disaster recovery, rehabilitation, and reconstruction.

2.1.3.9 National Wetland Policy, 2012

This Policy has been formulated to conserve wetlands and promote the wise and sustainable use of wetland resources while fulfilling Nepal's commitments under international agreements, including the Ramsar Convention, the Convention on Biological Diversity, and the United Nations Framework Convention on Climate Change. The policy supports the conservation of wetlands of local, national, and international importance and contributes to the implementation of related sectoral policies, environmental laws, and biodiversity conservation objectives.

The Policy emphasizes balancing development with the conservation of wetland ecosystems by ensuring that development activities are environmentally sustainable. It requires wetlands of local, national, and international importance to be identified, conserved, restored, and managed through an integrated watershed approach. Development planning must assess potential impacts on wetlands, adopt effective mitigation measures, and avoid any reduction in wetland area or degradation of ecological quality. Where wetland loss is unavoidable, equivalent wetlands should be restored, expanded, or created to maintain biodiversity and ecosystem services. The policy also promotes the use of environmentally friendly technologies in infrastructure projects, including roads, irrigation systems, and hydropower, and mandates environmental assessments such as Initial Environmental Examinations (IEE) or Environmental Impact Assessments (EIA) for projects likely to affect wetlands. Furthermore, it addresses climate change adaptation, discourages pollution, waste disposal, and excessive groundwater extraction, promotes sustainable land-use and resource management practices, encourages scientific research, and requires regular monitoring of development activities in and around wetlands to safeguard their ecological integrity.

2.1.3.10 National Transport Policy, 2026

The National Transport Policy, 2026 has been formulated to develop a sustainable, safe, inclusive, green, technology-friendly, and regionally connected transport system through effective cooperation among the federal, provincial, and local levels. The transport sector is facing a transition phase due to rapid urbanization, expansion of economic activities, and a rapid increase in the number of vehicles. Major issues include road accidents, urban traffic congestion, particularly in the Kathmandu Valley, an imbalance in the vehicle fleet, air pollution, and the increasing environmental and financial dependence on fossil fuels. The Policy also recognizes the need to respond to climate change risks in line with Nepal's commitments under the Paris Agreement and its Nationally Determined Contributions (NDCs), while ensuring accessible and year-round transport services in remote and difficult geographical areas and a

safe and inclusive transport system for women, children, senior citizens, and persons with disabilities.

The Objectives of the Policy are to promote integrated planning, evidence-based decision-making, and efficient investment management in transport planning, project selection, construction, operation, and management; contribute to economic prosperity, regional balance, and social inclusion through quality, cost-effective, reliable, accessible, and technology-friendly transport services; fully adopt the Safe System Approach to reduce deaths and serious injuries; reduce carbon emissions and environmental risks through green and energy-efficient transport, electric mobility, climate adaptation, and resilient infrastructure; and strengthen regional and cross-border connectivity, roles and coordination, institutional capacity, public transport, Mass Transit, Intelligent Transport Systems (ITS), Shared Mobility, and economic corridors.

The Policies provide for transport and vehicle services based on the Safe System Approach; electric and alternative energy-based vehicles and green and climate-friendly engineering infrastructure; integrated development of road, rail, air, water, and ropeway transport as a multimodal network; priority to public transport in cities and metropolitan areas; Mass Transit, pedestrian- and bicycle-friendly infrastructure, Shared Mobility, and smart urban transport management; and the use of ITS, digital data platforms, research, innovation, and smart payment systems. The Policy also provides guidance on appropriate regulations, institutional arrangements, multi-level coordination, and financial frameworks to make the transport sector attractive for long-term, predictable, and sustainable investment. Regional and cross-border multimodal connectivity and the quality, standards, regulation, and long-term preservation and proper use of transport assets are also emphasized. To fulfill commitments under the Sustainable Development Goals (SDGs), Paris Agreement, and NDCs, Electric Mobility, Non-Motorized Transport, and Low-Carbon Transport Systems are identified as national priorities.

The Strategies include institutionalizing the Safe System Approach; strengthening education, training, and public awareness on road user behavior; making post-accident rescue, treatment, and emergency response systems integrated, timely, and effective; gradually advancing the E-Mobility Transition; making transport infrastructure and services adaptive and resilient to climate change risks; mobilizing Green/Climate Finance and Carbon Finance; formulating and implementing a user-friendly, seamless, and holistic Multimodal Transport Master Plan; maintaining coordination between land-use planning and urban transport master plans; expanding Mass Transit systems; developing a safe, accessible, and sustainable urban mobility system by prioritizing pedestrians, bicycles, and other non-motorized transport; implementing Smart Urban Mobility and Demand Management; and strengthening coordination among the federal, provincial, and local levels.

The Policy further emphasizes institutional coordination and clearly defined roles at the federal, provincial, and local levels in transport planning, investment, data sharing, and implementation. It also provides for strengthened project preparation, financial structuring, risk management, and investment protection systems, including mechanisms such as PPP, BOT/BOOT, Performance-Based Contracts, Green/Climate Bonds, Carbon Trading, Blended Finance, Infrastructure Bonds, Land Value Capture, and VGF. Emerging technologies such as Ride-Sharing, ITS, Digital Enforcement, Smart Licensing/Ticketing, and Autonomous Systems are also addressed. For electric mobility, the Policy recognizes the need for clear guidance on charging infrastructure, battery management, safety standards, recycling systems, and vehicle operation. Climate Risk Assessment will be required for new transport infrastructure and major upgrading projects, with climate-resilient standards, bio-engineering, nature-based solutions, locally available materials, and “River-sensitive design” promoted to address climate risks. The Policy also promotes appropriate management of transport in archaeological, World Heritage, and special tourism areas, including priority to Non-Motorized Transport and low-emission vehicles, Vehicle-Free Zones and Pedestrian Zones, and local materials and designs reflecting indigenous local culture. Quality, standards, safety, and regulatory systems will be

strengthened through Life Cycle Management throughout the stages of transport infrastructure and services.

2.1.3.11 Solid Waste Management National Policy, 2022

The Solid Waste Management National Policy, 2022 has been formulated in response to the increasing nature and quantity of waste due to the rise in population and urbanization, growing industrialization, and changes in consumption patterns. The Constitution of Nepal has adopted the policy of adopting the principle of environmentally sustainable development by increasing the awareness of the public about environmental hygiene and minimizing the adverse impact on the environment. In the present context, it is necessary to formulate policy management for guidance on implementing constitutional provisions and international commitments regarding sanitation and environmental protection, national standards, government responsibilities at various levels, and interrelationships, as well as the roles of private, community, and non-governmental organizations.

The vision of the policy is to establish a clean, healthy, and prosperous society through proper waste management. The goal of the policy is to ensure the right of citizens to live in a clean and healthy environment through the sustainable management of waste. The objectives of the policy are to guide the laws and standards related to the management of waste generated from domestic, industrial, and service sectors; minimize environmental pollution and adverse impacts on public health caused by waste; clarify the role of federal units in solid waste management; and contribute to the economy by utilizing waste as a resource, encouraging the use of the latest technology, and promoting investment in waste management.

2.1.3.12 Policy Document, Environmental Assessment in the Road Sector of Nepal, Geo-Environmental Unit, Department of Roads, 2000

This Policy Document explains the environmental assessment procedures applicable to the road sector and provides guidance for integrating environmental considerations into the planning, design, construction and maintenance of road projects. The use of environmental assessment has been introduced as a requirement of all projects in the road sector. The Department of Roads, as the government agency responsible for the planning, design, construction and maintenance of the strategic road network, is required to ensure that all environmental assessment obligations are completed. The purpose of this Policy Document is to explain what environmental assessment procedures involve and to propose a straightforward set of procedures which make it workable and useful. The document identifies five main types of environmental assessment activities, namely Screening, Initial Environmental Examination (IEE), Scoping, Environmental Impact Assessment (EIA) and Monitoring, which are to be applied at different stages of road project development.

This Policy Document emphasizes that environmental assessment should be considered as a positive and useful contribution to the decision-making process and not simply as another bureaucratic hurdle to project approval. It provides guidance on procedures and responsibilities so that environmental concerns are properly addressed during road development activities. The document also presents the categories of adverse environmental impacts, associated problems and general mitigation measures, and provides guidance on the steps to be followed while carrying out environmental assessment, including environmental monitoring requirements. Every professional engineer has a responsibility to ensure that actions safeguard the environment and the livelihoods of others as far as possible.

2.1.3.13 Public-Private Partnership Policy, 2015

This Policy has been formulated recognizing that sustainable economic growth requires the development of public infrastructure and services such as roads, bridges, airports, modern

communication facilities, drinking water, irrigation, electricity, railways, cable cars, ropeways and other infrastructure. Since the resources allocated from the State Treasury are insufficient compared to the resources required for the construction and operation of infrastructure services, the Policy seeks to attract the resources, skills and technology available in the private sector for national development based on the concept of public-private partnership and make the operation of public assets and services more economical, effective and reliable.

The Policy recognizes the importance of ensuring the proper use of managerial skills, modern technology, appropriate human resources and capital available in the private sector in the production of public goods and services and the construction and operation of infrastructure and services. It also recognizes the need to create a favorable policy environment by appropriately addressing private sector participation in the construction and operation of public infrastructure, while effectively implementing the role of the Government and appropriate measures for risk reduction, management and operation.

The Vision of the Policy is to ensure quality and sustainable development of public infrastructure and services and ensure access of the general public to such infrastructure and services. The Goal is to increase public and private sector investment in the development and operation of public infrastructure services for broad social and economic development through public-private partnership.

The Objectives of the Policy are to create an environment that attracts private investment by mobilizing the capital, means and resources required for the development, reconstruction and operation of public infrastructure and services, and to utilize the professionalism, efficiency, entrepreneurship and technical expertise available in the private sector to provide quality public infrastructure services required by the country.

2.1.4 Act

2.1.4.1 Forests Act, 2019

This Act has provisions relating to the “Use of Forest Area” under Section 42. As per Section 42(1), notwithstanding anything contained elsewhere in this Act, if there is no alternative to the use of any part of the national forest for the operation of a national priority project, plan of which investment is approved by the Investment Board, project of national pride, or national priority mineral-based industry that meets the criteria prescribed by the Government of Nepal, and the environment examination referred to in the prevailing law indicates that such plan, project or industry does not result in significant adverse effects on the environment, or such effects can be managed through necessary appropriate risk mitigation measures, the Government of Nepal, Council of Ministers may approve the use of national forest for such purpose.

As per Section 42 (2) and Section 42 (3), a Province or Local Level may request the Government of Nepal for the use of national forest for a priority development plan or project when there is no alternative and the environmental examination confirms that significant adverse effects will not occur or will be controlled through appropriate risk mitigation measures. The Government of Nepal, Council of Ministers may provide approval for such use of forest area.

According to Section 42 (4), while approving the use of forest area, the project shall arrange private land at least equal to the forest area used, carry out plantation, and ensure the growing and maintenance of trees for five years. The operator of such project shall deposit the prescribed amount for forest development, plantation and maintenance of trees, including plantation at the rate of five times the number of trees removed. As per Section 42 (5), Government of Nepal, Province Government, Local Level or entities with majority ownership of the Government of Nepal shall also deposit the prescribed amount for plantation and maintenance of trees; however, basic services-related projects such as drinking water, roads,

bridges, irrigation, communication, public transportation, electricity transmission lines and health services constructed by the Government of Nepal are exempted from such payment.

Under Section 42 (6), electricity transmission, distribution and communication service projects using forest areas shall deposit the prescribed amount for tower pad areas and for plantation and maintenance of trees within the right of way area. The amounts received under Section 42 (4), Section 42 (5) and Section 42 (6) shall be used for forest development, plantation, restoration, conservation and management of forests as provided under Section 42 (7). The person obtaining approval under Section 42 (1) or Section 42 (3) shall obtain approval of the environment assessment report before project implementation as per Section 42 (8). The Department shall provide permission for tree felling or removal after completion of the prescribed process under Section 42 (9). The deposited revenue shall be reported to the Ministry of Finance and fifty percent of the collected revenue shall be deposited into the Forest Development Fund as per Section 42 (10). The amount received from carbon emission reduction or carbon credit sales shall also be deposited into the Forest Development Fund under Section 42 (11). If the use of forest area causes any loss or damage to any person or community, the Government of Nepal shall make appropriate provision for compensation as per Section 42 (12).

2.1.4.2 Land Use Act, 2019

This Act has been enacted to make necessary arrangements regarding the classification, proper utilization and effective management of land to achieve maximum and sustainable benefits from land resources. The Act provides a framework for conducting land use programs, delineating land use areas, classifying land and preparing land use plans. As per Section 3, the Government of Nepal may conduct land use programs throughout Nepal considering the proper use of land and public interest, and a public notice shall be published before implementing such programs.

According to Section 4, land shall be classified into different land use sectors based on land capability, suitability, existing use and requirements. The categories include Agricultural Sector, Residential Sector, Commercial Sector, Industrial Sector, Mining and Mineral Sector, Forest Sector, River, Stream, Pond and Wetland Sector, Public Use Sector, Cultural and Archaeological Significance Sector, and other areas designated by the Government of Nepal. As per Section 5, the Ministry shall prepare or arrange for the preparation of land use area maps for each local level and carry out the required land use mapping and transfer process in accordance with the Act

2.1.4.3 Disaster Risk Reduction and Management Act, 2017

This Act has been prepared to amend and unify the prevailing law on reduction of disaster risks and management to protect human lives and properties of the public, private and individual, preserve natural and cultural heritage, and keep physical infrastructures safe from natural and non-natural disasters through effective coordination and management of disaster risk reduction and management activities. The Act defines “Natural disaster” and “Non-natural disaster”, including flood, landslide, soil erosion, earthquake, fire, environmental pollution, deforestation, damage to physical infrastructure and other similar disasters.

The Act establishes the National Disaster Risk Reduction and Management Authority under the Ministry of Home Affairs as per Section 10 to effectively carry out and manage disaster management activities. As per Section 11, the functions of the Authority include conducting studies and research on river control, floods, landslides, earthquakes, climate change, land use and mitigation measures of various disasters, and providing financial and technical assistance to provincial and local levels for disaster management plans. According to Section

20, public enterprises and business establishments shall provide devices, equipment, materials and emergency exits, provide disaster management orientation training, keep resources and disaster risk reduction machinery in standby position, apply measures to reduce negative impacts on the environment and human lives through proper management of waste and pollution, and formulate and implement disaster management plans. As per Section 21, government offices, non-governmental organizations, local organizations, communities, volunteers, civil societies, the private sector and individuals shall support disaster management activities including data collection, loss and damage assessment, relief, rehabilitation, reconstruction, awareness, capacity building, training, search, rescue and relief operations. Section 24 provides that any person who commits negligence that may cause a disaster or directly involves in causing such incident shall be punishable with a fine up to five lakh rupees or imprisonment for a term which may extend to two years, or both, based on the severity of the offence.

2.1.4.4 National Parks and Wildlife Conservation Act, 1973

This Act has been promulgated to make arrangements for the management of national parks, conservation of wildlife and their habitats, regulation of hunting, and conservation, promotion, development and appropriate use of places of special importance from the point of view of natural beauty.

This Act has provisions relating to the operation of services within national park or reserve under Section 6. As per Section 6 (1), the Government of Nepal may, in the utmost interest of the national park, reserve or conservation area, make arrangements for operating hotels, lodges, public transport services or similar other services or facilities by itself or through other parties by entering into a contract following the prescribed procedure. According to Section 6 (2), no person shall operate services or facilities of any kind within the national park, reserve or conservation area without entering into a contract under Section 6 (1).

Under Section 15, collection of specimens from national parks, reserves or wildlife habitats for scientific research requires a license, and the prescribed officer may issue such license subject to prescribed conditions and fees. Section 22 prohibits any person from destroying, dismantling, disfiguring, removing or otherwise obstructing the boundaries, enclosure, wall, signboards or notices of a national park, reserve, conservation area or buffer zone. As per Section 26 (1), any person who illegally kills or injures, sells, purchases, transfers or obtains protected wildlife or keeps, purchases or sells protected wildlife parts shall be punished with a fine or imprisonment or both. Furthermore, as per Section 26 (1a), any person who trespasses on, seizes, sells or damages a national park, wildlife reserve, hunting reserve or conservation area, or harms its natural structure or beauty, shall be punished with imprisonment up to ten years, a fine up to one million rupees, or both.

2.1.4.5 Public Roads Act, 1974

This Act has been promulgated to make provisions to classify all kinds of public roads and acquire lands required for the development, maintenance, expansion or improvement of public roads, and to collect development tax from landholders near the roads who benefit from the public roads, in order to maintain the convenience and economic interest of the general public.

As per Section 3, the Government of Nepal shall, by a notification in the Nepal Gazette, classify the public roads and specify the road border not exceeding thirty-one meters on both right- and left-hand sides from the central line of such roads. According to Section 3A (1), the Government of Nepal may prohibit any person from building any kind of permanent structure or building within such distance specified by the Government of Nepal, not exceeding six meters from the road border specified pursuant to Section 3 and from the side of the public road where the road border has not been specified. As per Section 3A (2), if any person

constructs any permanent structure or building within the prohibited distance, such structure or building may be demolished by the order of the Department of Roads, and the Department of Roads may recover the expenses incurred in the demolition from the concerned person.

According to Section 4, if it is required to acquire any land for the development, expansion or improvement of a public road or road border, the Government of Nepal may acquire the land in accordance with the prevailing laws relating to land acquisition. As per Section 14, the Department of Roads may temporarily requisition any land required for the development, expansion or improvement of a public road for holding construction materials and equipment, building houses or sheds for persons monitoring or controlling such works, and constructing temporary roads required for traffic movement or transportation of materials and equipment. According to Section 15, compensation shall be provided for loss sustained due to requisition of land, including loss from inability to use houses, sheds or structures, inability to cultivate crops, and expenses required to restore the land to its previous condition.

As per Section 16, the Department of Roads shall plant trees on the right- and left-hand sides of a public road as per necessity, and the concerned Village Development Committee or Municipality shall take care of and protect such trees. According to Section 17, if it is necessary to take soil, stone or sand from any land in the vicinity for the development and maintenance of a public road, such materials may be taken by the order of the Department of Roads, and compensation shall be paid for any damage caused to crops, plants, trees or other things, including the amount required to fill any hole created. As per Section 19, no person shall build an access road joined to a public road, dig or demolish a hole or ditch on a public road or within the road border, install or place barriers, pegs or forts, build a house or shed, cultivate land within the road border, or perform similar acts without obtaining permission from the Department of Roads.

2.1.4.6 Roads Board Act, 2002

This Act has been promulgated to make necessary provisions on repair and maintenance of roads, minimizing the expenditures to be incurred in repairing and maintaining the roads, and making the repairing and maintaining works of the roads transparent and effective.

This Act has provisions relating to the establishment of the Roads Board under Section 3 to carry out routine, recurrent, periodic and emergency repair and maintenance works of roads and to make arrangements for imposition and collection of tolls from motor vehicles plying on roads. As per Section 3 (5), the functions, duties and powers of the Board include causing repair and maintenance of roads, collecting tolls and additional charges, recommending to the Government of Nepal on fixation of road toll or fuel levy, formulating integrated annual plans for repair and maintenance of roads, providing funds to road-related agencies for repair and maintenance, disbursing toll amounts for repair and maintenance of roads, causing reconstruction, rehabilitation and upgrading of roads, and preparing action plans to minimize expenditures on repair and maintenance of roads.

According to Section 6 (1), the Government of Nepal may, by a notification published in the Nepal Gazette, levy such toll as may be prescribed on motor vehicles making use of the prescribed roads. As per Section 6 (2), the Board shall collect or arrange for the collection of tolls prescribed by the Government of Nepal, including toll for using roads, toll levied on fuel used by motor vehicles, toll levied on registered vehicles, and toll levied on motor vehicles registered abroad entering into Nepal.

2.1.4.7 Right to Information Act, 2007

This Act has been enacted to make the functions of the state open and transparent in accordance with the democratic system, to make public bodies responsible and accountable

to the citizen, to make the access of citizens simple and easy to the information of public importance held in public bodies, and to protect the right of citizens to be well-informed.

This Act has provisions relating to the Right to Information under Section 3. As per Section 3 (1), every citizen shall, subject to this Act, have the right to information, and as per Section 3 (2), every citizen shall have access to the information held in the Public Bodies. The term "Right to Information" includes the right to ask for and obtain information of public importance held in Public Bodies, to study or observe written documents, materials and proceedings of Public Bodies, to obtain verified copies of documents, to visit or observe the place where any construction of public importance is going on, and to obtain verified samples of materials as defined under Section 2 (e).

According to Section 3 (4), if a Public Body has both information in its record that can be made public and information that cannot be made public in accordance with this Act, the Information Officer shall provide information to the applicant after separating the information which can be made public. As per Section 7 (1), a Nepali Citizen interested to obtain any information under this Act shall submit an application before the concerned Information Officer by stating the reason to receive such information. According to Section 7 (2), the Information Officer shall provide information immediately if the information can be provided immediately and shall provide information within fifteen days from the date of application if the information cannot be provided immediately.

2.1.4.8 Vehicles and Transport Management Act, 1993

This Act has been promulgated to make transportation services consolidated, efficient and effective with a view to preventing motor vehicle accidents, enabling the victims of accidents to have compensation, providing for insurance and making transportation facilities available to the public generally in a simple and easily accessible manner.

This Act provides provisions relating to the classification and operation of motor vehicles. As per Section 3, Section 4 and Section 5, heavy motor vehicle, medium motor vehicle and light motor vehicle are classified based on their weight. According to Section 6 (1), (2), a motor vehicle having obtained the certificate of registration to operate the transport service shall be called as a public motor vehicle, and the public motor vehicles shall be divided into passenger motor vehicles and cargo motor vehicles. As per Section 7 (1), a public motor vehicle having obtained the certificate of registration to provide the transport service to foreign tourists shall be called as a tourist motor vehicle, while Section 8 (1), (2) provides that a motor vehicle having obtained the certificate of registration for private use shall be called as a private motor vehicle and shall not be used for the transport service.

The Act provides provisions relating to transport management and road safety. As per Section 74, the Department of Transport Management shall designate routes for the operation of transport service by public motor vehicles and publish a public notice thereof. According to Section 75, no public motor vehicle shall operate the transport service on the routes designated pursuant to Section 74 without obtaining the route permit. As per Section 115, Section 116 and Section 117, provisions are made regarding speed limits, weight limits of motor vehicles, and permissible number of passengers and quantity of goods in public motor vehicles. Furthermore, Section 119 provides for posting, displaying or affixing necessary traffic signs, Section 121 provides for determination of parking places, and Section 126 (1), (2) provides that while digging a pit at a public place, prior approval shall be obtained and warning signs shall be placed to avoid accidents.

2.1.4.9 Land Revenue Act, 1978

This Act has been promulgated to amend and consolidate the provisions relating to the collection and recovery of land revenue and to make additional provisions relating to the

cultivation of land. Section 2, Sub-section (2) defines "Government Land" to include road, pathway or railway, along with government house, building or land, forest, river, stream, lake, pond and its banks, canal, barren land, minerals, hills, cliffs, public garden, and other land under the ownership, control or possession of the Government of Nepal. Section 2, Sub-section (3) defines "Public Land" to include drain or pathway, well, water source, pond and its bank, grazing land, cremation ground, religious places, public square, market, public place for recreation or sports, private land provided for public purposes, and other land designated as public land by the Government of Nepal. Section 8, Sub-section (4) provides that, upon the application of the concerned person, the Land Revenue Office may, on the recommendation of the prescribed committee, delete the person's name from such land where private land is to be registered for public purposes. Section 24, Sub-section (1) provides that Government Land, Public Land or Community Land shall not be registered or cultivated in the name of any individual; however, the Government of Nepal may make arrangements for Public Land for public purposes, Government Land for any work deemed appropriate by the Government of Nepal, and Community Land for any work deemed appropriate by the concerned community. Section 24, Sub-section (3) provides that the Land Revenue Office shall register Government Land, Public Land and Community Land and maintain updated records in the prescribed manner.

2.1.4.10 Land Acquisition Act, 1977

This Act has been promulgated to amend and consolidate current Nepal law pertaining to land acquisition. As per Section 2 (b), “Public Purposes” means undertaken in the interest of or for the benefit or use of the general public, or functions to be undertaken by Government of Nepal or Provincial Government, including projects approved by Government of Nepal or Provincial Government and projects undertaken by local level. According to Section 3, Government of Nepal may, if it so deems necessary, acquire any land at any place for any public purpose, subject to compensation under this Act.

As per Section 7 (1), (2), compensation shall be paid for losses resulting from clearing of crops and trees, demolition of walls, etc., or for damage suffered as a result of the removal or digging of earth, stone, ditches, or boring. According to Section 13 (1), (2), compensation payable under this Act shall be paid in cash, and there shall be a committee consisting of the Chief District Officer, Land Administrator or Chief of the Land Revenue Office, Project-in-chief, if the land has been acquired for a project, and representative of the concerned rural municipality or municipality to determine the amount of compensation. As per Section 16 (1), the Compensation Fixation Committee shall take the guidelines issued by Government of Nepal and the losses suffered by the concerned person as a result of being required to shift their residence or place of business due to the acquisition of the land into consideration while determining compensation.

According to Section 4 (1), Government of Nepal may decide to have the land acquired for an institution for the construction of residential quarters, welfare functions, or to operate a project connected with an institution fully owned by Government of Nepal, subject to payment of compensation and all other expenses under this Act. As per Section 5 (1), preliminary action may be initiated after the decision made by Government of Nepal to acquire the land for the purpose of Sections 3, 3 A and 4. According to Section 9 (1), the local officer shall issue a notification containing particulars of the land to be acquired, including the purpose, location, plot number, area of the land and other necessary particulars.

As per Section 25 (1), in case it becomes urgently necessary for Government of Nepal to acquire any land to maintain transport or communication facilities, or to ensure safety of life and property against extensive damage, or to protect any other public property in the event of sudden diversion of the course of any river, natural disaster, or other extraordinary circumstances, it may order the local officer to initiate action for the acquisition of such land. According to Section 27, Government of Nepal may acquire any land for any purpose through

negotiations with the concerned landowner. As per Section 34 (1), if any land acquired pursuant to this Act is found unnecessary for the purpose for which it has been acquired, or there remains surplus land, it shall be returned to the expropriated landowner unless it is otherwise utilized under Section 33.

2.1.4.11 National Trust for Nature Conservation Act, 1982

This Act has been enacted to establish the National Trust for Nature Conservation in order to conserve and manage the nature and natural heritage.

Under Section 9 (a), (b) and (c), the functions and duties of the Trust are to conserve, promote and manage wildlife and other natural heritages, make necessary arrangements for development of national parks and reserve, and conduct scientific study and research into wildlife and other natural heritages.

As per Section 10 (a), (b), (c) and (d), the Trust may receive assistance from national or international organizations, keep contact with foreign organizations and international organizations related to wildlife and other natural heritages, collect donation through foreign organizations or international organizations, and perform such other functions for the interest of the Trust as are required.

Under Section 18, the Trust shall keep contact to the Government of Nepal through the Department of National Park and Wildlife Conservation, Ministry of Forest and Soil Conservation.

2.1.4.12 Soil and Watershed Conservation Act, 1982

This Act has been formulated to make legal provisions on the land and watershed conservation by controlling natural calamities such as flood, landslide and soil erosion and maintain convenience and economic interests of the general public

Under Section 2 (a) and (b), “Conserved Watershed Area” means a protected watershed area declared under Section 3, and “Soil and Watershed Conservation” means acts to prevent or save any area from being destroyed from natural calamities such as flood, landslide and soil-erosion.

As per Section 3 (1), the Government of Nepal may declare any area of Nepal as a conserved watershed area by a Notification in the Nepal Gazette. Under Section 4, the watershed conservation officer may carry out acts including construction, maintenance and protection of prevention or control dam, check dam, embankment, ditch, diversion channel, drainage, retaining wall, pond or similar other necessary structure.

Under Section 10, no person shall, without permission of the watershed conservation officer, carry out activities in land vulnerable or likely to be vulnerable to floods, landslide, soil-erosion or soil-cutting, including blocking or diverting water, excavating or taking away stone, sand or soil, dumping stone, sand, mud or solid wastes, or establishing industry, business or settlement.

As per Section 13, the Watershed Conservation Officer may prohibit acts that may cause soil-erosion or soil cutting. Under Section 14, the Government of Nepal may acquire privately-owned land for soil and watershed conservation pursuant to the prevailing law relating to land acquisition.

Under Section 17, no person shall destroy, damage, deform or alter any act carried out in a conserved watershed area pursuant to Section 4. As per Section 20 and Section 21 (2), (3), (4) and (5), the Watershed Conservation Officer may take possession of tools, four-footed animals, motor vehicles and other goods used in violation of this Act, and such acts shall be punishable with imprisonment, fine, or both.

2.1.4.13 Solid Waste Management Act, 2011

This Act has been formulated to manage solid waste in a systematic and effective manner by reducing it at its source, reusing, processing, or disposing of it, and to maintain a clean and healthy environment by minimizing adverse effects on public health and the environment.

Under Section 3 (1), the Local Level shall be responsible for the management of solid waste by construction and operation of infrastructure like transfer station, landfill site, processing plant, compost plant, biogas-plant and also collection of waste, final disposal and processing. As per Section 3 (2) and (3), the Local Level shall be responsible for the arrangement or its use in any other way of the solid waste collected in the course of cleaning, throwing or placing of solid waste at solid waste collection center, transfer center or processing site, and any material or substance thrown or placed at the Solid waste collection center, transfer center or processing site or deposited in the course of cleaning shall be considered as solid waste.

Under Section 4 (1) and (2), the Local Level shall be responsible to manage or cause to manage the solid waste under this Act, and the responsibility for the processing and management within the set standard of harmful waste, health institution related waste, chemical waste or industrial waste shall be of the individual or body producing such solid waste.

As per Section 5 (1) and (2), any individual, organization or body shall, as far as possible, reduce the production of solid waste while carrying out some transaction or activity and reduce the amount of remaining solid waste by making arrangement for disposal or reuse of solid waste which might have been otherwise disposed off on such individual, organization or body's own area.

Under Section 6 (1) and (2), the local body shall prescribe to separate the solid waste into at least organic and inorganic including different kinds at its source, and the liability of transporting the solid waste up to the collection center by separating at its source shall lie on individual organization or body responsible for the production of such waste.

As per Section 7 (1), the time, place and manner for discharge of solid waste shall be as determined by the local body. Under Section 7 (2), any individual, organization or body producing harmful or chemical waste shall be responsible for the management of such waste as prescribed, and under Section 7 (3), harmful waste or chemical waste shall not be discharged at solid waste collection center or transfer center.

2.1.4.14 Labor Act, 2017

This Act has been formulated to amend and consolidate labor laws in order to safeguard the rights, interests and benefits of workers, promote healthy labor relations, eliminate labor exploitation, and enhance productivity.

Section 3 (1) stipulates minimum labor standards, and Section 3 (2) provides that any employment contract offering remuneration or benefits below the standards prescribed by the Act or its Rules shall be invalid to that extent. Section 4 (1) prohibits employers from engaging any person in forced labor, while the explanation to the Section defines forced labor as work performed against a person's will due to threats of financial, physical or mental harm. Section 5 prohibits the employment of children in work that is contrary to law. Section 6 (1) prohibits discrimination in employment on the grounds of religion, color, sex, caste, ethnicity, origin, language, ideological belief or similar grounds. As per Section 6 (2) (a–c), reasonable distinctions may be made based on the inherent requirements of a job, lighter duties may be assigned to pregnant workers without reducing their remuneration or benefits, and suitable employment opportunities may be provided for persons with disabilities. Section 7 (1) requires equal remuneration for work of equal value regardless of sex, and Section 7 (2) provides that

the value of work shall be determined based on the nature of the work, time required, labor, skill and productivity.

Under Section 28 (1), employers shall not require workers to work more than eight hours per day or forty-eight hours per week. As per Section 28 (2), workers shall be entitled to a thirty-minute rest break after five consecutive hours of work, while Section 28 (3) requires rotational rest periods for continuous operations, and Section 28 (4) provides that such rest periods shall be counted as part of working hours. Under Section 54 (1), employers shall provide annual medical insurance of at least NPR 100,000 for each worker, and Section 54 (2) provides that the insurance premium shall be shared proportionately between the employer and the worker. Section 55 (1) requires employers to provide accidental insurance coverage of at least NPR 700,000 for every worker, with the employer bearing the full premium under Section 55 (2). As per Section 55 (3) and (4), where a worker dies or suffers total physical or mental disability due to an accident, the worker or the legal heir shall receive one hundred percent of the insured amount, and in the case of partial injury or disability, compensation shall be provided in proportion to the degree of incapacity

Local Government Operation Act, 2017This Act has been formulated to implement the provisions regarding the rights of local levels and to ensure accessible and quality services through public participation, accountability, transparency, cooperation, coexistence, and coordination among the federal, provincial, and local levels. The Act further aims to strengthen the socialist-oriented federal democratic republican governance system from the local level by adhering to the principles of the rule of law and sustainable development, distributing the benefits of democracy proportionately, inclusively, and fairly, and developing local leadership and institutionalizing legislative, executive, and judicial practices at the local level. Section 11(1) provides that the single authority of rural municipalities and municipalities shall be as mentioned in Schedule 8 of the Constitution. Section 11(2) specifies the functions, duties, and rights relating to development projects at the local level; local market management, environmental conservation and biodiversity; local roads, rural roads, agricultural roads and irrigation; and conservation of water bodies, wildlife, mines, and minerals. Section 11(3) provides that the common rights to be exercised by rural municipalities and municipalities in collaboration with the federation and provinces shall be as mentioned in Schedule 9 of the Constitution. Section 11(4) specifies the duties, responsibilities, and rights relating to forests, wildlife, birds, water use, environment, ecology, and biodiversity, subject to federal and provincial laws. Section 11(5) provides additional duties, rights, and functions relating to transportation services.

2.1.4.15 Control of International Trade of Endangered Wild Fauna and Flora Act, 2017

This Act has been enacted to make necessary legal provisions for conservation of various species of the endangered fauna and flora in order to implement the Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973 and for regulation and control of international trade thereof.

Under Section 3 (1), no person shall purchase, sell, possess, use, plant, rear, captive breed, transport, import or export, or cause to be done so, a threatened or vulnerable wild fauna or flora or a specimen thereof. As per Section 3 (2), a threatened or vulnerable wild fauna or flora or a specimen thereof may be purchased, sold, possessed, used, captive bred, transported, imported or exported, having obtained a license pursuant to Section 6 and subject to the prescribed terms and conditions, for rearing wild fauna, planting and rearing plants, producing, purchasing or selling wild fauna or flora or a specimen thereof within or outside the country, and for studies, researches, experiments, trainings, exhibitions, conservation education, genetic resource conservation or academic purposes.

Under Section 20 (a), purchasing, selling, possessing, using, rearing, planting, upbringing, captive breeding, transporting, importing or exporting a threatened or vulnerable wild fauna or

flora or a specimen thereof in contravention of Section 3 shall be deemed to be an offence under this Act.

As per Section 21 (a) and (b), whoever commits an offence pursuant to Section 20 (a) with regard to a threatened or vulnerable wild fauna or flora or a specimen thereof shall be liable to imprisonment or fine, or both, based on the category of wild fauna or flora and the degree of the offence committed.

2.1.4.16 Environment Protection Act, 2019

This Act has been formulated to amend and consolidate the prevailing law on environmental protection in order to protect the fundamental right of each citizen to live in a clean and healthy environment, provide the victim with compensation for damage resulting from environmental pollution or degradation, maintain a proper balance between environment and development, mitigate adverse environmental impacts on environment and biodiversity, and face the challenges posed by climate change.

Section 3 requires the proponent to prepare the prescribed environmental study report and submit it to the concerned body for approval. Depending on the nature and jurisdiction of the proposal, the report may be a Brief Environmental Study (BES), Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA). The proponent shall also hold a public hearing while preparing the environmental study report.

Section 4 requires the proponent to make a detailed analysis of the possible adverse effects on the environment, various alternatives that can be adopted for mitigation of such effects, recommend the appropriate alternative, and set out the possible short-term, mid-term and long-term adverse effects on the environment and the measures for mitigation.

Section 5 requires the scope of the proposal and, in the case of an Environmental Impact Assessment, the scope and work schedule, to be approved by the concerned body prior to preparing the environmental study report. Section 6 requires the environmental study report to be prepared in the prescribed form while maintaining the standards and quality determined by the Government of Nepal.

Sections 7 and 8 require the concerned body to make necessary inquiry into the environmental study report and approve it upon specifying the terms and conditions to be observed by the proponent. No proposal shall be implemented without approval of the environmental study report. Section 9 provides for Strategic Environmental Analysis of policies, plans and programs as prescribed.

Sections 10, 11 and 12 require the proponent to prepare and implement an Environmental Management Plan, conduct a Supplementary Environmental Impact Assessment where revision in physical infrastructure, design, structure, forest area or project capacity is required, and comply with environmental examination and directions issued by the Ministry or prescribed body to mitigate adverse environmental impacts.

Section 15 provides for standards for the mitigation or doing away with the impacts of pollution and prohibits pollution contrary to the prescribed standards. Sections 21 and 22 require monitoring and inspection to ensure compliance with the approved environmental study report during project implementation. Section 30 provides that, in making any road or other physical infrastructures, the Government of Nepal may specify any specific area as an open or green area with a view to protecting the environment of such area.

2.1.4.17 Child Labor (Prohibition and Regulation) Act, 2000

This Act has been promulgated to prohibit engaging children in factories, mines or similar risky activities and to make necessary provisions with regard to their health, security, services and facilities while engaging them in other activities.

Section 3, Sub-sections (1) and (2) prohibit engaging a child who has not attained the age of fourteen years in works as a laborer and prohibit engaging any child in any risky business or work referred to in the Schedule.

Section 4 prohibits engaging any child in works as a laborer against his or her will by way of persuasion, misrepresentation or by subjecting the child to any influence, fear, threat, coercion or by any other means.

Section 6, Sub-sections (1) and (2) require an enterprise intending to engage a child in works to obtain approval from the concerned Labor Office or the prescribed authority, as well as from the father, mother or guardian of the child. The Labor Office may impose appropriate conditions with the objective of developing the skills and qualifications of the child or providing education to the child, and the enterprise shall comply with such conditions.

Section 7, Sub-section (1) requires an enterprise to obtain a certificate of qualification certifying that the child is able to work as a laborer prior to engaging the child in an enterprise.

Section 8, Sub-section (1) requires an enterprise engaging a child in work to submit, within fifteen days from the date of engagement, the particulars, details and photograph of the child to the Labor Office.

Section 9, Sub-sections (1) to (5) prohibit engaging a child in work between six o'clock in the evening and six o'clock in the morning, prohibit engaging a child in work for more than six hours in a day and more than thirty-six hours in a week, entitle a child to a leisure of half an hour after three consecutive hours of work and one day's leave in every week, deem such leisure time and weekly leave to be the duration of work, and prohibit a child already engaged in one enterprise from being engaged in the work of another enterprise on the same day.

Section 10, Sub-sections (1) and (2) prohibit discrimination on the grounds of sex, race, religion, caste or tribe and require equal remuneration and benefits for the same works. Remuneration, allowances, leave and other benefits to which a child engaged in an enterprise is entitled shall be as prescribed.

Section 11 requires an entrepreneur to make the prescribed provisions relating to the health and safety of a child engaged in an enterprise.

2.1.4.18 Ancient Monument Preservation Act, 1956

This Act has been promulgated to preserve the ancient monument, control the trade in archaeological objects as well as the excavation of the place of ancient monuments, and acquire and preserve ancient monument and archaeological, historical or artistic objects.

Under Section 3 (1), where the Government of Nepal wishes to declare any place or area where any monument is located as a Preserved Monument Area, it shall display a notice at the place where the monument is located and also at the adjoining public place specifying the boundaries of the Preserved Monument Area.

Under Section 3 (5), anyone wishing to install or connect a telephone line or electricity, dig ground for drinking water or sewerage, construct or repair a road, shoot a film, organize a fair or festival, perform dancing or singing ceremony, park vehicles, or paste a poster or painting within the Preserved Monument Area shall obtain permission from the Department of

Archaeology. However, permission shall not be required to conduct and perform traditional dancing and singing or organize a fair or festival.

As per Section 3 (6), (7) and (8), anyone wishing to construct a new house or building, or repair, alter or reconstruct a house or building on his own land within the Preserved Monument Area shall do so as is matching the style of the area and as is in consonance with the standard prescribed by the Department of Archaeology. Before giving its consent to the drawing of a house or building within the Preserved Monument Area, the Municipality shall obtain approval of the Department of Archaeology. The Department of Archaeology may approve, reject or approve the drawing with amendment. If the construction, repair, alteration or reconstruction is not done in accordance with the approved drawing, the Department of Archaeology may issue an order to stop such work.

2.1.4.19 Pashupati Area Development Trust Act, 1987

This Act has been formulated to provide for the security and development of the Pashupatinath area and to maintain the good conduct and convenience of the general public. Section 6.1.2 requires the systematic protection, maintenance, and development of the Pashupati area in accordance with the dignity and significance of Shri Pashupatinath. Section 6.1.3 provides for the maintenance, conservation, and promotion of ancient historical, religious, cultural, and nationally significant objects and sites, as well as the natural heritage within the Pashupati area. Section 6.1.3A provides for the continuation of worship, religious rituals, cultural festivals, and social and public welfare activities in accordance with traditional religious practices at the Pashupatinath Temple and other temples under Raj Guthi within the area. Section 6.1.4 provides for the systematic improvement and development of the Pashupati area as an international pilgrimage destination for Hindu devotees and tourists.

Section 10.1.8 authorizes the Council to identify, prohibit, and control activities that may not be carried out at specific locations within the Pashupati area, taking into consideration their importance, significance, recognition, and sensitivity. Section 10.1.17 provides for prescribing necessary standards for construction within the Pashupati area and, in accordance with prevailing laws, acquiring and allocating land for various purposes. Section 17.1 prohibits land-right transfers and construction-related activities in locations prohibited by the Council and requires construction in other areas to comply with standards prescribed by the Council. Section 17.2 specifically provides for the prescription and enforcement of standards relating to buildings, roads, pathways, bridges, water supply, drainage and sewerage, and other basic public utilities. Section 20A requires governmental and non-governmental bodies to obtain the prior consent of the Trust before exercising any authority granted under prevailing laws within the Pashupati area, and any work or action undertaken without such prior consent shall be deemed void.

2.1.4.20 Urban Area Public Transport (Management) Authority Act, 2022

This Act has been formulated to make public transport services in urban areas convenient, accessible, passenger-friendly, reliable, cost-effective, and safe, and to ensure their effective management, development, and expansion. Section 2 defines the integrated transport system, public transport, and service providers, covering various modes of public transport including electric and fuel-operated buses, taxis, rail, metro rail, light rail, sky rail, monorail, cable cars, and ride-sharing services. Section 5 provides for the functions, duties, and powers of the Authority, including formulation of public transport policies, plans and strategies; operation and management of public transport; development of an integrated transport system; studies, research and transport data management; setting service quality, vehicle and operational standards; determining routes, fares, bus stops, passenger waiting areas, parking areas and minimum passenger facilities; ensuring environmentally friendly public transport; coordination with the private sector, public bodies and different levels of government; managing roads for

pedestrians, cyclists and persons with disabilities; and monitoring, evaluating and inspecting public transport services. Section 6 provides for the development and operation of an integrated transport system in the Kathmandu Valley in coordination with concerned agencies. Section 12 provides for the establishment of the Federal Capital Urban Area Public Transport Authority to regulate and manage public transport services in the Federal Capital Urban Area, with its central office in Kathmandu, monitoring by the Provincial Government, and provision for contact offices as necessary Section 18 provides for penalties for fare-related violations, inappropriate behaviour toward passengers, use of improper language, damage to public transport, and littering. Section 19 requires coordination with concerned provincial and local governments while implementing the integrated transport system. Section 20 requires service providers intending to operate public transport services within the jurisdiction of the Authority to obtain the Authority's approval before operating new public transport vehicles, while service providers already operating public transport services before the commencement of the Act must obtain approval from the Authority within six months from the date of commencement of the Act. Section 22 provides that the Government of Nepal may acquire and provide land to the Authority, in accordance with prevailing law, for implementing its transport management, operation, and development plans.Rules

2.1.4.21 Environment Protection Rules, 2020

These Rules have been framed by the Government of Nepal under Section 44 of the Environment Protection Act, 2019.

Rule 3 requires the proponent to carry out a Brief Environmental Study (BES), Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) of the proposals mentioned in Schedule-1, Schedule-2 and Schedule-3, respectively. Rule 4 (1)–(10) requires the proponent to prepare a Scoping Document for proposals requiring an EIA, publish a public notice, collect opinions and suggestions, prepare the Scoping Document accordingly, and submit it to the concerned authority for approval. Rule 5 (1)–(6) requires the proponent to prepare and obtain approval of the Terms of Reference (ToR) before preparing the environmental study report.

Rule 6 (1)-(5) requires the proponent to conduct a public hearing in the affected area during the preparation of the environmental study report, involve the affected local community, representatives of forest user groups and the local level, publicize the date, time, place and project through local newspaper, radio or other media, paste a notice at the relevant ward office and public places, and include the attendance, opinions, suggestions, photographs and audio-visual materials in the environmental study report. Rule 7 (1)-(9) requires the proponent to prepare the environmental study report based on the approved Scoping Document, approved Terms of Reference and suggestions received from the public hearing, publish a notice inviting opinions and suggestions on the report, prepare the report in the prescribed format through experts, and prepare the report in Nepali language or, for proposals with foreign investment, in Nepali or English language with a Nepali executive summary.

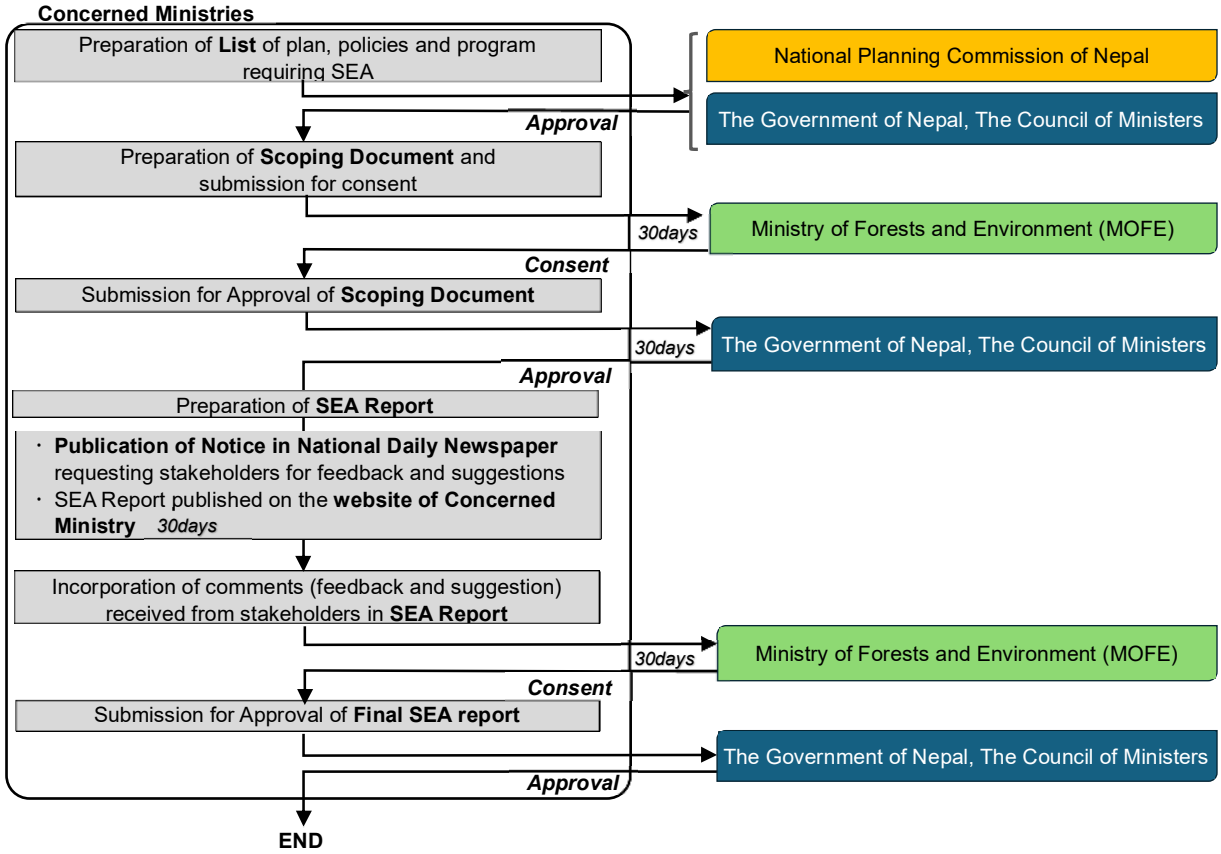
Rule 8 (1)-(16) requires the proponent to submit the environmental study report to the concerned authority for approval. Rule 8 (8)-(10) requires the proponent to include the recommendation of the local level and the subject related office while submitting the environmental study report for approval. If no recommendation is received within the prescribed period, the proponent may proceed with the approval process by attaching proof of submission of the application. Rule 9 (1)-(5) provides that the concerned authority shall examine the environmental study report, may constitute a committee, conduct site inspection, seek opinions from concerned bodies, and require additional environmental study where necessary.

Rule 10 (1)-(13) provides for Strategic Environmental Analysis (SEA). The concerned Ministry shall prepare a list of policies, programs or projects requiring SEA, obtain the consent of the

National Planning Commission, and submit the list to the Government of Nepal, Council of Ministers for approval. The concerned Ministry shall prepare a Scoping Document, obtain the consent of the Ministry, prepare the Strategic Environmental Analysis Report, publish a notice in a national daily newspaper inviting opinions and suggestions, make the report available on its website, and submit the final report to the Government of Nepal, Council of Ministers for approval.

Rule 11 (1)-(6) provides for Supplementary Environmental Impact Assessment, Rule 12 (1) provides for revision of the Brief Environmental Study Report or Initial Environmental Examination Report, and Rule 13 (1)-(4) requires the proponent to commence implementation of the proposal within three years from the approval of the environmental study report, provides for extension of time in special circumstances, and requires the environmental study to be conducted again if implementation is not commenced within the prescribed period.

Schedule 15 of EPR 2020 describes key principles of the Strategic Environmental Analysis, as shown in Figure 2.1-1.



Source: Flow diagram based on Environment Protection Rules (EPR), 2020, JICA Expert Team

Figure 2.1-1: Flow Diagram for the Strategic Environmental Analysis Study

Table 2.1-2 Principle of Strategic Environmental Analysis in EPR 2020

No.	Principle
1	To be analyzed in an integrated manner.
2	Leadership provided by the concept of sustainable development (Sustainability-led)
3	Focused with subject
4	Clearly defined responsibilities for accountability
5	Participatory in nature
6	Passed through the iterative phase
7	Strategic Environmental Analysis should be favorable to conditions (for assessing the context).
8	Strategic Environmental Analysis should be holistic, inter-sectoral, and integrated, taking into account far-fetched aspects.
9	Rather than the current situation, the focus should be on sensitive issues based on analysis of trending conditions.
10	Supportive to sustainable decision-making.
11	Multidisciplinary conceptualization, good governance, and information should be communicative.
12	Monitoring and provision of support should be imbibed.
13	Helpful in making critical decisions.

Source: Environment Protection Rules, 2020

2.1.4.22 Forest Rules, 2022

These Rules have been formulated in exercise of the powers conferred by Section 83 of the Forest Act, 2019 to regulate the management, conservation and utilization of forests, including the procedures governing the use of national forest areas for development projects.

Rule 87 requires development projects to be designed in a manner that avoids the use of national forest areas as far as possible. Rule 87(2) further requires that where the use of national forest land is unavoidable, only the minimum area necessary shall be used after undertaking a feasibility study, consulting the relevant forest management agency, and analyzing alternatives to minimize the forest area and the number of trees to be removed. Rule 87(3) further requires coordination with the concerned Divisional Forest Office during project design, feasibility studies and environmental assessment.

Rule 88 (1) requires a development project seeking to use national forest area to submit an application to the Ministry through the concerned agency together with the approved environmental study report, feasibility study report, detailed engineering design, description of the forest area to be used, number of trees proposed for removal, and other prescribed project approval documents. Rules 89 and 90 require verification of the proposal by the Divisional Forest Office, the Department and the Ministry before the Government of Nepal grants approval for the use of the national forest area subject to prescribed conditions, while ownership of the forest land remains with the Government of Nepal.

Rule 91 requires the development project to provide suitable land for establishment of an equivalent national forest as compensation for the forest area used. Where suitable land cannot be provided, Rule 91 (2) requires the project to apply to the Land Acquisition Facilitation Committee constituted under Rule 92 for acquisition of replacement land. Where land acquisition is not possible, Rule 93 requires the project to deposit the prescribed amount into the designated fund for land acquisition, compensatory plantation and forest management. Rule 94 further requires the Department to enter into an agreement with the development project before permitting the use of the national forest area.

Rule 98 requires the project proponent to obtain permission from the Divisional Forest Office before entering the national forest area for project implementation. Rule 96 requires the project to implement all mitigation measures identified in the approved environmental study report at

its own expense, prioritize the participation of affected forest user groups and local communities, and construct wildlife-friendly structures where necessary. Rule 97 further requires compensation for damage to private or community forest resources and adverse impacts on the livelihoods of forest-dependent persons or communities.

Rule 102 (1) provides that trees within the approved forest area may only be removed after obtaining the prescribed approval. Rules 102 (2) and 102 (3) further require approval where additional trees are to be removed during project implementation or where trees within the approved right-of-way of roads or canals require removal. Rule 93 (5) requires the project to bear the cost of compensatory plantation based on planting ten saplings for every tree and pole removed.

Rule 103 requires the project to fell, process and collect approved trees at its own expense and deposit the timber and other forest products at the location designated by the Divisional Forest Officer. Rule 103 (3) further provides that forest products obtained from community forests shall generally be handed over to the concerned Community Forest User Group, while Rule 103 (5) permits the use of stone, gravel and sand generated during project implementation upon payment of the prescribed royalty and fees.

2.1.4.23 National Trust for Nature Conservation Rules, 1984

These Rules have been framed in exercise of the powers conferred by Section 16 of the "National Trust for Nature Conservation Act, 1982" to regulate the administration, functions and operation of the National Trust for Nature Conservation.

Rule 9 authorizes the Trust, in coordination with the concerned authority of the Government of Nepal and other concerned organizations or individuals, to undertake and support activities relating to nature conservation and natural heritage. These activities include tree plantation, conservation of land and water resources, providing technical advice on national park and wildlife conservation, conducting scientific studies and research, promoting public awareness, preparing long-term conservation plans, providing policy recommendations to the Government of Nepal, undertaking consultancy and information services, and performing other activities relating to nature and natural heritage.

Rule 14 empowers the Trust to provide financial, technical or other necessary assistance to governmental or non-governmental organizations or individuals for activities relating to the conservation of nature and natural heritage. Rule 14(2) requires an organization or individual seeking such assistance to submit an application together with the details of the proposed work or plan, while Rule 14(3) requires the recipient to comply with the terms and conditions prescribed by the Trust.

2.1.4.24 Solid Waste Management Rule, 2013

These Rules have been issued by the Government of Nepal by exercising the power conferred by Section 50 of the Solid Waste Management Act, 2011.

Rule 3, Sub-rules (1), (2) and (3) require the Local Level to make arrangements for the segregation of at least organic and non-organic solid waste at its source and to manage harmful or chemical waste separately. The generator of such harmful or chemical waste shall be responsible for its management, and the Local Level shall conduct programmes to increase public awareness on the reduction, segregation and management of solid waste at its source.

Rule 4, Sub-rules (1), (2) and (3) require the Local Level to determine the time, place and manner for the discharge of solid waste, taking into account the ease and convenience of transportation, processing and final discharge. The Local Level may determine a separate time, place and manner for the transportation of solid waste up to the processing site and shall

ensure that such arrangements take into account the possible adverse effects on public health and the environment and the measures for reducing such effects.

Rule 5, Sub-rules (1) to (9) prescribe the management of harmful, chemical, organic and inorganic waste. These provisions prohibit the mixing of harmful, chemical, organic or inorganic waste with other waste, require such waste to be processed before final discharge, require any individual, organization or agency responsible for generating, processing, discharging or managing such waste to obtain permission from the Local Level, require the Local Level to verify that the proposed management system and technology meet the standards prescribed by the Government of Nepal and to monitor compliance with the permitted methods, standards, processes and technologies, and require the collection, storage and transportation of harmful, chemical, organic or inorganic waste to be carried out using safe methods in accordance with the standards prescribed by the Government of Nepal and the prevailing environmental law.

Rule 7 requires the Local Body to use vehicles for the transportation of solid waste that ensure that solid waste is not visible, does not fall out and does not cause seepage of liquid materials, prevents leachate and odor from escaping, facilitates easy loading and unloading of solid waste, and is conducive to the road capacity and condition.

2.1.4.25 Soil and Watershed Conservation Rule, 1986

These Rules have been framed by the Government of Nepal in exercising the power conferred by Section 25 of the Soil and Watershed Conservation Act, 1982.

Rule 4, Sub-rules (1) and (2) require the Watershed Conservation Officer, for the purposes of the works mentioned in Section 4 of the Act, to clearly classify the land within the conserved watershed area, including its boundary, area and the works to be executed on such land, in consultation with the District Soil and Watershed Conservation Committee.

Rule 10, Sub-rules (1), (2) and (3) require the Watershed Conservation Officer to determine the area and boundaries of the land within the conserved watershed area that is or may be subject to flooding, landslides, soil erosion or land degradation. No work specified in clauses (a), (b), (c), (d), (e), (f), (g) and (h) of Section 10 of the Act shall be carried out on such land without obtaining permission. A notice containing the boundaries of the land designated as vulnerable to natural disasters and specifying the activities that cannot be carried out without permission shall be posted at the office of the concerned rural municipality or municipality and the District Coordination Committee for the information of the general public.

Rule 11, Sub-rules (1) and (2) require any person intending to carry out the works specified in clauses (a), (b), (c), (d), (e), (f), (g) and (h) of Section 10 of the Act on land designated as vulnerable to natural disasters to submit an application to the Watershed Conservation Officer in the prescribed format, stating the reasons for such action. The Watershed Conservation Officer may grant permission if the proposed action does not appear to be contrary to the purpose of the Act.

Rule 12, Sub-rules (1) and (2) empower the Watershed Conservation Officer to prohibit any work on the land under Section 4 of the Act, as well as on the surrounding land, to prevent activities that may cause soil erosion or land degradation. A notice specifying the boundaries of the affected land and the prohibited activities shall be pasted at the office of the concerned local level authority and the District Coordination Committee for the information of the general public.

2.1.4.26 Child Labor (Prohibition and Regulation) Rules, 2006

These Rules have been framed by the Government of Nepal in exercise of the powers conferred by Section 27 of the Child Labor (Prohibition and Regulation) Act, 2000.

Rule 3 requires the Manager operating a risky profession or activities to notify the Labor Office, in addition to the description mentioned in Sub-section (1) of Section 5 of the Act, regarding the time of operation of the enterprise, daily working hours, date of operation of risky activities or profession, number, name, age and address of the workers working in the enterprise, services provided to the workers, remuneration and other facilities, contact address of the enterprise, and provisions relating to health and security.

Rule 4, Sub-rules (1), (2) and (3) require an application to be filed in the Labor Office before employing a child as a laborer to examine the child's health in relation to his or her ability and inability to do the work, mentioning the nature of the work and the age of the child. Upon receipt of the application, the Labor Office shall cause a doctor to examine the health of the child, and if the child is found to be capable of the work, the doctor shall provide a Certificate of Eligibility in the prescribed format.

Rule 5 requires an enterprise employing a child to submit to the Labor Office, in addition to the particulars mentioned in Sub-section (1) of Section 8 of the Act, the working hours of the child, a photocopy of the appointment letter stating whether the employment is permanent or temporary, whether the facility of quarter is provided, and the section or division where the child works.

2.1.4.27 Labor Rule, 2018

These Rules have been framed by the Government of Nepal by exercising the power conferred under Section 182 of the Labor Act, 2017. Rule 3, Sub-rules (1) and (4) provide for regular employment and require the employment agreement to disclose the nature of employment, primary work and position of the employee, the place, time and effective date of the employment contract, and other essential conditions related to the services or work provided by the employee. Rule 16, Sub-rule (1) requires the employer to determine the working hours based on the nature of the work and inform all employees accordingly, Rule 20 requires payment of wages for weekly leave, and Rule 22, Sub-rule (1) requires the employer to deposit the provident fund for employees.

Rule 34, Sub-rule (1) requires employers to formulate a policy related to occupational safety and health addressing safety precautions, workers' health, potential accidents, precautions for operating machinery and equipment, and safety measures for using chemicals. Rule 35 requires the employer to make necessary arrangements to transport the employee to a hospital or health center for treatment immediately in the course of an accident or illness during work and inform the Labor Office regarding occupational safety and health obligations. Rule 36 requires manufacturers, importers and suppliers to inform the employer regarding the safe use, storage and management of chemicals. Rule 39 requires protection of eyes, protection from the effects of chemicals, protection from fire, and a suitable working environment. Rule 41 requires employers to employ trained and experienced workers, ensure the use of protective equipment, provide guardrails, conduct welding activities in a separate safe area, regularly inspect electrical equipment, and arrange separate parking or a safe place to keep goods. Rule 41, Sub-rules (1)- (4) require the use of equipment or machinery for lifting heavy loads and prescribe weight limits for lifting.

Rules 44 to 47 require employers to provide proper sanitation, clean air, adequate lighting, proper disposal of scraps and garbage, sound control equipment, clean drinking water, bathrooms and modern toilets, non-smoking areas, annual health examinations where required, infant care rooms, rest rooms and canteens. Rule 49 requires employers to arrange first aid, bear treatment expenses and pay wages during hospitalization or home treatment resulting from workplace injuries. Rule 50 requires employers to notify the Labor Office of work-related injuries or deaths, and Rule 53 requires employers to provide construction workers with necessary safety equipment or clothing and arrange immediate first aid at construction sites.

2.1.4.28 Ancient Monuments Preservation Rules, 1990

These Rules have been framed in exercise of the power conferred by Section 21 of the Ancient Monuments Preservation Act, 1956. Rule 4.1, Sub-rule (4.1.1) requires any person or institution willing to install telephone and electricity, dig the land for drinking water and sewerage, construct and repair the road, shoot a film, cinema, celebrate festival and fare, dance, park vehicles, or place the poster and photograph, to obtain approval from the Department. Rule 4.1, Sub-rule (4.1.2) provides that the Chief Archaeological Officer shall, having done the necessary investigation on the matter, provide approval if the construction work pursuant to Sub-rule 4.1.1 is not hampered to the monuments conserved zone. Rule 4.2 provides that the Department, upon taking the advice of the Technical Committee and considering the value of the preserved monument zone, shall prescribe the style and necessary standards for construction, maintenance, alteration, or reconstruction of houses or buildings on privately owned or occupied land within the preserved monument zone.

2.1.4.29 Vehicles and Transport Management Rules, 1997

These Rules have been framed by the Government of Nepal in exercise of the powers conferred by Section 179 of the Motor Vehicles and Transport Management Act, 1993. Rule 15 classifies passenger motor vehicles and prescribes their seating capacity, including buses, minibuses, jeep, van, pick-up and microbus, car and taxi, tempo, and motorcycle, scooter and sun shine. Rule 16 classifies cargo motor vehicles and prescribes their seating and load bearing capacity, including truck and tanker, mini truck, power tiller, and pick-up. Rule 17 provides that the classification and load bearing capacity of other motor vehicles such as dozers, loaders, dumpers, cranes, fire brigades, road rollers and excavators shall be as specified by the Government of Nepal. Rule 18, Sub-rules (2), (3), (4), and (4a) prescribe the period of operation of buses, minibuses and microbuses based on the type of service, subject to annual mechanical and technical examination. Rule 18, Sub-rule (4b) requires local bus service, mini bus and micro bus operating on long, medium and short routes to have the provision of primary treatment including necessary medicines and aids and a fire extinguisher. Rule 18, Sub-rule (4c) provides for the operation of direct bus, express bus, local bus service, mini bus and micro bus, including the maximum route distance for micro buses. Rule 18, Sub-rules (5), (6), and (7) prescribe the maximum speed of different categories of motor vehicles, empower the Department to determine or alter speed having regard to geographical situation and road condition, and require compliance with notified speed limits. Rule 18, Sub-rules (8) and (9) require passenger motor vehicles to depart and arrive according to the schedule determined by the Office issuing the route permit and prohibit delay or inconvenience to passengers except in circumstances beyond control. Rule 60 provides that drivers shall observe the traffic signs set forth in Schedule 63, including Regulatory Signs, Warning Signs, Information Signs, and Traffic Lights.

2.1.4.30 Land Rules, 2064

These Rules have been framed by the Government of Nepal in exercising the power conferred by Section 61 of the Land Act, 1964. Rule 21, Sub-rules (1) to (6) prescribe the procedure for payment of compensation to the landowner, including determination of compensation by the valuation committee, publication of the compensation amount determined in relation to each landowner by the land reform officer, determination of compensation where the land is situated within two or more districts, submission of an appeal before the concerned Appellate Court against the determined compensation, payment of compensation to the concerned landowner according to the published list or the final decision made by the Appellate Court, and keeping the compensation for the portion of land which has a dispute on ownership and is sub judice before a court or a competent authority adjourned (unpaid) until such dispute is decided.

2.1.4.31 International Trade Control Regulations on Endangered Wildlife and Flora Rule, 2019

These Rules have been framed by the Government of Nepal in exercising the power conferred by Section 37 of the Control of International Trade of Endangered Wild Fauna and Flora Act, 2017. Rule 3, Sub-rule (1) prescribes the submission of an application to the management body for obtaining a permit for the export, import, re-export, keeping, using, producing, transporting, buying and selling, controlled breeding, and trading of endangered wild fauna or flora, or their samples, in the formats specified in the respective Schedules. Rule 26 provides that, to determine whether any wild flora or fauna is classified as endangered, the scientific body can refer to the lists in Schedule-1, Schedule-2, and Schedule-3 published on the official website of the Convention.

2.1.4.32 National Parks and Wildlife Conservation Rules, 1974

These Rules have been framed by the Government of Nepal in exercise of the powers conferred by Section 33 of the National Parks and Wildlife Conservation Act, 2029. Rule 3, Sub-rules (1), (4), and (5) provide that the Government of Nepal may operate services or facilities in a National Park or Reserve through a notice, require the person operating such services or facilities to prepare a detailed project report and obtain approval from the Government of Nepal while conducting any type of construction work for operating such service, and require environmental studies to be conducted in accordance with the prevailing law when allowing the operation of services or facilities or when the Government of Nepal itself operates the services or facilities in accordance with Section 6 of the Act. Rule 22, Sub-rule (1) provides that any person desiring to catch or hunt any wildlife or birds or to collect any other insects, bacteria, fish or any natural products for scientific research shall submit an application before the Chief.

2.1.5 Standard

2.1.5.1 Nepal Road Standard, 1970

This standard was introduced by the Department of Roads (DoR) to achieve consistency in road design and construction and revised to address non-uniformity in the design, construction, maintenance and management of roads and bridges. Clause 3 classifies roads into National Highways, Feeder Roads, District Roads and Urban Roads based on administrative classification. Clause 21 provides that all roads should be designed and constructed with proper assessment of all environmental and social aspects and their impacts, the Environment Protection Acts and Rules of the Government of Nepal should be followed, road alignment should avoid preserved zones such as national parks, historical monuments and other sensitive areas, highways should be located away from populated areas, provisions should be made for migration of animals across roads in forest areas and under/overpass bridges for movement of people, provisions of sound barriers should be made on roads passing through populated areas, bio-engineering techniques should be applied on road slope stabilization, roadside arboriculture should be implemented, quarries for construction materials should be properly managed, and dust/smoke producing pavement technology shall not be adopted near populated areas. Clause 22 provides that roadside service facilities, including gas filling stations, highway motels, camping stations, technical service centers, telephone booths, highway police control rooms, emergency medical service centers, lay-bys, parking lots, recreational areas, wash rooms, public toilets and drinking water facilities, should be provided along highways.

2.1.5.2 National Sound Quality Standard, 2012

This Standard has been prescribed in exercise of the powers conferred by Rule 15 of the Environment Protection Rules, 1997. The Standard prescribes the limits of sound (Leq) as 75 dB during the day and 70 dB at night for industrial areas, 65 dB during the day and 55 dB at night for commercial areas, 45 dB during the day and 40 dB at night for rural residential areas, 55 dB during the day and 50 dB at night for urban residential areas, 63 dB during the day and 55 dB at night for mixed residential areas, and 50 dB during the day and 40 dB at night for peace areas. The Standard also prescribes the maximum sound emission limits of 65 dB for water pumps, 90 dB for diesel generators, and 70 dB for entertainment devices.

2.1.5.3 National Ambient Air Quality Standard, 2026

This Standard prescribe concentration limits for air quality parameters relevant to transport infrastructure. The standards include TSP with a 24-hours concentration maximum of 230 µg/m³; PM10 with Annual 70 µg/m³ and 24-hours 120 µg/m³; PM2.5 with 24-hours 40 µg/m³ and Annual 25 µg/m³; Ozone with 8-hours 157 µg/m³; Sulfur Dioxide with Annual 50 µg/m³ and 24-hours 70 µg/m³; Nitrogen Dioxide with Annual 40 µg/m³ and 24-hours 80 µg/m³; Carbon Monoxide with 8-hours 10,000 µg/m³; Lead with Annual 0.5 µg/m³; and Benzene with Annual 5 µg/m³. The Standards further provide that, in the case of the automatic monitoring method, to calculate the 24-hour average, at least 75% of the hourly data measured during that period must be available, and the specified test methods shall not preclude the use of other internationally, regionally, or nationally recognized methods in common use.

2.1.5.4 National Drinking Water Quality Standard, 2022

This Standard has been published by the Government of Nepal in accordance with the powers granted under Section 18, Sub-section (1) of the Water Resources Act, 1993**,** regarding the quality of drinking water. The Standard prescribes mandatory parameters for drinking water quality, including physical parameters such as turbidity (5 NTU), pH (6.5–8.5), color (5 TCU), taste and odor (not to be offensive), and electrical conductivity (1500 µS/cm); chemical parameters including iron (0.30 mg/L), manganese (0.20 mg/L), arsenic (0.05 mg/L), fluoride (0.50–1.50 mg/L), ammonia (1.50 mg/L), chloride (250 mg/L), sulphate (250 mg/L), nitrate (50 mg/L), copper (1 mg/L), zinc (3 mg/L), aluminum (0.20 mg/L), total hardness (500 mg/L), and residual chlorine (0.10–0.50 mg/L, only in systems where chlorine is used); and the microbiological parameter of E. coli (0 CFU/100 ml)**.** The Standard further prescribes parameters that need further testing based on risk and relevance**,** including total dissolved solids (1000 mg/L), calcium (200 mg/L), lead (0.01 mg/L), cadmium (0.003 mg/L), chromium (0.05 mg/L), cyanide (0.07 mg/L), mercury (0.001 mg/L), nitrites (3 mg/L), and total coliform (0 CFU/100 ml in 95 percent of samples). It further requires all service providers to test the mandatory parameters at least once in all systems and prepare baseline data within five years of implementation, conduct additional testing for harmful metals, wastewater compounds, and pollution based on risk and relevance, test E. coli and other suspicious microbial contaminants during waterborne epidemics, inform consumers to use domestic and alternative methods for water purification during emergency situations where drinking water quality cannot be maintained, and comply with the specified provisions relating to monitoring, residual chlorine, fluoride, and other harmful parameters. For transport infrastructure projects, these requirements are relevant where project activities involve drinking water supply systems or may affect drinking water quality.

2.1.5.5 Exposure Limit (Standard) of Noise for Work Place, 2017

This standard has been prescribed in exercising the power conferred by Section 36 of the Labor Act, 1992. The Standard prescribes the recommended maximum sound pressure levels

(dB) associated with various durations of exposure per day, including 90 dB for 8 hours, 95 dB for 4 hours, 100 dB for 2 hours, 105 dB for 1 hour, 110 dB for 30 minutes, and 115 dB for 15 minutes. No exposure of 115 dBA is to be permitted, exposure to impulsive or impact noise should not exceed 140 decibel peak sound pressure level, and hearing protection shall be mandatory above 85 dBA. The Standard further prescribes the Permissible Exposure Levels (PEL) of Impulsive or Impact Noise at Workplace, including 140 dB (100 impulses per day), 135 dB (315 impulses), 130 dB (1,000 impulses), 125 dB (3,160 impulses), and 120 dB (10,000 impulses per day), with no exposure in excess of 140 decibel peak sound pressure level permitted. The noise monitoring procedure should be guided by the International Standards: ISO 1996 and 1999. These provisions are relevant to transport infrastructure projects involving construction, operation, and maintenance activities where workers may be exposed to occupational noise.

2.1.5.6 Permissible Exposure Limit (Standard) of Light Illumination for Work Place, 2017

This standard prescribes the minimum light illumination (lux) required for various work tasks to ensure safety and efficiency, including 10 lux for emergency exits and emergency pathways, 20 lux for inactive storage, stock-yards, main entrances and exits, 50 lux for rough active storage, warehouses, passageways, corridors, stairways, compressor houses, stock rooms, platforms, basements, engine and boiler rooms, elevators and similar work areas, 100 lux for simple assembly, rough bench work, simple inspection, wrapping, packing, labelling, control houses and general production activities, 300 lux for moderately difficult assembly and inspection, checking and sorting, service garage repair areas, welding, drilling, riveting and similar work, 500 lux for difficult assembly and inspection, fine assembling, fine inspection, fine machine work, glass polishing, fine woodworking and similar activities, and 1,000 lux for extra fine assembling, extra fine inspection, testing of extra fine instruments, jewelry and watch manufacturing, and similar precision work. The Standard further prescribes Prevention of Glare, requiring that where any source of artificial light is less than five meters above floor level, no part of the light source shall cause glare to persons normally employed within 30 meters of the source, and any local light shall be provided with a suitable shade of opaque material or other effective means to prevent glare, or shall be so placed that no person is exposed to glare. These provisions are relevant to transport infrastructure projects for ensuring adequate workplace lighting and safe working conditions during construction, operation, maintenance, workshops, garages, warehouses, tunnels, and other work areas.

2.1.5.7 Standards for excavation, sale, and management of stones, gravel, and sand (First Amendment), 2022

This Standard has amended the Standards for Excavation, Sale, and Management of Stones, Gravel, and Sand, 2020 to make contemporary revisions relating to monitoring provisions, distance standards for the crusher industry, and coordination mechanisms. The amendment provides that the arrangement for the formation of the technical team shall be prescribed by the District Disaster Management Committee (Clause 3), omits the provision relating to "river within two kilometers of dense settlements and forest areas, five hundred meters from the highway" (Clause 4), requires that for the collection of riverine materials, the rural municipality or municipality shall ensure that there is no change to the river course by constructing a dam or embankment, shall use advanced technology for sand processing through river mining, and may carry out the sale of such materials through a public-private partnership, with other arrangements prescribed by the District Monitoring Committee (Clause 5). It further provides that no mining of riverine material shall be carried out from mid-June to mid-August of each year, and the District Disaster Management Committee may prohibit excavation work for up to fifteen days before or after that period if river flow exceeds the average level due to unseasonal rains (Clause 6). Clause 13, Sub-clause (1) prescribes the distance norms for the operation of

crusher industries, including from the Right of Way (RoW) of the Highway (500 meters in the Terai and 200 meters in the Hills), concrete bridges (500 meters), and other sensitive areas. Clause 14 provides that these distance criteria shall not apply to crusher industries established within the approved mining area. Clause 16 further provides that the establishment and operation of sand and soil washing and processing industries shall not be permitted within 300 meters of a highway, 200 meters from a riverbank, or 500 meters from a road bridge. Clause 18, Sub-clause (2) provides that the validity period of the approved environmental study report shall be three years, and that, in the case of crusher industries established within the approved mining area, the distance criteria shall not be applied. These provisions are relevant to transport infrastructure projects involving the sourcing, processing, and management of construction materials and the siting of crusher industries in relation to highways, bridges, and associated infrastructure.

2.2 Other Laws and Guidelines relevant to the Master Plan and SEA

Beyond the primary legal frameworks governing environmental assessment, the Master Plan and the SEA must operate within a broad policy environment encompassing social equity, transport sector specific planning, and national climate change commitments.

2.2.1 Key Local-Level Laws relevant to SEA of KVUTSMP

2.2.1.1 Kathmandu Metropolitan City Environment and Natural Resources Act, 2021

This Act has been formulated to protect the fundamental right of citizens to live in a clean and healthy environment, ensure the proper use and sustainable management of natural resources, maintain a balance between environment and development, and conserve natural resources, the environment, and biodiversity, while establishing legal provisions for implementing the local-level powers relating to environment, natural resources, and biodiversity. Section 4 provides for identifying and designating areas requiring environmental protection as Environmentally Protected Special Areas and, in relation to the construction of roads, buildings, river management works, and other physical infrastructure, designating specific areas as open spaces or green areas for environmental protection, as well as designating environmentally sensitive areas where excessive environmental pollution, landslides, excessive exploitation of natural resources, or natural disasters occur or are likely to occur and may adversely affect public health or the environment, with management of such designated areas as prescribed. Section 5 provides that the protection of heritage within the Metropolitan City shall be the duty of the Metropolitan City, its citizens, and the concerned agencies. Section 6 requires proponents to conduct environmental assessments in accordance with prevailing laws and standards and submit the Brief Environmental Assessment Report or Initial Environmental Examination Report to the Municipal Executive for approval for proposed development, construction activities, or projects falling within the jurisdiction of the Metropolitan City. Section 14 prohibits pollution generated in contravention of prevailing standards or in a manner causing significant adverse impacts on human life, public health, or the environment; prohibits the discharge of noise, visual pollution, heat, radioactive radiation, electromagnetic waves, solid waste, or wastewater in contravention of prescribed standards; prohibits activities that pollute rivers, ponds, lakes, or other surface water or groundwater sources and adversely affect aquatic life, fauna, or flora; and prohibits the emission of smoke, dust, gases, or other substances causing air pollution in contravention of prescribed standards. Section 20 assigns the Metropolitan City responsibility for managing and ensuring the management of solid waste within its area. Section 61 provides that priority shall be given to, and the use of electric vehicles and clean energy shall be encouraged and promoted for the purpose of reducing air pollution in the Kathmandu Valley.

2.2.1.2 Kathmandu Metropolitan City Vehicle and Transport Management Act, 2019

This Act has been formulated to ensure easy and convenient access to public transportation services, promote public transportation and increase investment, and operate and manage transportation services in a safe, reliable, accessible, quality, environmentally friendly, consumer-oriented, and service-oriented manner, while prioritizing environmentally friendly technologies in the transportation sector and establishing legal provisions for overall transportation management. Section 7 requires public transport institutions and companies to ensure regular inspection, maintenance, and cleaning of vehicles; provide first-aid materials, fire-fighting equipment, and waste containers; use designated bus stops; and provide reserved seats and accessibility for persons with disabilities, women, children, and senior citizens, while directing the use of high-technology and environmentally friendly vehicles, wheelchair accessibility, GPS tracking, and conversion of fossil-fuel-powered vehicles into environmentally friendly electric vehicles. Section 15 provides for coordination with relevant stakeholders for the formulation of local policies and the regulation and management of public transport in accordance with an integrated transport concept and for improving the transport service system. Section 21 provides for the approval and implementation of necessary policies and plans to promote environmentally friendly, climate change-adaptive, disaster risk-sensitive, disability-friendly, and gender-friendly transport systems, including the conversion of fossil-fuel-powered vehicles into environmentally friendly electric vehicles, as well as support and coordination for the construction and management of charging stations required for electric vehicles.

2.2.1.3 Kathmandu Metropolitan City Disaster Risk Reduction and Management Act, 2019

This Act has been formulated to make necessary legal provisions for the coordinated and effective implementation of all activities relating to disaster risk reduction and management and to protect the lives of the general public, as well as public, private and personal property, natural and cultural heritage, and physical structures from natural and non-natural disasters within Kathmandu Metropolitan City. Section 8 provides for support and coordination with Federal and Provincial security agencies mobilized for disaster management activities. Section 9 requires fire brigades, ambulances, and other similar service providers to comply with the instructions of the Committee for the provision of emergency search, rescue, and relief services. Section 11 requires government offices, non-governmental organizations, local organizations, communities, volunteers, civil society, the private sector, and individuals to assist the Metropolitan City in disaster management activities, including data collection, damage assessment, relief, rehabilitation, reconstruction, public awareness, capacity building, emergency simulation exercises, training, search, rescue, and relief distribution. Section 14 provides for compliance with and coordination in the declaration of a disaster-affected area and requires the Metropolitan City to comply with and ensure compliance with orders issued by the Government of Nepal in the event of a severe disaster.

2.2.1.4 Kathmandu Metropolitan City Heritage-Friendly Building Conservation and Construction Standards and Incentives (Procedure) Act, 2025

This Act has been formulated to establish specific standards for the conservation/renovation, repair, improvement or alteration of external facades, and reconstruction of privately and institutionally owned buildings of historical, archaeological, cultural, and architectural importance within Kathmandu Metropolitan City while maintaining their traditional appearance; to reuse materials from such buildings and use new materials retaining their traditional original character; to provide incentives and encourage property owners to maintain their traditional original style; and to conserve heritage settlements within Kathmandu Metropolitan City. Section 3 provides that the local physical form, social values and norms, and culture of heritage

buildings and settlements shall be preserved, and that changes to the existing physical form and structure shall be avoided as far as possible; where changes are necessary, they shall comply with prevailing national and international heritage conservation norms and required approval procedures. Section 7 provides basic requirements for the construction, reconstruction, and retrofitting of heritage-friendly buildings. In particular, the right-of-way of roads and paths within heritage settlements shall be maintained in accordance with the existing footprint of the settlement, the existing building line shall be maintained along the street or towards the square, as it currently exists, and reconstruction shall not reduce the existing road width, total area, or the size and footprint of existing groups of buildings.

2.2.1.5 Kathmandu Metropolitan City Procedure on Solid Waste Collection and Transportation, 2024

This Procedure has been formulated to provide legal provisions for the community-level collection and transportation of solid waste, with waste segregated at source and waste reduction, reuse, and disposal activities carried out on a sector-wise basis through public-private partnership, procurement of services from the private sector, or an income-based contracting process. Clause 14 requires the Metropolitan City to make available vehicles and equipment for solid waste transportation, monitor and evaluate solid waste collection and transportation activities, conduct awareness programs relating to solid waste management, and use electronic means in all aspects of solid waste collection and transportation. Clause 29 provides that the powers and duties relating to other activities of solid waste management shall remain vested in the Metropolitan City when solid waste collection and transportation are carried out through service providers. These responsibilities include the management of the sale of recyclable and reusable waste, biodegradable waste, final disposal of waste at the landfill site, legacy waste, construction-related solid waste, river-based waste, and electronic waste.

2.2.1.6 Lalitpur Metropolitan City Disaster Risk Reduction and Management Act, 2019

This Act has been formulated to provide for the coordinated and effective implementation of all activities relating to disaster risk reduction and management in order to protect the lives and safety of the general public, as well as public, private and personal property, natural and cultural heritage, and physical infrastructure from natural and non-natural disasters within the Lalitpur Metropolitan City area. Section 8 provides for support to and coordination with Federal and Provincial security agencies mobilized for disaster management activities. Section 9 requires fire brigades, ambulances, and other similar service providers to comply with the instructions issued by the Committee for emergency search, rescue, and relief services. Section 11 requires government offices, non-governmental organizations, local organizations, communities, volunteers, civil society, the private sector, and individuals within the Metropolitan City to provide assistance in disaster management activities. Section 14 provides for compliance with and coordination in the declaration of a disaster-affected area and requires the Metropolitan City to comply with and ensure compliance with orders issued by the Government of Nepal in the event of a disaster of a severe nature.

2.2.1.7 Lalitpur Metropolitan City Solid Waste Management Act, 2019

This Act has been formulated to ensure the proper and effective management of solid waste within Lalitpur Metropolitan City through source reduction, reuse, processing, or disposal of solid waste, and to maintain a clean, healthy, and pleasant environment by reducing adverse impacts on public health and the environment. Section 3 establishes the Metropolitan City as having the primary responsibility for solid waste management. Section 10 provides that the Metropolitan City may designate solid waste management and processing sites for the management and permanent disposal of solid waste collected within its area, subject to the

prevailing environmental laws, and that the operation and management of the solid waste management site of the Metropolitan City shall be carried out in accordance with the prescribed environmental standards.

2.2.1.8 Lalitpur Metropolitan City Land Development Standards, 2019

These Standards have been formulated to ensure planned land development within Lalitpur Metropolitan City while conserving agricultural land suitable for cultivation. Clause 7 provides that land intended for residential roads, open areas, green areas, public areas, community areas, and similar uses may be recommended for land fragmentation after ensuring compliance with urban development standards and verifying the development of necessary infrastructure through on-site inspection. Clause 14 requires physical infrastructure and utilities, including roads, drainage, drinking water, and electricity, to be provided as part of land development plans. Clause 15 provides that individual land may be fragmented for sale or transfer by maintaining roads in accordance with the standards of the Government of Nepal.

2.2.1.9 Bhaktapur Municipality Environment Protection and Pollution Control Act, 2020

This Act has been formulated to preserve the original form of roads, streets, and religious, cultural, and natural heritage in the historic Bhaktapur City listed as a World Heritage Site, maintain cleanliness through environmental protection within the municipal area, and regulate and control noise, visual, and environmental pollution. Section 3 identifies pollution-related offences, including disposal or discharge of solid waste other than at the place and time designated by the Municipality; Pollution of public places, heritage sites, water sources, or the house or land of another person through leakage or discharge of contaminated water (leachate) or sewage generated from solid waste; Haphazard parking of vehicles at intersections and open areas; storage of construction materials and other materials in intersections and open areas without permission; Disposal, placement, accumulation, or discharge of hazardous solid waste in a manner that adversely affects public health; Haphazard disposal, placement, or discharge of chemical waste, industrial waste, health-care waste, or hazardous substances; Operation or use of vehicles and machinery in a manner that generates excessive noise; Hanging or suspending communication and electricity wires other than as prescribed; Operation of production and industrial activities in the World Heritage Area and old urban area in a manner that generates excessive smoke and releases chemical substances; Construction of structures exceeding the height approved by the Municipality; Unauthorized placement of goods and materials on sidewalks and open areas; Haphazard cutting or destruction of trees and plants in riverbank and green areas without the approval of the Municipality; Construction in public squares, roads, and open areas without the permission of the Municipality; and haphazard disposal of debris, dead livestock or poultry, plastic, and solid waste.

2.2.1.10 Bhaktapur Municipality Vehicle Registration and Operation Act, 2019

This Act has been formulated to operate vehicles within the Municipality and surrounding areas to facilitate sanitation and public transportation, and to facilitate, regulate, and manage sanitation and public movement in the city. Section 5 requires every registered vehicle operated under this Act to undergo a mandatory mechanical inspection once every six months. Section 6 provides that the mechanical inspection shall consider the mechanical condition of the vehicle, its length, width, height, construction or physical configuration, pollution that may be caused by the vehicle, and the period during which the vehicle may be operated. Section 7 requires Bhaktapur Municipality to maintain an updated record of every vehicle registered under the Act, including the name and address of the vehicle owner, date of vehicle registration, registration number, name of vehicle manufacturer, model, year, engine number, chassis

number, type of vehicle, weight, and other relevant details. The updated details shall be forwarded to the nearest Transport Management Office, District Administration Office, Metropolitan Police Range, Bhaktapur, and Metropolitan Traffic Police Range, Bhaktapur for information.

2.2.1.11 Bhaktapur Municipality Physical Infrastructure and Construction Standards Regulation, 2004

This Regulation has been formulated with the concept of conserving and promoting the World Heritage Site and old City Area as cultural and tourist areas and carrying out planned urbanization in the new developing areas outside these areas. Clause 3 provides that construction in the old Municipal Area shall be permitted only in a manner that does not adversely affect heritage sites of archaeological and cultural importance, such as Patis, Pauwas, Satals, Temples, Chaityas, Bahas, Dyochhes, Stone Spouts, Ponds, etc. Solid waste and construction waste shall be disposed of only at the place and time designated by the Municipality or the concerned authority, and construction materials shall not be piled on public roads, footpaths, lanes, or squares in a manner that causes obstruction to neighbours and the general public. In the extended residential area, a setback shall be maintained in accordance with the prescribed road standards. In the commercial area, except for the Araniko Highway, a 2-meter setback shall be maintained after the RoW on other roads for which separate names and standards have been determined. In other cases, the setback shall be maintained as prescribed, and in the case of locations where two roads meet, the standards prescribed by the Department of Roads shall be applicable.

2.2.1.12 Madhyapur Thimi Municipality Disaster Risk Reduction and Management Act, 2022

This Act has been formulated to ensure the coordinated and effective implementation of disaster risk reduction and management activities and to protect lives, public, private and personal property, natural and cultural heritage, and physical infrastructure from natural and non-natural disasters within Madhyapur Thimi Municipality. Section 9 provides for the support and coordination of the Municipal Executive with federal and provincial security agencies mobilized for disaster management, provision of necessary materials available with the Municipality to security agencies for search and rescue operations, and mobilization of the Municipal Police for disaster response. Section 10 specifies the functions, duties, and powers of fire brigades, ambulances, and other service providers, including compliance with the directions of the committee during emergency search, rescue, and relief operations, authority for fire brigade service providers to enter any place and use the means and resources of persons or organizations as required for emergency operations, and operation and management of the municipal fire brigade in accordance with approved procedures and standards. Section 12 requires government offices, the Red Cross, non-governmental organizations, local organizations, communities, volunteers, businesses, and individuals within the Municipality to assist in disaster management activities, including data collection, damage assessment, disaster risk reduction, rehabilitation and reconstruction, raise public awareness, capacity development, emergency simulation exercises, disaster management training, and search, rescue, and relief distribution. Section 15 provides for compliance and coordination when the Federal Government declares an area within the Municipality as a disaster-affected area due to a severe disaster, including compliance with government orders, coordination by the Committee with concerned persons, institutions, and officials for implementation of such orders, and support for the dissemination of information regarding the declared disaster-affected area.

2.2.1.13 Madhyapur Thimi Municipality Basic Sanitation and Solid Waste Management Act, 2023

This Act has been formulated to promote awareness of basic health, establish systems for source segregation, reduction, reuse, processing and disposal of natural and human-generated solid waste, maintain cleanliness in houses, courtyards, neighbourhoods and roads, minimize adverse impacts on public health and the environment, and promote a clean, healthy and environmentally friendly municipality through the participation of the Municipality, private sector and community. Section 9 provides for the designation and management of solid waste management and processing sites, including the selection, acquisition or leasing of suitable land and, where necessary, requests to the Federal and Provincial Governments for the provision of suitable land. It allows such facilities to be extended to the ward level and sanitation collection and processing centres to be operated on a commercial basis, subject to prescribed provisions and standards. The Section requires biodegradable waste to be converted into compost with measures to control odour and provides for prescribed standards for the operation of sanitation collection and processing centres. It also allows the Municipality to coordinate with other local levels for the joint use of solid waste management sites subject to mutual written consent and conditions. The Municipality may, where necessary, declare solid waste management sites as environmentally sensitive areas, restrict the unauthorized use of such areas by livestock, birds, wildlife and humans, prohibit unauthorized access, solid waste disposal, and the extraction of soil, stone, gravel and sand, implement standards for environmental protection and proper management of such areas, and prohibit unauthorized entry into or disposal of solid waste within such sensitive areas, with violations subject to prescribed fines.

2.2.1.14 Madhyapur Thimi Municipality Regulation (Standards) relating to Physical Infrastructure Development and Construction, 1999

This Regulation (Standards) has been formulated with the objective of developing and expanding a physically safe, environmentally clean and beautiful city, ensuring the standards of buildings to be constructed within the municipal area, including the classification of roads, and developing and expanding a well-managed and planned city. Clause 40 requires that during any construction work on a road, necessary barricades and road signs shall be provided and necessary measures shall be adopted to prevent possible accidents. Clause 48 requires industries and businesses operating or to be established within the municipal area to make necessary arrangements to ensure that the environment is not polluted during their operation. Clause 49 requires a healthy environment to be maintained in buildings where industries and businesses are operated, in such a manner that no adverse effects are caused to the health of workers. Clause 50 prohibits the disposal of waste generated from industries, businesses, and residential buildings in public places. Clause 51 provides that chemically contaminated water discharged from any industry or factory shall not be discharged into rivers, streams, or canals without treatment. Clause 52 requires necessary arrangements to be made during construction activities to prevent environmental pollution and prohibits, without the approval of the Municipality, the construction of any drainage system within the municipal area in such a manner as to cause pollution of the Manohara or Hanumante Rivers.

2.2.1.15 Madhyapur Thimi Municipality Gender Equality and Social Inclusion Mainstreaming Strategy, 2024

This Strategy has been formulated to localize and implement national policies and laws and international commitments relating to gender equality and social inclusion at the local level. Clause 4, Rationale of the Strategy, states that, as provided for in the Constitution of Nepal, the Local Government Operation Act, 2017 recognizes the need for local governments to

localize and implement the specified national policies and laws and international commitments within their legal jurisdiction and responsibilities. The Strategy provides guidance for localizing the provisions relating to gender equality and social inclusion and ensuring the meaningful participation of targeted groups in the mainstream of development; facilitates the prioritization, formulation, and implementation of plans based on the needs and demands of targeted groups, including disaggregated data; contributes to establishing a just society by eliminating discriminatory practices, malpractices, and all forms of discrimination and providing equal access and opportunities for achieving the Sustainable Development Goals; establishes a basis for fully adopting, from the local level, the national and international provisions endorsed by the Government of Nepal and adopting a governance system that is gender-equality and social-inclusion-friendly; encourages the formulation and implementation of gender-responsive plans and the adoption of gender equality and social inclusion-friendly practices by maintaining uniformity in the conceptual understanding of gender equality and social inclusion and developing coordination and partnership; and provides guidance and encouragement through regular coordination and cooperation among all public, private, and social organizations for developing gender-sensitive practices and formulating gender-friendly policies, laws, and plans and implementing programs accordingly. Clause 5, Vision, Mission and Goal, sets the vision of building a municipality free from discrimination and inclusive in terms of gender and social inclusion and an egalitarian, prosperous, and just society free from caste and gender discrimination; the mission of eliminating all forms of discrimination based on gender, class, caste, ethnicity, and other grounds; and the goals of reducing poverty by integrating excluded groups into the mainstream through equitable and inclusive development and bringing changes in the existing values, norms, traditions, and practices relating to gender equality and social inclusion while addressing and mainstreaming the issues of disadvantaged groups and communities.

2.2.1.16 Madhyapur Thimi Municipality Standards for Skills and Technology Transfer for the Preservation and Promotion of Culture, 2025

This Standard has been formulated to make the provision of skill training and technology transfer along with physical materials to various cultural groups within the municipal area, using the budget allocated by the Federal Government, Provincial Government, and the Municipality for the conservation and promotion of culture, more effective, systematic, and transparent in accordance with the changing times. Clause 3, Objectives, focuses on promoting tourism by preserving and promoting culture within the Municipality; developing skills and transferring the necessary physical materials and technologies for the conservation, promotion, and enhancement of intangible heritage; carrying out necessary studies, research, and documentation; and establishing necessary standards to make skill development and technology transfer activities transparent, accountable, and result-oriented.

2.2.1.17 Suryabinayak Municipality Forest, Environment and Natural Resources Conservation Act, 2022

This Act has been formulated to protect the fundamental right of citizens to live in a clean and healthy environment, ensure the proper utilization and sustainable management of natural resources, maintain a balance between environment and development, and conserve forests, the environment, natural resources, and biodiversity, while establishing legal provisions for the implementation of the powers of the local level relating to forests, environment, natural resources, and biodiversity. Section 3 assigns the Municipality the primary responsibility for protecting forests, forest products, and the environment within its jurisdiction and recognizes the duty of every citizen to contribute to the protection and promotion of forests and the environment and the creation of an environmentally friendly society. Section 4 empowers the Municipality to identify and designate areas requiring environmental protection as Special Areas for Forest and Environmental Protection, open areas, green areas, forest areas,

zoological parks, environmentally sensitive areas, or disaster-affected areas, including in relation to road, building, river management, and other physical infrastructure construction, in coordination with the concerned Federal and Provincial Government agencies. Section 5 provides that the protection of heritage within the municipal area is the duty of the Municipality, citizens, and concerned agencies and allows coordination and partnership with government agencies and local communities for heritage protection. Section 6 requires proponents to conduct environmental assessments of proposals in accordance with prevailing laws and standards, submit the Brief Environmental Assessment Report or Initial Environmental Examination Report to the Municipality for approval of proposed development or construction activities or projects falling within the jurisdiction of the local level, and conduct a detailed analysis of potential adverse environmental impacts and alternatives for their mitigation and recommend the most appropriate alternative for implementation along with the basis and reasons for its implementation. Section 20 assigns the Municipality responsibility for managing and ensuring the management of solid waste within the Municipality. Section 35 assigns the Municipality responsibility for identifying, documenting, and protecting knowledge, skills, practices, and other matters possessed by individuals or groups within local communities in relation to biodiversity.

2.2.1.18 Suryabinayak Municipality Water Resources Act, 2021

This Act has been formulated to provide for the proper utilization, conservation, management, and development of water resources, ensure adequate clean and safe drinking water to the community, prevent environmental and other harmful effects arising from such utilization, and keep water resources free from pollution. Section 7 allows the Municipality to utilize or develop water resources and to acquire water resources utilized by any person, together with related land, buildings, equipment, and structures, and undertake necessary development, expansion, operation, and management for broad public use.

2.2.1.19 Suryabinayak Municipality Disaster Risk Reduction and Management Act, 2018

This Act has been formulated to ensure the coordinated and effective implementation of activities related to disaster risk reduction and management for the protection of lives, public, private and personal property, natural and cultural heritage, and physical structures from natural and non-natural disasters within Suryabinayak Municipality. Section 8 requires the Municipal Executive to provide support to and coordinate with Federal and Provincial security agencies mobilized for disaster management and to mobilize Municipal Police and employees for disaster response, while providing necessary materials available with the Municipality for search and rescue operations. Section 9 requires fire brigades, ambulances, and other service providers to comply with the Committee's instructions for emergency search, rescue, and relief and authorizes fire brigade service providers, as directed by the Committee, to enter any place and utilize the means and resources of any person or organization during emergency operations. Section 11 requires government offices, non-governmental organizations, local organizations, communities, volunteers, civil society, the private sector, and individuals within the Municipality to support disaster management activities, including data collection, damage assessment, relief, rehabilitation and reconstruction, public awareness, capacity building, emergency simulation exercises, training, search, rescue, and relief distribution. Section 14 requires the Municipality to comply with and coordinate the implementation of orders issued by the Government of Nepal when an area within the Municipality is declared a disaster-affected area and to support and coordinate the dissemination of information concerning such areas.

2.2.1.20 Suryabinayak Municipality Land Use Procedure, 2022

This Procedure has been formulated to make necessary provisions for achieving maximum and sustainable benefits through the classification, proper utilization, and effective management of land within the area of Suryabinayak Municipality. Section 11 provides for the functions, duties, and powers of the Local Land Use Council, including: approving the Municipality's land use plan; collecting, analyzing, and utilizing land-related records; updating land use zoning maps; classifying sub-zones as necessary; preparing and implementing procedures and standards for the implementation of the land use plan; monitoring its implementation; recommending changes in land use with clear grounds and reasons; taking action where land is used for purposes other than the designated use; protecting religious, historical, cultural, archaeological, public, and community sites; and formulating and implementing necessary land use policies. Section 13 provides for the updating and modification of land use zoning maps and details based on changes in geographical conditions and other local needs and circumstances and provides for necessary technical assistance from the Department of Survey upon request by the Municipality.

2.2.1.21 Suryabinayak Municipality Road Maintenance Directive, 2018

The main objective of this Directive is to develop a system for the effective and planned maintenance of roads within the municipal area and to facilitate the planning of maintenance works, implementing them on the basis of priorities, and estimating the cost of such works. Other objectives include systematically operating resources received from the Central Government, Provincial Government, Road Board Nepal, and other sources for the Road Maintenance Fund; assisting in mobilizing local resources through participation and coordination with the Municipality and concerned groups; assisting in identifying and prioritizing maintenance works to be carried out on rural roads and preparing the annual municipal road maintenance program; facilitating and systematizing activities such as monitoring and inspection of maintenance works; and bringing uniformity in the process of establishing and operating the Maintenance Fund in the Municipality. Road maintenance works shall be carried out to achieve the following objectives: maintaining uninterrupted road service by properly maintaining roads and keeping them in a condition that does not cause obstruction or difficulty to the operation of vehicles; reducing vehicle operating costs and travel time and making travel more comfortable; reducing the possibility of accidents arising from inadequate maintenance, narrowing of road width, and deterioration of slopes along roads; and reducing the need for costly and complex maintenance and reconstruction works through regular minor maintenance works.

2.2.2 Gender Equality, Disability, and Social Inclusion (GEDSI)

The Constitution of Nepal lays a strong and comprehensive foundation for GEDSI in Nepal, with a clear vision of an inclusive state that guarantees the right to equality for all its citizens, as articulated in the Preamble of the Constitution:

“Recognizing the multi-ethnic, multi-lingual, multi-religious, multi-cultural, and diverse regional characteristics, we are committed to ending all forms of discrimination and oppression created by the feudalistic, autocratic, centralized, unitary system of governance. Our resolve is to build an egalitarian society founded on the principles of proportionality, inclusivity, and participation, in order to ensure economic equality, prosperity, and social justice. We are determined to eliminate discrimination based on class, caste, region, language, religion, and gender, as well as all forms of caste-based untouchability.”

The Gender Equality and Social Inclusion (GESI) Operational Guidelines, 2017, of MOPIT provide the specific mandate for GESI mainstreaming in the transport sector. The Guideline provides technical direction to MOPIT and its associated departments to implement gender

equality and social inclusion in all aspects of its policies, institutions, and program/project processes. The Guideline ensures that a GESI-responsive approach is adopted to improve the access of women, the poor, and the excluded to resources, opportunities, and benefits derived from the Ministry's programs and services. The SEA must evaluate the MP's components against these guidelines, particularly concerning access, safety, and participation of disadvantaged groups. Furthermore, the Fifteenth Plan (Fiscal Year 2019/20 – 2023/24) explicitly states the goal of enhancing the access and use of public transport for vulnerable groups including women, children, and people with disabilities.

2.2.3 Climate Change Goals and Policies

The MP is a significant long-term planning document and must align with Nepal's national and international climate commitments. National Climate Change Policy, 2019, prioritises environment-friendly technology in transportation and seeks to build a climate-resilient society. Further, in fulfilment of the country's commitments under the Paris Agreement, the Government of Nepal submitted the Long-Term Low Greenhouse Gas Emission Development Strategy, to the United Nations Framework Convention on Climate Change in 2021. Based on this, the Nationally Determined Contribution (NDC) 3.0, published in May 2025 set the specific, quantifiable targets and actions for the 2025–2035 period. Transport-sector Mitigation Targets for 2025 are presented in Table 2.2-1 below. It is important to note all Transport sector mitigation targets are conditional, meaning that Nepal can only implement or fully achieve them if it receives international support (grants, concessional loans, foreign direct investment, and technical assistance).

Table 2.2-1 Transport Sector Targets in NDC 3.0

No.	Target	Reference Status (2024)	Costs (USD) and Conditionality
1	In 2030 and 2035, increase sales of battery electric vehicles (BEVs) to 90% and 95% for all private passenger vehicles (including 2-wheelers), and to 70% and 90% for all public passenger vehicles respectively.	12.38% of private passenger vehicle sales were BEVs (46% of four-wheelers and 9.6% of two-wheelers). 29% of public passenger vehicle sales were BEVs.	By 2035: 9.2 billion conditionals. Of this, by 2030: 4.45 billion conditionals.
2	Build and operate at least 50 km by 2030 and 100 km by 2035 of integrated electric bus, trolley and light rail transit system in Kathmandu Valley.	0 km	By 2035: 12.75 billion conditionals. Of this, by 2030: 1.5 billion conditionals.
3	Build and operate 200 km by 2030 and 300 km by 2035 of the electric rail networks to support public commuting and mass transportation of goods (freight).	0 km. Note: 112 km of railway trackbed laid of around 1000 km planned length. 52 km operational using diesel-electric multiple units.	By 2035: 5.55 billion conditionals. Of this, by 2030: 3.7 billion conditionals.

Source: Nationally Determined Contribution (NDC) 3.0, May, 2025

2.2.4 Policies and Plans Related to Urban Development

2.2.4.1 National Urban Development Strategy, 2017

The National Urban Development Strategy (NUDS) is a document outlining Nepal's urban development sector strategy, drafted by the Ministry of Urban Development (MOUD) and approved and published by the government in 2017. This strategy is expected to enhance the national urban policy vision and facilitate periodic review and appropriate changes, while also

providing strategic directions for the Ministry of Urban Development. I The objectives of the strategy are as follows:

- To develop a medium-to-long-term strategic vision for desirable and realistic urban systems at the national and regional levels
- To establish benchmarks and standards for urban infrastructure, urban environment, urban planning and management, and urban governance
- To identify challenges, clarify priorities, and define investments, taking into account factors such as urban infrastructure, the urban environment, resource potential, and comparative advantages
- To identify key issues with respect to investments for urban development and strategies to augment urban financing and implementation
- To suggest institutional framework and legal instruments to facilitate implementation and monitoring of the National Urban Policy (NUP) and national urban development strategies

2.2.5 Related Plans for City Development and Urban Planning

2.2.5.1 Kathmandu Valley Strategic Development Master Plan (2015–2035) and Vision 2035

Since around 2015, KVDA has been developing the Kathmandu Valley 20-Year Strategic Development Master Plan (2015–2035). The Kathmandu Valley region consists of three districts: Kathmandu, Lalitpur, and Bhaktapur. The Kathmandu Valley covers an area of 648 km² and experienced a rapid population increase from approximately 1.6 million in 2001 to about 2.47 million in 2011. Vision 2035 and Beyond, prepared under the name of the KVDA Development Commissioner and published in 2017, defines the development vision and mission that form the backbone of the Strategic Development Master Plan (SDMP) as follows:

- Development Vision: To establish the Kathmandu Valley as a liveable city where nature, society, and culture coexist.
- Mission: To establish the Kathmandu Valley as a safe, clean, orderly, prosperous, and elegant capital city

2.2.5.2 Kathmandu Valley Master Plan

KVDA is currently formulating the Urban Development MP with 2045 as the target year. The development vision and planning frame shall be prepared by paying attention to the future plans (population, land use, etc.).

2.2.6 Heritage Impact Assessment (HIA) Framework of Archaeological Significance

2.2.6.1 Heritage Impact Assessment in Nepal: Establishing HIA

Heritage Impact Assessment (HIA) is a tool to ensure that development and conservation activities around heritage properties do not cause unacceptable negative impacts. It requires legal justification and integration into official procedures (Department of Archaeology [DoA], 2021). HIA has been promoted by the World Heritage Committee and advisory bodies International Council on Monuments and Sites (ICOMOS) and International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), and is established for World Heritage as well as all identified cultural heritage sites (DOA, 2021).

HIA is in the process of being embedded in the legislation of DoA through the draft of the sixth amendment of the Ancient Monument Preservation Act (AMPA 1956), which will only mention the establishment of HIA while leaving the details to regulations, giving the Department the authority to require HIA where necessary. The HIA process has three main components: defining the need for HIA, carrying out HIA, and monitoring and enforcing HIA. Its objectives include providing a permit system to control impacts of proposed projects and activities on heritage, mitigating past or ongoing impacts through assessments and recommendations for rectification, and planning measures to control the risk of future projects to safeguard heritage sites, monuments, historic buildings, and cultural objects (DOA, 2021).

The involved parties in the HIA process include the Actor (the person or legal body that carries out actions that could impact heritage), DOA as the focal authority under the Ministry of Culture, Tourism and Civil Aviation, represented by the HIA Committee chaired by the Director General of DOA, consultants listed in the roster of DOA, and advisory bodies such as ICOMOS Nepal for World Heritage properties. Once the need for HIA is decided, DOA notifies the Actor, who submits a Detailed Project Report. DOA assesses the project/activity based on defined indicators, and the Actor pays the required fees, which forms the basis for the selection of consultants. Thus, the HIA process includes submission of the Detailed Project Report, selection of consultants by DOA, preparation and review of the HIA, and a recourse mechanism for Actors (DOA, 2021).

2.3 Ministries Related to Environmental and Social Considerations in Nepal

2.3.1 Ministry of Infrastructure Development (MOID)

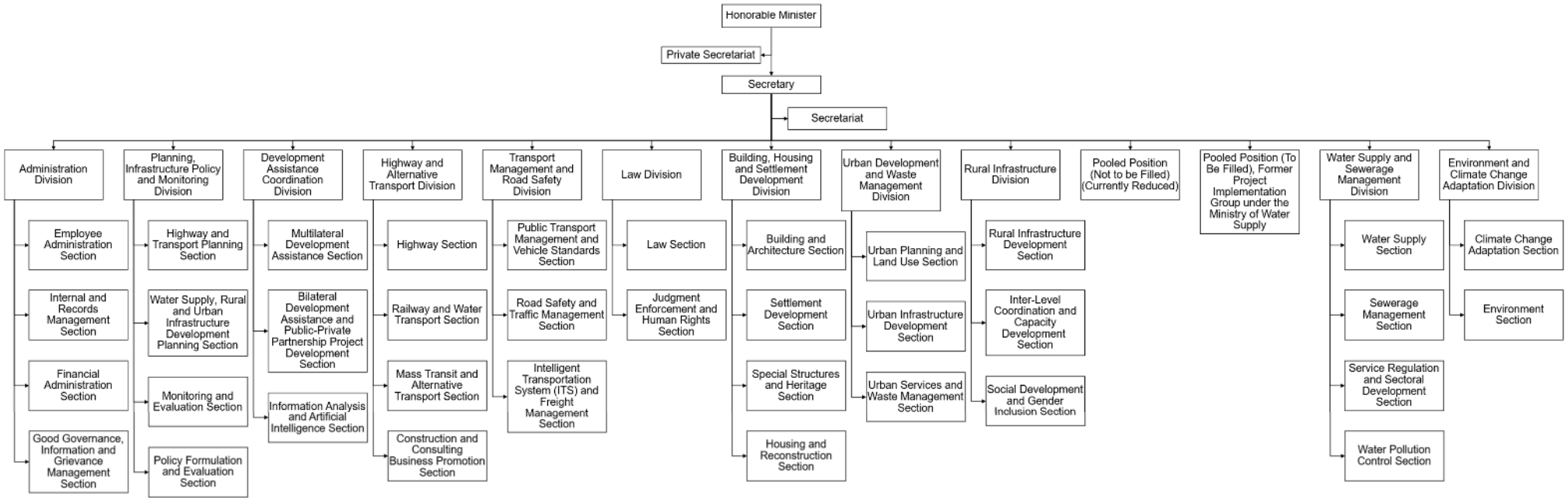
The organizational chart of MOID is shown in Figure 2.3-1. The organizational structure of MOPIT positions the Secretary under the Minister, with Joint Secretaries assigned to the four divisions listed below:

- Administrative Division
- Planning, Infrastructure Policy and Monitoring Division
- Development Assistance Coordination Division
- Highway and Alternative Transport Division
- Transport Management and Road Safety Division
- Law Division
- Building, Housing and Settlement Development Division
- Urban Development and Waste Management Division
- Rural Infrastructure Division
- Water Supply and Sewerage Management Division
- Environment and Climate Change Adaptation Division
- Pooled Position (not to be filled)
- Pooled Position (to be filled)

Reviews related to Environmental Impact Assessment (EIA), Initial Environmental Examination (IEE) and Brief Environmental Study involve reports compiled by relevant departments within MOID, such as the Department of Roads (DOR), Department of Railways (DORW), Department of Transport Management (DOTM) and Nepal Shipping Office being sent to MOID . These reports are then scrutinized, followed by interactions with the Ministry of Agriculture, Forests and Environment (MOAFE) before approval is granted.

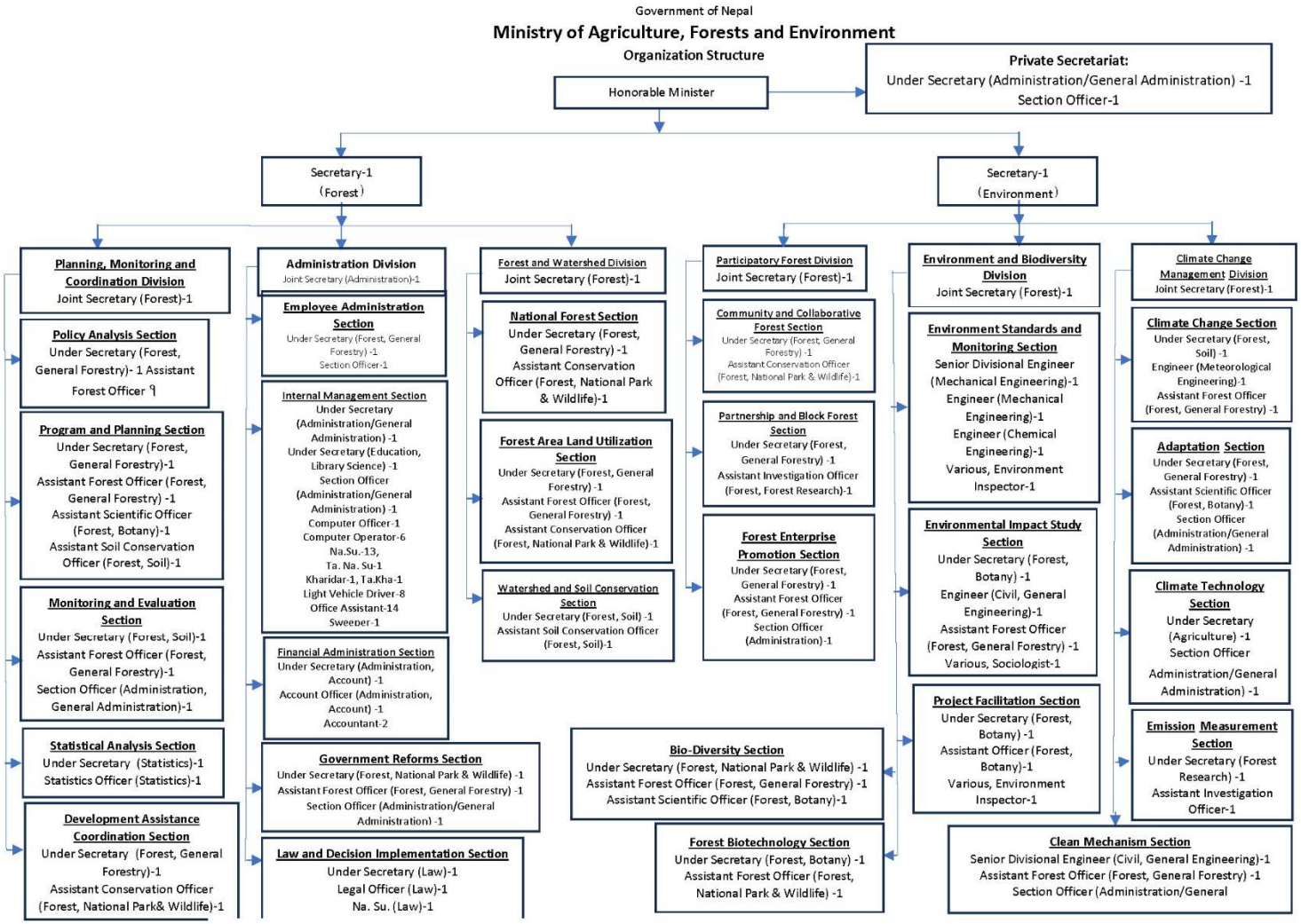
2.3.2 Ministry of Agriculture, Forests and Environment (MOAFE)

The organizational chart of MOAFE is shown in Figure 2.3-2. The Brief Environmental Examination and Initial Environmental Examination reports for projects related to MOID are approved by MOID, whereas the EIA Reports are approved by MOAFE.



Source: http://www.mopit.gov.np (Accessed Date: September 15, 2026)

Figure 2.3-1: Modified Organizational Structure of MOID



Source: https://www.mofe.gov.np (Accessed Date: September 15, 2026)

Figure 2.3-2: Organizational Structure of MOAFE

2.4 JICA Guidelines for Environment and Social Considerations

The gap analysis between Nepal's legal framework for environmental impact assessment and land acquisition/resettlement and the Japan International Cooperation Agency Guidelines for Environmental and Social Considerations (January 2022) (hereinafter referred to as JICA ESC GL) regarding EIA are shown in the following table, along with proposed countermeasures for full-scale cooperation.

Table 2.4-1 Gap Analysis and Proposed Countermeasures Regarding Environmental and Social Considerations for EIA

S.No.	Items	JICAGL Policy (Attachment 1 and II.2.1)	Country System (EPA 2019)	Gaps / Policy to fill up gaps in this Study
1	Basic Principle	a. Environmental and social impacts caused by projects must be assessed and examined at the earliest possible planning stage. Alternatives or mitigation measures must be examined, in order to avoid such impacts as much as possible, and to minimize, reduce or mitigate them when such avoidance is impossible. The result of the examinations must be reflected into the project plan. b. Such examinations must be endeavored to include an analysis of environmental and social costs and benefits in the most quantitative terms possible, as well as a qualitative analysis, and to be in a close harmony with the economic, financial, institutional, social, and technical analyses of projects. c. The findings of the examination of environmental and social considerations, including alternatives and mitigation measures, must be documented as an independent document or as a part of other documents. Environmental assessment reports must be prepared for projects with potential significant impacts. d. For projects which may have significant impacts in particular, or for controversial projects, a committee of experts may be formed so that projects may seek their opinions, in order to increase accountability. (Refer to the same item in JICAGL Attachment 1)	・ The proponents of specific projects must conduct an environmental assessment before starting work. (EPA, 2019 Section 3) ・ Prepare environment management plan. (EPA, 2019 Section 10)	There is no significant gap.
2	Examination of Measures	a. Multiple alternatives must be examined in order to avoid or minimize adverse impacts by the project and to choose better project options in terms of environmental and social considerations. In the examination of measures, priority is to be given to avoidance of environmental impacts. When this is not possible, minimization, reduction, and then mitigation of the impacts must be considered, in accordance with the mitigation hierarchy.	The Environment Protection Rules (EPR), 2020, outline essential legal requirements and procedure (rule 3), Public hearing (rule 6) Recommendation letter from local bodies and report format (Rule 8), for environmental assessments of	There is no significant gap.

S.No.	Items	JICAGL Policy (Attachment 1 and II.2.1)	Country System (EPA 2019)	Gaps / Policy to fill up gaps in this Study
		Compensation measures must be examined only when significant impacts still remain even with the aforementioned measures. b. Appropriate plans and systems for measures, such as monitoring plans and environmental management plans, must be prepared. The costs of implementing such plans and systems, and the financial methods to fund such costs, must be determined. For projects with particularly significant impacts, detailed environmental management plans must be prepared.	development projects in Nepal.	
3	Impacts to be assessed	a. The impacts to be assessed with regard to environmental and social considerations include impacts on human health and safety, as well as on the natural environment, that are transmitted through air, water, soil, waste, accidents, water use, climate change, biodiversity, and ecosystem services, including transboundary or global scale impacts. These also include social considerations such as: Migration of population including involuntary resettlement, local economy such as employment and livelihood, utilization of land and local resources, social institutions such as social capital and local decision-making institutions, existing social infrastructures and services, vulnerable social groups such as poor peoples and indigenous peoples, equality of benefits and losses and equality in the development process, gender, children's rights, cultural heritage, local conflicts of interest, infectious diseases such as HIV/AIDS, and working conditions including occupational safety. b. In addition to the direct and immediate impacts of projects, derivative, secondary, and cumulative impacts as well as impacts associated with indivisible projects are also to be examined and assessed to a reasonable extent. It is also desirable to consider the impacts through a project life cycle. (Refer to the same item in JICAGL Attachment 1)	The proponent shall make detailed analysis of environmental and social considerations which include impact on human health and safety, as well as on the natural environment, that are transmitted through air, water, soil, waste, flora and fauna. (Rule 7 and Annex 11 of EPR, 2020) In addition, the Environmental and Social Management Framework 2025 DOR provides guidelines chapter 5 describes impact assessment and mitigation measures.	There is no significant gap.
4	Compliance with Laws, Standards, and Plans	a. Projects must comply with the laws, ordinances, and standards related to environmental and social considerations established by host country governments, including local governments. Projects must also conform to the environmental and social consideration policies and plans of the host country governments. b. In principle, Projects must be	The Environment Protection Act (EPA), 2019, and the Environment Protection Regulation (EPR), 2020, outline essential legal requirements for environmental assessments of development projects	[Gap] ・National Road Standard and National Bridge Standard do not cover criteria for design and construction of climate resilient structures. ・National

S.No.	Items	JICAGL Policy (Attachment 1 and II.2.1)	Country System (EPA 2019)	Gaps / Policy to fill up gaps in this Study
		undertaken outside of areas that are specifically designated for conservation of nature or cultural heritages by the host country governments, unless the main purpose of the Projects is to promote or restore the protection of such areas. Also, projects shall not cause significant adverse impacts on such designated conservation areas.	in Nepal. The Environmental and Social Management Framework 2025 DOR provides guidelines on the integration of the environmental and social assessment process in road project cycles.	design standards for tunnel and flyover project design and constructions are not available. {Measures to fulfil the gap} ・Revision of Nepal road Standard and National Bridge Standard and accommodate factors influencing climate change impacts in roads and bridges. ・Rely on international standards applicable to the local conditions.
5	Social Acceptability	a. Projects must be adequately coordinated so that they are accepted in a socially appropriate manner for the countries and areas where the projects are planned. For Projects with potentially significant environmental and social impacts, sufficient consultations with local stakeholders, such as local residents, must be conducted via disclosure of information at an early stage, at which time alternatives for project plans are examined. The outcome of such consultations must be incorporated into the project plans.	The Environment Protection Act (EPA), 2019, and the Environment Protection Rules (EPR), 2020, outline essential legal requirements, including alternative analysis and mitigation measures, for environmental assessments of development projects in Nepal. The Environmental and Social Management Framework 2025 DOR emphasizes the importance of engaging with stakeholders throughout the project lifecycle.	There is no significant gap.
		b. Appropriate considerations must be given to vulnerable social groups, such as women, children, elderly peoples, people in poverty, indigenous peoples, persons with disabilities, refugees, internally displaced persons, and minorities. Such vulnerable social groups are susceptible to environmental and social impacts and may have little access to decision-making processes within society. (Refer to the same item in JICA-GL	The Environmental and Social Management Framework 2025 DOR provides guidelines on the integration of the environmental and social assessment process in road project cycles.	

S.No.	Items	JICAGL Policy (Attachment 1 and II.2.1)	Country System (EPA 2019)	Gaps / Policy to fill up gaps in this Study
		Attachment 1）		
6	Climate Change	a. For projects that are expected to generate more than a certain amount of greenhouse gas emissions, the total amount of greenhouse gas emissions will be estimated and disclosed before the project implementation.	Chapter 5.3.4 of the Environmental and Social Management Framework 2025 DOR provides guidelines on the integration of the environmental and social assessment process including adequate mitigation measures for climate change in road project cycles.	[Gap] •No provision to address climate change and disaster related issues and impacts There is no significant gap. {Measures to fulfil the gap} ・Need a separate guideline to address climate change impacts and deal with disaster related impacts for DoR projects. ・Rely on international standards and good practices applicable to local conditions.
7	Biodiversity	a. Projects must not involve significant conversion or significant degradation of critical habitats or critical forests. b. Illegal logging of forests must be avoided. Project proponents need to obtain logging permits from regulatory agencies and are encouraged to obtain forest certifications for forestry projects, in order to ensure the prevention of illegal logging. (Refer to the same item in JICA-GL Attachment 1）	Environment Protection Regulation (EPR), 2020, Rule 7 (5) Annex- 11 explain about report format including impact to bio diversity and their mitigation measures for development projects in Nepal.	There is no significant gap.
8	Involuntary Resettlement and Loss of Livelihood	a. Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. If avoidance is not possible even after such examination, effective measures to minimize impacts and to compensate for losses must be taken upon agreement with the affected people.	Section 10 (2) of the Environment Protection Act (EPA), 2019, mandates to prepare EMP with negative impact mitigation measures for the project Land Acquisition Act (2019) and Land Acquisition, Rehabilitation and Relocation Policy （2015） Clause 3 of the Land Acquisition Act states that any asset that is required for public purposes shall be acquired by providing compensation. Compensation	The following gaps are identified ・No provision for RAP preparation ・No provision for non-cash compensation options such as land-for-land and replacement homes, ・Valuation of lost assets considers depreciation ・No provision of compensation for non-titleholders (encroachers and squatters).

S.No.	Items	JICAGL Policy (Attachment 1 and II.2.1)	Country System (EPA 2019)	Gaps / Policy to fill up gaps in this Study
			Fixation Committee shall establish the Compensation rates. Guthi Corporation Act, 2033 (1976). Section 42 of this Act states that Guthi land (religious trustland) acquired for the purpose of the development shall be replaced with other land, than compensated in cash. Compensation shall be provided of loss of crop damaged and income.	·No provision of displacement allowances. In line with JICA Guidelines for Environmental and Social Considerations and ESMF, RAP including replacement cost will be prepared.
		b. Project affected people, such as people to be resettled involuntarily and/or people who may lose their livelihoods by the project, must be provided sufficient compensations and supports by the project proponents in a timely manner. Compensations must be calculated at full replacement cost as much as possible and provided in advance. Project proponents must make efforts for the affected people to improve or at least restore their standards of living, income opportunities and production levels to the pre-project levels. Measures to achieve this may include providing land or monetary compensations for losses of land or assets, supporting for alternative sustainable livelihood, supporting for expenses necessary for relocation, and supporting for re-establishment of communities at resettlement sites.	Land acquisition Act 1977 mandates to make necessary acquisition and compensation for other losses. Land acquisition Act 1977 does not specify about the provision of mandatory replacement cost. Therefore, ESMF strongly recommended that: Practical provisions must be made for the compensation for all lost assets to be made at replacement cost without depreciation or reductions for salvage materials. Efforts must be made to assess the real replacement costs of land to the extent possible. A procedure should be established for determining compensation rates accurately plus rigorous efforts to assess the replacement costs and market rates for all assets, including labor costs for construction.	
		c. Compensation standards are disclosed and consistently applied. The project affected persons need to be aware of the compensation standards. In principle, the contents	ESMF regulated RAP preparation and disclosed it to the PAPs	

S.No.	Items	JICAGL Policy (Attachment 1 and II.2.1)	Country System (EPA 2019)	Gaps / Policy to fill up gaps in this Study
		of the individual compensation to be agreed are explained to the project affected persons in writing, and the project affected persons can confirm the contents at any time.		
		d. Appropriate participation of the project affected people and their communities must be promoted in the planning, implementation and monitoring of measures against involuntary resettlement and loss of livelihood.		
		e. For projects that result in large-scale involuntary resettlement, a Resettlement Action Plans (RAP) must be prepared and made available to the public prior to the resettlement and provision of compensation and support. In preparing the RAP, consultations must be held with the project affected people and communities, based on sufficient information made available to them in advance. When consultations are held, explanations must be given in languages and forms that are understandable to the project affected people. It is desirable that the RAP includes elements laid out in the Environmental and Social Standard (ESS) 5 of the World Bank's environmental and social policies. (Refer to the same item in JICA-GL Attachment 1)		
9	Indigenous Peoples	a. Any adverse impacts that a project may have on indigenous peoples are to be avoided when feasible by exploring all viable alternatives. If avoidance is not possible even after such examination, effective measures for indigenous peoples must be taken to minimize the impacts and to compensate for the losses.	There is no clear provision to avoid a project if it may have adverse impacts on indigenous people according to EPR, 2020. National Foundation for the Development of Indigenous Nationalities Act (2002), ILO Convention 169 (2007) The GoN encourages including and considering IPLC's concerns in each and every development and infrastructure programs and formulating a plan or mechanism to incorporate income generation program targeted to IPLC.	Though there are following gaps, but there is no affected indigenous people in this project. ・No provision of IPPF/IPDP ・The GoN encourages 'development programs to incorporate income generation schemes for IPs, ・The provision of FPIC and broad community support in relation to IPs is absent. Nonetheless, the GoN has ratified ILO 169 and the United Nations Declaration of
		b. When projects may have adverse impacts on indigenous peoples, all of their rights in relation to land and resources must be respected in accordance with the spirit of the	But if the proposed project will have impact on indigenous people, compensation shall	

S.No.	Items	JICAGL Policy (Attachment 1 and II.2.1)	Country System (EPA 2019)	Gaps / Policy to fill up gaps in this Study
		relevant international declarations and treaties, including the United Nations Declaration on the Rights of Indigenous Peoples. Efforts must be made to obtain the Free, Prior, and Informed Consent (FPIC) of the affected indigenous peoples.	be provided for their losses.	Rights of Indigenous People (UNDRIP). ・The GoN is in the process of preparing National Action Plan to implement these international commitments.
		c. Measures for the affected indigenous peoples must be prepared as an Indigenous Peoples Plan (IPP), which may constitute as a part of other documents for environmental and social considerations, and must be made public in compliance with the relevant laws and ordinances of the host country. In preparing the IPP, efforts must be made to obtain the FPIC of the affected indigenous peoples based on sufficient information made available to them in advance. When consultations are held, explanations are given in languages and forms that are understandable to the indigenous peoples concerned. It is desirable that the IPP includes the elements laid out in the ESS 7 of the World Bank's environmental and social policies. (Refer to the same item in JICAGL Attachment 1)	Relevant guidelines on environmental and social considerations of DOR such as "Draft Interim Guidelines for Enhancing Poverty Reduction Impact of Road Projects 2007 GESU of DOR at MoPIT" in which issues and countermeasures for poverty reduction, ethnic groups and indigenous peoples are discussed and guided are applied for road projects.	
10	Monitoring	a. During the project implementation, project proponents monitor whether any unforeseeable situations occur, and the performance and effectiveness of the planned mitigation measures. Project proponents take appropriate measures based on the results of such monitoring. b. In cases where sufficient monitoring is deemed essential for appropriate environmental and social considerations, such as projects for which mitigation measures should be implemented while monitoring their effectiveness, Project proponents must ensure that the project plans include feasible monitoring plans. c. Project proponents should make efforts to make the monitoring results available to local stakeholders involved in the project. d. When third parties point out specifically that environmental and social considerations are not being fully undertaken, project proponents should make efforts to reach an agreement on the procedures to resolve the problems, through forums for discussions and examinations of the countermeasures with participation of stakeholders involved in the projects, based on sufficient information disclosure. (Refer to the same item in JICA-GL	Proponent shall conduct self-monitoring and submit report to concerned agency every six months during construction and operation phase of project. (Section 10 (4) of EPA, 2019 and Rule 45 of EPR, 2020)	There is no significant gap.

S.No.	Items	JICAGL Policy (Attachment 1 and II.2.1)	Country System (EPA 2019)	Gaps / Policy to fill up gaps in this Study
		Attachment 1）		
11	Grievance Redress Mechanism	a. A mechanism for handling concerns and grievances from people and communities affected by the project's environmental and social impacts must be in place. b. The grievance redress mechanism needs to be easily accessible for the project affected people and communities. Project proponents disseminate the information about the grievance redress mechanism through consultations with local stakeholders. The project affected people and communities must not be disadvantaged by filing a grievance. c. Project proponents should make efforts to respond promptly to the grievances they receive, taking into account the concerns and needs of the project affected people and communities. (Refer to the same item in JICA-GL Attachment 1）	The proponent shall establish grievance redressal unit to resolve problems, and when third parties point out that environmental and social consideration are not being fully undertaken, the grievance redressal unit shall coordinate with concerned stakeholders, and forums for discussion and examination of countermeasures are established to resolve the problems. There is provision to complain to concerned agency by third party if proponent have not fully undertaken environmental and social considerations. (Section 36 of EPA, 2019)	There is no significant gap.
12	Information Disclosure	a. In principle, project proponents disclose information about environmental and social considerations of their projects. JICA assists the project proponents through implementing cooperation projects as needed. b. JICA discloses important information about environmental and social considerations at the key stages of cooperation projects, in an appropriate manner in accordance with the JICA Guidelines. c. JICA discusses and agrees with project proponents on the frameworks that ensure information disclosure at the early stage of cooperation projects. d. The information to be disclosed has to include environmental and social considerations, as well as the project information. In addition to the information to be disclosed, e. JICA provides information about environmental and social considerations to third parties to the extent possible in response to their requests. f. JICA actively encourages project proponents to disclose and present information about environmental and social considerations of their projects to local stakeholders. g. Project proponents disclose information well in advance when they have consultations with local	Rule 6 of EPR, 2020 stipulates Public hearing. Before consultation meeting, the proponent shall use local newspaper, radio or other media to publicize the date, time, place and project, and also paste a notice in the relevant ward office of the local level and any public place in the project area. Similarly, EPR Rule 9 stipulates about collection of suggestions before approval of environmental study report. ・Prevailing national polices including EPA, 2019 and EPR, 2020 has envisaged the stakeholder engagement at different stage of the project design and implementation. Stakeholder	The following gaps are identified: -Does not require stakeholder analysis and preparation of stakeholder engagement plan -Does not cover indirect parties and wider level stakeholders. [Measures to fulfil the gap] -Conduct the stakeholder analysis -Disclose the SEA Report to Public to cover indirect parties and wider level stakeholders

S.No.	Items	JICAGL Policy (Attachment 1 and II.2.1)	Country System (EPA 2019)	Gaps / Policy to fill up gaps in this Study
		stakeholders in cooperation with JICA. On such occasions, JICA supports project proponents in preparation of documents in an official or widely used language(s) and in a form understandable by local peoples. h. JICA discloses information on its website in Japanese, English, official language(s) and/or language(s) widely used in the host countries. It also provides the relevant reports for public reading at the JICA library and at related overseas offices. i. JICA pays due consideration to the confidentiality of the commercial and other matters of project proponents, taking into account their competitive relationships. JICA encourages project proponents to exclude confidential information from any documents on environmental considerations that they submit which may later be subject to public disclosure. JICA takes into account the management of information of project proponents and discloses their documents subject to their approval. Any information that is prohibited from public disclosure in the agreement documents between JICA and project proponents may be disclosed only upon obtaining the approval of the project proponents or in accordance with legal requirements. (Refer to JICAGLⅡ.2.1)	consultation disclosure and grievance hearing system are provisioned.	

Source: JICA Expert Team

2.5 Approach to the SEA

Under Nepal's legal framework, SEA applies to policies, programs or projects. However, the requirement to conduct SEA for a Master Plan is not explicitly stated in Nepal's regulations. Furthermore, no SEA for the Master Plan has been formally conducted in Nepal since SEA became a legal requirement. In this context, during the first TWG3 meeting held on March 10, 2025, it was agreed that MOPIT and MOFE would hold a high-level discussion to obtain clear direction regarding the approach to conducting the SEA for KVUTSMP. Then, MOPIT issued an official letter to MOFE on March 27, 2025, seeking MOFE's opinion on this matter. In response, MOFE informed MOPIT that SEA for KVUTSMP should be conducted by i) incorporating international SEA best practices and ii) in accordance with the spirit of the Environment Protection Act, 2019 of Nepal, as deemed appropriate for the preparation of the Master Plan.

Based on the above, it was agreed that SEA for KVUTSMP would be conducted in accordance with the JICA Guidelines for Environmental and Social Considerations (2022), while also aligning with the spirit of the Environment Protection Act, 2019. The latter means that, while the formal approval is not sought, all relevant government bodies including MOFE will be closely consulted during the preparation of the SEA. In addition, all relevant requirements including preparation of key reports such as the Scoping Report and Strategic Environmental Assessment Report would be carried out in line with the requirement of the laws of Nepal.

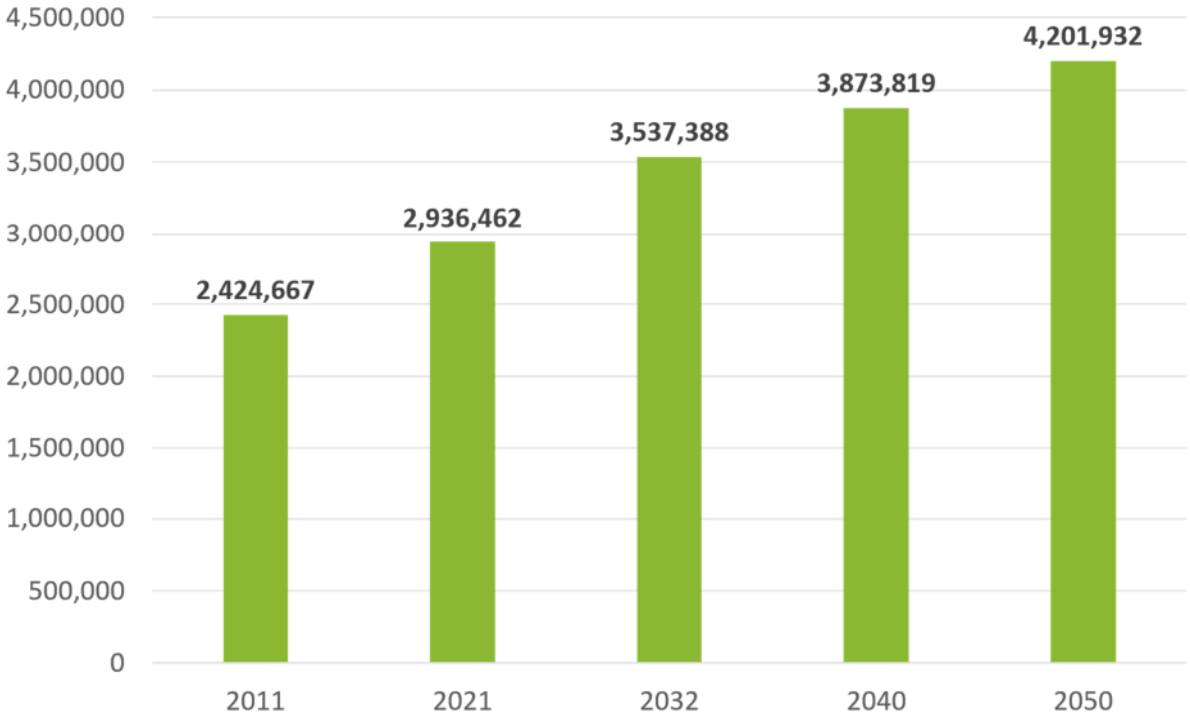
This approach was discussed and agreed upon at the 3rd JCC meeting held on June 5,2025 which paved the way for the first Stakeholder Meeting of the SEA, which was held on August 3, 2025.

Chapter 3: Description of Master Plan

3.1 Future Urban Structure

3.1.1 Future Population

The future population of the Kathmandu Valley has been estimated by the National Statistics Office (NSO) based on the National Population and Housing Census 2021. NSO provides population projections up to 2051 at the district and ward levels. The population of the Kathmandu Valley will reach approximately 3.5 million in 2032, 3.9 million in 2040, and 4.2 million in 2050.



Source：National Statistics Office (NSO), 2021

Figure 3.1-1: Future Population of Kathmandu Valley

3.1.2 Alternatives of Future Urban Structure

Before establishing the urban structure plan, a conceptual plan indicating the direction of urbanization was analysed, taking into account previous conditions such as development potential, the nodal concept, and new town projects.

3.1.2.1 Case-0 (Base Case: Monocentric)

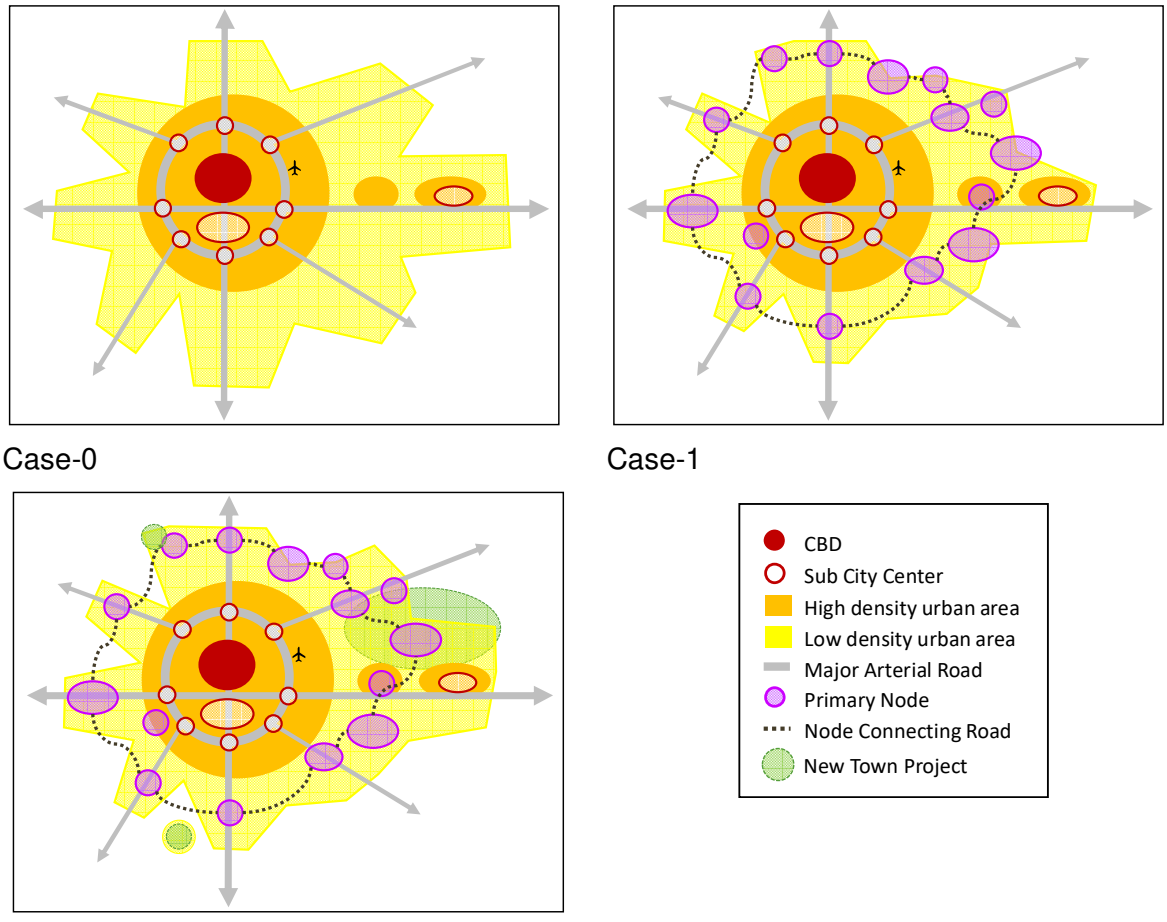
- Monocentric structure (sole city center)
- Urban area expands to suburbs in sprawl
- Dispositioning sub-city centers on the Ring Road

3.1.2.2 Case-1 (Development along with Nodal Concept)

- Development of "Node Connecting Road" instead of Outer Ring Road
- Development of sub-city centers in each Municipality at the crossing point of radial road and Node Connecting Road
- Urban area expands within nodal areas

3.1.2.3 Case-2 (Development along with Nodal Concept and New Town Projects)

- Development of "Node Connecting Road" instead of Outer Ring Road
- Development of sub-city centers in each Municipality at the crossing point of radial road and Node Connecting Road
- Urban area expands within nodal areas
- New town projects are in progress



Source: JICA Expert Team

Figure 3.1-2: Conceptual Plan Alternative Cases

The advantages and disadvantages of each urban structure alternative are analysed, as shown in Table 3.1-1. Based on the discussion in the TWG1 meeting, Case-2 is recommended as the definitive urban structure.

Table 3.1-1 Alternatives Study of Urban Structure Alternatives

Item	Cases	Case-0	Case-1	Case-2
Description	Concept	・Uncontrolled development will continue (Base case)	・Development based on “Node Concept” of KVDA MP	・In addition to Case-1, Ishan new town project will be implementing
	Land Use	・Existing city center of KV will continue as the sole center of whole area. ・Built-up area will expand to high development potential areas in sprawl.	・Sub city centers will be developed in “Primary Node” of each Municipality. ・Expansion of Built-up area will be controlled within areas of “Secondary Node” and “Tertiary Node”.	・In addition to Case-1, development of Ishan new town project will be on-going in accordance with physical development plan.
	Road Network	・Ring Road and radial roads will be strengthened. ・Development of Outer Ring Road (ORR) will be omitted.	・Ring Road and radial roads will be strengthened. ・Node connecting roads will be developed instead of ORR.	In addition to Case-1, several arterial roads will be developed in new town areas.
	Population	・NSO’s projection	・NSO’s projection	Calibrated population considering Ishan
Evaluation	Advantage	・No Advantage	・New urban areas are developed in high development potential areas (avoiding hazardous and reservation areas) ・The development of new sub-city centers and Node Connecting Road will help alleviate traffic congestion to and from the city center	・New urban areas are developed in high development potential areas (avoiding hazardous and reservation areas) ・The development of new sub-city centers and Node Connecting Road will help alleviate traffic congestion to and from the city center ・Population concentration in the city center will be mitigated
	Disadvantages	・Sprawl development without sufficient infrastructure ・Much heavier traffic congestion not only in the city center but also around suburb areas ・Vast agricultural land is lost and converted into built-up areas	・In addition to the development of the Node Connecting Road, improvement of radial arterial roads is essential	・As nearly 200,000 migrants will newly inhabit the new town project areas, investments in the public transport and the road network are essential to avoid further traffic congestion
	Complicated Evaluation			Recommendation

Source: JICA Expert Team

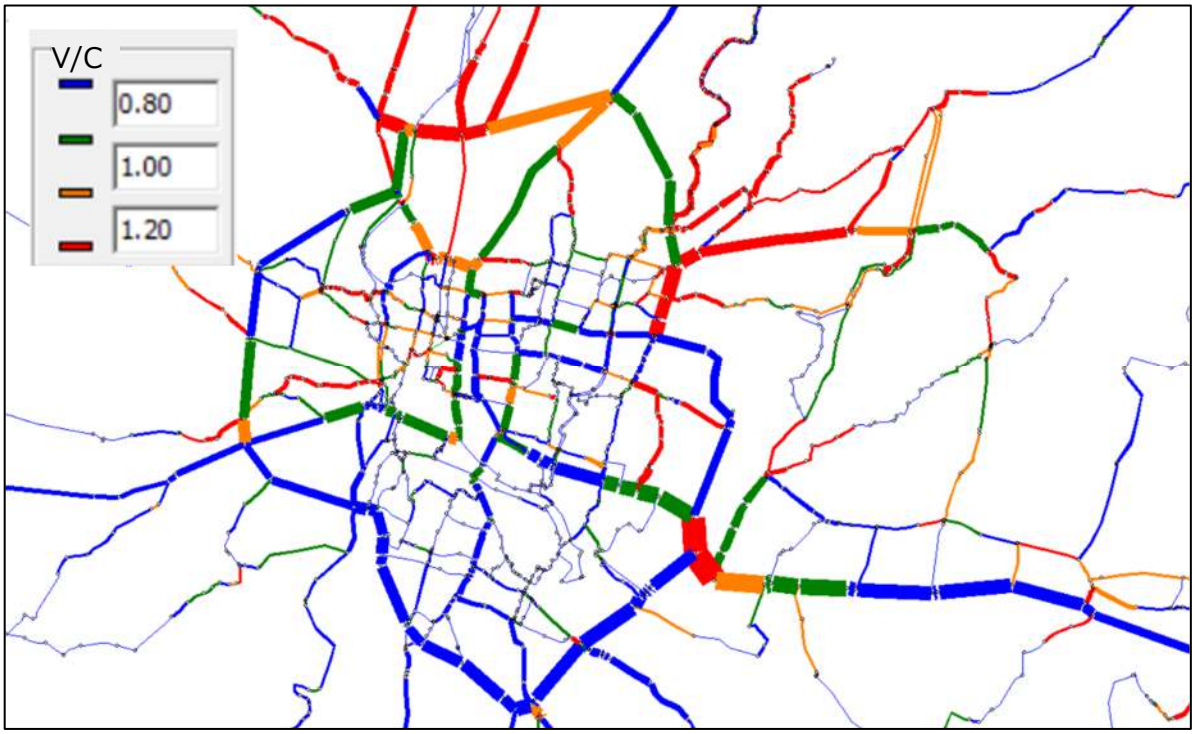
3.2 Traffic Demand Forecast

3.2.1 Current Traffic Conditions (Base year model of the traffic demand forecast)

Based on the current traffic assignment results, the following findings were confirmed.

- Koteshwor, Gaushala, Siddhitol area is congested.

  Minor roads in northern area are congested due to narrow road width.



Note: V/C = Volume-to-Capacity Ratio. When V/C = 1, it means that the road capacity is equal to the traffic demand. V/C > 1.0 indicates that the traffic demand exceeds the road capacity, resulting in congestion conditions

Source: JICA Expert Team

Figure 3.2-1: Current Traffic Status of KV

3.2.1.1 Traffic Demand Forecast - Do Minimum Case -

- Do minimum = With planned project by Nepal side excluding MP project.
- In 2050, eastern side of Ring Road is seriously congested.
- Araniko Highway and Boudhanath Sadak are highly congested.

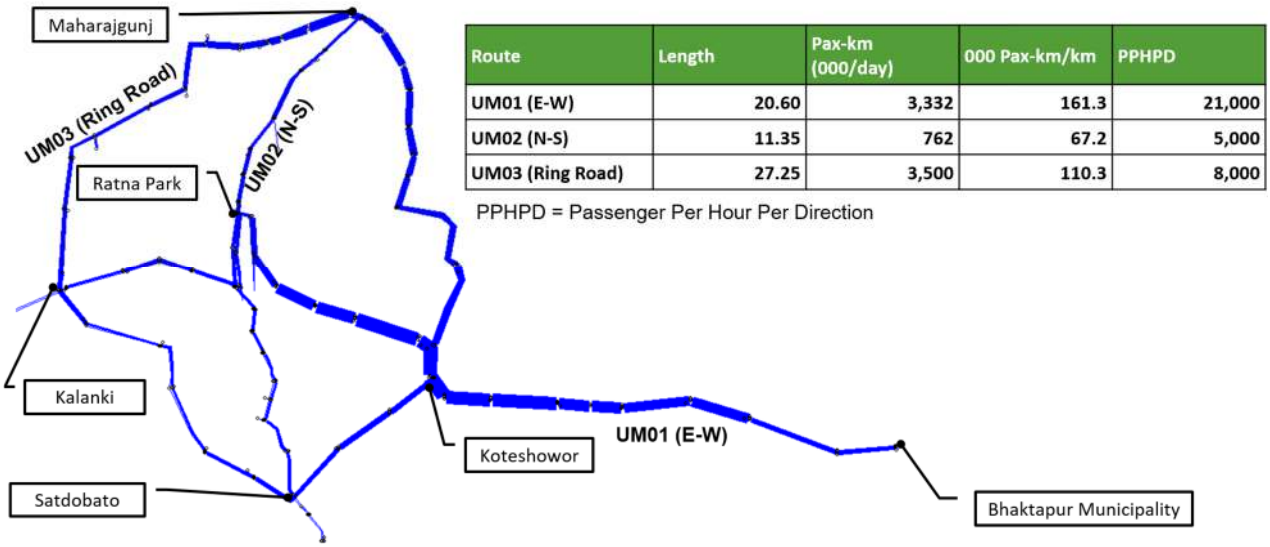


Source: JICA Expert Team

Figure 3.2-2:Traffic Demand Forecast 2050- Do Minimum Case

3.2.1.2 Railway Network Performance (MP Case)

- Based on the result of traffic demand forecast, Mass transport is an option for solving the traffic problem for major congested route.
- The maximum demand case as introduction of Mass transport is estimated with precondition which are Vmax=40km/h and no fare case.



Route	Length	Pax-km (000/day)	000 Pax-km/km	PPHPD
UM01 (E-W)	20.60	3,332	161.3	21,000
UM02 (N-S)	11.35	762	67.2	5,000
UM03 (Ring Road)	27.25	3,500	110.3	8,000

PPHPD = Passenger Per Hour Per Direction

Source: JICA Expert Team

Figure 3.2-3:Railway Network Performance (MP Case)

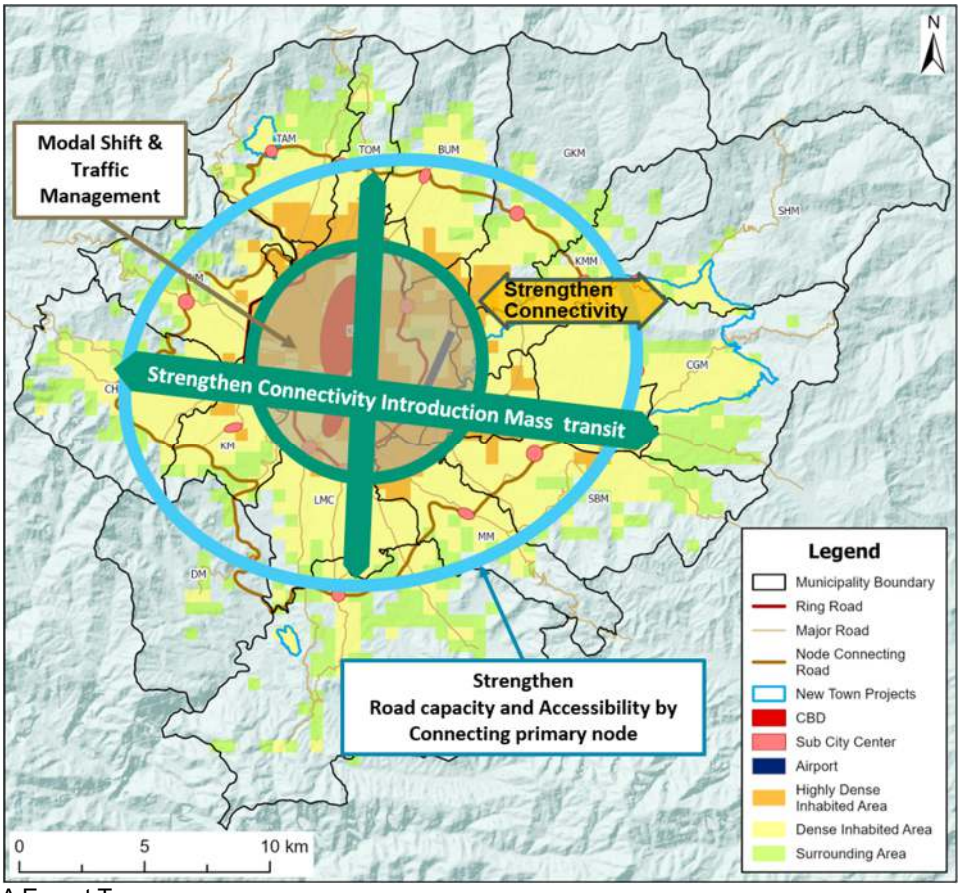
3.3 Strategic Direction for a Sustainable Urban Transport System

Traffic demand in Kathmandu Valley will continue to grow substantially toward 2050 due to population growth, urban expansion, economic development, and increasing motorization. The analysis indicates that traffic demand will become highly concentrated along the east-west corridor connecting Kathmandu Metropolitan City and Bhaktapur Municipality and the Ring Road corridor where intra-urban traffic converges. Even under the planned road development scenario, these strategic corridors are expected to experience persistent congestion because road capacity alone cannot accommodate future traffic demand.

Furthermore, the current transport system relies heavily on motorcycles and passenger car ownership is expected to increase with economic growth. Without a fundamental shift in transport policy, increasing private vehicle and motorcycle ownership will further worsen congestion, travel time reliability, road safety, energy consumption, and environmental impacts. Expanding road infrastructure alone is therefore insufficient to solve the transport problems facing Kathmandu Valley.

To establish a sustainable urban transport system, it is essential to gradually shift traffic demand from motorcycle and private vehicles to high-quality public transport while simultaneously improving road network efficiency. Based on these findings, the Master Plan adopts three integrated strategic directions:

- Promotion of modal shift through attractive public transport;
- Improvement of public transport services through bus rationalization and service enhancement;
- Strengthening road connectivity and traffic management to improve overall network performance.



Source: JICA Expert Team

Figure 3.3-1: Ideal Transport System for future Kathmandu Valley

3.4 Direction for Transport System Master Plan toward 2050

3.4.1 Phased Development Strategy of the Master Plan

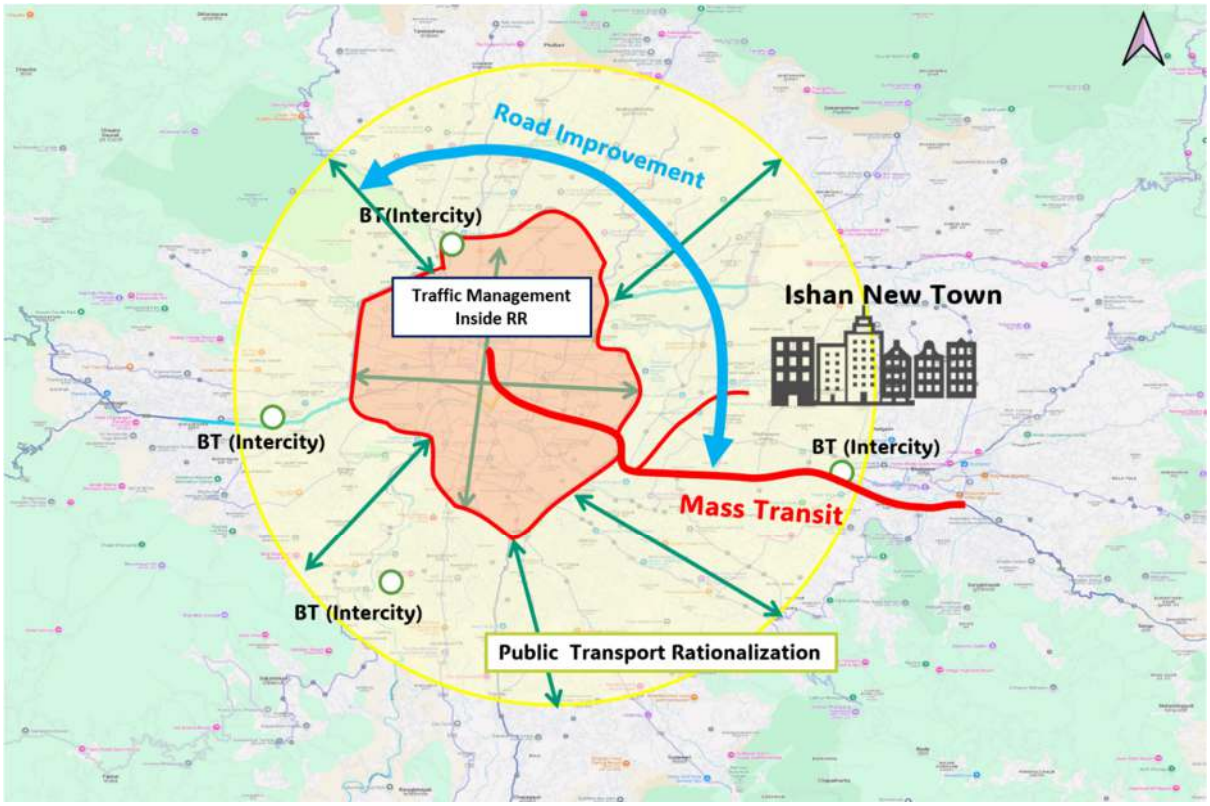
Although the long-term transport demand clearly supports the development of all three mass transit corridors, implementing the entire network within the Master Plan horizon is not considered feasible.

Construction of multiple urban rail or mass transit corridors requires enormous capital investment, advanced technical capacity, complex land acquisition, institutional coordination, and sustainable financial resources. Given the current fiscal conditions of Nepal and the implementation capacity of relevant agencies, simultaneous construction of a full metropolitan mass transit network would involve considerable financial and institutional risks.

Therefore, this Master Plan adopts a phased development strategy, whereby transport investments are prioritized according to demand, implementation feasibility, and economic efficiency. The first priority is the East-West Mass Transit Corridor connecting Kathmandu and Bhaktapur.

3.4.2 Overall Development Concept

The Master Plan proposes pathway toward the long-term vision of Kathmandu Valley's transport system. Rather than attempting to construct the entire mass transit network by 2050, the Master Plan concentrates investment on the East-West corridor while simultaneously improving bus services, road infrastructure, and traffic management. This phased approach establishes the institutional and operational foundation for future expansion of the north-south and Ring Road mass transit corridors as travel demand continues to increase beyond the Master Plan period. Image of overview of the KVUTS-MP is shown in Figure 3.4-1.



Source: JICA Expert Team

Figure 3.4-1: Overview of the Master Plan Components

3.4.3 Target Year

The target years are divided into three phases: short, middle and long term.

- Short Term (Phase 1) : 2032 (after 5 years of the project on KVUTS-MP)
- Middle Term (Phase 2) : 2040
- Long Term (Phase 3) : 2050

3.5 Necessary Project / Interventions in Master Plan

3.5.1 Proposed Projects

In the Kathmandu Valley, high V/C ratios are observed not only in the city center and at major intersections, but also around the existing Ring Road and on radial roads outside the Ring Road. In particular, in the northern and northeastern areas, traffic tends to concentrate on sections with limited road width and few alternative routes, resulting in congestion spreading across wider areas.

In addition, the major road network faces various structural issues, including discontinuous road widths, bottlenecks at bridges, insufficient intersection capacity, and a lack of pedestrian space. Therefore, it is necessary not only to improve individual intersections, but also to combine measures for increasing road capacity, strengthening connectivity between suburban areas, securing alternative routes, and using existing road space more efficiently.

Based on these existing issues and the V/C analysis results, the necessary road improvements and traffic management measures were identified according to the following concepts.

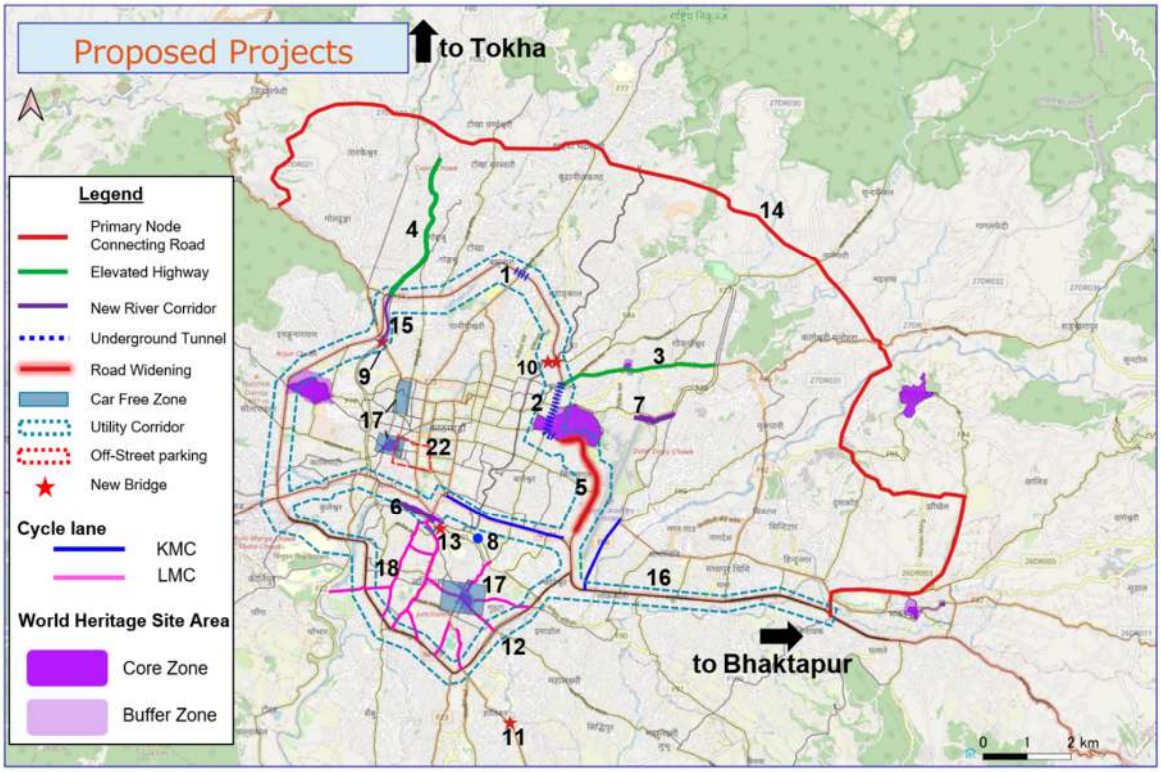
- Increase road capacity through elevated and underground roads.
- Strengthen outer-area connectivity and disperse radial traffic.
- Secure alternative routes through river corridors and new bridges.
- Improve traffic flow inside the Ring Road through intersections and signal control.
- Develop emergency transport and evacuation routes.
- Improve safety and walkability in tourism and commercial areas.
- Introduce utility corridors to support road works and ITS.

Table 3.5-1 and Figure 3.5-1 shows road-related projects identified as necessary based on the above concepts, from the perspectives of addressing future traffic demand, increasing road capacity, strengthening connectivity, improving traffic management and safety, and enhancing disaster resilience.

Table 3.5-1: Proposed Road and Road-Related Project and the Expected Development Status in the Target Year

No.	Project	Emergency Road※	The Progress status by Phase			Remarks
			Phase1 (2032)	Phase2 (2040)	Phase3 (2050)	
1	Maharajgunj Underpass	○	○			・ Major intersection at north of Ring Road. ・ There is still land acquisition problem.
2	Chabahil-Gaushala Underground Tunnel	○		○		・ Retain the existing 4 lanes and add 4 underground lanes to significantly increase capacity. ・ The project is located within a UNESCO world heritage area.
3	Chabahil-Bagmati River Elevated Highway	○			○	・ Two-lane elevated road is feasible due to inconsistent road width.
4	Bishnumati River Corridor Elevated Highway	○			○	・ This elevated road will help alleviate traffic congestion in north-western Kathmandu. ・ For safety reasons, this route must be designed as a four-lane to accommodate large sized vehicles.
5	Widening Ring Road (Gaushala-Tinkune)	○	○			・ This section should be widened to avoid future bottlenecks. ・ A dedicated right-turn lane is needed for smooth airport access without obstructing through traffic.
6	New River Corridor (Thapathali-Tripureshwor)		○			・ A Bagmati riverside road will provide an alternative route for the Tripureshwor–Thapathali–Maitighar corridor.
7	Improvement of the unpaved road on the Bagmati River		○			・ As part of the road along the Bagmati River（800m）is currently unpaved, this section needs to be paved.
8	UN Park Bridge Widening	○	○			・ Add a dedicated left-turn lane to smooth south-side turning traffic. ・ Use the existing bridge toward LMC and the new bridge toward KMC.
9-13	New Bridge (Bishnumati River/Dhobi Khola River/Karma Nasa/Gwarko/Thapatali)		○			・ These bridge projects will improve congestion by adding two-lane bridges beside existing bottleneck bridges, where four-lane approach roads narrow to two lanes, or by constructing new bridges.
14	Primary node Connecting Road	○			○	・ To alleviate congestion on radial roads in the northeastern KV, development of a ring road is essential. ・ The ring road will be developed through two approaches: new construction involving hillside cutting, embankment works, and bridges, and widening of existing roads.
15	Balaju Bishnumati River Corridor		○			・ The government has relocated squatters along the Bishnumati River, securing space for the corridor. ・ The proposed road is expected to disperse traffic concentrated on the Ring Road and serve as an alternative route during congestion or incidents.
16	Establishment of Utility Corridor Network under Major Arterial Roads			○		・ Consolidate utilities under major arterial roads, including power, telecom, and fiber optic cables. ・ Reduce road excavation and traffic disruption caused by frequent utility works. ・ Enhance the urban landscape by reducing overhead utility lines.
17	Car Free Zone		○			・ Heterogeneous traffic conditions have been persistently observed in these three tourism areas. ・ KMC has implemented a limited car-free zone around Durbar Square and has a plan for Thamel. LMC has a car-free zone expansion plan for Durbar Square and carried out pilot of it in 2025.
18	Cycling path		○			・ LMC has developed some bicycle lanes, while KMC's are under construction. ・ Additional bicycle lanes are proposed to connect major World Heritage Sites and promote bicycle use.
19	Road Safety Project		○			・ Strengthen accident data collection and analysis capacity. ・ Enhance road safety engineering, enforcement, and awareness activities.
20	Intersection Improvement and installation of traffic signals including center system	○	○(23)	○(85)		・ Phase-1: Bottleneck points of the KV, Phase-2: Major intersections in the KV ・ Introduce coordinated traffic signals and pedestrian signals, together with intersection improvements. ・ Install a traffic control center and roadside systems to monitor signals, traffic flow, and accidents.
21	Development of Emergency Road Network	○	○	○		・ Define emergency roads by function and target width: ➢ Class-1 includes national highways and major radial roads connecting key facilities such as the airport, military facilities, bus terminals, major government institutions, and large hospitals. ➢ Class-2 includes other roads connecting major government institutions, parks, fire stations, and large hospitals. ・ Improve Class-1 and Class-2 roads inside the Ring Road to 8–12 m by 2040.
22	Installation of Off-street Parking			○		・ Expand parking capacity around Durbar Square and Ratna Park. ・ Develop Ratna Park as a TOD hub with bus, pedestrian, and future rail access.

※○ : When the project becomes part of a designated Emergency Road Section.
Note: As the master plan stage, the listed proposed project location and design have not been examined in detail and are not yet fixed.
Source: JICA Expert Team



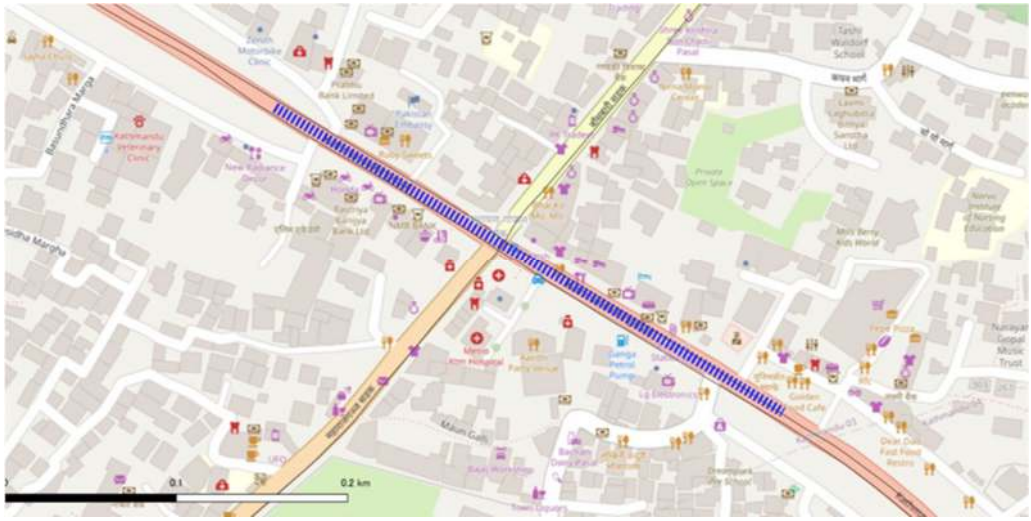
Source: JICA Expert Team
Note: As the master plan stage, the listed proposed project location and design have not been examined in detail and are not yet fixed.

Figure 3.5-1: Location Maps of the projects listed in the table above.

3.5.1.1 Road Projects

a. No.1 : Maharajgunj Underpass

The north part of Ring Road will be responsible for China aid, but the end point of their section is ended westside of Maharajgunj intersection. Although it is a major intersection where the north–south arterial road (Maharajgunj Sadak) and the Ring Road intersect, land acquisition has not progressed, and the planned underpass structure has not been implemented.



Source: JICA Expert Team

Figure 3.5-2: Location Maps of Maharajgunj Underpass project

b. No.2 : Chabahil-Gaushala Underground Tunnel

This section is already congested under current traffic conditions. The standard Ring Road cross-section consists of 2+2 main lanes and service lanes on both sides. However, this section is constrained by roadside buildings and passes through a UNESCO World Heritage area, making surface widening or elevated structures infeasible. Therefore, the only feasible option is to construct an underground tunnel beneath the existing Ring Road. Before construction, a Heritage Impact Assessment (HIA) must be conducted, including archaeological investigations, in order to assess and mitigate potential impacts on the UNESCO World Heritage area.

As lane regulation or road closure would be highly difficult, the proposed approach is to retain the existing 4 lane while adding 4 underground lanes. A stacked two-level TBM tunnel is proposed to enable construction within the existing road width.



Source: JICA Expert Team

Figure 3.5-3: Location maps of Chabahil-Gaushala project

c. No.3: Chabahil-Bagmati River Elevated Highway

This section is also already congested under current traffic conditions. Due to inconsistent existing road width, a two-lane elevated road is considered the most feasible option for the section between Chabahil and the Bagmati River Bridge. Since a World Heritage site, including a stupa, is located along the corridor, a Heritage Impact Assessment (HIA) may be required.

To reduce congestion, a partial on-ramp toward Chabahil will be provided. On- and off-ramps will be staggered at both ends of the elevated road to minimize land acquisition. Chabahil Intersection will also require comprehensive improvement, including layout revision, signal installation, and optimized signal control.

The construction method should be selected to minimize impacts on existing traffic.



Source: JICA Expert Team

Figure 3.5-4: Location Maps of Chabahil- Bagmati River Elevated Highway project

d. No.4: Bishnumati River Corridor Elevated Highway

The proposed elevated road is expected to alleviate congestion in north-western Kathmandu by adding road capacity along the Bishnumati River corridor. The route will connect to the Ring Road at Balaju Machha Pokhari and should be designed as a four-lane facility to accommodate large vehicles.

Although a 20-metre setback from the riverbank is required under river corridor regulations, applying this setback would make it difficult to construct a four-lane road within the corridor. Therefore, the alignment and structural options should be carefully examined in coordination with the relevant authorities.

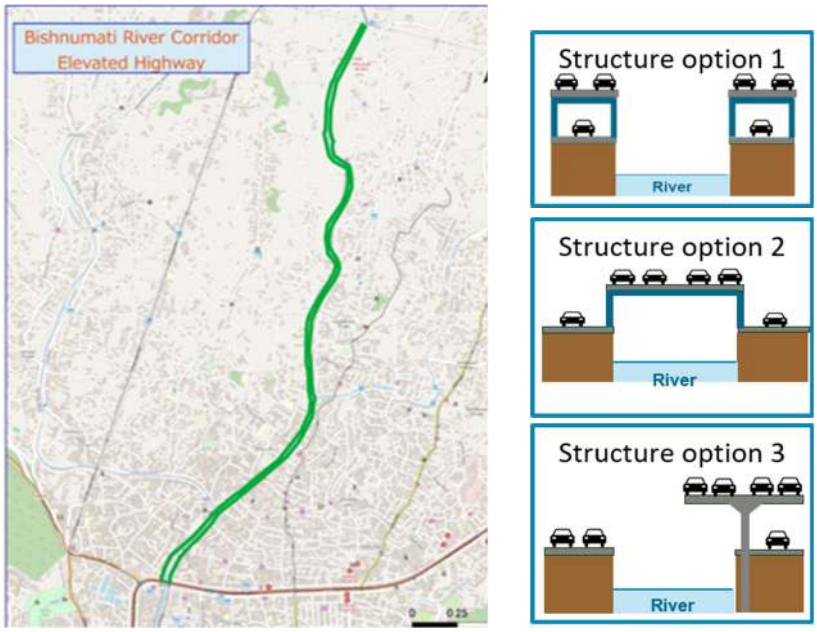
JET examined three structural options and recommends Option 3 as the most practical solution.

Option 1: Gantries on both sides of the river; longest construction period.

Option 2: Customized gantry designs due to varying river widths; longer design and construction time.

Option 3: Structure on one side of the river; lowest cost, shortest construction period, and sufficient road capacity.

Therefore, Option 3 is considered the most feasible option.



Source: JICA Expert Team

Figure 3.5-5: Three Options Considered for Bishnumati River Corridor Elevated Highway

e. No.5: Widening Ring Road (Gaushala-Tinkune)

This section should be widened to prevent future bottlenecks, taking into account the planned road widening in the southern Koteshwor area. In particular, smooth access to the airport should be secured by providing a dedicated right-turn lane, so that airport-bound traffic does not obstruct through traffic. The project will add two-lane service roads on both sides of the existing four-lane main carriageway, thereby improving road capacity and traffic flow.



Source: JICA Expert Team

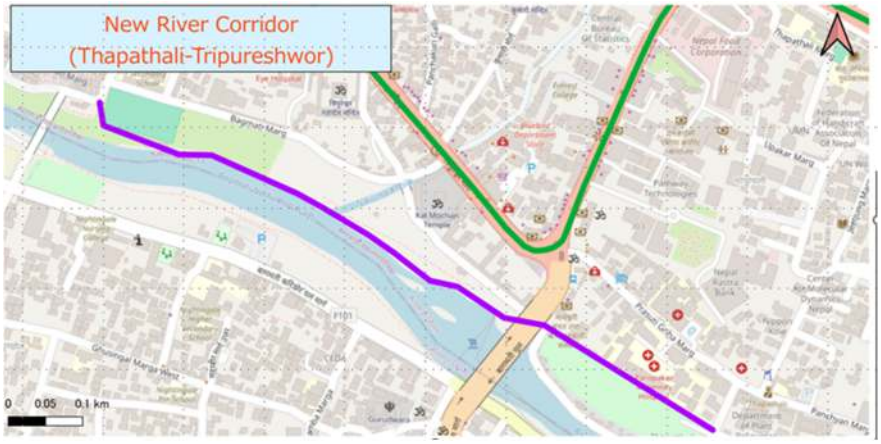
Figure 3.5-6: Widening Ring Road Project

f. No.6:New River Corridor （Thapathali-Tripureshwor)

This project aims to eliminate the missing link along the Bagmati River corridor and provide an alternative route for the Tripureshwor–Thapathali–Maitighar section.

The route will be developed by utilizing the riverside road currently being constructed along the Bagmati River near the ADB-supported water treatment plant, as well as the road space within government-owned land on the opposite side of the river. Additional road and footpath sections will be extended where necessary to ensure continuous connectivity.

Due to the limited clearance under Thapathali Bridge, large vehicles will not be able to use this alternative route. In addition, a new bridge will be required at the intermediate point of the corridor to complete the connection.

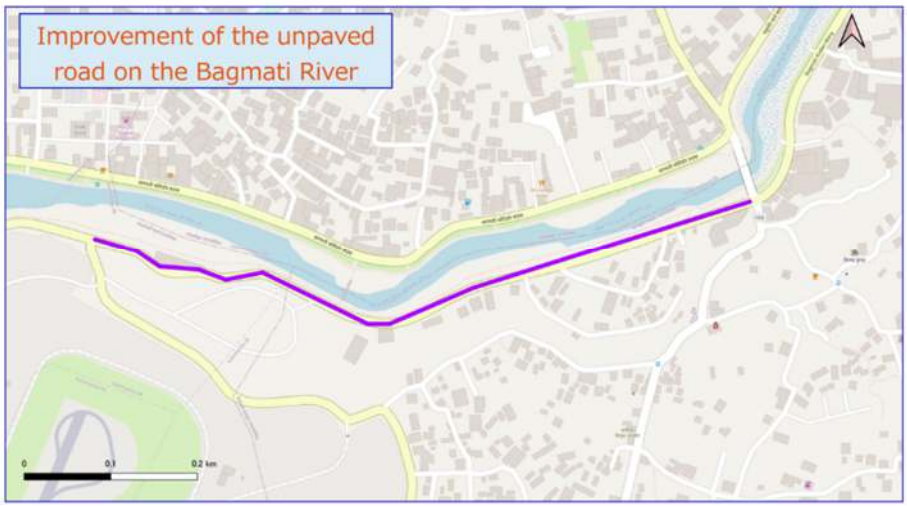


Source: JICA Expert Team

Figure 3.5-7: Purple Line can be Alternative of Green Line

g. No.7: Improvement of the Unpaved Road on the Bagmati River

As part of the road along the Bagmati River (800m) is currently unpaved, this section need to be paved to ensure the connectivity of river side corridor.



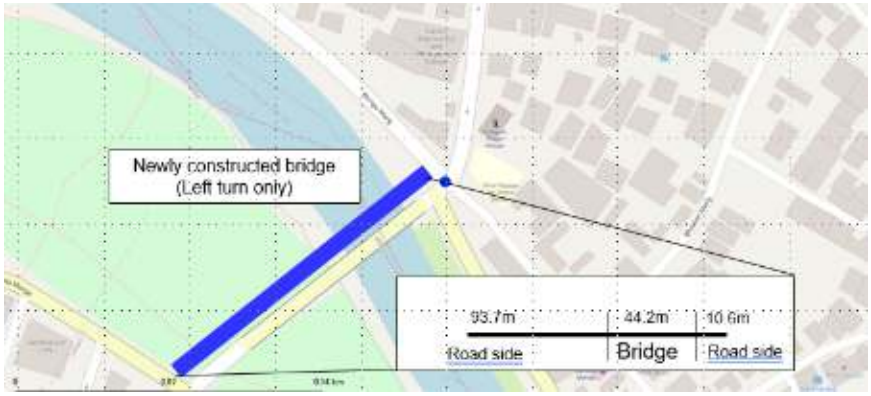
Source: JICA Expert Team

Figure 3.5-8: Unpaved Section of Bagmati River Corridor

h. No.8: UN Park Bridge Widening

At this location, traffic volume is particularly high along the riverside road from the south and across the bridge. Since left-turning vehicles from the south obstruct traffic entering the bridge from other directions, a dedicated left-turn lane will be constructed on the downstream side of the Bagmati River.

The existing bridge will be operated as a two-lane bridge toward LMC, while the new bridge will be operated as a one-lane bridge toward KMC. Traffic on the two bridges will be separated and will not merge between the intersections. In addition, intersection improvement on the KMC side will also be implemented, including appropriate adjustment of signal locations and signal displays.



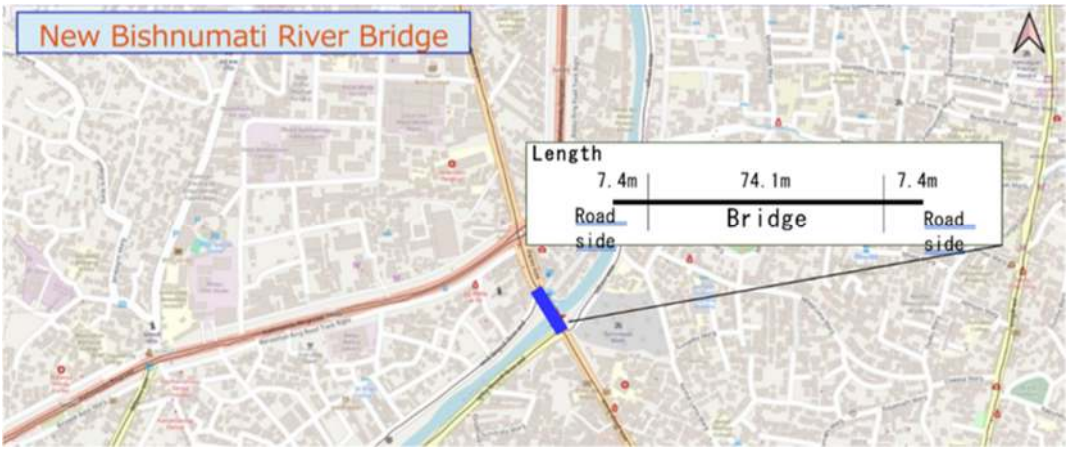
Source: JICA Expert Team

Figure 3.5-9: Location of UN Park Bridge Widening

i. No.9: New Bishnumati River Bridge

The existing two-lane bridge is located between four-lane approach roads, creating a bottleneck. This bottleneck remains because a temple is located on the upstream side, making bridge widening on that side difficult.

To avoid impacts on the temple and secure a continuous four-lane roadway, an additional two-lane bridge will be constructed on the downstream side. Since the bridge is located near Gongabu Bus Park and Balaju Intersection, the project is expected to improve traffic flow and bus accessibility in the area.



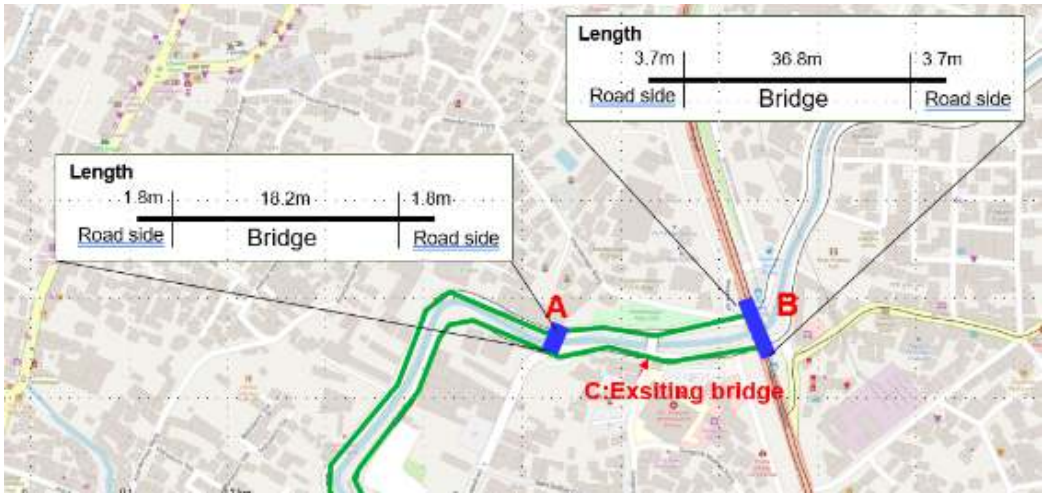
Source: JICA Expert Team

Figure 3.5-10: Location of New Bishnumati River Bridge

j. No.10: New Dhobi Khola River Bridge

For Bridge A, the existing bridge is narrow and traffic from both directions converges at the bridge, causing chronic congestion. Therefore, a new one-lane bridge will be constructed, and the existing and new bridges will be operated as a loop system to improve traffic flow.

For Bridge B, a new bridge will be constructed next to the existing narrow bridge on the northern section of the Ring Road. This will secure the same number of lanes as the main Ring Road and eliminate the bottleneck.



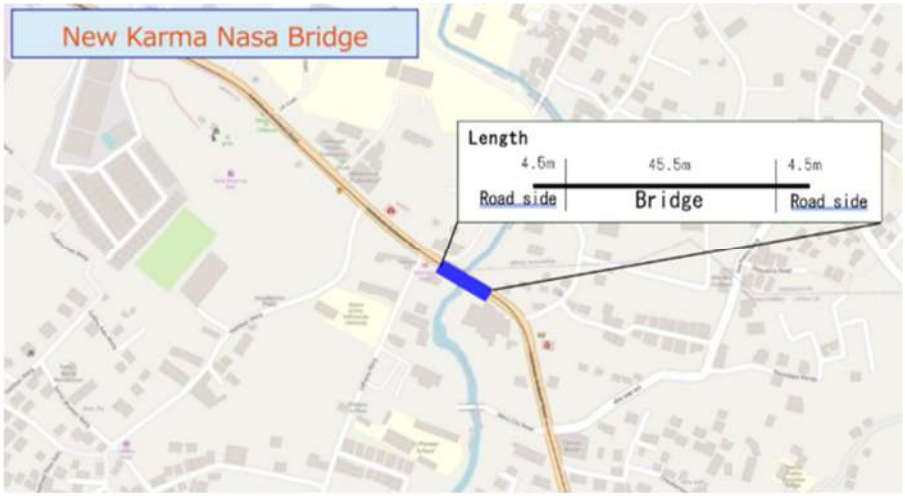
Source: JICA Expert Team

Figure 3.5-11: Location of New Dhobi Khola River Bridge

k. No.11: New Karma Nasa Bridge

The Karma Nasa Bridge, located on the Satdobato–Godabari road, is a bottleneck because the four-lane approach roads narrow to two lanes at the bridge. In addition, the bridge has no sidewalks, creating safety risks for pedestrians and cyclists.

Therefore, bridge widening is required to secure continuous road capacity and improve traffic safety.



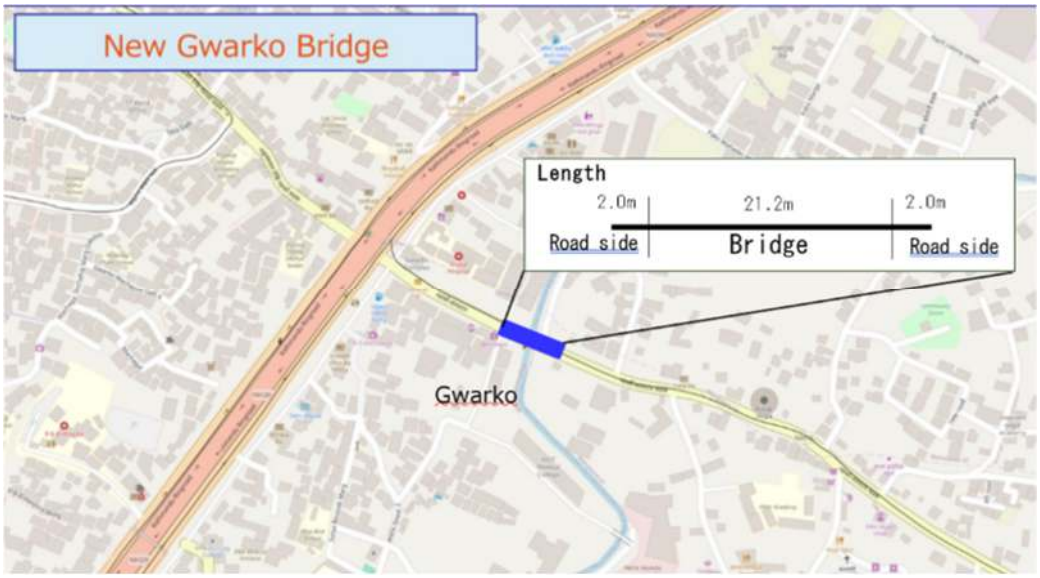
Source: JICA Expert Team

Figure 3.5-12: Location of New Karma Nasa Bridge

l. No.12: New Gwarko Bridge

The Gwarko Bridge is located near the Gwarko Flyover. Although the approach roads on both sides have four lanes, the bridge itself has only two lanes, creating a bottleneck.

Pedestrian steel bridges are currently installed on both sides of the bridge. Therefore, bridge widening is required to secure continuous road capacity while maintaining pedestrian safety.



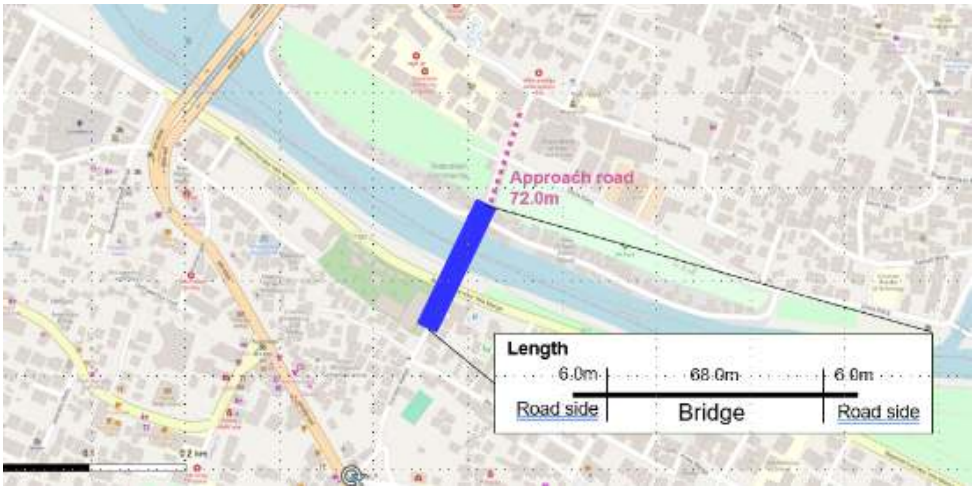
Source: JICA Expert Team

Figure 3.5-13: Location of New Gwarko Bridge

m. No.13: New Bagmati River Bridge

The New Bagmati River Bridge is planned upstream of Thapathali Bridge to provide a new river crossing for vehicles using the Bagmati riverside corridor. This project will improve connectivity between KMC and LMC.

Since Thapathali Bridge is not directly connected to the Bagmati River corridor, the new bridge will help manage traffic from the river corridor more effectively and serve as an alternative route to bypass Thapathali Bridge.



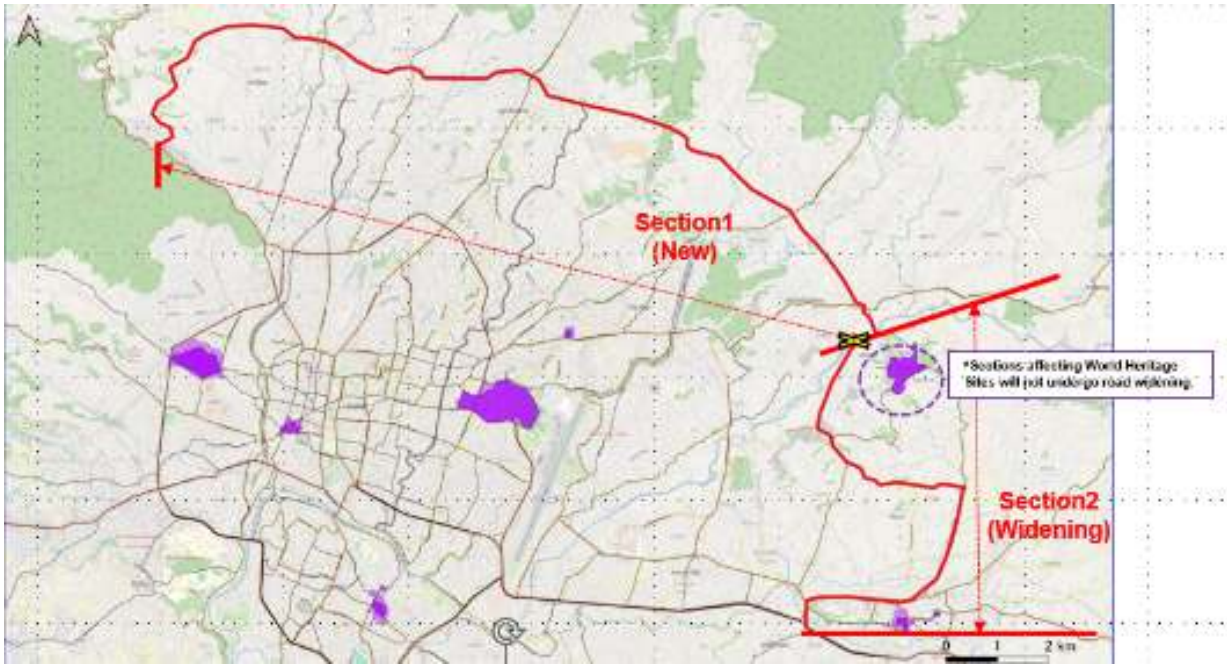
Source: JICA Expert Team

Figure 3.5-14: Location of New Bagmati River Bridge

n. No.14: Primary Node Connecting Road

To alleviate congestion on radial roads in the northeastern part of the Kathmandu Valley, it is essential to develop a ring-like road network. This road is also expected to support the future development of satellite cities in the area.

Section 1 will be developed mainly through new construction, including hillside cutting, embankment works, and bridge construction. Section 2 will be developed mainly through widening of the existing road.



Source: JICA Expert Team

Figure 3.5-15: Location of Primary Node Connecting Road

o. No.15: Balaju Bishnumati River Corridor

The government has relocated squatters along the Bishnumati River, securing space for the development of a riverside corridor. The proposed road is expected to distribute traffic currently concentrated on the Ring Road and serve as an alternative route during congestion or incidents.

However, due to insufficient bridge clearance for large vehicles at both ends of the corridor, heavy vehicles cannot use this route continuously. Therefore, they need to re-enter the Ring Road via at-grade intersections to access the northern section of the Ring Road.



Source: Open Street Map

Figure 3.5-16: Location of Balaju Bishnumati River Corridor and Situation of Clearance and Insufficient Height of Crossing Bridge

p. No.16: Establishment of Utility Corridor Network under Major Arterial Roads

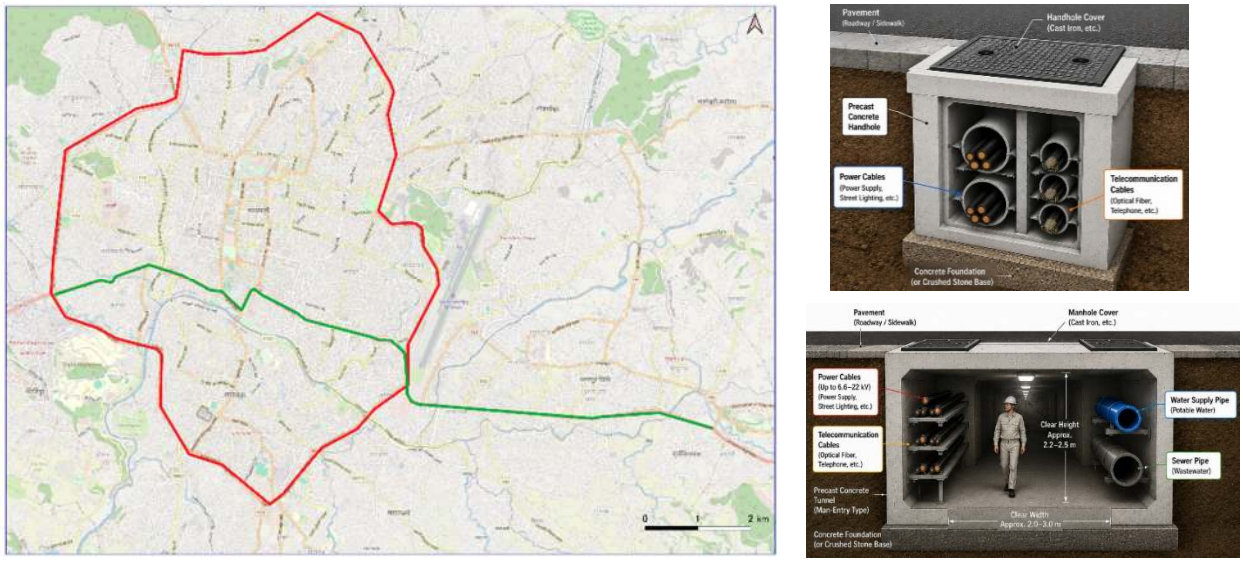
In Kathmandu Valley, overhead utility lines such as power, telecommunication, fiber optic, and CATV cables are heavily congested along major arterial roads. In addition, underground utilities have been installed by different agencies with limited coordination, and utility records and GIS databases are incomplete. As a result, utility conflicts during excavation works often cause project delays and traffic congestion.

To address these issues, it is proposed to establish a utility corridor network under major arterial roads, including the Ring Road and the Araniko Highway–Kalanki corridor. The utility corridor network is expected to provide the following benefits:

- Efficient use of limited underground space,
- Reduction of repeated road excavation and traffic disruption,
- Easier utility maintenance and asset management,
- Reduced conflicts among utility operators,
- Improved safety and service reliability, and
- Better urban landscape through undergrounding of utility lines.

Two options are considered for the utility corridor system, as shown in Table 3.5-2.

Considering the existing road conditions in Kathmandu Valley, Option A is considered the most practical solution for existing arterial roads, while Option B may be considered for new roads and future urban development areas.



Source: JICA Expert Team

Figure 3.5-17: Proposed Utility Corridor

Table 3.5-2: Option for the Utility Corridor System

Item	Option A: Regular Duct System	Option B: Walkable Utility Tunnel
Main target utilities	Power and telecommunication cables	Power, telecommunication, water supply, and sewerage utilities
Accessibility	Access through handholes	Direct access by maintenance staff
Maintainability	Moderate	High
Construction period	Relatively short	Relatively long
Traffic impact during construction	Limited	Significant
Applicability	Existing arterial roads	New roads and future urban development areas

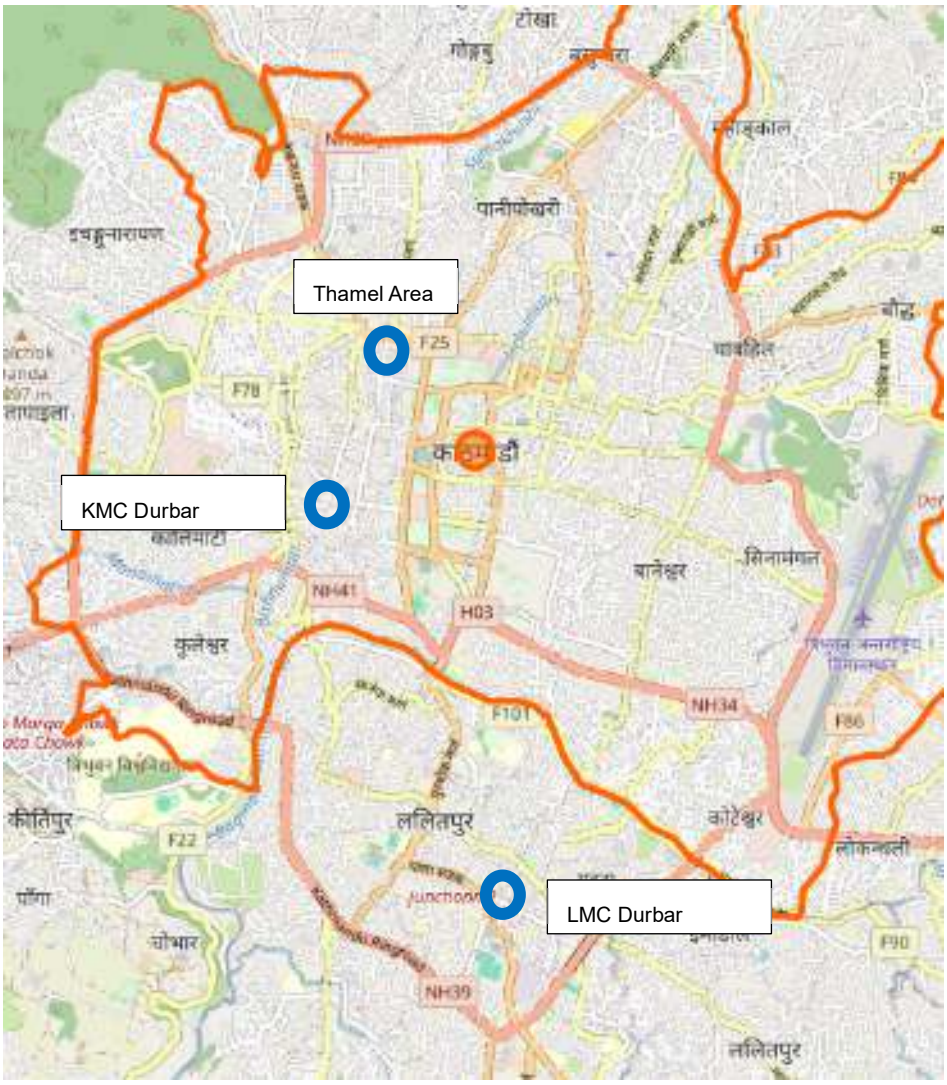
Source: JICA Expert Team

q. No.17: Car Free Zone

Both KMC and LMC have introduced Car-free zones by closing parts of Durbar Square.

LMC has a plan to expand the car-free zone in the LMC Durbar Square area. In contrast, the current car-free zone in the KMC Durbar Square area remains insufficient, as pedestrians, tourists, motorcycles, and cars are not adequately separated, resulting in potential safety risks.

In addition, the Thamel area in KMC, similar to Durbar Square, attracts a high concentration of tourists. Although on-street parking is prohibited within the area, it remains a location where frequent potential conflicts occur between pedestrians, motorcycles, and vehicles.



Source: Open Street Map

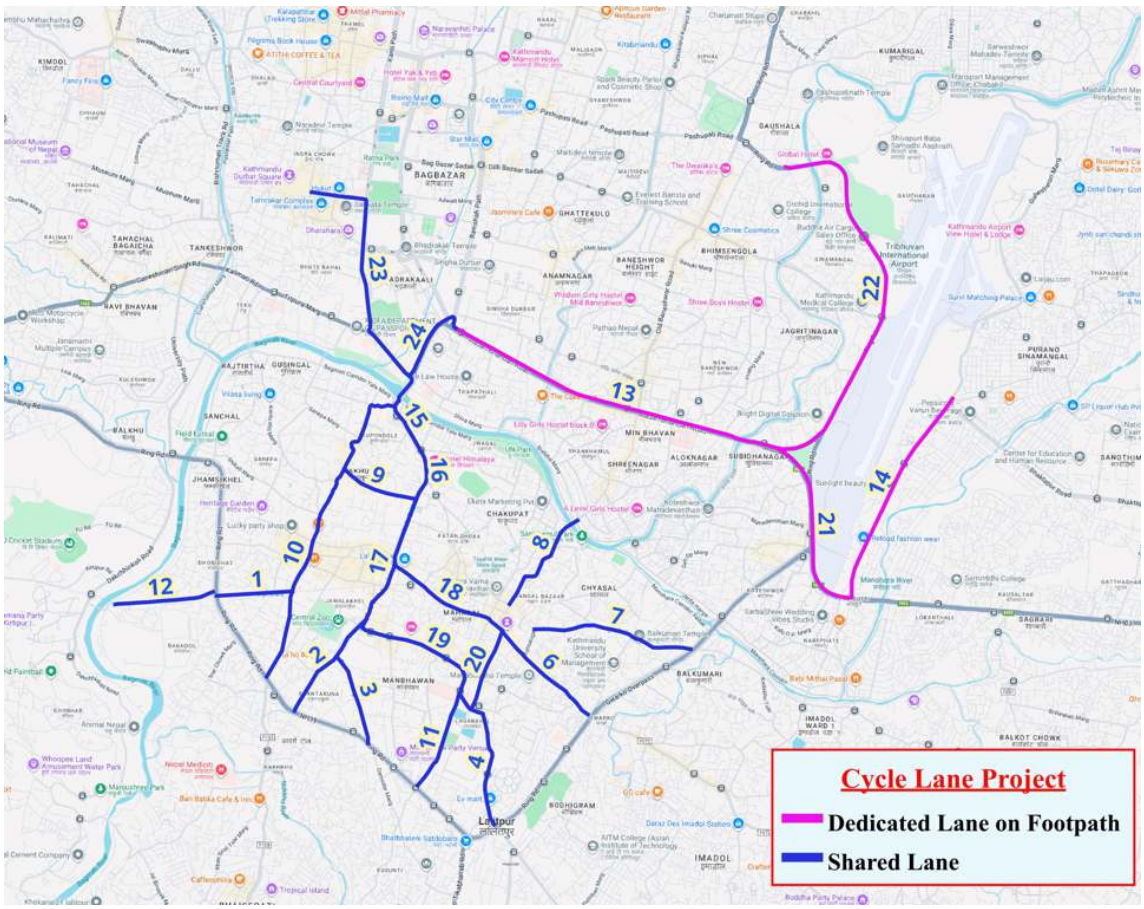
Figure 3.5-18: Proposed Car-free zone

r. No.18: Cycle Path

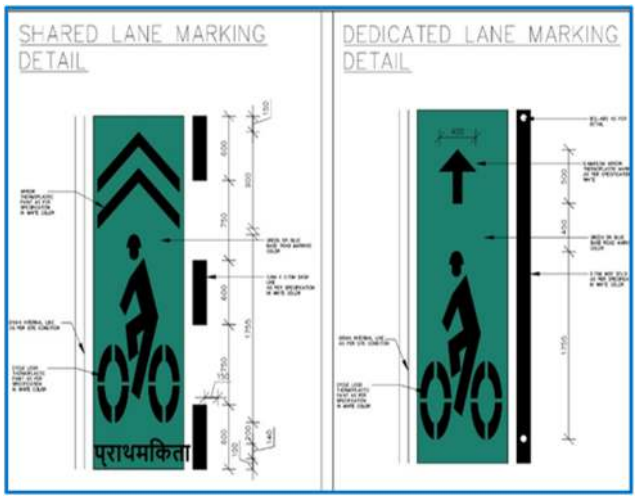
Both KMC and LMC have plans to develop bicycle lanes. LMC has already implemented bicycle lanes in some sections, while KMC is currently developing its bicycle lane network.

To encourage bicycle use and enhance the attractiveness of cycling as a travel mode, it is recommended to connect bicycle lanes to major World Heritage sites. The additional sections required for this network development are as follows:

- Dedicated bicycle lanes: 4.534 km (Sections 21 and 22)
- Shared lanes with carriageway: 2.90 km (Sections 23 and 24)







Source: JICA Expert Team

Figure 3.5-19: Cycle Path Project

s. No.19: Kathmandu Road Safety Project

Nepal is facing a serious and worsening road safety situation. According to the Asian Transport Observatory, based on WHO estimates, Nepal's road traffic fatality rate was 28.2 deaths per 100,000 population in 2021, compared with the Asia-Pacific average of 15.2 and the South Asia average of approximately 16.1. The fatality rate increased by approximately 13% between

2010 and 2021. In addition, the number of road crash fatalities increased by approximately 5.4% per year between 2016 and 2021.

To strengthen Nepal's capacity to address the frequent road accidents in Kathmandu, it is essential to systematically enhance the capabilities of government institutions—particularly the National Road Safety Council (NRSC)—in the following four areas:

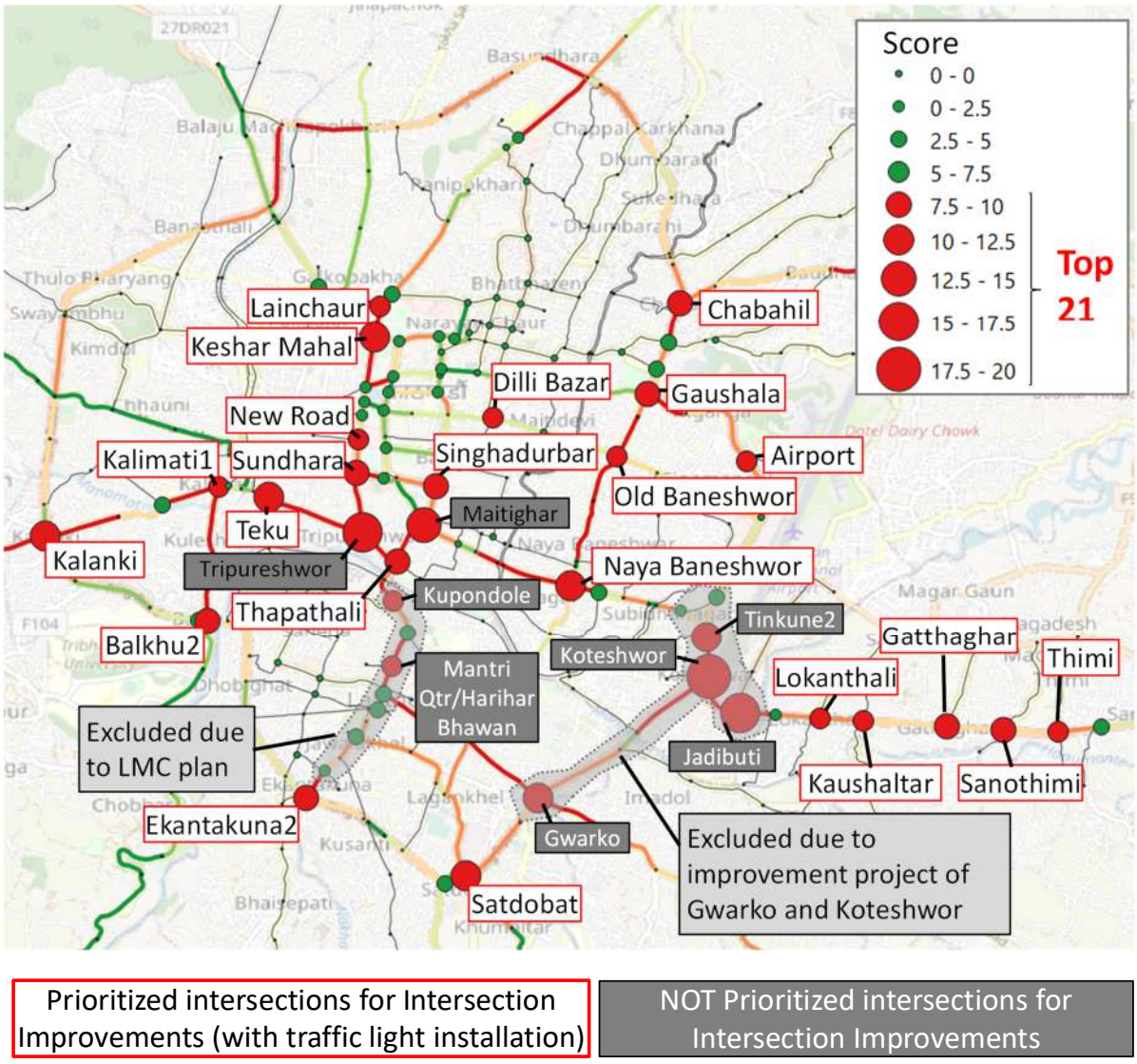
- Strengthening road accident data collection and analysis capacity
- Enhancing road safety engineering
- Strengthening traffic control and enforcement
- Strengthening road safety education and public awareness

t. No.20: Intersection Improvement and installation of traffic signals including center system

Kathmandu Sustainable Urban Transport Project (KSUTP) by ADB listed 108 intersections in KV and prioritized categories by time of installation. Thus, final target should be 108 intersections but the first phase of introducing coordinated traffic signals and intersection improvement includes 23 locations selected by the JICA study "The Project for Introduction of Urban Transport Management in Kathmandu Valley".

Intersection performance can be improved through both physical upgrades and coordinated signal control, and the two measures reinforce each other. Followings are some examples of method which can increase the effect of signalization.

- Addition of Dedicated Right-Turn and Left-Turn Lanes
- Widening of Approach Lanes
- Relocation (Offsetting) of Pedestrian Crosswalks
- Corner Widening (Corner Cut), etc.



Source: The Project for Introduction of Urban Transport Management in Kathmandu Valley

Figure 3.5-20: The intersections Requiring High Prioritization for Improvement

Collection, analyzing various traffic data is required for big city to avoid congestion and accidents. The following are reasons why the utilization of traffic data can contribute to the alleviation of traffic congestion and the reduction of accidents:

(a) Benefits for Congestion Management

- Identify bottlenecks scientifically, including where and when congestion occurs.
- Enables optimal signal control, such as cycle length, green-time distribution, and offsets.
- Allows quantitative evaluation of improvements through before-and-after comparisons (travel time, delay, queue length, etc.)

(b) Benefits for Safety Management

- Identifies high-risk locations (black spots) based on crash records and traffic behavior patterns.

- Reveals underlying causes of crashes through speed, compliance, and trajectory data.
- Verifies the effectiveness of safety measures in a measurable, data-driven way.

Therefore, it is recommended that the KVTPO establish a center not only for signal control but also for comprehensive traffic monitoring, data collection, and analysis. In recent years, image-analysis technology has advanced rapidly. Whereas cameras were previously used only to visually confirm traffic conditions as a supplementary tool, it is now possible to perform various types of analysis using cameras alone, without relying on traditional traffic-detection sensors. From camera footage, it is now feasible to detect vehicle speed, vehicle type, traffic volume, illegal parking, and many other traffic phenomena. Since many cameras are already installed within the Kathmandu Valley, it is easier to begin traffic monitoring using existing cameras rather than installing additional sensors.

u. No.21: Emergency Road Network in KV

The Emergency Road Network is planned to secure essential access for evacuation, emergency vehicles, injured people, and emergency supplies during and after disasters. In the Kathmandu Valley, many roads have insufficient width, discontinuous road sections, and bottlenecks, which may limit emergency access in the event of a major disaster. Therefore, the Emergency Road Network was defined based on road function, connectivity to key facilities, and target road width. Figure 3.5-21 explains the emergency road network plan.

The Emergency Road Network is classified into the following categories:

Class-1: National highways.

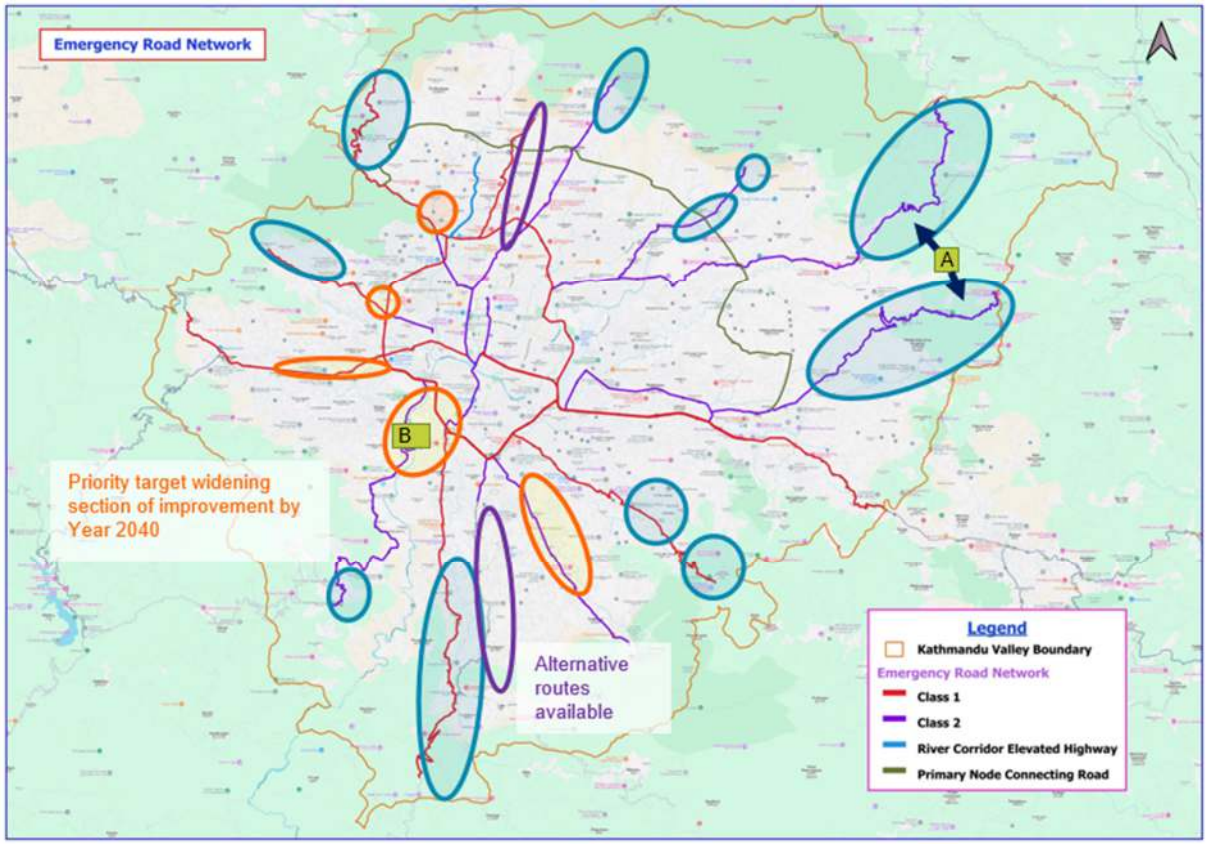
Class-2: Roads other than national highways that connect to major government institutions, parks, fire stations, and large hospitals.

Section B shown in Figure 3.5-21 serves as an access road to the Dry Port, a key logistics hub; a width of 12 m is required. In addition, **Fast Track project** is planned to connect to the Dry Port.

Development policy of Emergency Road Network is as follows:

- For road widening by 2040, priority will be given to connectivity with the Ring Road. A total of 5.3 km (indicated by **orange circles**) will be prioritized for widening.
- The road sections indicated by **blue circles** are located in suburban areas. From the perspectives of ensuring access for suburban residents to the Ring Road—where major medical and administrative facilities are concentrated—and improving accessibility during disasters by utilizing Primary Connecting Roads, these sections will be developed sequentially.
- **Section A** is an access road to Ishan new town planned by KVDA; therefore, its development policy needs to be examined in conjunction with future development.
- On the other hand, the sections indicated by **purple circles** are expected to be substitutable through the utilization of existing roads; therefore, not part of Emergency Road Network.

  Color and section mentioned above are shown in Figure 3.5-21.



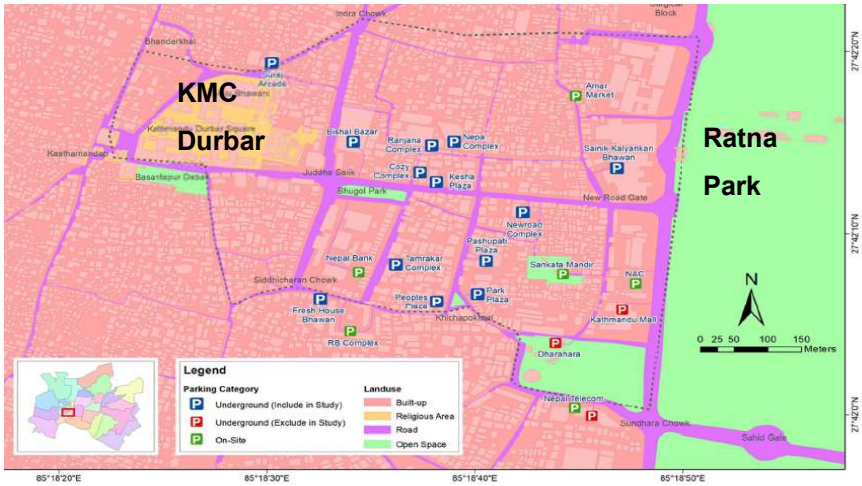
Source:JICA Expert Team

Figure 3.5-21: Emergency Road Network Plan

v. No.22: Installation of Off-street Parking

KMC has several parking facilities around Durbar Square; however, the current parking capacity is insufficient. In addition, a rail-based transit station is planned at Ratna Park, and KMC is also planning to develop an underground parking facility beneath Ratna Park.

Therefore, Ratna Park has the potential to function as a TOD hub by integrating bus services, pedestrian movement, rail transit, and parking facilities. Pedestrian bridges are already provided along the route between Ratna Park and Durbar Square, allowing pedestrians to access Durbar Square directly from the station within a walkable distance.



Source: JICA Expert Team

Figure 3.5-22: Existing Parking Facilities and Land Use around KMC Durbar Square

3.5.1.2 Public Transport Improvement Projects

To address the issues and challenges that must be resolved before Kathmandu Valley can establish a safe and reliable public bus system meeting the travel needs of users, the expert team has identified additional actions that the Government can take to improve public transport services.

Table 3.5-3: Public Transport Projects to be Included in the Transport Master Plan

Category	Proposed Projects			Term			Remarks
				Short (-30)	Middle (-40)	Long (-50)	
Bus Transport Sector Management / Capacity Building	P01	Operation Management		Phase 1	Phase 2		Intended to support all other projects, especially bus industry reform / route restructure
		Capacity Building					
Bus Industry Reform and Route Restructure	P02	Consolidation (by Block)	Business Acquisition				Political Issues between Bagmati & FCCPTA shall be resolved
			O&M Facility Development				
			Fleet Procurement & Charging Station				
	P03	Route Planning	Route Restructure				The concept plan was proposed in this report
			Licensing Scheme				
Bus-park /Facilities Improvement	P03	Improvement of Existing Bus-park					KVDA-MP proposed to develop new bus-park only outside of the ring road.
	P04	Development of New Bus-park					
	P05	Bus Stop Improvement					
Bus Corridor Traffic Management	P06	Expansion of Express Bus (Priority Lane), PTPS					Shall be coordinated with the traffic management projects.
	P07	BRT (East-West & Ring Road)	Fleet Procurement (Articulated Bus * 400 units)				Assumed transport capacity is 10,000 of passengers per hour per direction (pphpd).
			Infrastructure (16 + 27 km)				
Bus Fleet Renewal/Maintenance	P08	Fleet / Maintenance Standards					Shall be coordinated with other international donors.
	P09	Vehicle Renewal Program					
Bus Driver's Training	P10	Capacity Development on Driver's Training					Partly done by Japanese (Tokyu) and Foreign Investor
	P11	Development of Comprehensive Training Centre					
ICT for Public Transport	P12	AFC Installation					For user's platform (MaaS), project by Indian provider is on-going
	P13	GPS: Estimated Arrival Time Information					

Maas: Mobility as a Service
Source: JICA Expert Team

a. Bus Transport Industry Reform

Table 3.5-4 presents three possible scenarios for the bus transport industry in Kathmandu. Case 1 represents the most likely outcome but should be avoided. Case 2 poses challenges

for authorities with limited regulatory capacity, while Case 3 also demands strong public-sector intervention. Although there is no single optimal solution to overcome barriers such as operator resistance, it is expected that further in-depth analysis of existing and new case study cities will provide valuable policy insights for developing countries.

Table 3.5-4: Scenarios of Bus Transport Industry in Kathmandu

	Scenario	Outline	Issue
1	Business As Usual	Current industrial structure is accepted, and each bus operator will seek to survive on its own.	Modal shift to the private modes associated with motorization can't be stopped and many operators will go bankrupt. QOL for the citizens (especially those who can't own the private mode) is suffered.
2	Centralized Control	(ex. Seoul) Centralized control in terms of planning, LOS management and financing	Need strong leadership, executive capacity and deep knowledge on route planning, operation management, etc. The government also needs to be responsible on financing
3	**Step-wise Control**	(ex. Yangon, Dhaka) While maintaining market autonomy, the government eliminates unnecessary competition and provides support for little-by-little modernization.	More drastic consolidation (from 63) is necessary, and the operators shall be companies rather than union Financial transparency should also be a requirement for participation in the bus business

Source: JICA Expert Team

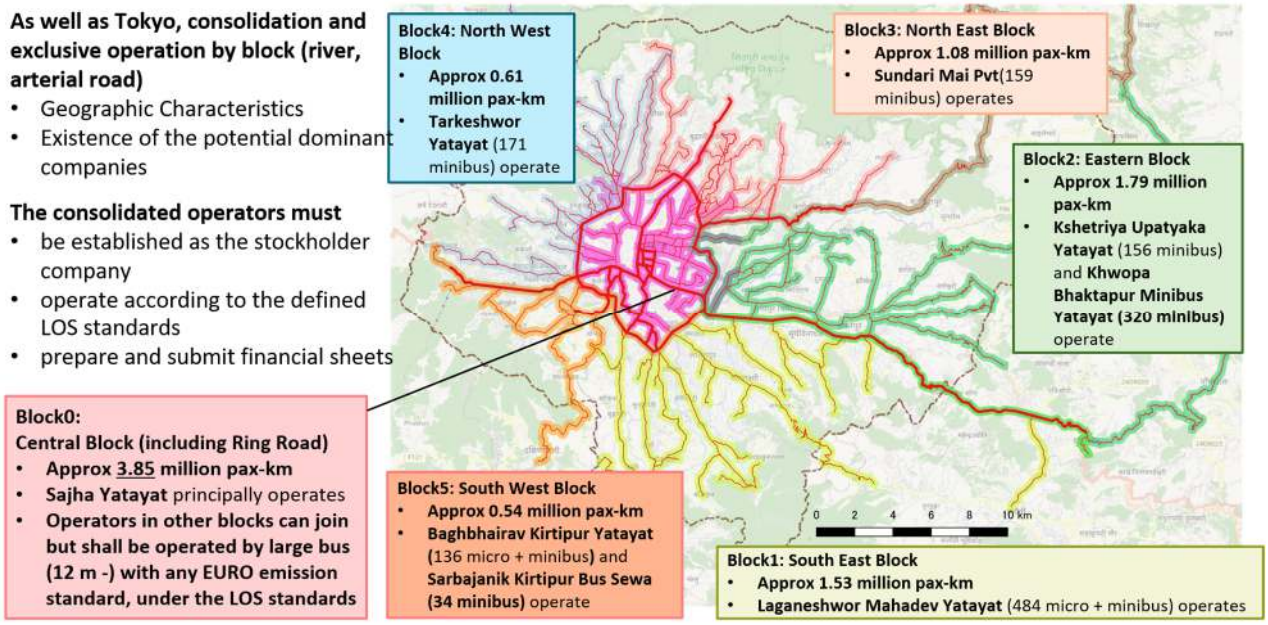
Based on this concept, JET has developed a proposed consolidation scenario for the bus transport system in the Kathmandu Valley, following an approach similar to that adopted in Tokyo, as shown in Figure 3.5-23. The urban area is divided into six operational blocks based on geographical features, such as surrounding mountains and rivers, as well as the presence of potentially dominant operators.

The required number of buses has been estimated based on passenger demand on each section. The consolidated operators are expected to satisfy the following requirements:

- Be established as joint-stock companies;
- Operate in compliance with defined Level of Service (LOS) standards; and
- Prepare and submit financial statements.

In the central block, Sajha Yatayat is proposed as the primary operator. However, approximately 1,000 large buses would be required, which would be difficult for a single company to manage. Therefore, other operators may also participate in service provision. As a general rule, only large buses that meet applicable emission standards should be permitted to operate. If this regulation is enforced, congestion caused by minibuses, micros, and tempos could be significantly reduced.

Assuming that the proposed block-based exclusive operation represents a medium- to long-term future vision, the most realistic approach would be to gradually reduce competition among operators and promote consolidation in a phased manner.



Source: JICA Expert Team

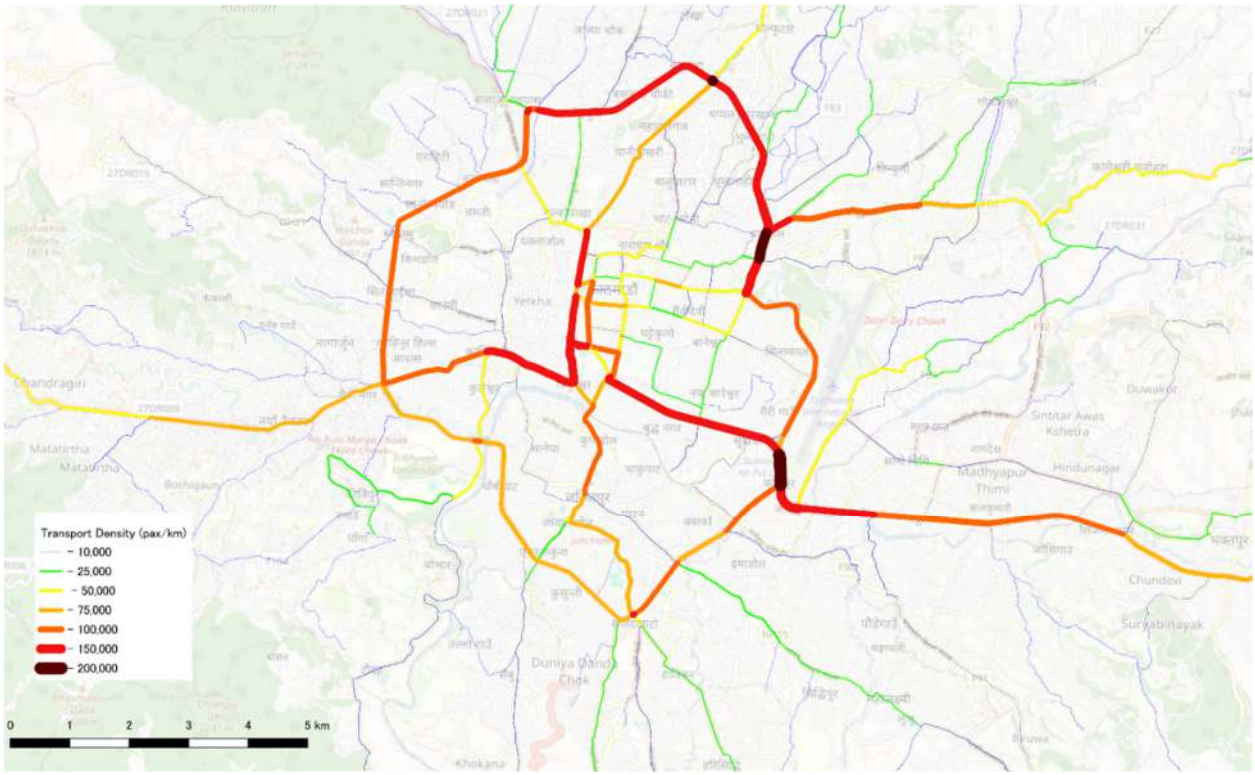
Figure 3.5-23: (Example of) Exclusive Operation by the Urban Blocks

b. Bus Route Restructuring

Figure 3.5-24 illustrates sectional transport density, indicating the number of passengers carried per day in both directions.

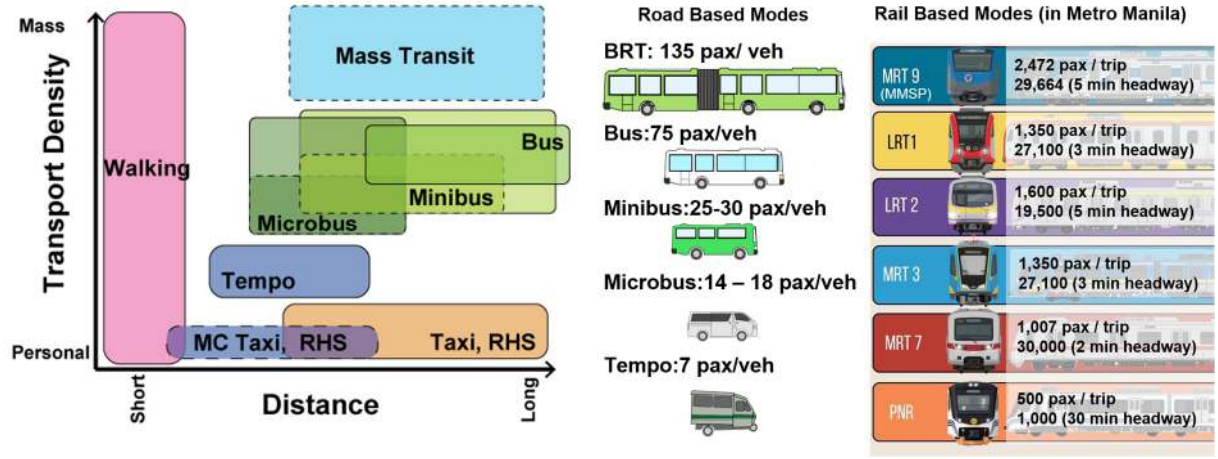
- Sections with more than 50,000 passengers (orange or red): introduction of large or articulated buses should be considered.
- Sections with more than 100,000 passengers (red): such volumes may exceed the capacity of road-based transport, and the introduction of a metro system should be discussed.

Figure 3.5-25 conceptualizes the applicability of different transport modes according to passenger demand, taking local conditions into account. In Kathmandu, both road space and the availability of large buses are limited. Therefore, simply increasing the number of smaller vehicles may aggravate congestion caused by public transport vehicles.



Source: JICA Expert Team

Figure 3.5-24: Transport Density by Road Section



Source: JICA Expert Team

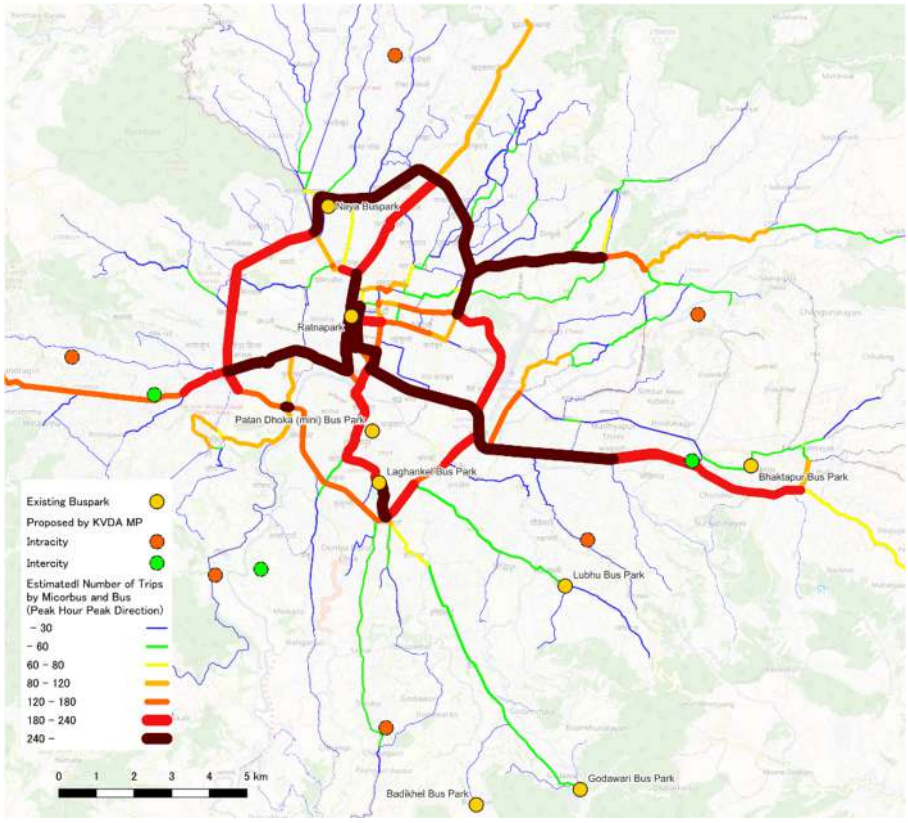
Figure 3.5-25: Transport Density by Travel Mode

c. Bus-park / Facilities Improvement

(a) Bus-park Development / Improvement

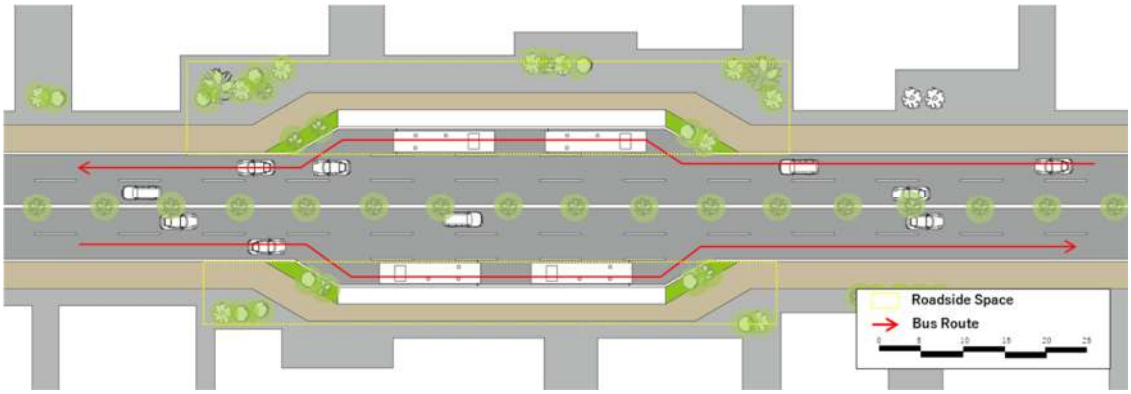
Several facilities known as bus parks exist in the Kathmandu Valley, with the main ones located at Ratnapark, Lagankhel, and Gongabu (Naya Bus Park). There remains considerable room for improvement in both major and minor facilities. The KVDA Master Plan Study proposes the development of intercity and city bus parks outside the Ring Road, considering the challenges of land acquisition. However, given the urban structure and the existing public transport network, it is preferable to locate intermodal facilities within or along the Ring Road. Although land acquisition for new terminal facilities is difficult, upgrading existing bus shelters could

serve as a practical alternative. The clear demarcation between public transport and other modes (such as motorcycles and taxis) remains a key issue.



Source: JICA Expert Team

Figure 3.5-26: Location of Buspark in Kathmandu



Source: JICA Project for Improving Public Bus Service in Yangon (2021)

Figure 3.5-27: Example of Intermodal Facilities within Right-of-Way (ROW)

As a case study on bus park improvement, the JET prepared a development concept plan for the existing bus park in Lagankhel. Based on the operational data collected through surveys, the transport demand at the site was analyzed, and an improved layout was proposed according to the following principles:

- ✓ **Separation of Boarding and Alighting Areas:** Allowing boarding and alighting at the same location causes longer dwell times and traffic congestion.

For routes entering the bus park, alighting zones should be placed before boarding stops.

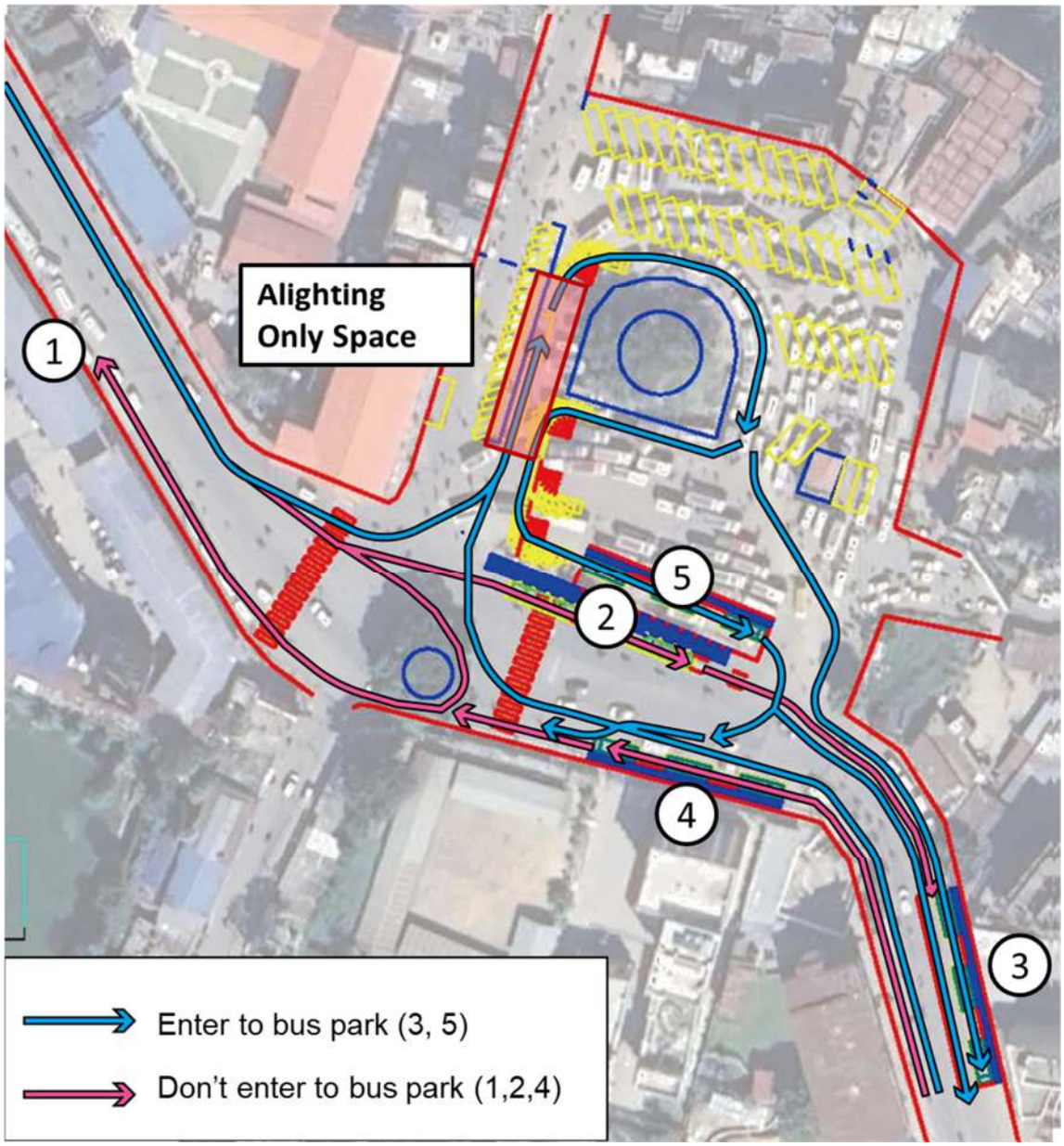
- ✓ **Allocation of Boarding Stops by Destination:** To minimize conflicts between buses, boarding areas should be assigned according to destination groups. Based on the bus operator interviews, the number of trips per route was estimated, and the required number of berths was designed accordingly.
- ✓ **Restriction of Dwell Time:** To secure space for boarding and alighting and improve traffic conditions, excessive dwelling times should be prohibited.

The draft concept plan for the improvement of the Lagankhel Bus Park is illustrated in **Figure 3.5-28**. Boarding areas are allocated by destination groups, as shown in **Table 3.5-5**.

Table 3.5-5: Proposal on Allocation of Boarding Space by the Destination Group

Boarding Space by Destination Group		# of Routes (*1)		# of Trips			Berth (*2)
		Type A	Type B	Micro	Bus	Total	
1	Route Operated by Sajha Yatyat and route to Ratna Park	5	3	467	596	1,063	3+
2	Intermediate Stop towards Southern Ward	0	7	493	161	654	2
3	Routes originate towards Southeastern wards	12	0	512	465	977	3
4	Intermediate Stop towards Northern Ward	0	4	493	0	493	2
5	Routes originate towards Nayabus, Baktapur and Western Wards	15	0	258	626	884	3

1) Type A: originate or terminate from Lagankhel . Type B: Pass Lagankhel as the intermediate stop.
2) Benchmark to develop 1 slot: 300 trips per day ≒ 30 trips per peak hour ≒ 2 minutes per trip
Source: JICA Expert Team



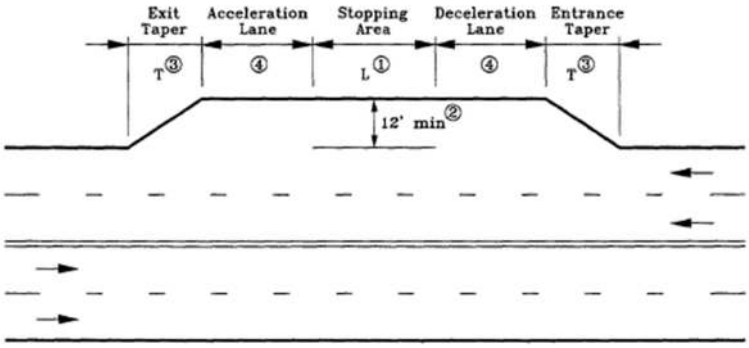
Source: JICA Expert Team

Figure 3.5-28: Draft Concept Plan for Improvement of Lagankhel Buspark

(b) Bus Stop Improvement and Preparation of Bus Stop Design Guideline

For the bus-related facilities including bus stops, appropriate design standards needs to be defined . The elements of the bus stops include:

Location	Bus stop pole and flag
Pedestrian access	Approach and exit paths
Waiting area	Type and height of kerbs
Shelters and seating	Drainage
Security and lighting	Surface markings



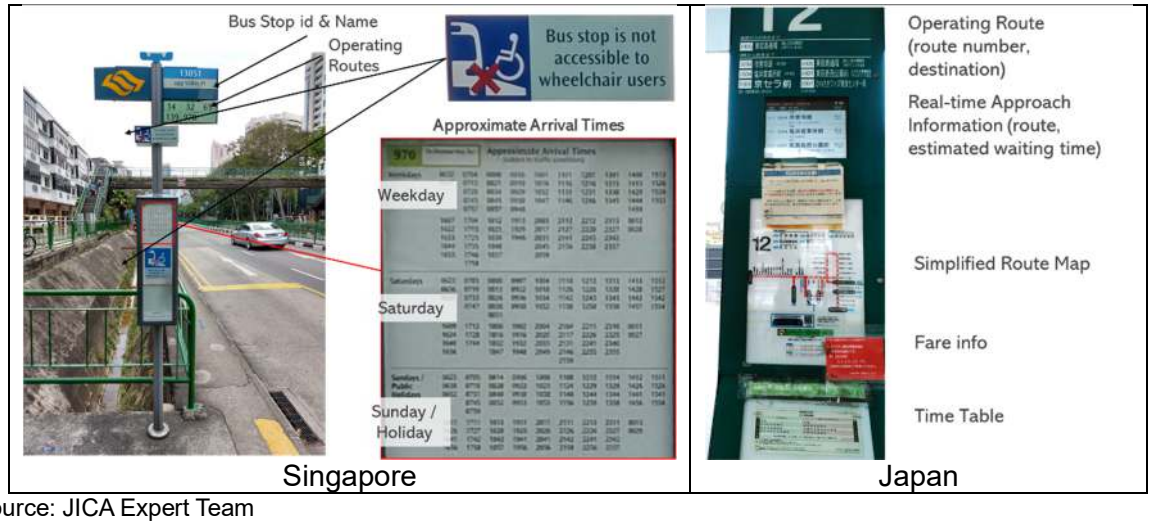
Source: "Guidelines for the Location and Design of Bus Stops", Transportation Research Board of National Research Council of the United States

Figure 3.5-29: Design of Bus Bay

It is nearly impossible to accommodate all bus traffic at a single bus stop (with one or two slots). Therefore, it is recommended to separate stops by destination or operator.

(c) Improvement / Upgrade

According to the design guidelines, bus stop development should be implemented systematically. Although it is difficult to upgrade all bus stops to full-scale facilities (with roofs, bays, and other infrastructure), reasonable improvements should be made based on passenger demand and space availability. In addition to physical infrastructure, basic equipment for displaying operational information—including the bus stop name and ID, signboards showing operating routes, and route maps—should also be provided.



Source: JICA Expert Team

Figure 3.5-30: Example of the Bus Information Provision

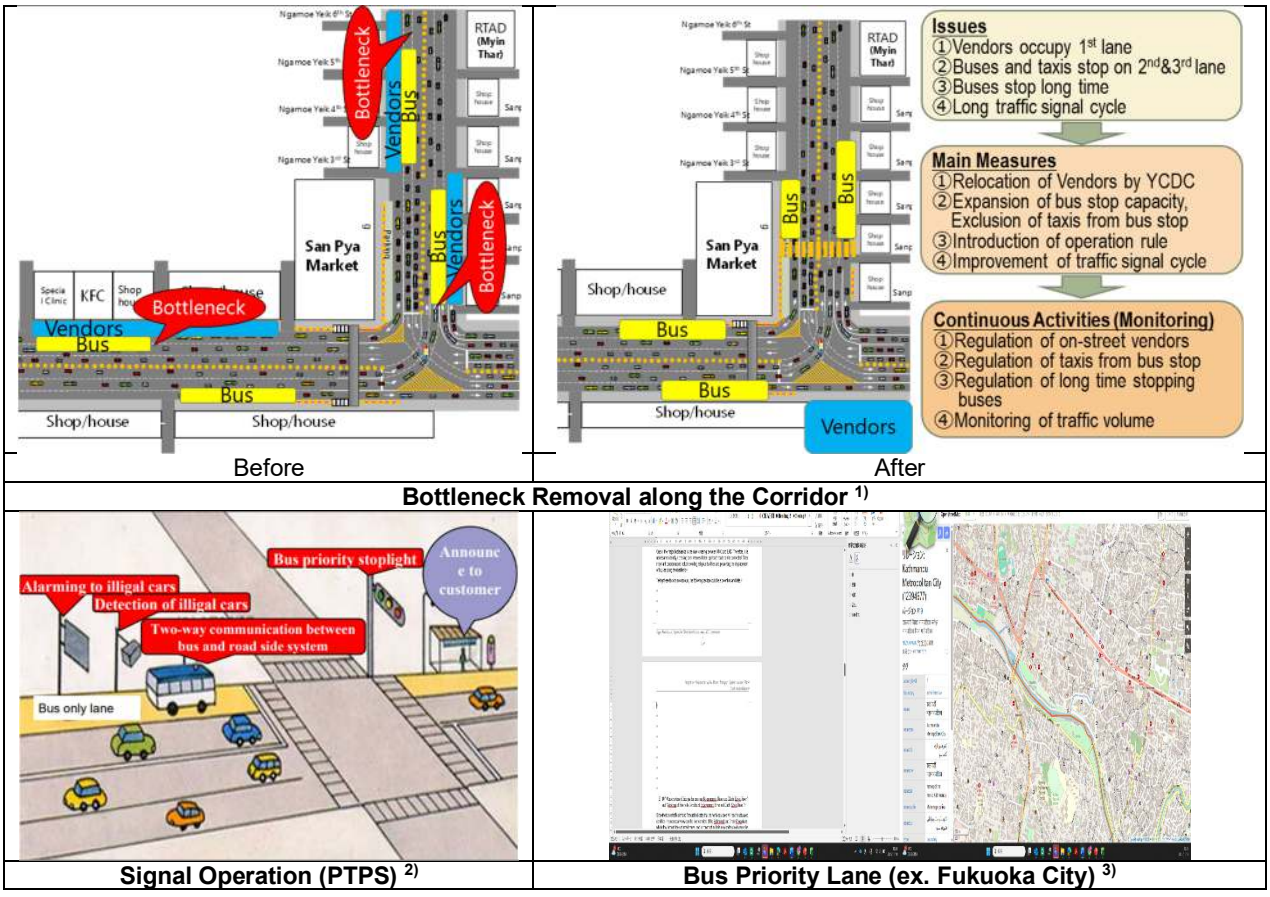
d. Bus Corridor Traffic Management

For the corridors with high traffic volume by buses (Refer **Figure 3.5-31**), any priority measures to secure smooth and safe traffic movement shall be introduced. The possible options are as follows:

- ✓ **Bottleneck Removal along the Corridor:** Congestion caused mainly by public transport operations can be observed in certain corridors. Typical countermeasures include intersection widening, lane reconfiguration, channelization of turning movements, relocation of on-street parking, and optimized access management.

✓ **Signal Operation (PTPS):** The Public Transport Priority Signal (PTPS) system provides preferential treatment to buses at signalized intersections. Using vehicle detection, GPS data, the system adjusts signal phases—such as extending green or shortening red—to reduce delays for approaching buses. PTPS improves service punctuality and enhances the overall attractiveness of public transport. When integrated with centralized traffic control, it can balance corridor-wide efficiency while maintaining acceptable service levels for cross-traffic and pedestrians.

✓ **Bus Priority Lane / Exclusive Lane (Including BRT):** These measures ensure punctual and reliable service regardless of mixed traffic congestion. Configurations range from curbside priority lanes for express services to fully segregated Bus Rapid Transit (BRT) corridors with median alignment, stations, and off-board fare collection. In Kathmandu Valley, a priority lane policy known as the "Express Bus" was previously attempted but was unsuccessful. Effective implementation requires strict enforcement, clear lane markings, and physical separation to maintain efficiency and public acceptance.

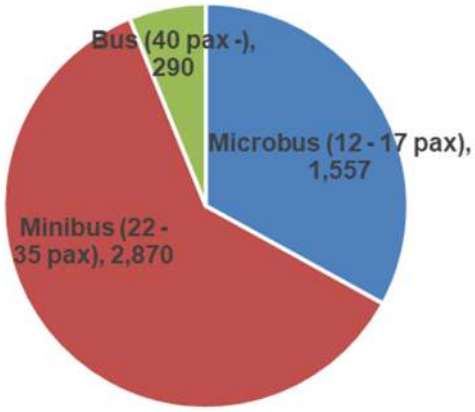


Source: 1) Project for Improving Public Bus Service in Yangon 2) Ministry of Land, Infrastructure, Transport and Tourism, Japan

Figure 3.5-31: Example of the Bus Corridor Traffic Management

e. Bus Fleet Renewal / Maintenance Program

According to the public transport operator interview survey, most bus fleets are classified as minibuses with a capacity of 22–35 passengers, offering little or no standing space. The number of large buses (with a capacity of 40 passengers or more) remains limited (Refer Figure 3.5-32). As noted in Section (c) Bus Route Restructuring, consolidating passenger demand from numerous small fleets into a smaller number of large fleets could help alleviate traffic congestion along major corridors.



Source: JICA Expert Team

Figure 3.5-32: Composition of Bus Fleets by Passenger Capacity

The introduction of a larger number of buses should be prioritized, particularly for arterial routes. However, procuring a large number of vehicles at once presents several challenges, including:

- ✓ Recruiting qualified drivers and maintenance staff and providing adequate training
- ✓ Ensuring sufficient garage and workshop capacity
- ✓ Managing medium- and long-term fleet operations

In particular, uneven fleet composition by manufacturing year complicates maintenance and replacement planning. If many new buses reach the end of their service life simultaneously, this may create budgetary burdens and safety risks due to rushed or insufficient maintenance. To balance investment and operating costs while ensuring safety, the fleet should be systematically renewed so that vehicle age distribution remains consistent over time.

In addition to fleet procurement, a structured maintenance system should also be introduced as a prerequisite for entering the bus industry. Regular daily, monthly, and annual maintenance is essential to maximize vehicle lifespan and minimize life-cycle costs. Public authorities should be required to inspect and verify maintenance records to ensure compliance.

f. Bus Driver's Training

Along with fleet renewal, drivers' operational behavior should be continuously improved. In Nepal, driving licenses are classified from Category A to K. Bus drivers are required to hold either Category F (Minibus/Minitruck) or Category G (Truck, Bus, and Lorry), with at least two years of driving experience under Category B (Passenger Car). Applicants must undergo practical training at a driving school for an average of 7–10 days (approximately 30 minutes per day). However, aptitude and customer service skills are not evaluated in the licensing process.

Most public transport operators, particularly micro-enterprises, do not monitor or prioritize driver behavior, as they are not held directly accountable for accidents or passenger complaints. Operators are required to maintain defined Level of Service (LOS) standards, with the number of traffic accidents per total operating distance being one of the potential indicators. To uphold these LOS standards, driver training support measures are essential. Specifically, the development of training manuals, training programs, and the establishment of dedicated training centers are recommended.

g. ICT for Public Transport

To implement public transport measures effectively and efficiently, technological innovations can be applied. In emerging countries, rapid leapfrogging from traditional operations to

advanced technologies is often encouraged across various sectors. The table below presents possible options for technological interventions in public transport.

An IC card system was previously introduced on routes operated by Sajha Yatayat (a public operator)[1] but was discontinued in 2024. In addition, GPS tracking and CCTV systems have been installed in some Sajha Yatayat buses.

Table 3.5-6: Options of ICT Utilization of Public Transport and Applicability in Kathmandu

Service	Contents	Term	Remarks
AFC	Conductors do not need to be assigned. It is a mandatory requirement to ensure financial transparency in the bus business. Manual fare collection causes embezzlement and underreporting of fare revenues Passengers tap the IC card reader only one time (at boarding). If the 2-tap rule (by distance- based fare) is introduced, origin-destination information of the passengers will be available and applicable for route planning.	Long term	Payment options (QR code, Pre-paid and Credit Card) shall be discussed.
CCTV	(in vehicle) Inspect the illegal behaviors of the passengers and drivers or conductors. (in front of vehicle) inspect the illegal behaviors of the other vehicle A technology to identify the number of passengers on board could be introduced.	Short-Middle term	These equipments could be included as the requirement for joining bus industry (or arterial routes). Considering the financial status of the operator, a period of grace shall be established for the introduction of each equipment.
GPS for Vehicles	Delay management and dispatch management Record of alert (over-speeding, sudden brake and stop) will be collected from GPS and utilized for training. Provision via mobile application or info-board at bus stop	Short – Middle term	Unified software or unified format of the exported record shall be provided.
General Transit Feed Specification (GTFS) Development	Specification of the public transport route information, which will be published in Google Maps. It could be utilized for the mobile application for providing route information and route planning With GPS information, GTFS-RT (real-time) can be developed.	Short term	A Bengaluru-based startup[2] developer is developing the application (with the preparation of GTFS).
Development of MaaS	An integrated platform for various transport services	Middle term	

Source: JICA Expert Team

3.5.1.3 Mass Transport Projects

a. Related Past Studies for Mass Transport in KV area

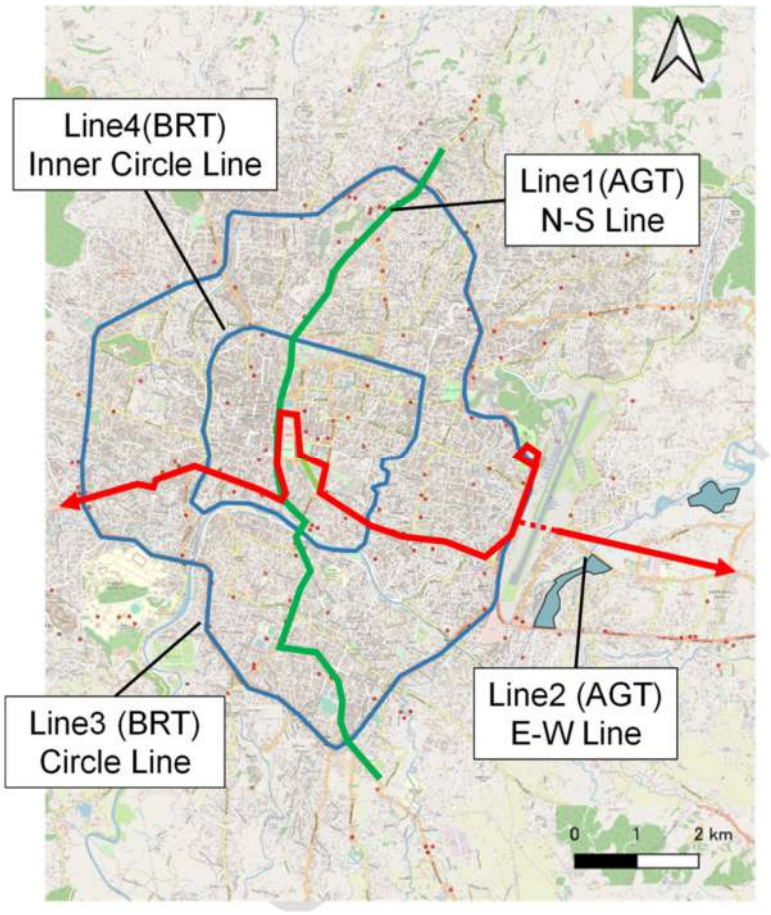
The discussion and proposal of introduction of mass transport have been made from the last MP etc. The followings are the main studies and proposals of mass transport in Kathmandu Valley area.

Further discussion will continue to determine the most suitable mass transport system (Bus Rapid Transit, Automated Guideway Transit, or Mass Rapid Transit) and routes based on the alternative scenarios.

[1] Gadgetbyte Nepal Pvt. Ltd: Sajha Yatayat to Introduce Smart Travel Card, February 2017 (https://www.gadgetbytenepal.com/sajha-yatayat-introduce-smart-travel-card/)
[2] YOURSTORY: Mobility-as-a-service startup Tummoc begins operations in Nepal, May 2025 (https://yourstory.com/2025/05/mobility-service-startup-tummoc-begins-operations-nepal)

(a) Master Plan 2017

In the 2017 MP, two AGT lines and two BRT lines were proposed. These were the North-South Corridor (Line 1) and the East-West Corridor (Line 2), respectively. The BRT lines would be the Outer Ring Road (Line 3) and the Inner Ring Road (Line 4). These are essentially dedicated lines that utilize the center of the road.

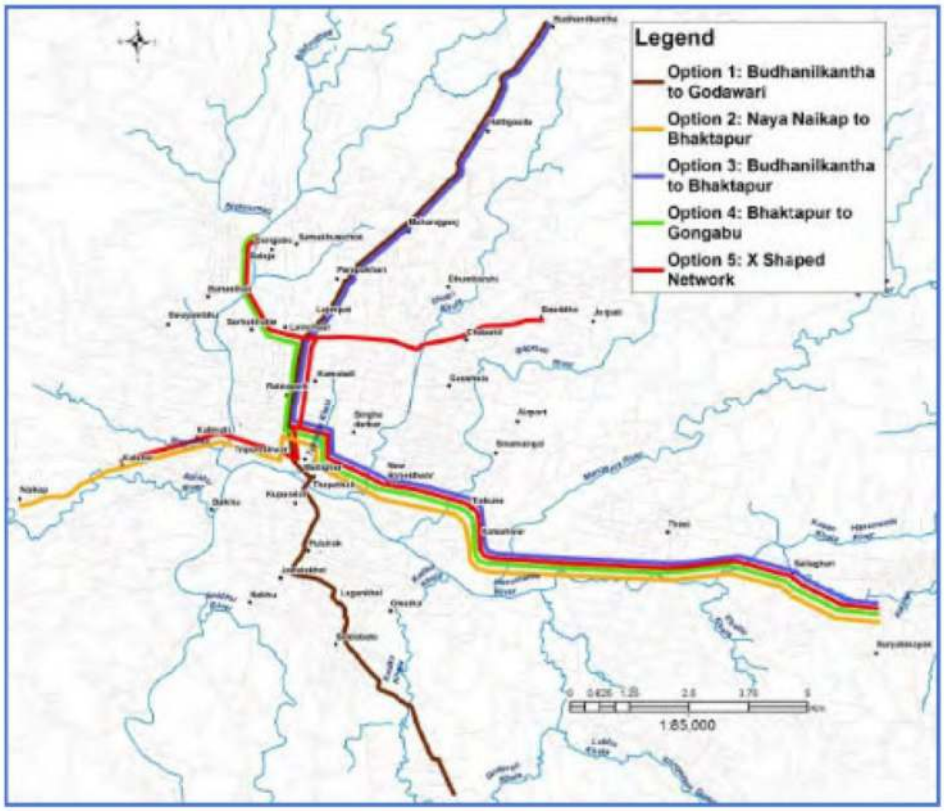


Source: 2017 Master Plan

Figure 3.5-33: Proposal of Mass Transport on 2017 MP

(b) Kathmandu Sustainable Urban Transport Project (KSUTP)

This study proposed a new optimal route by summarizing previously proposed MRT lines. Based on the traffic demand forecast results, five lines were proposed for the MRT, as shown in **Figure 3.5-34**. Option 4 was recommended as the top priority line based on multiple evaluation criteria. Demand forecast results estimated PPHPD (Passenger per Hour per Direction) at 20,000 to 40,000 by 2040. The structure is planned to be elevated and underground. The initial cost is estimated at USD 1.84 billion.



Source: KSUTP, 2025

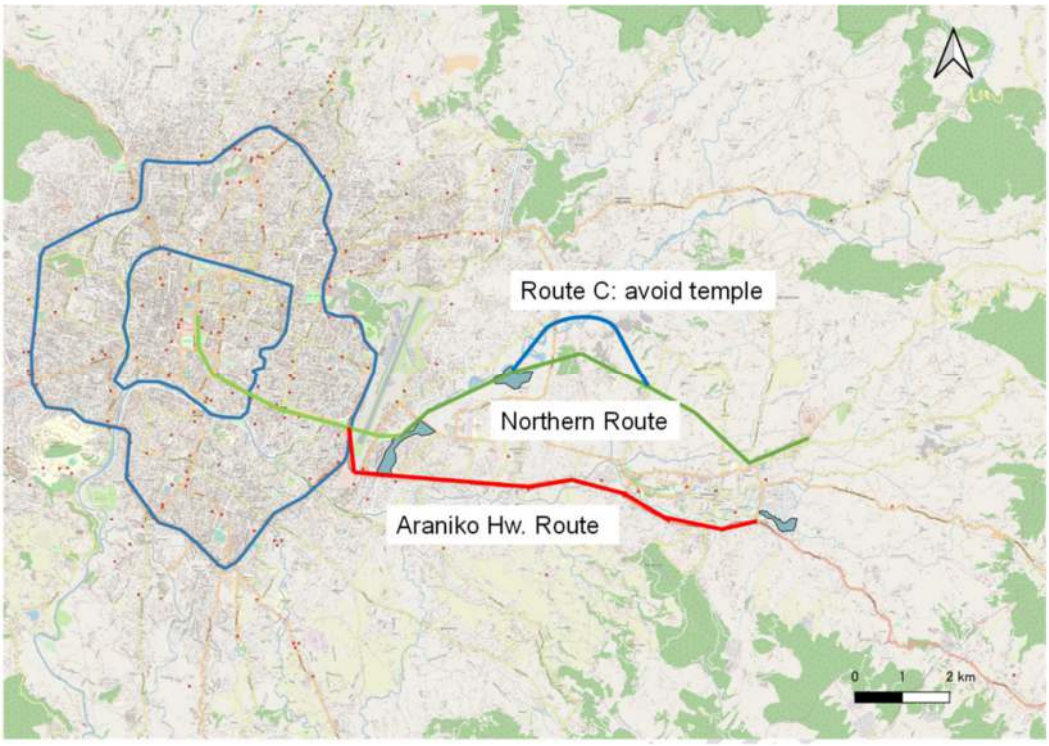
Figure 3.5-34: Proposal of Mass Transport on KSUTP

(c) JICA Data Collection Study in 2019

The need for urban railway development as a long-term solution in this study.

The route proposed in the 2018 KSUTP, which passes through the Araniko Highway (red line), has been revised. A route passing through the north (green line) and its detour route further north (blue line) have been proposed.

These routes were selected because of securing a rail depot and its gentle longitudinal alignment. Daily demand was estimated at 900,000 passengers, and initial construction procurement costs were estimated at USD 1.17 billion.



Source: JICA Data Collection Survey

Figure 3.5-35: Proposal of Mass Transport on 2019 JICA Study

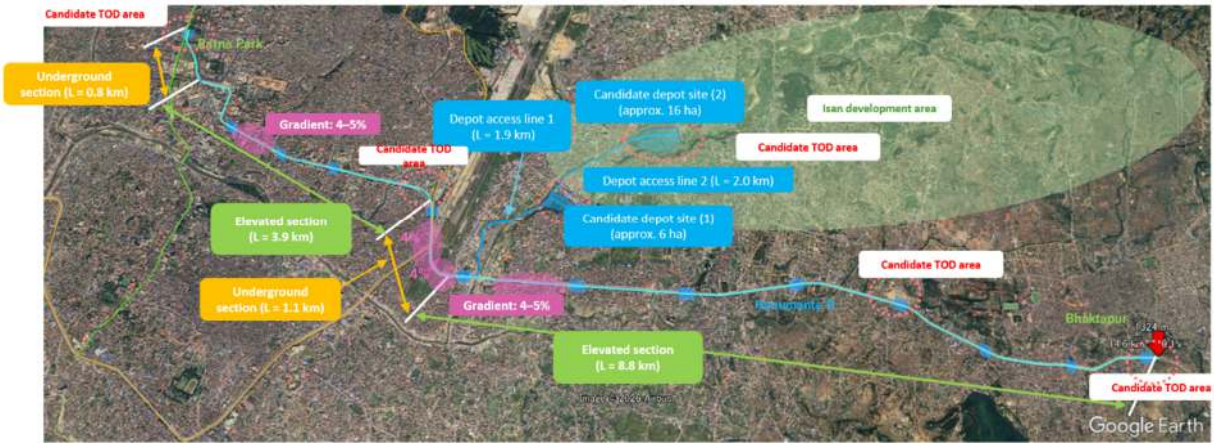
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b. Proposed route of Mass Transit System in this Master Plan

The traffic demand forecast undertaken in this study indicates that the east–west corridor connecting Kathmandu Metropolitan City and Bhaktapur Municipality will experience the highest passenger demand within Kathmandu Valley by the target year. The corridor accommodates a large concentration of residential areas, commercial districts, educational facilities, and government institutions, while also serving as the principal urban development axis of the Valley. Even with the implementation of planned road improvement projects, the forecast results indicate that traffic congestion along this corridor will continue to worsen due to increasing travel demand and the limited possibility for further road widening in densely urbanized areas.

In order to provide sufficient transport capacity, improve travel reliability, and promote a modal shift from private vehicles to public transport, the introduction of a high-capacity mass transit system is proposed as the highest-priority public transport investment under the Master Plan.

This proposal is based on the preliminary study based on the result of traffic demand forecast, site survey, and some analysis. Pre-F/S will be conducted in the next stage, and detail plan will be described in the Final Report.



Source: JICA Expert Team

Figure 3.5-36: Proposal of Mass Transit East-West Line Project

(a) Project Objectives

The objectives of the East–West Mass Transit Line are to:

- establish the backbone of the future public transport network in Kathmandu Valley;
- provide a fast, reliable, and high-capacity public transport service along the corridor with the highest passenger demand;
- encourage modal shift from motorcycles and private cars to public transport;
- reduce traffic congestion, travel time, greenhouse gas emissions, and traffic accidents; and
- support sustainable urban development through integration with Transit-Oriented Development (TOD).

The project also serves as the first stage of the long-term metropolitan mass transit network envisioned for Kathmandu Valley.

(b) Project Description

The proposed project consists of the construction of an east–west mass transit corridor between Ratna Park and Bhaktapur with a total length of approximately 16.5 km, including depot access tracks. The alignment has been developed based on the results of the transport demand forecast, existing urban structure, engineering feasibility, and future development potential.

Considering the topographical conditions of Kathmandu Valley, traffic conditions, and the need to minimize land acquisition and environmental impacts, the project adopts a combination of underground and elevated structures. Underground sections are proposed within the highly congested city centre and around the Koteshwor area, where road space is extremely limited and traffic disruption during construction should be minimized. Elevated structures are proposed for the remaining sections by utilizing the existing road right-of-way wherever possible.

To ensure operational flexibility and accommodate the geographical conditions of the Valley, the proposed system assumes either a Linear Metro or a Light Rail Transit (LRT) system. Both technologies are capable of operating on relatively steep gradients, negotiating constrained urban environments, and providing sufficient capacity to accommodate future travel demand.

The project also includes the construction of depot facilities, access tracks, stations, power supply systems, signalling and communication systems, rolling stock, and other operational facilities necessary for safe and efficient operation.

(c) Integration with Urban Development

The East–West Mass Transit Line is expected to function not only as a transport project but also as a catalyst for sustainable urban development.

Candidate Transit-Oriented Development (TOD) areas have been identified around major stations where mixed-use development, higher-density residential and commercial activities, and improved pedestrian accessibility can be promoted. These developments are expected to increase public transport ridership while contributing to more compact and sustainable urban growth.

The proposed mass transit line should be integrated with the future public transport network, including feeder bus services, intercity bus terminals, and other mass transit corridors planned for the longer term. Such integration will improve accessibility throughout Kathmandu Valley and maximize the effectiveness of the overall transport system.

(d) Future Development

The proposed East–West Mass Transit Line represents the first phase of the long-term metropolitan mass transit network. In the future, extensions toward newly developing urban areas, integration with north–south and Ring Road mass transit corridors, and expansion of the public transport network will be considered in accordance with future travel demand and financial capacity.

The phased implementation strategy adopted in this Master Plan enables Kathmandu Valley to establish a financially realistic and technically feasible pathway toward a comprehensive mass transit network while maximizing the benefits of early investment in the highest-demand corridor.

3.5.2 Implementation Schedule

3.5.2.1 Road and Traffic Management

This is the proposed project schedule. Construction and traffic management components are separated. Traffic management requires parallel progress of design and the EIA/EID process. The necessity of the Balambu–Kalanki elevated highway may need reassessment depending on the Fast Track progress. With coordinated signals and data-driven traffic management, establishing a Traffic Management Center and strengthening capacity will be essential.

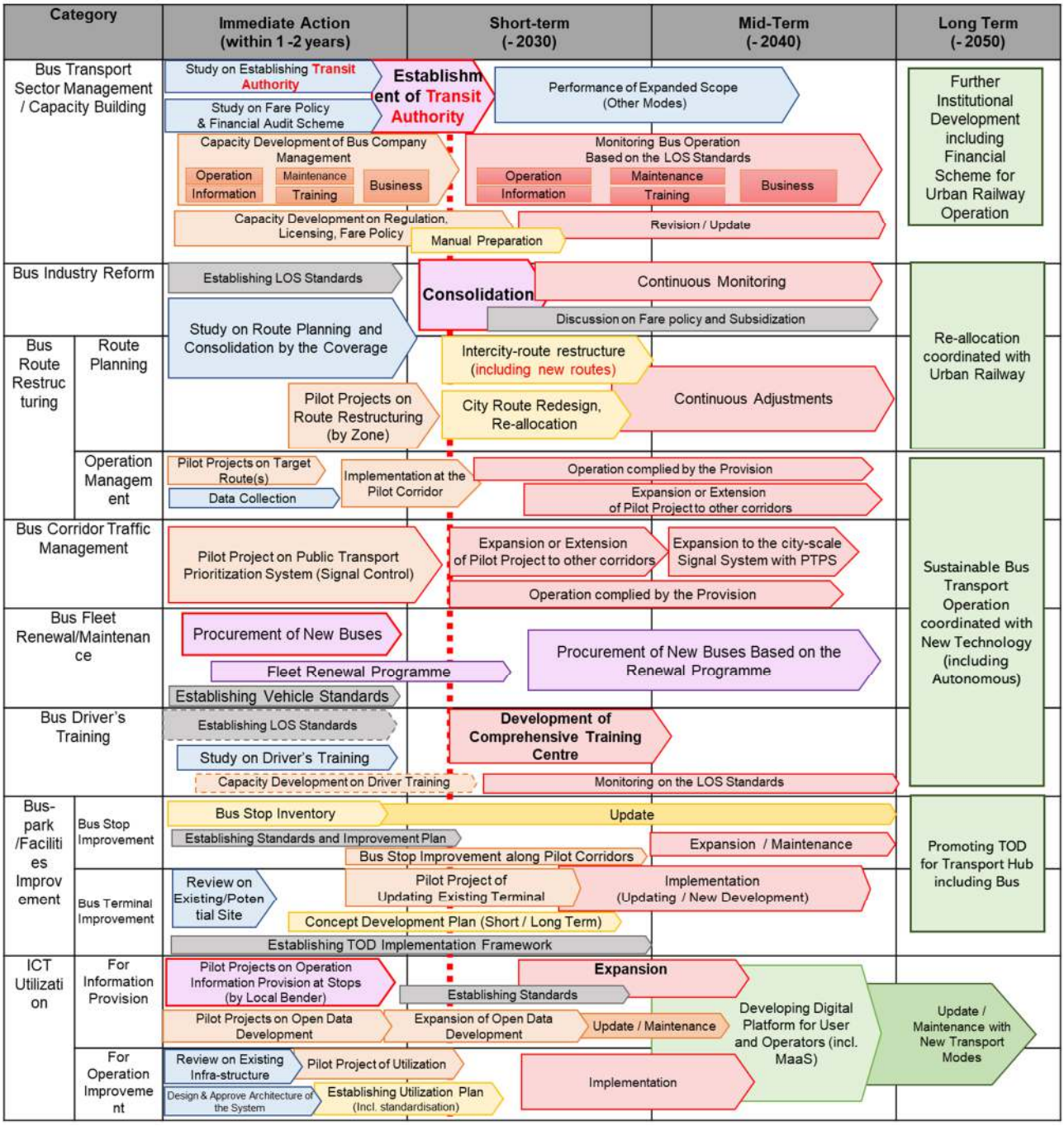
	Category	Short-term (-2032)	Mid-term (-2040)	Long-term (-2050)
Road Project Planning	1) Maharajgunj Underpass	LA → EIA → DC		
	2) Chabahil-Gaushala Underground Tunnel	LA, BD → EIA	DC	
	3) Chabahil-Bagmati River Elevated Highway		BD → EIA/HIA → DC	
	4) Bishnumati River Corridor Elevated Highway		BD → EIA → DC	
	5) Widening Ring Road （Gaushala-Tinkune）		BD → EIA → DC	
	6) New River Corridor (Thapathali-Tripureshwor)		BD → EIA → DC	
	7) Improvement of the unpaved road on the Bagmati River	EIA → D		
	8) UN Park Bridge Widening	BD → EIA → DC		
	9)-13) New Bridge (Bishnumati River/Dhobi Khola River/Karma Nasa/Gwarko/Thapatali)	BD → EIA → DC		
	14) Primary Node Connecting Road		LA → EIA → DC	
	15) Balaju Bishnumati River Corridor	EIA → D		
Other Road-related Project	16) Establishment of Utility Corridor Network under Major Arterial Road	Design and Coordination among related agencies	Construction & installation	
	17) Car Free Zone	HIA		
	18) Cycling Path	Implementation		
	19) Road Safety Project	Review, Pilot Implementation, Capacity building, Manual preparation		
	20) Intersection Improvement and installation of traffic signals including center system	Signal: DI(23) Center: DI Intersection Improvement: DC	Signal: DI(85) Continuous Updating System	
	21) Development of Emergency Road Network	Definition of Emergency Rd	Establishment/implementation of Legal Framework	
	22) Installation of Off-street Parking		Design & Operation	

Note: LA: Land Acquisition, BD: Basic Design, DC: Design & Construction, EIA/HIA: EIA/HIA Clearance.
DI: Design & Installation
Source: JICA Expert Team

Figure 3.5-37: Implementation Plans for Road and Traffic Management Sector

3.5.2.2 Public Transport Sector

Figure 3.5-38 presents a draft roadmap outlining the activities related to public transport. The chart was developed to illustrate the relationship between proposed actions and the potential impacts of delays. In particular, policy-making and institutional development actions are of critical importance, as they are closely linked to overall project progress. Until the Institutional Framework for Public Transport in Kathmandu is formally established, pilot projects should be implemented to verify the impacts and benefits of proposed actions and to strengthen the operational capacity of the relevant organizations, including private operators.



Source: JICA Expert Team

Figure 3.5-38: Implementation Plans for Public Transport

The introduction of mass transport is expected to be necessary by 2040. For more consideration, pre-F/S will be done by JICA Expert Team.

3.6 Alternative Analysis

. A comparative analysis of alternative scenarios for the prioritized projects and structural measures was conducted in terms of environmental, social, technical, economic, and financial aspects This analysis includes 'Without Option' as one of the alternative scenarios for doing nothing. Evaluation of prioritized projects or structural measures is carried out from the aspect of environmental and social consideration, and Items reflected to the master plan will be clarified.

3.6.1 Alternative Scenario

3.6.1.1 "Without Project" Scenario

The "Without Project" scenario assumes that routine maintenance of existing road services will continue. At present, traffic demand exceeds existing road capacity in many areas, and as urbanization expands and traffic demand increases in the future, traffic congestion and air pollution are expected to worsen.

3.6.1.2 "With Project" Alternative Scenario

i. Alternative Scenario 1: Comprehensive Mass Transit Network Scenario

This scenario assumes the phased development of a comprehensive mass transit network by 2050, consisting of east–west, north–south, and ring corridors. The objective is to maximize the modal shift from private vehicles to public transport by establishing a high-capacity rail-based network supported by feeder bus services and Transit-Oriented Development (TOD). This scenario provides the greatest long-term benefits in terms of travel time reduction, greenhouse gas emission reduction, and urban development; however, it requires substantial capital investment, large-scale land acquisition, institutional capacity, and a long implementation period. Considering the current financial and institutional constraints, the scenario represents a long-term vision rather than a realistic implementation plan within the target period.

ii. Alternative Scenario 2: Road-Oriented Improvement Scenario

This scenario prioritizes road infrastructure expansion and traffic management measures while maintaining the existing bus-based public transport system with only limited improvements. Major investments are directed toward road widening, new road construction, grade separations, intersection improvements, intelligent transport systems (ITS), and traffic operation enhancement. Although this scenario can improve traffic conditions in the short term with relatively lower institutional complexity, increasing dependence on private vehicles is likely to generate induced traffic demand, resulting in recurring congestion, higher greenhouse gas emissions, and deterioration of air quality. Furthermore, the scenario provides limited support for achieving the long-term objectives of sustainable urban mobility and climate resilience.

iii. Alternative Scenario 3: Integrated Transport Strategy Scenario

This scenario addresses widespread traffic congestion and structural deficiencies in the Kathmandu Valley through a comprehensive approach that combines road capacity expansion, enhanced network connectivity, alternative route development, and improved traffic management, rather than relying solely on individual intersection improvements. It aims to accommodate future traffic demand while improving traffic flow, safety, and disaster resilience.

3.6.2 Alternative Study

The four scenarios were evaluated relative to one another using a Multi-Criteria Analysis (MCA) framework from five perspectives: technical, economic, financial, environmental, and social. Each criterion was assessed using the following rating scale: A (Excellent:3 point), B (Good:2 point), C (Moderate:1 point), and D (Poor or Negligible :0 point).

Table 3.6-1 Alternative Analysis of Urban Transport System

	ID	Item	Description	Alternative Scenarios			
				0	1	2	3
Technical	TC1	Technical Feasibility	Maturity of the assumed technology and constructability	B	C	A	B
	TC2	Institutional and Operational Ease	Capacity of the operating organization, complexity of institutional arrangements	A	D	A	B
	TC3	Implementation Period	Time required from planning to service commencement	A	D	B	C
	TC4	System Integration	Connectivity and interoperability with the existing transport system	D	A	C	B
Economic	EC1	Regional Economic Spillover and Productivity Gains	Short term stimulus from construction investment combined with long term productivity gains from reduced travel time	D	A	C	B
	EC2	Land and Property Value Enhancement	Increase in land value and development potential along the corridor	D	A	C	B
	EC3	Industrial Location and Investment Attraction	Contribution to business location decisions and investment attraction	D	A	C	B
	EC4	Contribution to Fiscal Revenue	Fare revenue, increased property tax revenue along the corridor, etc	D	A	C	B
Financial	FI1	Initial Investment Burden	Scale of funding required for construction and installation	B	D	B	C
	FI2	Fiscal Feasibility	Feasibility within the budget constraints of the implementing agency	A	D	B	B
	FI3	O&M Burden	Operation and maintenance cost after commissioning	B	D	C	C
	FI4	Realism of Fund Procurement	Feasibility of securing loans, PPP, or private financing	A	D	B	B
Environmental	EN1	GHG Emission Reduction	Reduction in CO2 and other greenhouse gas emissions	D	A	C	B
	EN2	Air Quality Improvement	Local air pollution such as PM2.5 and NOx	D	A	C	B
	EN3	Climate Adaptation and Resilience	Infrastructure resilience against flood risk and other climate hazards	D	B	C	A
	EN4	Natural Environment and Biodiversity Impact	Land conversion, habitat fragmentation, consumption of natural resources	A	D	C	C
Social	SO1	Equity and Inclusiveness	Distributional bias in benefits reaching vulnerable groups	D	A	C	B
	SO2	Safety and Health Impact	Traffic accident risk, health impacts from air pollution	D	A	C	B
	SO3	Involuntary Resettlement Impact (Physical and Economic)	Physical displacement from land acquisition and economic displacement including loss of livelihood for informal transport operators, etc	A	D	C	C
	SO4	Heritage Impact	Harmonization with historical street scape, acid rain, negative impact on the tourism industry, etc.	B	D	C	C
Score				26	30	28	35
Priority Scenario for KVUTS Master Plan							✓

Source: JICA Expert Team

3.6.3 Overall Evaluation of Each Scenario

As a result of the multi-criteria evaluation, compared with other alternatives, the **Scenario 3 (Integrated Transport Strategy Scenario)** provides the most balanced performance across the environmental, social, technical, economic, and financial dimensions in consideration with implementation feasibility and long-term sustainability.

The proposed **Scenario 3** introduces the East–West Mass Transit corridor as the first priority project while simultaneously improving the bus network, traffic management, and strategic road infrastructure. This approach achieves significant improvements in mobility and environmental performance while remaining consistent with the financial, institutional, and implementation capacity expected by 2050.

While the **Scenario 1 (Comprehensive Public Transport Network scenario)** offers the greatest long-term benefits, its implementation is constrained by the scale of investment required and institutional feasibility.

In contrast, the **Scenario 2** (**Road-Oriented Improvement scenario)** can deliver short-term traffic improvements but lacks long-term sustainability due to the likelihood of induced traffic demand.

The **Scenario 0 (Do Nothing scenario)** fails to accommodate future transport demand and is therefore the least desirable option.

Chapter 4: Environmental and Social Baseline of Kathmandu Valley

4.1 Meteorology

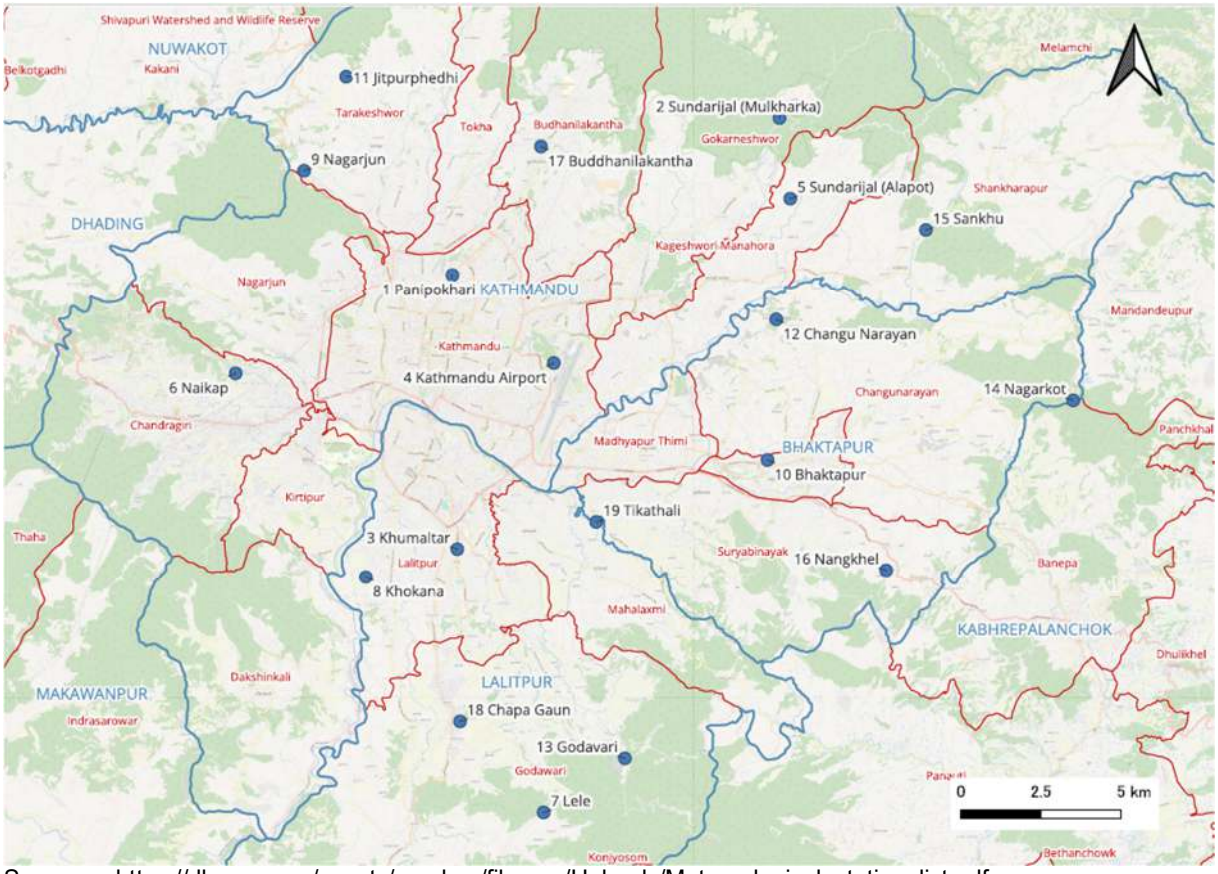
Nepal's meteorological landscape is managed by the Department of Hydrology and Meteorology (DHM), which was established in 1988 under the Ministry of Energy, Water Resources and Irrigation. DHM operates a comprehensive network of meteorological stations throughout the country, employing advanced technologies such as wireless communication, satellite data systems, and weather fax to monitor weather patterns (www.dhm.gov.np).

Table 4.1-1 and Figure 4.1-1 present the locations of nineteen Meteorological Stations of Kathmandu Valley.

Table 4.1-1 Details of Meteorological Stations of Kathmandu Valley

S. N.	Station Index	Station	District	Measuring Type	Longitude	Latitude	Elevation	Establishment
1.	1030	Kathmandu Airport	Kathmandu	Aeronautical	85.35625	27.70382	1337	1968-1-1
2.	1035	Sankhu		Precipitation	85.4769	27.74437	1436	1971-1-1
3.	1039	Panipokhari		Climatology	85.32415	27.722864	1329	1971-4-1
4.	1071	Budhanilkantha		Climatology	85.3578	27.7805	1428	1971-5-1
5.	1074	Sundarijal (Mulkarkha)		Precipitation	85.42779	27.77262	1658	1994-1-1
6.	1076	Naikap		Precipitation	85.25548	27.70094	1477	1997-1-1
7.	1077	Sundarijal (Alapot)		Precipitation	85.43119	27.75007	1384	1998-1-1
8.	1079	Nagarjun		Precipitation	85.2776	27.75788	1393	1998-1-1
9.	1081	Jitpurphedi		Precipitation	85.29049	27.78419	1409	2000-5-25
10	1043	Nagarkot	Bhaktapur	Climatology	85.52086	27.69335	2147	1971-6-1
11.	1052	Bhaktapur		Climatology	85.42397	27.67668	1315	1971-6-1
12.	1059	Changu-Narayan		Climatology	85.42676	27.71606	1502	1974-6-1
13	1082	Nangkhel		Precipitation	85.46158	27.64572	1413	2000-5-25
14.	1022	Godavari	Lalitpur	Climatology	85.37883	27.59292	1527	1953-1-1
15.	1029	Khumaltar		Agrometeorology	85.32577	27.65175	1334	1967-5-11
16.	1060	Chapa Gaun		Precipitation	85.32656	27.60326	1478	1976-1-1
17.	1073	Khokana		Climatology	85.29672	27.64377	1309	1991-8-17
18.	1075	Lele		Precipitation	85.35404	27.57682	1594	1994-9-1
19.	1080	Tikathali		Precipitation	85.36971	27.65932	1305	2000-1-1

Source : https://dhm.gov.np/assets/vendors/fileman/Uploads/Meteorological_station_list.pdf



Source : https://dhm.gov.np/assets/vendors/fileman/Uploads/Meteorological_station_list.pdf
Open Street Map (base map) and Open Data Nepal, Administrative Boundaries

Figure 4.1-1: Meteorological Monitoring Station Map in Kathmandu Valley

4.1.1 Climate

Nepal exhibits a highly varied climate because of its wide altitudinal range, from the low lying Terai plains in the south to the high Himalayas in the north. The climatic pattern across the country is inconsistent. Different altitudinal features influence the climate of Nepal, creating wide variations in temperature and precipitation. Due to the large altitudinal and topographical variation, the climate of Nepal varies from tropical in the south to alpine type in the north.

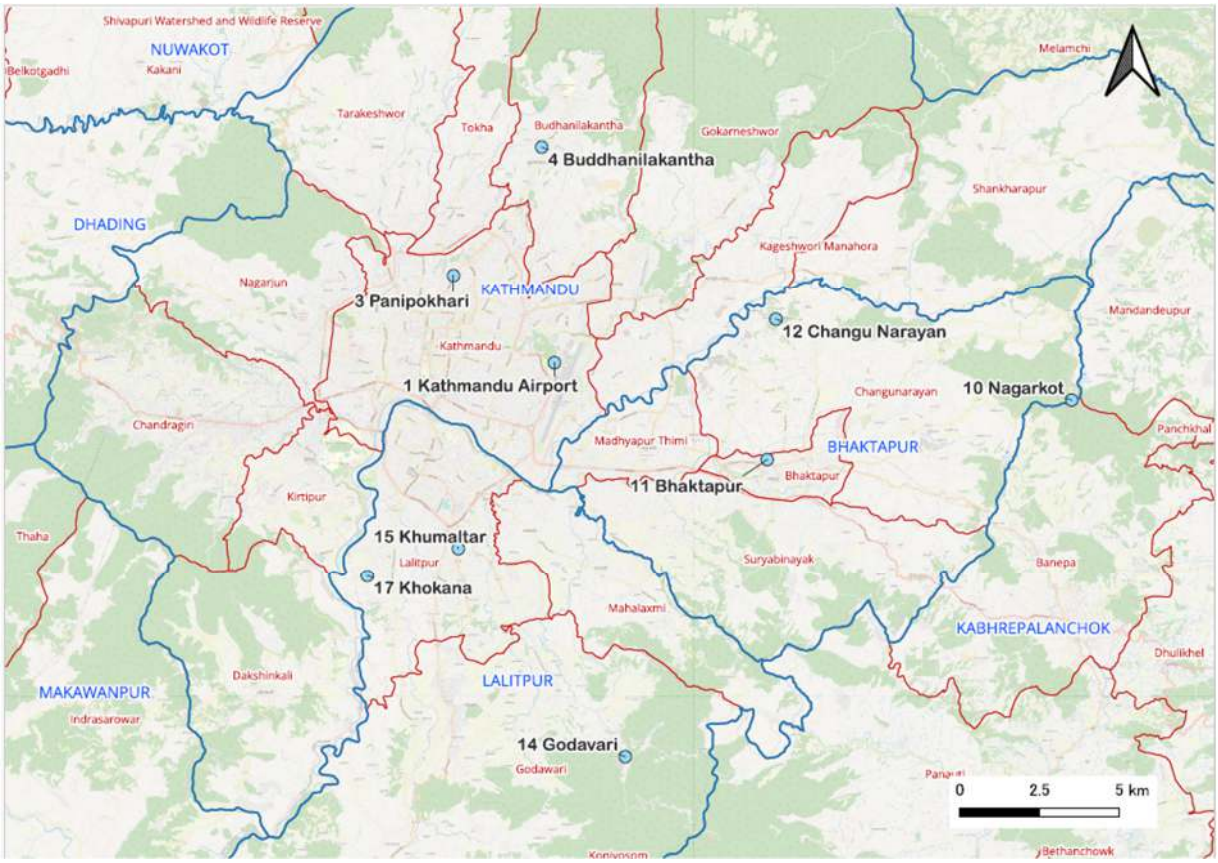
4.1.2 Temperature

Table 4.1-2 and Figure 4.1-3 present the monthly average air temperature from 2021 to 2025 at nine stations, as presented in Figure 4.1-2, namely, Kathmandu Airport, Panipokhari, Buddhanilakantha, Nagarkot, Bhaktapur, Changu Narayan, Godavari, Khumaltar and Khokana. The average monthly temperature of the Kathmandu Valley shows significant seasonal variations. Data from 2021 to 2025 reveals a clear pattern of cooler temperatures during the winter months (November to February), and warmer temperatures during the summer, pre-monsoon, and monsoon months (April to September).

An analysis of the average monthly air temperature over five years (2021 to 2025) at nine stations reveals significant temperature variations. The highest maximum temperature occurred in June 2024, reaching 30.33°C, which was the hottest month in the period of five years. In contrast, the lowest minimum temperature was recorded in January 2021, when the temperature dropped to 3.11°C, making it the coldest month in the five-year span

The temperature data reveals distinct seasonal trends. During winter (November to February), temperatures are noticeably lower, with January standing out as the coldest month on average. As the season transitions into the pre-summer period (March to May), temperatures begin to rise steadily, with both maximum and minimum values increasing significantly by May. The summer and monsoon seasons (June to September) are characterized by high maximum temperatures and elevated humidity levels. Among these, June and August are typically the warmest months based on average maximum temperatures. Finally, in the post-monsoon period (October to November), temperatures gradually decline, leading to milder days and cooler nights as the region shifts back into the winter season.

The detailed information on the average monthly air temperature has been presented in Table 4.1-2.



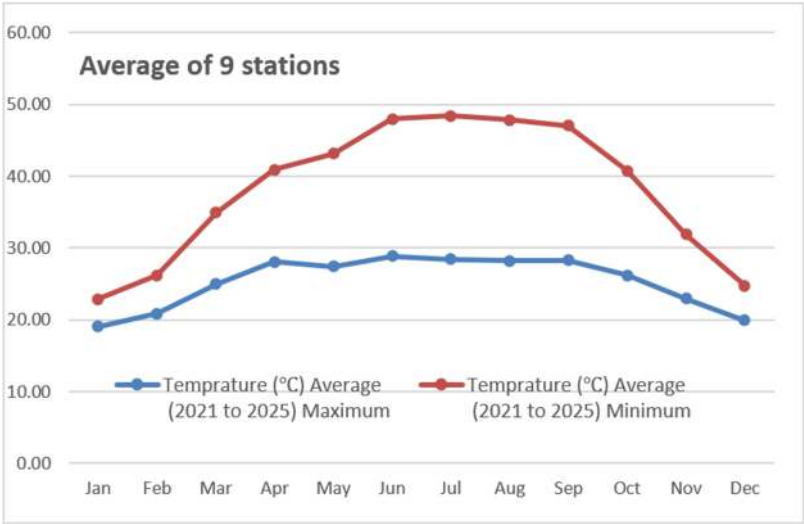
Source : https://dhm.gov.np/assets/vendors/fileman/Uploads/Meteorological_station_list.pdf
Open Street Map (base map) and Open Data Nepal, Administrative Boundaries

Figure 4.1-2: Temperature Monitoring Nine Stations in Kathmandu Valley

Table 4.1-2 Monthly Average Air Temperature at Nine Station in Kathmandu Valley (2021–2025)

Month	Temperature (°C)											
	2021		2022		2023		2024		2025		Average (2021-2025)	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
January	19.33	3.95	16.72	4.17	19.74	3.35	18.58	3.11	20.79	4.78	19.03	3.87
February	21.21	5.67	17.95	4.36	22.45	6.5	20.44	4.41	21.97	5.95	20.84	5.39
March	24.73	9.6	26.62	11.29	24.02	9.35	23.74	9.28	25.74	9.88	24.97	9.94
April	27.3	11.23	28.6	14.96	27.26	11.63	29.53	13.07	27.7	13.16	28.08	12.81
May	25.8	15.65	27.04	15.9	27.23	13.88	29.17	16.32	28.02	16.6	27.45	15.67
June	27.59	18.9	27.74	18.98	29.82	18.49	30.33	19.69	29	19.23	28.9	19.1
July	27.46	19.66	28.51	19.78	28.5	19.79	28.54	20.48	29.15	20.13	28.43	19.97
August	27.19	19.57	29.02	19.55	27.82	19.55	28.79	19.59	28.23	19.93	28.21	19.64
September	27.74	18.36	27.7	18.51	29.33	18.87	28.36	18.75	28.45	19.05	28.32	18.71
October	26.5	15.6	25.69	13.5	26.15	14	27.11	15.44	25.58	14.12	26.21	14.53
November	21.73	8.04	22.92	8.3	23.73	9.01	23.2	9.97	23.1	9.51	22.93	9
December	18.88	4.35	20.31	4.78	19.95	5.56	20.19	4.36	20.24	5.3	19.91	4.87

Source: Station Index 1030 (Kathmandu Airport), Department of Hydrology and Meteorology, 2024, https://pollution.gov.np/portal, accessed on February 2, 2026.
Department of Hydrology and Meteorology (DHM), June 12, 2026



Source: Department of Hydrology and Meteorology, June 12, 2026

Figure 4.1-3: Air Temperature Monthly Average at Nine Station in Kathmandu Valley (2021–2025)

4.1.3 Rainfall

An analysis of the monthly precipitation data from 2021 to 2025 at 19 stations reveals a clear seasonal pattern, with the majority of rainfall concentrated during the monsoon months (June to September). Despite some year-to-year fluctuations, the data reflects a consistent monsoonal influence on the region's climate, with distinct wet and dry periods shaping the overall precipitation pattern.

The monthly precipitation data for the Kathmandu Airport station from 2021 to 2025 at 19 stations is presented in Table 4.1-3.

The annual average precipitation over the five-year period was 1,736 mm, indicating relatively stable rainfall trends across the years. Considering the years, 2024 recorded the highest annual total with 2032 mm, while 2023 received the lowest, at 1,524 mm. Over the five-year period, July recorded the highest average monthly rainfall among the monsoon months, with 450 mm, followed by August, which averaged 377 mm.

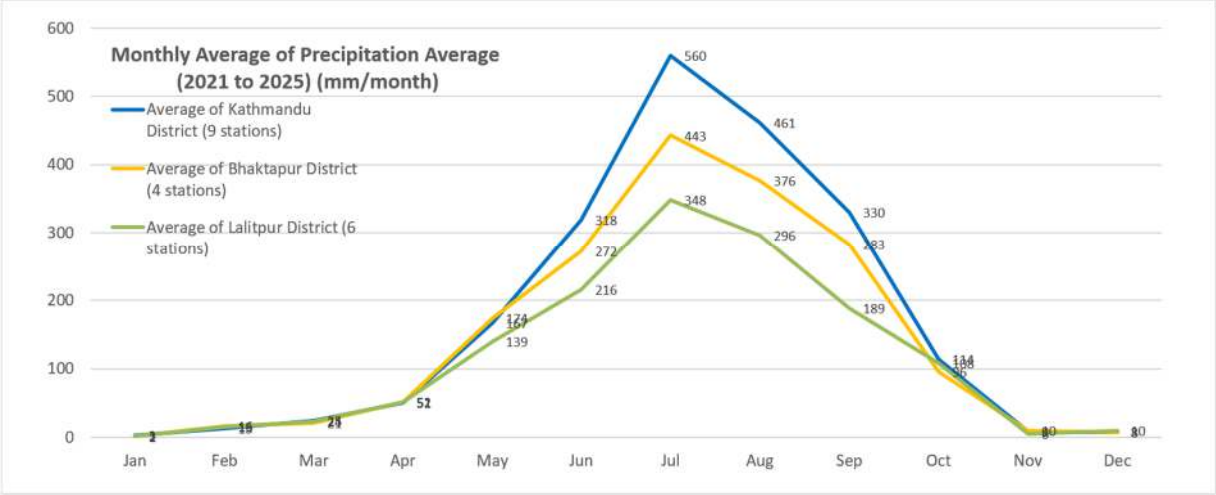
The Kathmandu Valley experiences consistent rainfall during the pre-monsoon period, which typically sees a gradual increase in rainfall leading into the monsoon season. In contrast, rainfall during the post-monsoon period is more variable, with significant rainfall observed only in certain years. This variation in the post-monsoon months, alongside the consistent pre-monsoon rainfall, indicates increasing variability in the region's seasonal weather patterns. These fluctuations highlight the growing influence of both monsoonal rains and the unpredictable nature of the pre- and post-monsoonal climatic conditions, emphasizing how traditional wet and dry periods are increasingly shaped by factors beyond the typical monsoon season.

Table 4.1-3 Monthly and Annual Precipitation at 19 stations in Kathmandu Valley (2021–2025)

Year / Month	Precipitation(month/mm)					
	2021	2022	2023	2024	2025	Average (2021-2025)
January	0	10	0	0	0	2
February	7	47	9	10	0	15
March	7	5	43	50	9	23
April	70	39	55	9	83	51
May	176	244	122	89	169	160
June	226	365	240	201	311	269
July	492	398	370	699	291	450
August	339	323	390	471	364	377
September	269	208	189	453	217	267
October	59	130	106	37	198	106
November	0	0	0	13	27	8
December	42	0	0	0	0	8
Total	1,687	1,769	1,524	2,032	1,669	1,736

Source: Department of Hydrology and Meteorology (DHM), June 12, 2026

Monthly average precipitation at three districts in Kathmandu Valley (2021–2025) is shown in Figure 4.1-4. When comparing the average values of monthly precipitation for the three districts, the annual seasonal variation trends are similar. However, when ranked by precipitation in July (the month with the highest precipitation), the order is Kathmandu, Bhaktapur, and Lalitpur. The difference in precipitation between Kathmandu District and Lalitpur District is more than 200 mm per month.



Source: Department of Hydrology and Meteorology (DHM), June 12, 2026

Figure 4.1-4: Monthly Average Precipitation at Three Districts in Kathmandu Valley (2021–2025)

4.1.4 Humidity

Table 4.1-4 presents the monthly average of relative humidity data from 2021 to 2025 at nine stations, as preseted in **Figure 4.1-2**, namely, Kathmandu Airport, Panipokhari, Buddhanilakantha, Nagarkot, Bhaktapur, Changu Narayan, Godavari, Khumaltar,and Khokana.

According to the relative humidity data from 2021 to 2025, the lowest and highest average monthly relative humidity were recorded in April 2024 (59.05%) and August 2023 (87.12%), respectively. These variations highlight significant seasonal fluctuations in humidity levels throughout the year

The relative humidity in the Kathmandu Valley is strongly influenced by seasonal changes, with significant increases during the monsoon and moderately lower levels during the pre-monsoon and winter months. These variations highlight the region's distinct seasonal weather patterns and the influence of both monsoon and non-monsoon periods on the overall climate.

Table 4.1-4 Relative Humidity Monthly Average at Nine Station in Kathmandu Valley (2021–2025)

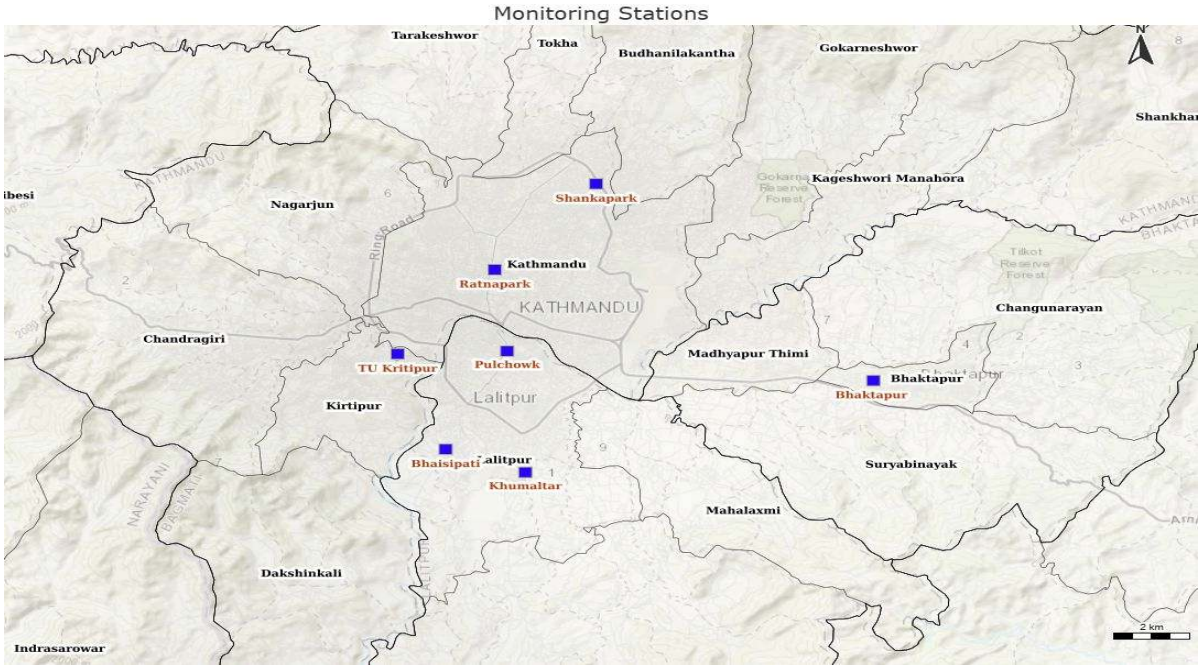
Month	Relative Humidity (month/%)					
	2021	2022	2023	2024	2025	Average (2021 to 2025)
January	76.8	82.97	73.55	78.28	77.73	77.87
February	76.84	78.31	73.41	71.45	73.03	74.61
March	66.56	70.58	70.1	70.85	65.98	68.81
April	59.63	69.44	61.72	59.05	65.1	62.99
May	78.21	79.1	70.73	71.32	73.26	74.52
June	81.08	84.13	72.2	76.66	80.75	78.96
July	86.9	85.46	84.66	86.72	83.65	85.48
August	86.2	83.72	87.12	86.36	86.92	86.07
September	86.24	86.92	83.74	85.35	85.39	85.53
October	83.88	80.82	81.59	82.75	80.98	82
November	81.24	80.04	81.24	82.49	79.96	80.99
December	80.75	79.8	81.61	79.22	80.04	80.28

Source: Department of Hydrology and Meteorology, June 12, 2026

4.2 Pollution Control

4.2.1 Air Quality

The air quality status of the Kathmandu Valley is based on measurements from seven monitoring stations located across the valley, as shown in the map, namely Bhaisipati, Bhaktapur, Khumaltar, Pulchowk, Ratnapark, Shankhapark, and TU-Kirtipur. Particulate matter is measured across all stations, whereas ozone monitoring is limited to selected stations. Regarding other parameters, there is no continuous monitoring data available for pollutants such as NOx, SOx, and CO from relevant secondary data sources.



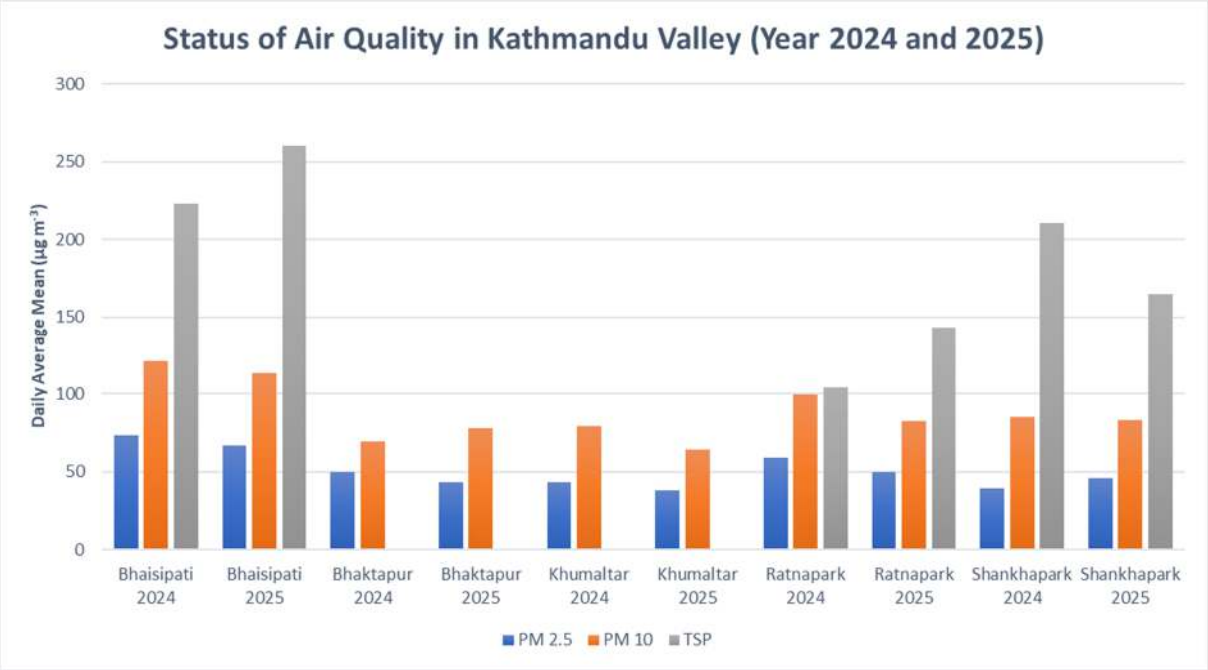
Source: https://pollution.gov.np/portal, accessed on February 2, 2026.

Figure 4.2-1: Monitoring Stations in Kathmandu Valley

The comparative assessment of ambient air quality for the years 2024 and 2025, as per the annual reports published by the Department of Environment, is presented below.

4.2.1.1 Daily Average Mean Concentration of Air Pollutants

Figure 4.2-2 illustrates the direction and magnitude of change in average pollution levels across stations, complementing the compliance figures presented separately. $PM_{2.5}$ and PM_{10} concentrations broadly improved, declining at four of five stations for both pollutants with Shankhapark the exception for $PM_{2.5}$ and Bhaktapur the exception for PM_{10} indicating some progress in reducing sources associated with combustion and vehicular emissions. In contrast, TSP concentrations rose sharply at both Bhaisipati and Ratnapark, with Ratnapark increasing by approximately 37 percent, the largest single change observed in the dataset, while concentrations at Shankhapark decreased substantially. This divergence suggests the presence of a separate, coarser-particle source, potentially related to dust, construction activity, or road disturbance, which does not appear to be influenced by the factors driving improvement in $PM_{2.5}$ and PM_{10} levels. Shankhapark warrants particular attention, as $PM_{2.5}$, PM_{10}, and TSP each recorded a contrasting change at this station. TU-Kirtipur and the two ozone-only stations, Khumaltar and Pulchowk, were excluded from the chart, as 2025 data were not available for comparison at these locations.



Source: Department of Environment (2026), Status of Air Quality in Nepal, Annual Report 2024 & 2025.

Figure 4.2-2: Comparison of Daily Average Mean Concentration of Air Pollutants (PM2.5, PM10, TSP) Across Monitoring Stations in Kathmandu Valley for the year 2024 and 2025

As depicted in the Table 4.2-1, a high number of "Total days exceeding NAAQS" means the station recorded unsafe air quality on many days, indicating persistent rather than occasional pollution and greater health risk to nearby residents. Additionally, as shown in the table, a high "Total days of valid measurement," on the other hand, means the station collected data for a larger portion of the year, making its reported figures more complete and more reliable to compare against another year.

The number of days recorded at each station changed considerably between years, affecting how fairly 2024 and 2025 can be compared. Bhaktapur (+104 days), Shankhapark (+55 to 56 days), and Ratnapark (+37 to 38 days) recorded substantially more days in 2025, while Bhaisipati (−25 to −29 days) and Khumaltar (−7 days) recorded fewer.

Exceedance days moved in both directions. The clearest improvements in Ratnapark PM_{10} (−73 days), Khumaltar $PM_{2.5}$ (−54 days), and all three pollutants at Bhaisipati (−12 to −38 days) occurred without extra recording days, pointing to genuinely cleaner air. The most notable concerns are Bhaktapur PM_{10} (+64 days) and Shankhapark $PM_{2.5}$ (+42 days), where the rise is too large to be explained by extra recording alone, suggesting real worsening. Ratnapark TSP's smaller increase (+34 days), against a much larger jump in recorded days (from 137 to 306), is more plausibly tied to the extra days recorded rather than a true change in pollution.

These indicators provide a more complete understanding when interpreted alongside the concentration averages rather than considered in isolation. A falling average combined with falling exceedance days, as seen at Bhaisipati and Khumaltar, confirms a real improvement in air quality, while a station where exceedance days rise despite a similar or falling average, as seen at Bhaktapur PM_{10}, indicates that pollution is occurring more frequent even if not more severe on average, a pattern the average concentration alone would not reveal. Overall, Ratnapark PM_{10} and Khumaltar $PM_{2.5}$ show the most reliable improvement, while Bhaktapur PM_{10} and Shankhapark $PM_{2.5}$ show the clearest worsening.. The variations in the number of recorded days likely reflect practical factors such as equipment availability and staffing, whereas exceedance trends are more likely associated with environmental factors such as rainfall, wind, temperature, and local pollution sources, which vary by station and year.

Table 4.2-1 Status of Air Quality in Kathmandu Valley: Compliance Status

S. No.	Name of Station of Kathmandu Valley	Parameters	Annual Report 2024			Annual Report 2025				
			Compliance Status		Daily Average Mean (µg m-3)	Compliance Status		Daily Average Mean (µg m^{-3})		
			Total days of valid measurement	Total days of exceeding NAAQS		Total days of valid measurement	Total days of exceeding NAAQS	Minimum	Maximum	Mean ± S.D.
1.	Bhaisipati	$PM_{2.5}$	117	91	73.2	88	72	2.1	167..8	66.5 ± 36.5
		PM_{10}	117	59	121	88	47	3.3	240.1	113.5 ± 58.2
		TSP	113	96	222.8	88	58	3.5	506.5	260.1 ± 131.7
2.	Bhaktapur	$PM_{2.5}$	231	169	49.6	335	154	5.4	184.4	43.5 ± 34.0
		PM_{10}	231	6	69.4	335	70	7.8	380.7	78.2 ± 70.2
3.	Khumaltar	$PM_{2.5}$	351	194	43.5	344	140	4.6	169.0	38.1 ± 28.2
		PM_{10}	351	71	79.5	344	49	6.5	260.7	63.9 ± 50.0
		O_3 (ppb)*	328	-	29.2	-	-	-	-	-
4.	Pulchowk	O_3 (ppb)*	269	-	18.3	-	-	-	-	-
5.	Ratnapark	$PM_{2.5}$	268	179	59.2	306	178	7.1	175.2	49.8 ± 32.6
		PM_{10}	269	119	99.5	306	46	15.1	253.9	82.6 ± 50.5
		TSP	137	1	104.3	306	35	21.5	407.0	143 ± 82.5
6.	Shankhapark	$PM_{2.5}$	296	134	39.4	351	176	7.1	175.0	45.6 ± 32.5
		PM_{10}	296	65	85	351	88	8.8	306.7	83.4 ± 65.5
		TSP	295	119	210.8	351	96	9.1	532.7	164.8 ± 131.1
7.	TU- Kirtipur	$PM_{2.5}$	133	112	53.4	-	-	-	-	-
		PM_{10}	133	26	89.6	-	-	-	-	-
		TSP	133	27	168.8	-	-	-	-	-

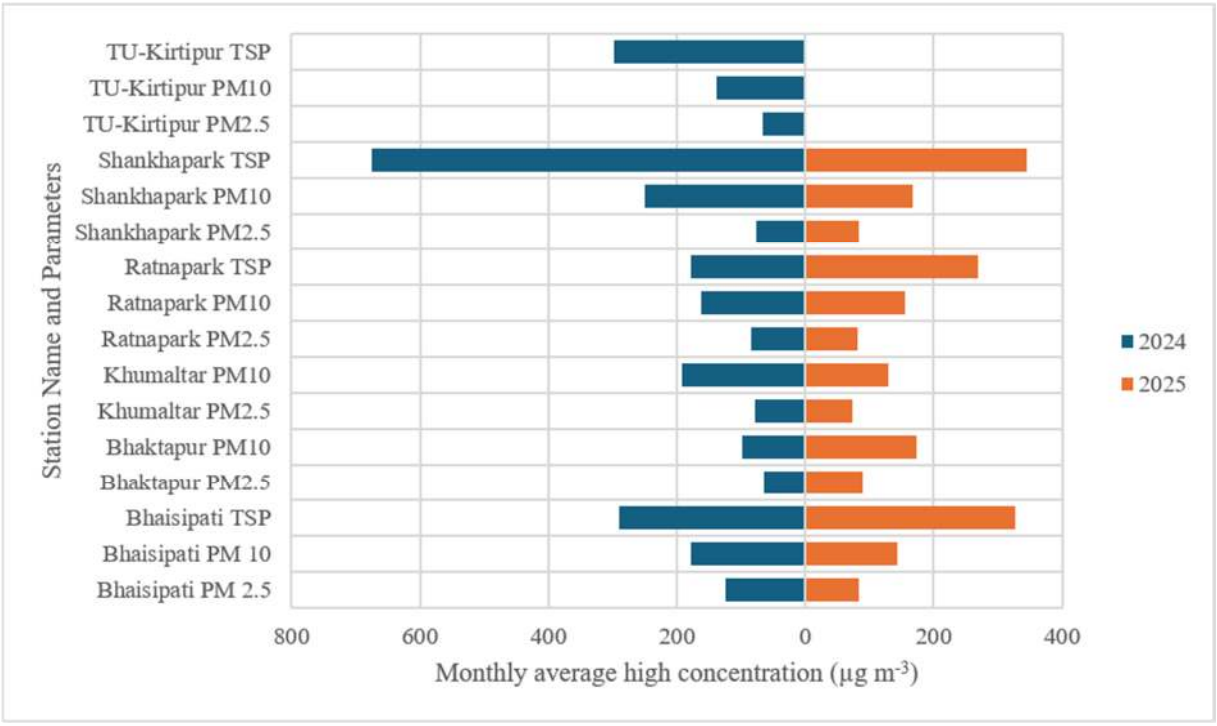
Source: Department of Environment (2026), Status of Air Quality in Nepal, Annual Report 2024 & 2025.

4.2.1.2 Monthly Average Concentration of Air Pollutants

The chart below illustrates monthly average high-concentration data for the years 2024 and 2025 and shows a broadly encouraging shift: at most stations, the worst single month of pollution was less severe in 2025 than in 2024. This trend is most evident for TSP, where the maximum concentration at Shankhapark nearly halved, from 674.8 to 344.54 µg/m³, representing the single largest improvement in the dataset. This was accompanied by consistent declines in the maximum $PM_{2.5}$ and PM_{10} concentrations at Bhaisipati, indicating fewer high-pollution episodes overall.

However, this improvement was not observed at every station. Both $PM_{2.5}$ and PM_{10} levels at Bhaktapur increased, and the highest TSP concentration also increased at Ratnapark, indicating that these two stations experienced more pronounced short-term pollution spikes in 2025, even as the broader trend across the city moved in the opposite direction. Shankhapark illustrates the importance of examining station-level details. Its highest TSP concentration declined substantially, while its highest $PM_{2.5}$ concentration increased, demonstrating that improvement and deterioration occurred simultaneously at the same location, depending on the pollutant considered.

TU-Kirtipur falls outside the scope of this comparison altogether. It recorded some of the highest concentrations in the dataset in 2024, with TSP reaching 297.8 µg/m³, but ceased reporting in 2025. Therefore, its figures serve only as a historical reference rather than as evidence of a trend.



Source: Department of Environment (2026), Status of Air Quality in Nepal, Annual Report 2024 & 2025.

Figure 4.2-3: Comparison of pollutant concentrations (µg/m³) across various air quality monitoring stations in Kathmandu Valley for 2024 and 2025 (Data source: Department of Environment (2026), Status of Air Quality in Nepal, Annual Report 2024 & 2025)

Beyond the monthly average high concentration discussed above and shown in Figure 4.2-3, , the lower monthly concentrations shown in Table 4.2-2 reveal a separate pattern worth noting. At most stations, the cleanest months in 2025 were markedly cleaner than in 2024. At Bhaisipati, for example, the lowest recorded PM2.5 concentration decrease from 41.8 to just 2.72 µg/m³. Because the highest values did not decline as consistently, the gap between a station's best and worst months widened in 2025 at several sites, pointing toward a more seasonally polarized pollution pattern rather than a flat year-over-year shift.

The timing of these readings provides additional insight. April emerges as the most common month for peak concentrations across stations and pollutants in both years, while August recurs repeatedly as the month of lowest readings, a pattern consistent with the pre-monsoon dust season giving way to monsoon rains that clear the air. This seasonal rhythm holds fairly steady across years even where the absolute concentration values shifted.

Data completeness also varies meaningfully across stations: Khumaltar and Shankhapark report close to full 12-month coverage in both years, while Bhaisipati and Ratnapark had noticeably fewer months monitored in 2024 (3 and 4-9 months respectively) than in 2025, which means their 2024 figures represent a narrower and potentially less representative sampling window than other stations. O3 remains a separate gap, tracked only in 2024 at Khumaltar and Pulchowk with no 2025 data to compare.

Table 4.2-2: Status of Air Quality in Kathmandu Valley: Monthly Average (µg/m^3)

S. No.	Name of Station of Kathmandu Valley	Coordinates	Parameters	Annual Report 2024					Annual Report 2025				
				Monthly Average (µg m^{-3})					Monthly Average (µg m^{-3})				
				Available Months (Nos)	Higher Concentration		Lower concentration		Available Months (Nos)	Higher Concentration		Lower concentration	
					Month	Value	Month	Value		Month	Value	Month	Value
1.	Bhaisipati	27°39'11.20"N 85°18'8.11"E	$PM_{2.5}$	3	May	123.6	June	41.8	4	February	84.10	May	2.72
			PM_{10}	3	May	178.4	June	70.1	4	February	143.27	May	4.82
			TSP	3	May	288.8	June	157	4	February	327.79	May	11.18
2.	Bhaktapur	27°40'25.54"N 85°25'3.10"E	$PM_{2.5}$	8	April	63.7	October	36.4	12	February	89.73	August	9.85
			PM_{10}	8	April	97.7	October	51.5	12	April	172.81	August	15.59
3.	Khumaltar	27°38'47.94"N 85°19'24.24"E	$PM_{2.5}$	12	April	78.6	August	9.8	12	February	73.97	August	9.94
			PM_{10}	12	April	191	August	15	12	April	128.99	August	14.67
			O_3 (ppb)*	11	April	52.3	July	15.3	-	-	-	-	-
4.	Pulchowk	27°40'57.29"N 85°19'7.83"E	O_3 (ppb)*	9	Mar/ 24	25.1	Dec/ 23	9.6	-	-	-	-	-
5.	Ratnapark	27°42'25.25"N 85°18'55.48"E	$PM_{2.5}$	9	January	85	June	14.5	11	April	82.23	August	13.26
			PM_{10}	9	April	161.2	June	15.2	11	April	154.88	August	24.13
			TSP	4	December	177.7	June	16	11	April	268.52	September	47.44
6.	Shankhapark	27°43'58.17"N 85°20'34.17"E	$PM_{2.5}$	10	April	75.3	August	12.7	12	April	84.43	August	13.10
			PM_{10}	10	April	249.9	August	20.5	12	April	167.96	August	17.61
			TSP	10	April	674.8	November	43.6	12	January	344.54	August	29.62
7.	TU-Kirtipur	27°40'54.19"N 85°17'21.53"E	$PM_{2.5}$	4	April	66.3	March	50.2	-	-	-	-	-
			PM_{10}	4	April	137.7	March	77.1	-	-	-	-	-
			TSP	4	April	297.8	March	132.2	-	-	-	-	-

Source: Department of Environment (2026), Status of Air Quality in Nepal, Annual Report 2024 & 2025

4.2.1.3 Seasonal Average Concentration of Air Pollutants

Seasonal data reveals a fairly consistent pattern across the Kathmandu Valley is shown in Table 4.2-3. For most stations, concentrations peak in winter or pre-monsoon and drop to their lowest during the monsoon (June–September), when rainfall clears particulate matter from the air. This holds for $PM_{2.5}$, $PM_{10,}$ and TSP alike 2025 monsoon readings dropped as low as 13–29 µg/m³ across most stations and pollutants, while winter and pre-monsoon peaks generally ran several times higher, in some cases exceeding 140 µg/m³.

Where comparable data exists across both years, most stations show concentrations rising from 2024 to 2025 rather than falling. Bhaisipati and Shankhapark both recorded higher winter peaks in 2025. Bhaisipati's $PM_{2.5}$ rose from 57.7 to 84.0 µg/m³, and Shankhapark's from 56.8 to 77.1 µg/m³ with TSP following the same upward pattern at Bhaisipati (172.1 to 327.79 µg/m³). Khumaltar was the one station showing a modest decline across all three pollutants instead.

One limitation that should be noted is that, for Bhaisipati (all three pollutants) and Ratnapark (TSP), only one season of data was available in 2024. This means the "higher" and "lower" concentration values shown for these cases are actually the same single measurement, not a true seasonal maximum and minimum as reported for other stations. Comparing them directly with multi-season stations may therefore appear misleading, and any 2024–2025 change calculated from them should be treated as indicative only, not a confirmed trend.

Table 4.2-3: Status of Air Quality in Kathmandu Valley: Seasonal Average

S. No.	Name of Station of Kathmandu Valley	Parameters	Annual Report 2024					Annual Report 2025				
			Seasonal Average (µg m^{-3})					Seasonal Average (µg m^{-3})				
			Available seasons (Nos)	Higher Concentration		Lower concentration		Available seasons (Nos)	Higher Concentration		Lower concentration	
				Season	Value	Season	Value		Season	Value	Season	Value
1.	Bhaisipati	$PM_{2.5}$	1	Winter		57.7		2	Winter	84	Pre-monsoon	45.33
		PM_{10}	1	Winter		96.9		2	Winter	143.27	Pre-monsoon	77.49
		TSP	1	Winter		172.1		2	Winter	327.79	Pre-monsoon	177.49
2.	Bhaktapur	$PM_{2.5}$	2	Pre-monsoon	54	Post monsoon	43.4	4	Winter	80.89	Monsoon	13.76
		PM_{10}	2	Pre-monsoon	79.2	Post-monsoon	56.8	4	Winter	135.08	Monsoon	22.55
3.	Khumaltar	$PM_{2.5}$	4	Pre-monsoon	63	Monsoon	16.2	4	Winter	61.52	Monsoon	14.38
		PM_{10}	4	Pre-monsoon	135.8	Monsoon	27.6	4	Pre-monsoon	101.39	Monsoon	23.37
		O_3 (ppb)*	4	Pre-monsoon	43.2	Winter	22.2	-	-	-	-	-
4.	Pulchowk	O_3 (ppb)*	3	Pre-monsoon	23.1	Winter	13.6	-	-	-	-	-
5.	Ratnapark	$PM_{2.5}$	3	Pre-monsoon	54	Post monsoon	43.4	4	Winter	75.42	Monsoon	17.63
		PM_{10}	3	Pre-monsoon	79.2	Post-monsoon	56.8	4	Pre-monsoon	116.38	Monsoon	34.43
		TSP	1	Post-monsoon		137.2		4	Pre-monsoon	213.04	Monsoon	73.03
6.	Shankhapark	$PM_{2.5}$	4	Winter	56.8	Monsoon	19.7	4	Winter	77.13	Monsoon	18.02
		PM_{10}	4	Pre-monsoon	149.6	Monsoon	38.2	4	Winter	142.58	Monsoon	28.60
		TSP	4	Pre-monsoon	393	Post-monsoon	79.2	4	Winter	283.18	Monsoon	54.45
7.	TU-Kirtipur	$PM_{2.5}$	2	Pre-monsoon	55.8	Winter	55.1	-	-	-	-	-
		PM_{10}	2	Pre-monsoon	103.5	Winter	80.8	-	-	-	-	-
		TSP	2	Pre-monsoon	210.3	Winter	132.7	-	-	-	-	-

Source: Department of Environment (2026), Status of Air Quality in Nepal, Annual Report 2024 & 2025
Note: Pre-monsoon: March–May; Monsoon: June–September; Post-monsoon: October–November; Winter: December–February

4.2.1.4 Compliance Inspection of Vehicular Emission Monitoring

The Compliance Inspection of Vehicular Emission Monitoring was carried out from 5th December 2024 to 20th January 2025. The site selected was random location of Bhaktapur, Kirtipur, Lalitpur and Kathmandu respectively. The monitoring was only conducted for diesel type of vehicle only. A device name 'Smoke meter' was used for the monitoring. Firstly, the vehicle was stopped, a pipe was inserted in the silencer of the diesel vehicle and was instructed to give an accelerator. The value obtained in the smoke meter was noted in the sheet including date and time of monitoring. During the monitoring if the smoke density value was obtained above 65 the tested vehicle was considered to be fail and instructed for retesting after some time interval. From the total of 927 diesel operated vehicle only 647 (69.79%) vehicles were passed whereas 280 (30.21%) vehicles were failed in the compliance inspection. Later only 32 (11.42%) of the failed vehicle returned for retesting.

Table 4.2-4: Compliance Inspection of Vehicular Emission Monitoring (2024/ 2025)

S.N.	Description	Numbers	Percentage (%)
1.	Passed vehicles	647	69.79
2.	Failed Vehicles	280	30.21
Total		**927**	**100**

Note: Total number of vehicles returning for re-testing is 32.
Source: Department of Environment, 2025; retrieved from https://doenv.gov.np/downloadfiles (accessed 2025-07-04)

4.2.2 Noise Level

For the study of noise level, different stations has been selected inside Kathmandu Valley. For Kathmandu District Industrial Area (Balaju Industrial Area), Urban Residential Area (Bohoratar, Balaju), Commercial Area (Gongabu Bus Park, Koteshwor, Asan, New Road Gate), Silent Zone (Tri-Chandra Campus, Hanuman Dhoka Durbar Square, Bir Hospital) were selected for the study (DOE, 2017).

Additionally, for Lalitpur District Industrial Area (Patan Industrial Area), Urban Residential Area (Sanepa), Commercial Area (Patan Dhoka, Lagankhel, Satdobato), Silent Zone (Patan Durbar Square, Patan Hospital) and Bhaktapur District Industrial Area (Bhaktapur Industrial Area), Urban Residential Area (Chardobato), Commercial Area (Gatthaghar, Chyamhasingh, Suryabinayak), Silent Zone (National Tuberculosis Center, Bhaktapur Durbar Square) were selected for the study.

Similarly, the monitoring time for the study were Morning (9:00 a.m 11:00 a.m), Afternoon (1:00 p.m – 3:00 p.m) and Evening (6:00 p.m – 8:00 p.m) respectively. The Government of Nepal has set specific noise level limits for different zones: 65 dB(A) (day) and 55 dB(A) (night) for commercial areas; 50 dB(A) (day) and 40 dB(A) (night) for silent zones; 75 dB(A) (day) and 70 dB(A) (night) for industrial areas; and 55 dB(A) (day) and 50 dB(A) (night) for residential areas.

Similarly, the monitoring times for the study were morning (9:00 a.m.–11:00 a.m.), afternoon (1:00 p.m.–3:00 p.m.), and evening (6:00 p.m.–8:00 p.m.), respectively. The Government of Nepal has set specific noise level limits for different zones: 65 dB(A) during the day and 55 dB(A) at night for commercial areas; 50 dB(A) during the day and 40 dB(A) at night for silent zones; 75 dB(A) during the day and 70 dB(A) at night for industrial areas; and 55 dB(A) during the day and 50 dB(A) at night for residential areas

Noise measurements revealed that at Asan Bazaar, the morning noise level (9:00–11:00 AM) was within the permissible limit, while other commercial locations exceeded the prescribed standards at all measured times. In silent zones, noise levels at all three measured times were found to exceed the national standard. In industrial areas, most recorded noise levels were

below the set limits, whereas in urban residential areas, noise levels at most measurement sites were higher than the permissible limits set by the Government of Nepal.

Noise levels were measured from November to December 2021 using a sound level meter at 15 selected locations during the morning (9:00–10:00 AM), afternoon (1:00–2:00 PM), and evening (5:00–6:00 PM) periods (Chand et al., 2022). The results indicated that in the silent zone, the highest average noise level was recorded at Amrit Campus (80.46 dB(A)) and the lowest at Teku Hospital (62.24 dB(A)). Similarly, in the residential zone, the highest average noise level was recorded at Banasthali (71.88 dB(A)) and the lowest at Dallu (66.02 dB(A). Overall, the equivalent noise levels in both zones exceeded the permissible limits set by the Government of Nepal as well as the standards recommended by the World Health Organization. The main sources of noise pollution were identified as vehicular traffic and loudspeakers. Survey results also indicated that the female population is slightly more affected by neighborhood noise compared to the male population.

4.2.3 Water Quality

4.2.3.1 Surface Water (river and stream)

The analysis of the seven rivers flowing through Kathmandu Metropolitan City Bagmati, Bishnumati, Manohara, Rudramati (Dhobikhola), Samakhusi, Bhachakhusi, and Tukucha based on 21 physico-chemical and microbial parameters, reveals a consistent pattern of deteriorating water quality from upstream to downstream stations (KMC, 2023).

In the Bagmati River, upstream sites near Dhap Dam exhibited relatively good quality with low turbidity and higher dissolved oxygen (DO), while downstream stations such as Guheshwari, Balkhu, and Chovar showed extreme pollution with high BOD, COD, turbidity, and microbial load due to sewage and industrial effluents.

The Bishnumati River followed a similar trend, with lower reaches near Teku displaying high turbidity, TSS, and organic pollution, while upper sites near Panimuhan were comparatively cleaner.

The Manohara River sampling stations showed strong spatial variation, with upstream areas maintaining moderate quality but downstream sites near Jadibuti and the industrial belt showing elevated EC, TDS, ammonia, and COD attributable to dyeing industries, domestic effluents, and cremation waste.

The Rudramati River exhibited high chloride, alkalinity, and hardness levels at midstream sites below Om Hospital and Rajdhani Press, indicating industrial and hospital discharges, while lower stations showed slight dilution effects.

The Samakhusi River sampling stations around Mitranagar and Gongabu recorded very low DO and high BOD/COD, alongside extreme microbial contamination, marking one of the poorest water qualities among all rivers.

Similarly, the Bhachakhusi River stations near Thulobharyang presented high turbidity, chloride, and organic pollution, reflecting the impact of untreated domestic discharge. The Tukucha Khola stations, particularly near Singhadurbar and Gairidhara, displayed elevated EC, TDS, and coliform counts, showing the effects of enclosed drainage systems and urban runoff.

Overall, across all sampling stations, parameters such as low DO (<2 mg/L), high BOD (>50 mg/L), elevated turbidity (>100 NTU), and excessive microbial counts indicate that almost all urban river sections are severely polluted, primarily by untreated sewage, industrial effluents, and solid waste intrusion, whereas upstream sites still retain partial ecological integrity.

4.2.3.2 Surface Water (Pond)

There has been significant degradation in the water quality of ponds in Kathmandu Valley due to urbanization, pollution and poor management practices (KMC, 2025). The physico-chemical and microbial analyses highlight alarming levels of contamination, with higher alkalinity in Rani Pokhari, higher turbidity in Gahana Pokhari, increased organic pollution in Kamal Pokhari, and severe fecal contamination in Rani Pokhari. These findings indicate widespread sewage infiltration, industrial discharge and urban runoff, posing serious ecological and public health risks. While some ponds, like Hiti Pokhari, exhibit relatively better conditions due to minimal urban pressure, most suffer from deteriorating water quality, necessitating urgent intervention. Key measures should include sewage diversion, pollution source control, bioremediation, and community-based conservation efforts. Restoring these ponds is crucial not only for maintaining biodiversity and groundwater recharge but also for preserving their cultural and historical significance in Kathmandu's rapidly urbanizing landscape. Sustainable management strategies must integrate scientific assessment, policy enforcement, and public awareness to ensure the long-term survival of these vital aquatic ecosystems.

4.2.4 Solid Waste Management Practice in Kathmandu Valley

Solid waste management in the Kathmandu Valley, encompassing Kathmandu, Bhaktapur, and Lalitpur districts, presents significant challenges due to rapid urbanization and population growth. Below is an overview of solid waste generation (both organic and inorganic), management practices, handling, and final disposal in each district, supported by reliable sources.

4.2.4.1 Kathmandu District

i. Waste Generation: Kathmandu Metropolitan City (KMC) produces the highest amount of solid waste among the municipalities in the valley. Around 60 % of wastes are organic and the waste are mostly unsegregated. The recyclable waste is brought back and sold to recycling industries (Wikipedia, 2025).

ii. Management Practices: Waste collection in Kathmandu involves various vehicles, including dump trucks, mini trucks, tractors, tippers, and rickshaws/carts. However, waste segregation at the source is limited, leading to mixed waste collection (Asian Development Bank, 2013)

iii. Handling and Final Disposal: The collected waste is initially taken to the Teku transfer station before being transported to the Sisdol landfill site, located in Kakani Rural Municipality, Nuwakot district. Sisdol has been the primary dumping site since 2005, receiving approximately 100 tons of waste daily.

Banchare danda landfill site (BDLS) is a sanitary landfill facility that commenced its operations on May 24, 2022 and serves as the disposal site for waste generated by 16 municipalities (Shahi et al. 2023). The design of this landfill allows for an operational period of up to 100 years, assuming waste segregation is practiced. This site is situated approximately 27 km north of the Kathmandu Valley and the construction cost of the landfill was supported by a total budget of NRs. 1.56 billion. The landfill site is equipped with lined cells that incorporate a leachate collection system and a leachate retention pond, providing a containment area for collected leachate. To address the management of landfill gases, the site is fitted with landfill gas wells, allowing for the controlled collection and treatment of gases generated during waste decomposition.

Moreover, a study of 1,885 samples in Kathmandu Metropolitan City (KMC) estimated the average daily per capita waste generation at 210 g (SE = 3.3 g; SD = 143.5 g), with a 95% confidence interval of 203.5–216.5 g, showing substantial individual variability (USAID, 2025).

Waste generation was higher on weekends (230 g) than weekdays (200 g) and higher in winter (245 tons) than summer (225 tons). Household waste was 75.2% organic (vegetable, fruit, food) and 24.8% inorganic (plastics, paper, glass, textiles, metals, leather/rubber), with organic waste increasing in winter (78.4%) and "other waste" decreasing from 6.7% in summer to 2.7% in winter. The average waste density was 223.4 kg/m^3, higher for organic (324.6 kg/m^3) than inorganic (79.1 kg/m^3). KMC's population of 1,121,120 generates approximately 235 tons of solid waste daily (177 tons organic, 58 tons inorganic). Among 102,957 commercial, industrial, and institutional facilities, 74,121 are not obligated to manage waste, contributing 156 tons/day (98 tons organic, 58 tons inorganic), dominated by shops and groceries. Waste volume depends on collection method, with mixed collection yielding 1,720 m^3/day and segregated collection producing 853 m^3 organic and 1,535 m^3 inorganic waste, emphasizing the need for effective waste management and source segregation.

4.2.4.2 Bhaktapur District

i. Waste Generation: A study in Bhaktapur Municipality reported that the household waste generation rate is 0.093 kg per capita per day. The waste composition includes 77% organic matter, 18% plastic, and 3% paper. (Ranjit, et al., 2019)

ii. Management Practices: Bhaktapur has initiated compulsory waste segregation practices in core city areas to promote recycling and reduce landfill usage. However, the effectiveness of these initiatives varies, and challenges such as inadequate waste segregation at the source persist. (World Bank Group, 2021)

iii. Handling and Final Disposal: Similar to Kathmandu, Bhaktapur Municipality transports its waste to the Sisdol landfill site for final disposal. The reliance on a single landfill has led to environmental and social concerns due to overcapacity and prolonged use beyond its intended lifespan.

4.2.4.3 Lalitpur District

i. Waste Generation: Previous Lalitpur Sub-Metropolitan City (LSMC) is the second-largest waste producer in the Kathmandu Valley. The waste composition is predominantly organic, similar to Kathmandu and Bhaktapur (Shrestha et al., 2014).

ii. Management Practices: Previous LSMC employs various vehicles for waste collection, including dump trucks, mini trucks, tractors, tippers, and rickshaws/carts. Efforts to promote waste segregation at the source are ongoing but face challenges in consistent implementation.

iii. Handling and Final Disposal: The collected waste from Lalitpur is also transported to the Sisdol landfill site. The overreliance on Sisdol has highlighted the need for alternative disposal sites, prompting the development of the Banchare Danda landfill.

4.2.4.4 Common Challenges Across Districts

i. Overdependence on Sisdol Landfill: All three districts rely heavily on the Sisdol landfill site, leading to overcapacity and environmental degradation.

ii. Inadequate Waste Segregation: Despite initiatives to promote waste segregation at the source, mixed waste collection remains a significant issue, hindering recycling and composting efforts.

iii. Need for Sustainable Practices: There is a pressing need to adopt sustainable waste management practices, including effective waste segregation, recycling, composting, and the development of additional sanitary landfill sites to accommodate the growing waste generation. (Maharjan, et al., 2019)

4.2.5 Wastewater Management in Kathmandu Valley

In the Kathmandu Valley there are total of four wastewater treatment plants among which only Guheshowori wastewater treatment plant is in functional whereas remaining project are in construction or in designing phase. The details of the wastewater treatment system have been presented in **Table 4.2-5**.

Table 4.2-5 Conventional Wastewater Treatment System in Kathmandu Valley

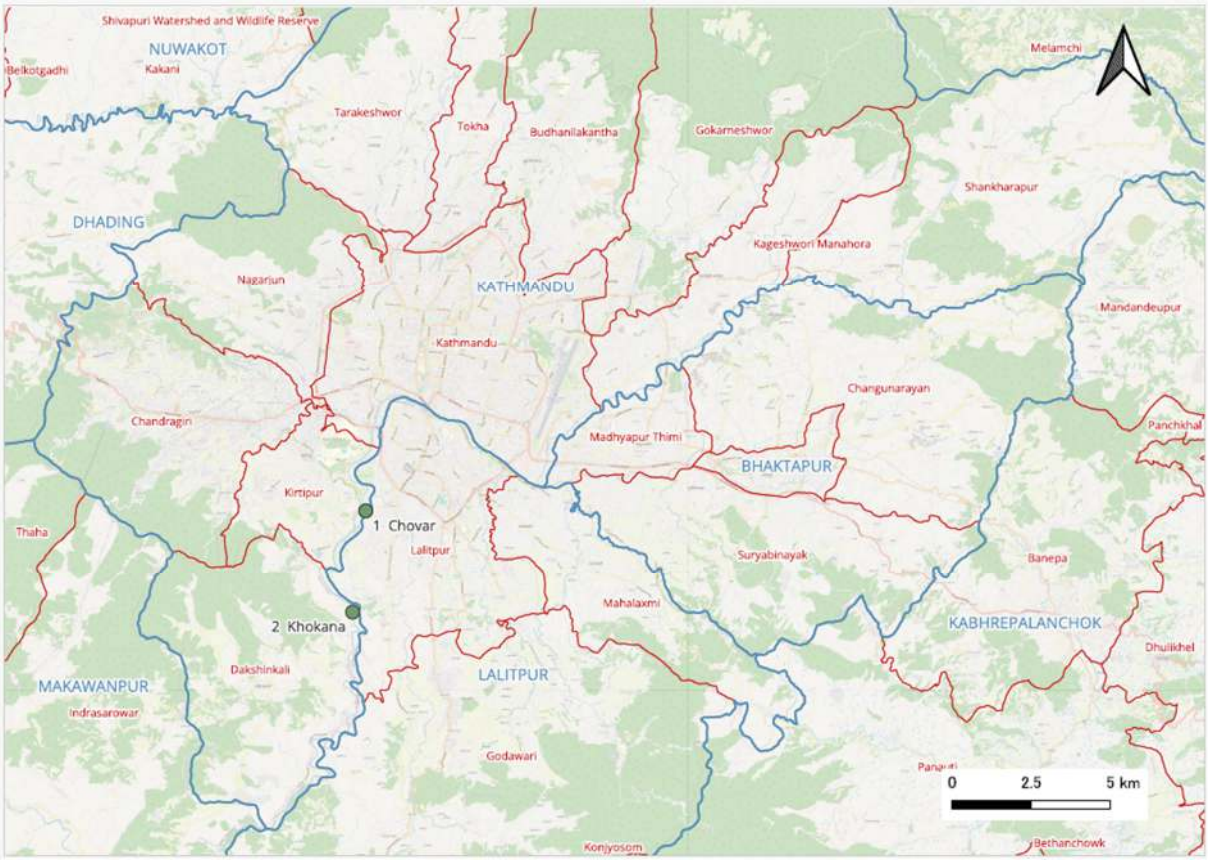
S. N.	Name of the Project	Location	Types of treatment system	Type of treatment plant	Treatment Capacity (MLD)	Status	Responsibe organization
1.	Guheshwori wastewater treatment plant	Guheshwori, BP	Biological	Activated sludge process	32.4	Functional	KUKL
2.	Sallagharii, Kodku, and Dhobighat wastewater treatment plant	Sallaghari, Kodku and Dhobighat, BP	Biological	Activated sludge process	14.2, 17.5, and 37	Construction phase	KUKL
3.	Dhobighat wastewater treatment plant	Dhobighat, BP	Biological	Activated sludge process	37	Construction phase	KUKL
4	DEWATS at Gokarna and Hanumanghat	Gokarna and Hanumanghat, Bhaktapur, BP	Biological	Membranebased biological reactor	1 and 3	Design phase	KUKL

Source: Karki et al. (2024), *Urban wastewater management in Nepal*

4.2.6 Sediment

In Kathmandu Valley, there are two sediment monitoring stations along the Bagmati River, at Chover and at Khokana, as shown in Figure 4.2-4.

As shown in Table 4.2-6 and Table 4.2-7, the results of sediment monitoring in the Bagmati River indicate that, with the exception of May 1976 at Chovar and March 2017 at Kokana, sediment concentrations tend to rise during July, August, and September, which correspond to the monsoon season in Kathmandu.



Source : Department of Hydrology and Meteorology (DHM), June 12, 2026
Open Street Map (base map) and Open Data Nepal, Administrative Boundaries

Figure 4.2-4: Sediment Monitoring Stations of Bagmati River in Kathmandu Valley

Table 4.2-6 Monthly Average Sediment Data at Chovar (1974–1978)

Month	Monthly Avg. Sediment (ppm)					
	1974	1975	1976	1977	1978	Average (1974 to 1978)
January	62	90	49	95	112	82
February	73	156	89	47	127	98
March	80	71	48	61	666	185
April	202	194	128	88	354	193
May	245	1,069	2,030	140	329	763
June	399	439	507	647	583	515
July	1,155	975	769	695	812	881
August	746	770	862	404	No Data	696
September	618	1,376	726	255	No Data	744
October	163	334	152	73	No Data	181
November	82	98	59	180	No Data	105
December	169	57	72	105	No Data	101

Source : f Department of Hydrology and Meteorology, June 12, 2026

Table 4.2-7 Monthly Average Sediment Data at Khokana (2016–2020)

Month	Monthly Avg. Sediment (ppm)					
	2016	2017	2018	2019	2020	Average (2016 to 2020)
January	174	335	81	206	150	189
February	259	251	111	1,074	175	374
March	303	2,311	206	212	121	631

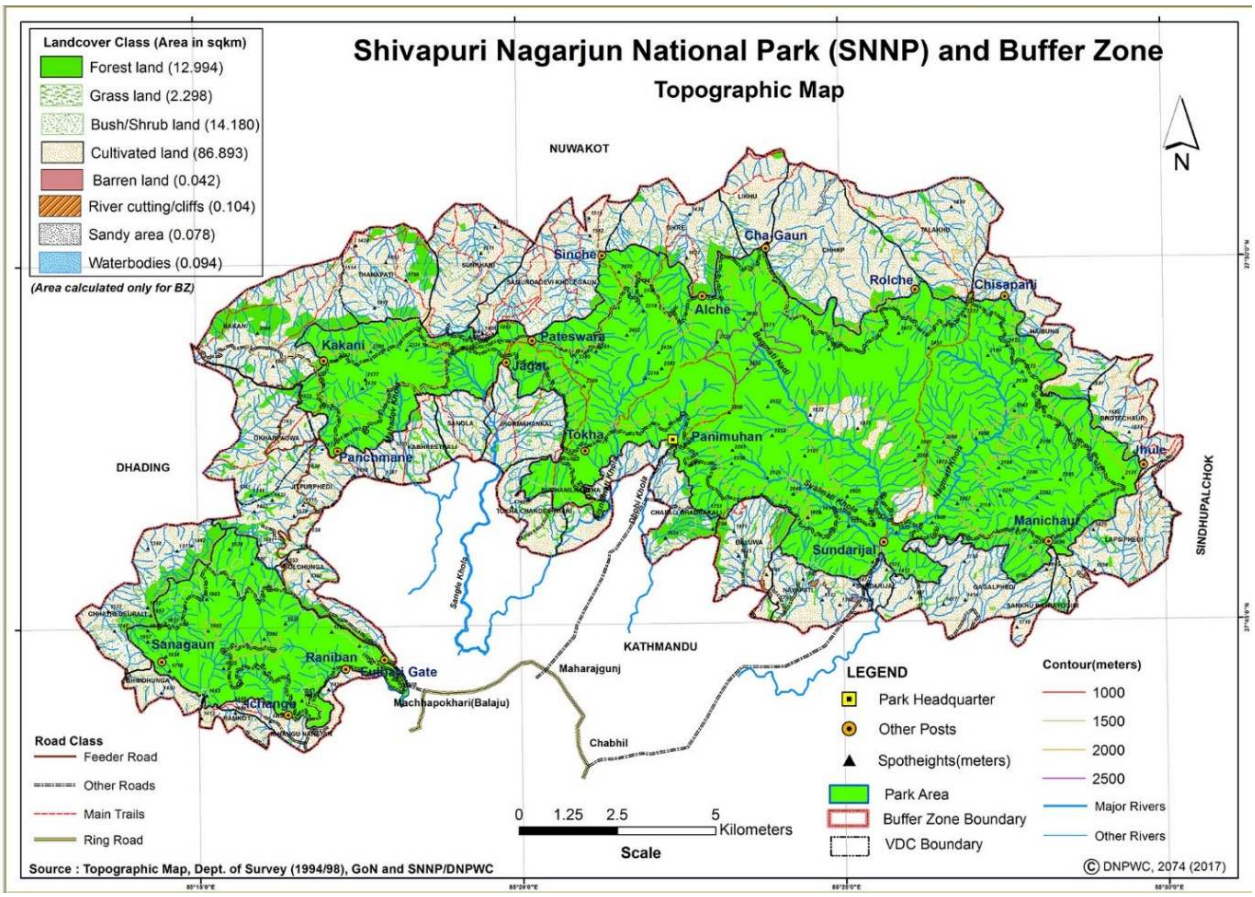
April	489	487	268	565	243	410
May	916	486	49	367	282	420
June	1,919	2,108	88	1,582	351	1,210
July	1,554	1,370	237	1,676	No Data	1,209
August	1,196	2,289	524	1,009	No Data	1,255
September	1,436	1,565	345	475	No Data	955
October	326	146	187	306	No Data	241
November	71	33	162	199	No Data	116
December	148	61	No Data	179	No Data	129

Source : Department of Hydrology and Meteorology, June 12, 2026

4.3 Natural Environment

4.3.1 Protected Area

Shivapuri Nagarjun National Park (SNNP), situated on the north side of Kathmandu Valley about 12km from downtown, is a 159-square-kilometer reserve known for its rich biodiversity and scenic forests of pine, oak, and rhododendron. It covers parts of Kathmandu, Nowakot, Sindhupalchowk and Dhading districts of central Nepal and elevation ranges from 960 to 2732. SNNP is designated as a protected area under the National Parks and Wildlife Conservation Act, 1973 of Nepal. It hosts wildlife such as Himalayan black bears, leopards, and numerous bird species, and is a popular spot for hiking to Shivapuri Peak. The park also holds cultural and religious significance as the source of the Bagmati River and home to historic monasteries and temples. Combining nature, trekking, and spiritual sites, it attracts both tourists and locals. Figure 4.3-1 shows the SNNP location map.



Source: https://www.snnp.gov.np/

Figure 4.3-1: Shivapuri Nagarjun National Park (SNNP) Location Map

4.3.2 Biodiversity

4.3.2.1 Flora

The Kathmandu Valley is a bowl-shaped valley located in the Himalayan mountains of Nepal. The Kathmandu Valley is surrounded by five mountain ranges: Shivapuri hills (at an elevation of 2,732 m), Phulchowki (2,762 m), Nagarjun (2,128 m), Champadevi (2,278 m) and Chandragiri (2,551 m). It lies in a transition zone between subtropical and temperate climates. Among these mountain ranges Shivapuri and Nagarjun area has been declared as National Park in 2002. The valley bottom lies at an altitude of 1324m (DNPWC, 2025).

The mountain slopes of the valley are covered by forest areas of different growth condition. There are some other forest patches in the valley floor such as Pashupati Forest, Gokarna Forest, Swayambhu hills, Hattiban forest, etc. In general, the forest types in the valley can be recognized in three forest categories. At the lower elevation the representative tree species forming forest type include *Schima wallichii*, *Castanopsis indica*, *Ilex doniana*, *Myrsine semiserrata*, *Myrica esculenta*, *Acer oblongum*, *Englehardtia spicata*, etc. At the middle elevation, the species forming forest type include *Quercus glauca*, *Quercus lanata*, *Lyonia ovalifolia, Rhododendron arboream, Castanopsis tribuloides*, etc. At the highest elevation other broad-leaf species are replaced by pure oak forest consisting of *Quercus semecarpifolia* with frequent presence of *Rhododendron arboreum* (DMP, 1986).

Pine forests consisting of *Pinus roxburghii* in the dry slopes of lower altitudes and *Pinus wallichiana* in the higher altitude is a common phenomenon. Wet ravines and gullies at several mountain slopes are occupied by *Alnus nepalensis* (DMP, 1986).

Other species found as undergrowth in the forests of the valley are *Daphne bholua*, *Ardisia macrocarpa, Luculia gratissima, Ligustrum indicum, Leucoceptrum canum, Mahonia nepalensis, Rosa brunoni, Viburnum coriaceum, Berberis* spp., *Colquhounia coccinea*, and several bamboos (Rokaya et al.).

i. Classification of forests based on geography

According to Department of Forest, 2002, the districts of Kathmandu Valley is categorized into the following vegetation types.

a. **Temperate Mountain Oak Forest:** The Species found in the upper forest areas of Shivapuri, Nagarjun, and Chandragiri were *Castanopsis tribuloides*, *C. hystrix*, *Quercus leucotrichophora*, *Q. lanata*, *Taxus wallichiana*, *Pranus carmesina*.

b. **Lower Temperate Oak Forest:** The Species found in the upper forest areas of Shivapuri, Nagarjun, and Chandragiri were *Acer oblongum*, *Fraxinus floribanda*, *Pranus cerasoids*.

c. **Mixed Blue Pine Oak Forest:** The Species found in the lower forest areas of Lapsiphedi, Chapa forest, Bhimdhuga, Sitapaila and Shivapuri were *Pinus wallichiana*, *Cedrus deodara*, *Picea smithiana*, *Cryptomeria japonica*.

d. **Mixed Oak Rhododendron Forest:** The Species found in the forest areas of Nagarjun, Bhimdhuga, Sitapaila and Lapsiphedi were *Schima wallichii*, *Castanopsis indica*, *Alnus nepalensis*, *Pinus roxburghii*, *Myrica essculanta*, *Pyrus pasia*, *Quercus semecarpifolia*, *Rhododendron arboretum*, *Juglans regia*, *Taxus wallichiana*, *Michelia champaka*, *Michelia kisopa*.

e. **Chirpine Forest:** The Species found in the forest areas of Yagyadole, Gokarna, Thankot, Thanagadhi and Mahadevsthan is *Pinus roxburghii*.

f. **Chirpine Broadleaved Mixed Forest:** The Species found in the forest areas of Bhimdhunga, Sheshnarayan, Machhenarayan, Goldhunga, Salkor and Maruwa were *Pinus roxburghii*, *Castanopsis indica*, *Schima wallichiana*, *Alnus nepalensis*.

g. ***Schima Castanopsis* Forest:** The Species found in the forest areas of Satungal, Thankot, Ramkot and Dakchinkali were *Schima wallichiana*, *Castanopsis indica***.**

h. **Schima Forest:** The Species found in the forest areas of Kirtipur, Alapot and Mahankal is *Schima wallichiana*.

ii. Forest Details of Kathmandu District

a. Status of Community Forest according to local level

There are total of 137 Community Forest User Group covering an area of 6223.43 hectares in the local level of Kathmandu District. The details of the community forest in the local level of Kathmandu district are presented in the **Table 4.3-1** below**.**

Table 4.3-1 Status of Community Forest according to local level

S.No.	Name of Loal Level	Number of Community Forest	Area (Ha.)
1.	Shankharapur Municipality	29	1729.7
2.	Budhanilkantha Municipality	6	135.77
3.	Kageshwori Manohara Municipality	13	30.09
4.	Gokarneshwor Municipality	4	94.17
5.	Kathmandu Metropolitan City	1	6.95
6.	Tokha Municipality	2	6.34
7.	Tarkeshwor Municipality	6	14.82
8.	Nagarjun Municipality	14	312.32
9.	Kirtipur Municipality	6	339.75
10.	Chandragiri Municipality	23	1402.99
11.	Dakshinkali Municipality	33	2152.90
Total		**137**	**6223.43**

Source: DFO, Kathmandu, 2024

b. Forest areas based on management type

Similarly, in the local level of Kathmandu District there are total of 160 user groups under management type of Community Forest, Government Managed Forest, Religious Forest, Leasehold Forest, and Private Forest covering an area of 6605.38 hectares. The details of the user's group in each management type are presented in the **Table 4.3-2** below.

Table 4.3-2: Forest areas based on management type

S.No.	Management type	Number of user group	Area (Hectare)	Benefitted household
1.	Community Forest	137	6223.43	17895
2.	Government Managed Forest	-	237.67	
3.	Religious Forest	8	43.48	
4.	Leasehold Forest	9	98.26	
5.	Private Forest	6	2.54	
Total		**160**	**6605.38**	

Source: DFO, Kathmandu, 2024

iii. Forest Details of Bhaktapur District

a. Status of Community Forest according to Local Level

There are total of 57 community forest handed to user groups covering an area of 1740.47 hectares in the local level of Bhaktapur District. The details of the community forest in the local level of Bhaktapur district is presented in the **Table 4.3-3** below**.**

Table 4.3-3: Status of Community Forest according to Local Level

S.No.	Municipality	Number of Community Forest	Area (Ha.)	Households
1.	Changunarayan Municipality	25	957.74	4910
2.	Suryabinayak Municipality	29	752.60	3691
3.	Madhyapur Thimi Municipality	3	30.13	456
4.	Bhaktapur Municipality	0	0	0
Total		**57**	**1740.47**	**9057**

Source: DFO, Bhaktapur, 2022

b. Forest Areas based on Management Type

Similarly, in the local level of Bhaktapur District there are total of 77 user groups under management type of management type such as Community Forest, Religious Forest, Government Managed Forest, Commercial Leasehold Forest, Private Forest, and others (National Zoological Park) covers a total area of 2082.87 Hectare. The details of the area in each management type are presented in the **Table 4.3-4** below.

Table 4.3-4: Status of forest Management type/ area according to Local Level

S.No.	Municipality	Types of Forest (Management Type)						
		Community Forest (Ha.)	Religious Forest (Ha.)	Government Managed Forest (Ha.)	Commercial Leasehold Forest (Ha.)	Private Forest (Ha.)	Others (National Zoological Park) (Ha.)	Total Area (Ha.)
1.	Changunarayan	957.74	5.44	57.41	1.27	2.64	0	989.4
2.	Suryabinayak	752.60	3.47	0	27.36	0.64	245.17	1063.24
3.	Madhyapur Thimi	31.13	0	0	0	0	0	30.13
4.	Bhaktapur	0	0	0	0	0	0	0
Total (Area)		**1740.44**	**8.91**	**57.41**	**27.63**	**3.28**	**245.17**	**2082.87**
Number (User Group)		**57**	**3**	**-**	**2**	**7**	**8**	**77**

Source: DFO, Bhaktapur, 2022

iv. Forest Details of Lalitpur District

a. Status of Community Forest according to Local Level

There are total of 206 community forest handed to user groups covering an area of 11190.12 hectares in the local level of Lalitpur District. The details of the community forest in the local level of Lalitpur district is presented in the **Table 4.3-5** below**.**

Table 4.3-5: Status of Community Forest according to local level

S.No.	Local Level	Number of Community Forest	Area (Ha.)	Households
1.	Lalitpur Metropolitan City	9	11.76	657
2.	Mahalaxmi Municipality	14	586.46	1079
3.	Godawari Municipality	64	3871.55	7078
4.	Bagmati Rural Municipality	58	2745.63	3081
5.	Mahankal Rural Municipality	37	2430.12	2274
6.	Konjyosom Rurak Municipality	24	1544.6	2214
Total		**206**	**11190.12**	**16383**

Source: DFO, Lalitpur, 2024

b. Forest Areas based on Management Type

Similarly, in the local level of Bhaktapur District there are total of 251 user groups under management type of Community Forest, Commercial Collaborative Forest, Urban Forest (Municipal Garden), Religious Forest, Private Forest and National Botanical Garden covering an area of 11412.52 hectares. The details of the area in each management type is presented in the

Table 4.3-6 below.

Table 4.3-6: Details of forest areas based on management type

S.No.	Types of Forest	Number	Area	Percentage in relation to the district's forest area	Benefited Households
1.	Community Forest	206	11190.12	47.39	16383
2.	Commercial Collaborative Forest	8	33.61	0.14	
3.	Urban Forest (Municipal Garden)	5	3.2	0.01	
4.	Religious Forest	6	83.96	0.35	
5.	Private Forest	25	19.63	0.08	
6.	National Botanical Garden	1	82	0.34	
Total		**251**	**11412.52**		

Source: DFO, Lalitpur, 2024

4.3.2.2 Fauna

The Kathmandu Valley supports a rich diversity of fauna across its surrounding forested and protected areas, including Phulchowki, Nagarjun, and Suryabinayak. The region's varied elevation and habitat types allow the presence of multiple species groups such as birds, amphibians, reptiles, butterflies, fish, and mammals.

Bird diversity includes species such as the Spiny Babbler (*Turdoides nipalensis*), which is endemic to Nepal, along with Hoary-throated Barwing, White-throated Fantail, and several tit and warbler species commonly observed in forested hills. Amphibians and reptiles such as the Long-legged Cricket Frog, Monocled Cobra, and Himalayan Keelback are found mainly in moist and forest-edge habitats, particularly around Nagarjun.

The valley also hosts notable butterfly species like the Golden Emperor and Kaiser-i-Hind, which are indicators of healthy forest ecosystems. Aquatic biodiversity includes fish species such as Snowtrout (*Schizothorax richardsonii*) and Mola Carplet, mainly recorded in upland water bodies around Phulchowki.

Mammalian fauna is comparatively more diverse, with species such as the Himalayan Black Bear, Wild Boar, Sambar Deer, and Himalayan Tahr found in Nagarjun and Phulchowki forests. Predators like the Leopard are also present in Suryabinayak forest areas, while the endangered Red Panda is associated with high-altitude forest habitats of Phulchowki.

Overall, the Kathmandu Valley holds significant ecological value due to its rich biodiversity and diverse habitats

Table 4.3-7: Common fauna of Kathmandu Valley

Species Type	English Name	Local Name (Nepali)	Scientific Name	Observed Locations
Birds	Spiny Babbler	Kande Bhyakur	*Turdoides nipalensis*	Phulchowki
	Hoary-throated Barwing	Thulo Phisto	*Actinodura nipalensis*	Phulchowki, Suryabinayak
	White-throated Fantail	Seto Ghati Bhardwaj	*Rhipidura albicollis*	Suryabinayak
	Himalayan Black-lored Tit	Kalo Thople Jureli	*Machlolophus xanthogenys*	Suryabinayak
	Humes Warbler	Hume ko Phisto	*Phylloscopus humei*	Suryabinayak
	Black-throated Tit	Kalo Ghati Jureli	*Aegithalos concinnus*	Suryabinayak
Amphibians	Long-legged Cricket Frog	Lamtope Bhyaaguto	*Minervarya syhadrensis*	Nagarjun

Species Type	English Name	Local Name (Nepali)	Scientific Name	Observed Locations
Reptiles	Monocled Cobra	Gokhro	*Naja kaouthia*	Nagarjun
	Himalayan Keelback	Pahadi Pani Saap	*Amphiesma platyceps*	Nagarjun
Butterflies	Golden Emperor	Sunaulo Maharani	*Dilipa morgiana*	Phulchowki
	Kaiser-i-Hind	Himalchuli Maharaj	*Teinopalpus imperialis*	Phulchowki
Fish	Common Snowtrout	Asala	*Schizothorax richardsonii*	Phulchowki
	Mola Carplet	Mola	*Amblypharyngodon mola*	Phulchowki
	Assamese Kingfish	Katle	*Cyprinion semiplotum*	Phulchowki
Mammals	Himalayan Black Bear	Kalo Bhalu	*Ursus thibetanus*	Nagarjun, Phulchowki
	Wild Boar	Jangali Suar	*Sus scrofa*	Nagarjun, Phulchowki
	Leopards	Chheupra	*Panthera pardus*	Suryabinayak
	Red Panda	Himalaya Rato Panda	*Ailurus fulgens*	Phulchowki
	Sambar Deer	Sambhar	*Rusa unicolor*	Nagarjun
	Himalayan Tahr	Tahr	*Hemitragus jemlahicus*	Nagarjun, Phulchowki

Source: BirdLife International & eBird (n.d.); Avibase – Bird Checklists of the World (n.d.); IUCN (1997); FishBase (n.d.)

4.3.3 Hydrology

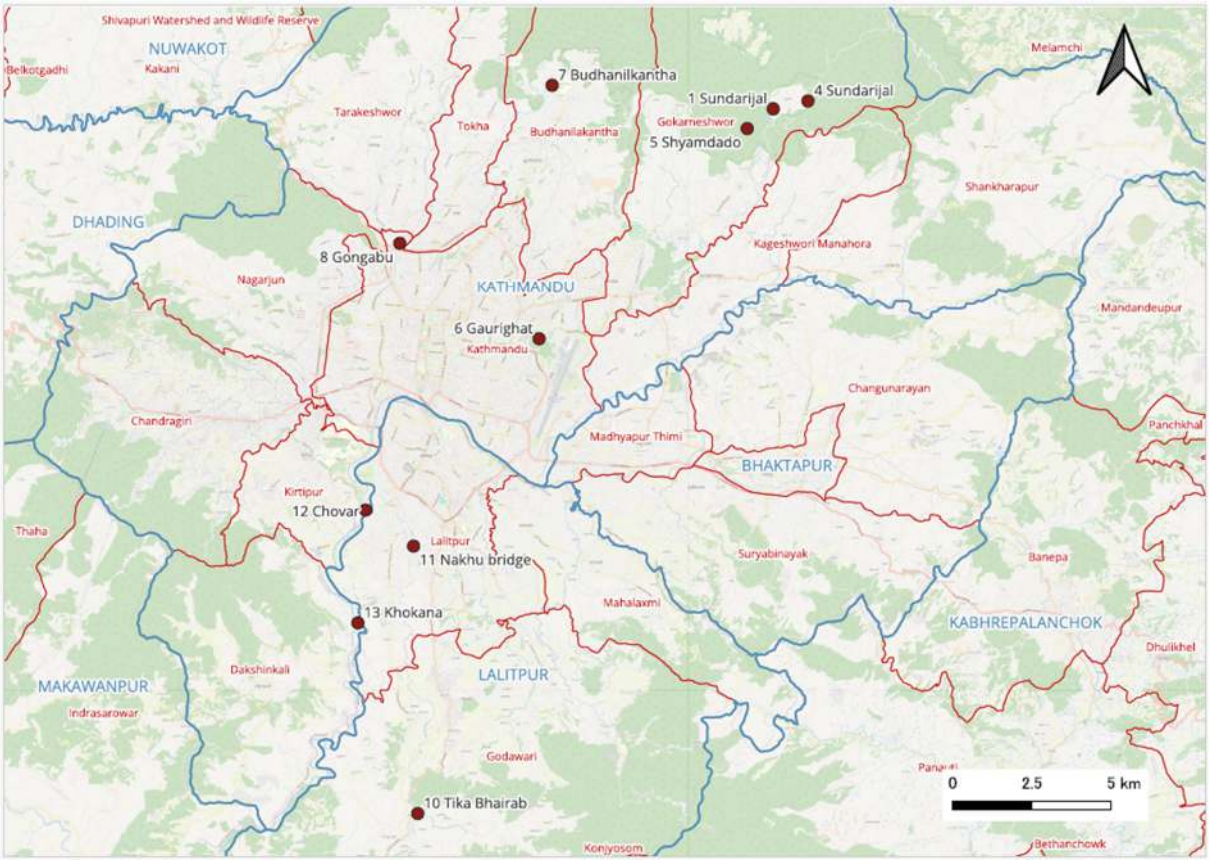
Table 4.3-8 and Figure 4.3-2 presents hydrological monitoring stations within the Kathmandu Valley covering major river systems such as the Bagmati, Bishnumati, Manohara, Nagmati, Sialmati, and Nakhu Khola. A total of 13 stations are listed with details on location, geographic coordinates, elevation, drainage area, and data availability period. The Bagmati River has the highest number of monitoring stations, ranging from its upstream location at Sundarijal to downstream points such as Chovar and Khokana, reflecting its importance in the valley's drainage system. Elevations of the stations vary from approximately 1,255 m to 1,800 m, indicating coverage from higher catchment areas to lower valley floors.

The drainage areas show significant variation, with the largest recorded at Khokana (606.06 km^2) and the smallest at Sialmati (3.00 km^2), highlighting differences in watershed size among tributaries.

Table 4.3-8: Details of Hydrological Stations of Kathmandu Valley

S. No.	Station No.	Name of the River	Location	Latitude (N)	Longitude (E)	Elevation (m)	Drainage Area (Km^2)	Published Data	
								From	To
1.	505	Bagmati River	Sundarijal	27°46'48.00"	85°25'22.80"	1600	14.44	1963	2022
2.	505.5	Bagmati River	Sundarijal Bridge	27°45'18.83"	85°25'17.49"	1350	35.48	2020	2022
3.	506	Nagmati River	Sundarijal	27°46'30.92"	85°26'19.02"	1800	12.78	2022	2023
4.	507	Nagmati	Sundarijal	27°46'38.00"	85°26'20.00"	1660	13.00	1963	1971
5.	510	Sialmati	Shyamdado	27°46'10.00"	85°25'110.00"	1660	3.00	1963	1971
6.	530	Bagmati	Gaurighat	27°42'46.89"	85°20'58.91"	1300	68.00	1991	2023
7.	536.2	Bishnumati	Budhanilkantha	27°46'54.00"	85°21'25.00"	1454	4.00	1969	1985
8.	536.5	Bishnumati	Gongabu	27°44'13.27"	85°18'29.33"	1300	38.68	2019	2022
9.	538	Manohara	Balkumari	27°40'32.17"	85°20'18.29"	1290	253.82	2020	2022
10.	540	Nakhu Khola	Tika Bhairab	27°34'30.00"	85°18'50.00"	1400	43.00	1963	1980
11.	540.5	Nakhu khola	Nakhu bridge	27°39'3.19"	85°18'45.17"	1292	52.63	2020	2022
12.	550	Bagmati	Chovar	27°39'40.00"	85°17'50.00"	1280	585.00	1963	1980
13.	550.05	Bagmati	Khokana	27°37'55.30"	85°17'34.92"	1255	606.06	1992	2023

Source: https://dhm.gov.np/assets/vendors/fileman/Uploads/Published_Station_List_2019_Final1.pdf



Source : Department of Hydrology and Meteorology (DHM), June 12, 2026
Open Street Map (base map) and Open Data Nepal, Administrative Boundaries

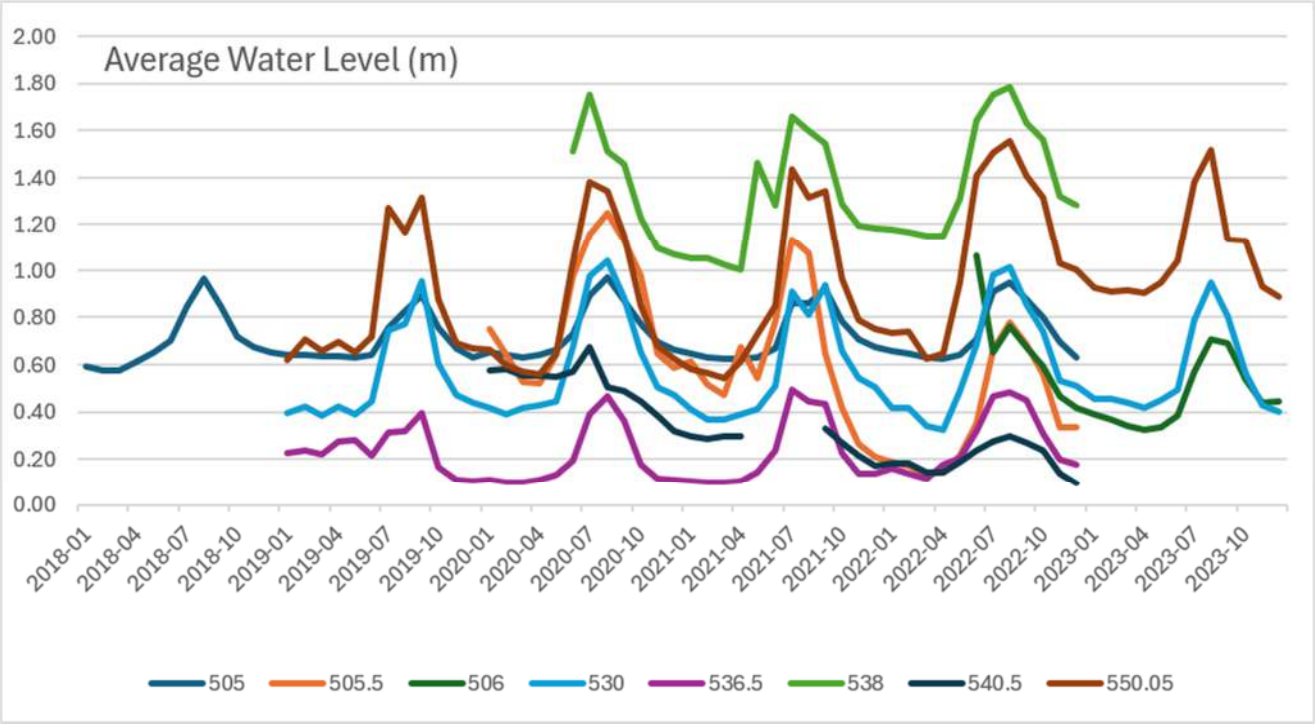
Figure 4.3-2: Hydrological Monitoring Stations of Kathmandu Valley

As shown in Table 4.3-8 and Figure 4.3-3, the results of monthly river water level average indicate that water level is changing between 0.1 m to 1.8m, and tend to rise during July, August, and September, which correspond to the monsoon season in Kathmandu.

Table 4.3-9: Water level at Hydrological Stations of Kathmandu Valley

S. No.	Station No.	Name of the River	Location	Elevation (m)	Drainage Area (Km^2)	Published Data		Monthly Average Water Level (m)		
						From	To	Min	Max	Ave.
1.	505	Bagmati River	Sundarijal	1600	14.44	1963	2022	0.58	0.97	0.72
2.	505.5	Bagmati River	Sundarijal Bridge	1350	35.48	2020	2022	0.14	1.25	0.6
3.	506	Nagmati River	Sundarijal	1800	12.78	2022	2023	0.32	1.06	0.53
6.	530	Bagmati	Gaurighat	1300	68.00	1991	2023	0.33	1.04	0.57
8.	536.5	Bishnumati	Gongabu	1300	38.68	2019	2022	0.1	0.49	0.23
9.	538	Manohara	Balkumari	1290	253.82	2020	2022	0.67	1.79	1.33
11.	540.5	Nakhu khola	Nakhu bridge	1292	52.63	2020	2022	0.09	0.67	0.34
13.	550.05	Bagmati	Khokana	1255	606.06	1992	2023	0.54	1.56	0.94

Source : Department of Hydrology and Meteorology (DHM), June 12, 2026

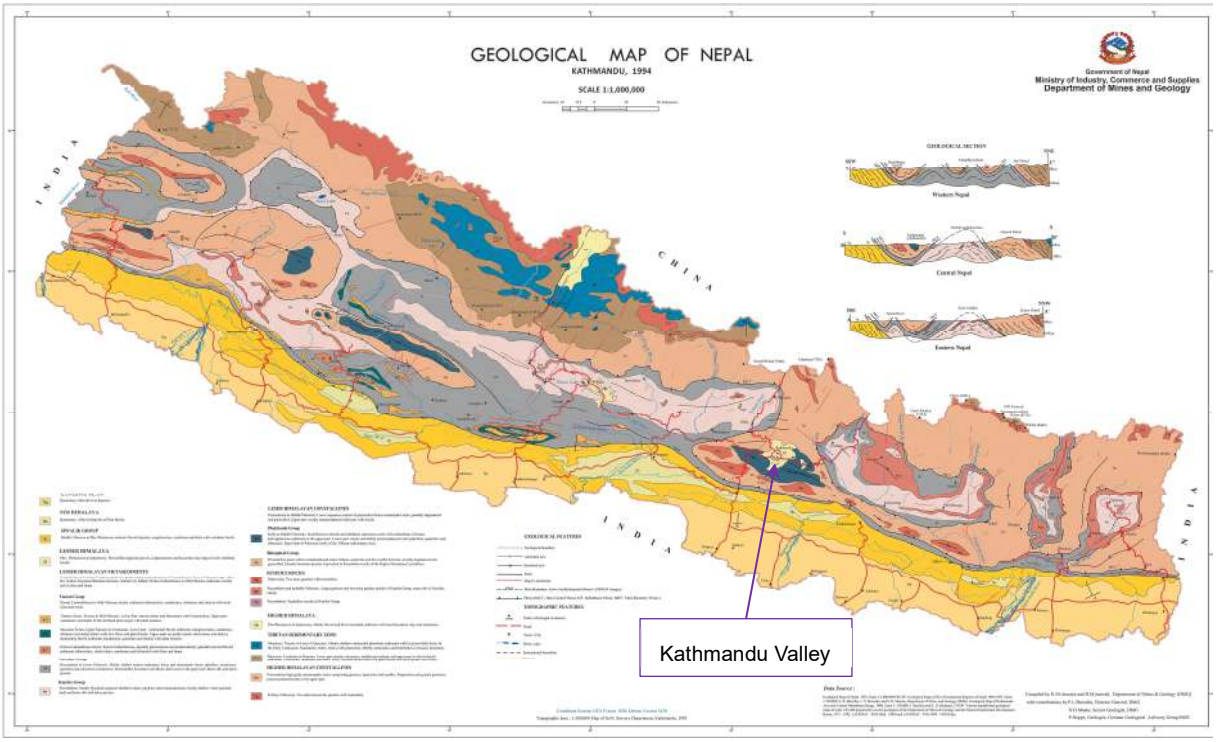


Source : f Department of Hydrology and Meteorology (DHM), June 12, 2026

Figure 4.3-3: River Water Level at Hydrological Station in Kathmandu Valley (2018–2023)

4.3.4 Topography/Geology

The Kathmandu Valley is an intermountain oval-shaped basin surrounded by high mountains with approximately 2,000 m in height. It occupies about 650 sq km of area and ranges in an average altitude of about 1300 m above sea level (JICA, 2012).



Source: Department of Mines and Geology, 1993

Figure 4.3-4: Geological Map of Nepal

As per the Geological Map of Nepal, the Kathmandu Valley is predominantly located within the Lesser Himalaya, including the Lesser Himalayan Metasediments and the Tansen Group formations. The Lesser Himalaya is Plio-Pleistocene to Quaternary in age and is characterized by fluvial and fluvioglacial gravels, conglomerates, and lacustrine clay deposits with vertebrate fossils. The Lesser Himalayan Metasediments are of Precambrian to Tertiary age and are predominantly low-grade clastic metasediments of Precambrian to Lower Paleozoic age, with a few marker limestone and dolomite horizons. These rocks are highly folded and include Permo-Carboniferous to Mid-Miocene sediments, which are locally rich in flora and fauna. The Tansen Group consists of Permo-Carboniferous to Mid-Miocene clastic sediments, including diamictites, sandstones, siltstones, and shales, with local limestone beds.

Sakai (2001) conducted a detailed stratigraphic study of the Kathmandu Valley sediments and identified distinct stratigraphic units that characterize the geological history of the valley. The study concluded that the Kathmandu Valley was originally a large tectonic lake during the late Pliocene to early Pleistocene period. Over time, this lake gradually filled with alternating layers of fluvial and lacustrine (lake) deposits, collectively known as fluvio-lacustrine sediments. These sediments include a complex mix of clays, silts, sands, and gravels deposited by ancient rivers and lakes, which created the thick sedimentary fill now underlying much of the valley floor. Sakai's work is significant in understanding the depositional environment and sediment characteristics that influence current geological processes and hazards such as seismic amplification.

Pandey et al. (1999) provided an in-depth analysis of the seismotectonic framework of the Himalayan region, with a particular focus on Nepal and the Kathmandu Valley. Their study highlighted the active tectonics caused by the ongoing collision between the Indian and Eurasian plates, which generates significant seismic hazards. One of the key contributions of this work was the identification of the amplification effects caused by the soft sedimentary layers that fill the Kathmandu Valley. These soft sediments tend to amplify seismic waves, increasing the intensity and destructiveness of earthquakes within the valley compared to surrounding hill regions with hard rock foundations. This finding underscores the heightened

vulnerability of the valley's urban centers to earthquake shaking and has implications for hazard mitigation and building design in the area.

Dhital (2015) presents a comprehensive overview of Nepal's geology, including detailed descriptions of geological units, fault systems, and sedimentation patterns in the Kathmandu Valley. The work synthesizes data from various geological surveys and research to explain how the valley's formation is related to the Himalayan orogeny and ongoing tectonic uplift. Dhital also highlights the structural complexities of the region, including the presence of major faults such as the Main Himalayan Thrust and other subsidiary faults that influence seismic risk. The sedimentation processes described emphasize the thick unconsolidated sediment layers in the valley, which play a critical role in geological hazards like liquefaction during earthquakes. Dhital's book serves as an essential reference for understanding both the regional geology of Nepal and the specific geological framework of the Kathmandu Valley.

The Japan International Cooperation Agency (JICA) in collaboration with Nepal's Ministry of Urban Development (MoUD) conducted a detailed study in 2012 focused on earthquake disaster mitigation for the Kathmandu Valley. This comprehensive study mapped areas within the valley that are prone to liquefaction, a phenomenon where saturated sediments lose strength during shaking, leading to ground failure. It also examined ground motion behaviors across different parts of the valley, demonstrating how sediment thickness and type influence seismic wave propagation and amplification. The report provides critical hazard maps that guide urban planners and engineers in designing earthquake-resilient infrastructure. It also proposes mitigation strategies to reduce disaster risks in densely populated urban areas of Kathmandu, Lalitpur, and Bhaktapur.

Shrestha et al. (2004) focused on the hydrogeological aspects of Kathmandu Valley, particularly groundwater availability and quality. Their study highlighted the valley's dependence on groundwater as a primary source of drinking water for its growing population. However, they raised concerns regarding the over-extraction of groundwater leading to declining water tables and potential land subsidence. Additionally, they identified contamination issues due to unregulated waste disposal, urban runoff, and leakage from septic systems, which threaten groundwater quality. The research stressed the importance of sustainable groundwater management and pollution control measures to safeguard this vital resource for future generations.

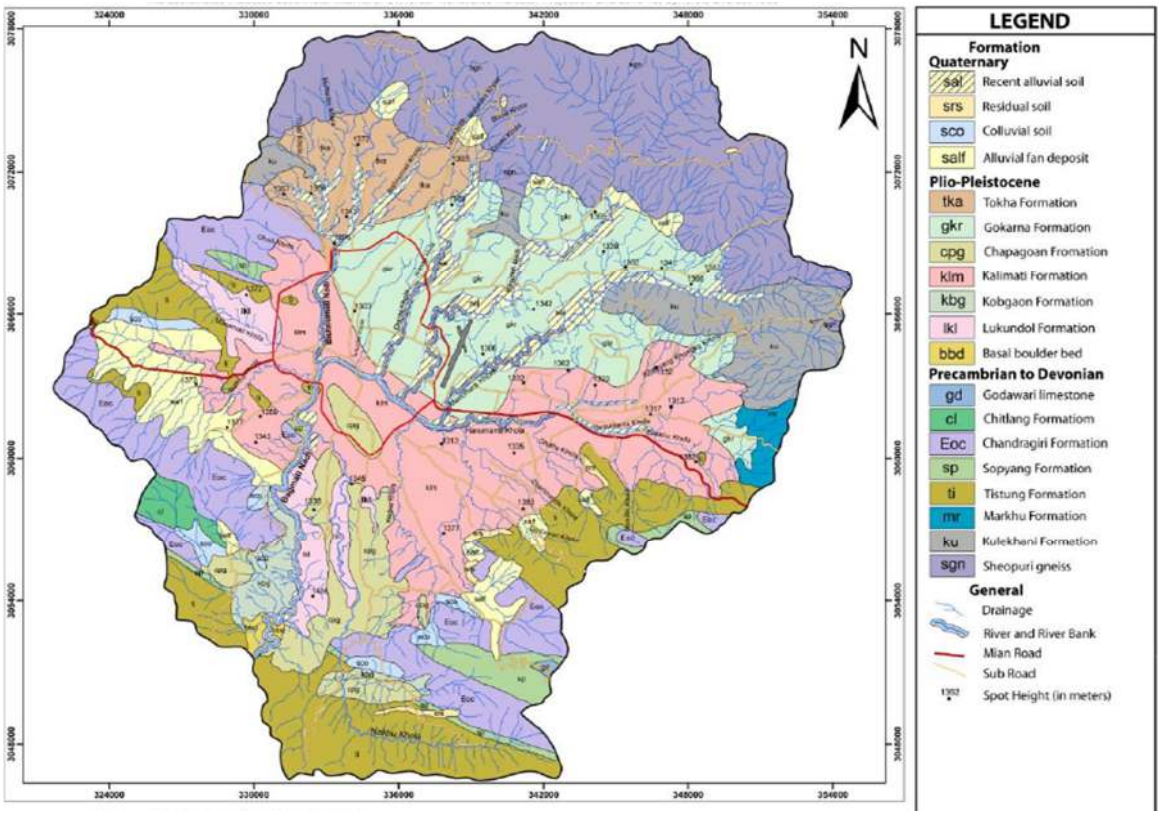
4.3.4.1 Geological Formation and History of Kathmandu Valley

The Kathmandu Valley is a tectonically formed intermontane basin that emerged as a result of the Himalayan orogeny the ongoing collision between the Indian and Eurasian tectonic plates. This collision, which began around 50 million years ago, caused significant uplift and deformation of the region's crust, leading to the formation of the Himalayas and associated valleys (Dhital, 2015). The valley itself was originally a large lake basin during the late Pliocene to early Pleistocene epochs, approximately 2 to 3 million years ago. Over time, this paleo-lake was gradually filled with sediments deposited by rivers and streams flowing into the basin. These sediments, primarily composed of fluvial and lacustrine deposits such as clay, silt, sand, and gravel, accumulated to depths of up to 600 meters, creating a thick alluvial fill beneath the valley floor (Sakai, 2001). Surrounding the valley are hills made predominantly of metamorphic rocks including schist, quartzite, and limestone, which form the ridge boundaries of the basin (Dhital, 2015). Tectonic uplift and deformation processes continued to shape the valley by gradually draining the ancient lake through the creation of outlet channels and fault movements, thus forming the present-day valley landscape. This ongoing tectonic activity contributes to the valley's complex geological structure and influences natural hazards such as earthquakes and landslides, making it a dynamically evolving geological system (Dhital, 2015).

4.3.4.2 Major Rock Types and Soil Composition

The geological makeup of the Kathmandu Valley can be broadly divided into two major formations: the surrounding hill rocks and the valley fill sediments. The hills encircling the valley such as the Chandragiri, Phulchoki, and Shivapuri ranges and are primarily composed of metamorphic rocks including schist, quartzite, limestone, and phyllite. These rocks belong to different geological formations shaped by intense pressure and heat during the Himalayan orogeny, giving the surrounding ridges their rugged and stable character (Dhital, 2015). In contrast, the valley floor is filled with thick sequences of unconsolidated sediments deposited over millions of years. Sakai (2001) identified these valley fill sediments as alternating layers of clay, silt, sand, and gravel, which were laid down by ancient rivers and lacustrine (lake) environments when the Kathmandu Valley was once a large lake. These sediments vary in thickness and composition throughout the valley.

In particular, the central parts of the valley, including areas such as Thimi and Gongabu, are dominated by thick layers of clay, which significantly influence the soil properties and seismic behavior of the area. Meanwhile, river terraces and alluvial fans along the valley edges tend to be composed predominantly of coarser materials like sand and gravel, deposited by the present-day river systems (JICA & Ministry of Urban Development, 2012). This spatial variation in soil composition is critical for urban planning and construction, as areas with thick clay deposits may be more susceptible to ground shaking and liquefaction during earthquakes, while sandy and gravelly deposits may behave differently under seismic stress. The Engineering geological and Environmental Map of Kathmandu valley is presented in **Figure 4.3-5**.



Source: Department of Mines and Geology, 1998

Figure 4.3-5: Engineering Geological and Environmental Map

4.3.4.3 Seismic Activity and Earthquake Risk

Kathmandu Valley lies within a highly active seismic zone primarily due to its proximity to the Main Himalayan Thrust (MHT) fault system, which is the major tectonic boundary where the Indian Plate is subducting beneath the Eurasian Plate. This tectonic setting makes the region extremely vulnerable to large and destructive earthquakes. Historically, the valley has experienced several major earthquakes, the most significant being the 1934 Bihar–Nepal earthquake, which caused widespread destruction and loss of life. More recently, the 2015 Gorkha earthquake, with a magnitude of 7.8, struck near the epicenter at Barpak village in Gorkha District, severely affecting the Kathmandu Valley

This earthquake resulted in extensive damage to buildings, infrastructure, and cultural heritage sites, particularly in areas underlain by soft, clay-rich sediments.

One of the critical factors that increase the earthquake risk in the valley is the presence of thick, unconsolidated sedimentary layers that amplify seismic waves. As detailed by Pandey et al. (1999), these soft sediments significantly increase ground shaking intensity during earthquakes compared to surrounding hard rock areas. The phenomenon of seismic wave amplification is well documented in studies conducted by JICA and the Ministry of Urban Development, which mapped the liquefaction-prone zones where saturated sediments can lose their strength during strong shaking, causing further ground failure and structural damage. These factors combined make Kathmandu Valley a high-risk zone for earthquake hazards, necessitating comprehensive risk mitigation strategies and resilient infrastructure development to safeguard the densely populated urban centers within the valley (Pandey et al., 1999; JICA & MoUD, 2012).

4.3.4.4 Hydrogeology and Groundwater Systems

Groundwater is the main source of water for drinking and daily use in the Kathmandu Valley, serving both domestic and municipal needs. The valley's aquifers are primarily found in sand and gravel layers, which are most abundant in the northern and eastern parts of the valley. These coarse sediments allow water to be stored and transmitted, making them important groundwater reservoirs. However, in recent years, groundwater levels have been steadily declining due to excessive extraction that exceeds natural recharge rates. This over-extraction poses a serious threat to sustainable water supply in the valley. Additionally, contamination of groundwater from surface pollutants such as sewage, industrial waste, and urban runoff is increasing, leading to concerns about water quality and public health (Shrestha et al., 2004). Sustainable management and protection of groundwater resources are essential to ensure safe and reliable water supply for the rapidly growing population of Kathmandu Valley.

4.3.4.5 Landslides and Geomorphological Hazards

While the Kathmandu Valley's flat floor is generally stable due to thick sedimentary deposits, the surrounding hills and slopes are highly susceptible to landslides, particularly during the intense monsoon season when heavy rainfall saturates the soil. These landslides pose a significant threat to communities living in and around the valley's periphery. High-risk landslide zones have been identified in areas such as Sankhu, Thankot, and Lele, where the combination of steep slopes, fragile geological formations, and human activities exacerbate slope instability (Dhital, 2015). The increased incidence of landslides in these areas is strongly linked to deforestation, which removes the natural vegetation cover that stabilizes soil and slopes. Additionally, rapid and often unplanned infrastructure development, including road construction and urban expansion, has disturbed the natural terrain and further increased the risk of slope failure.

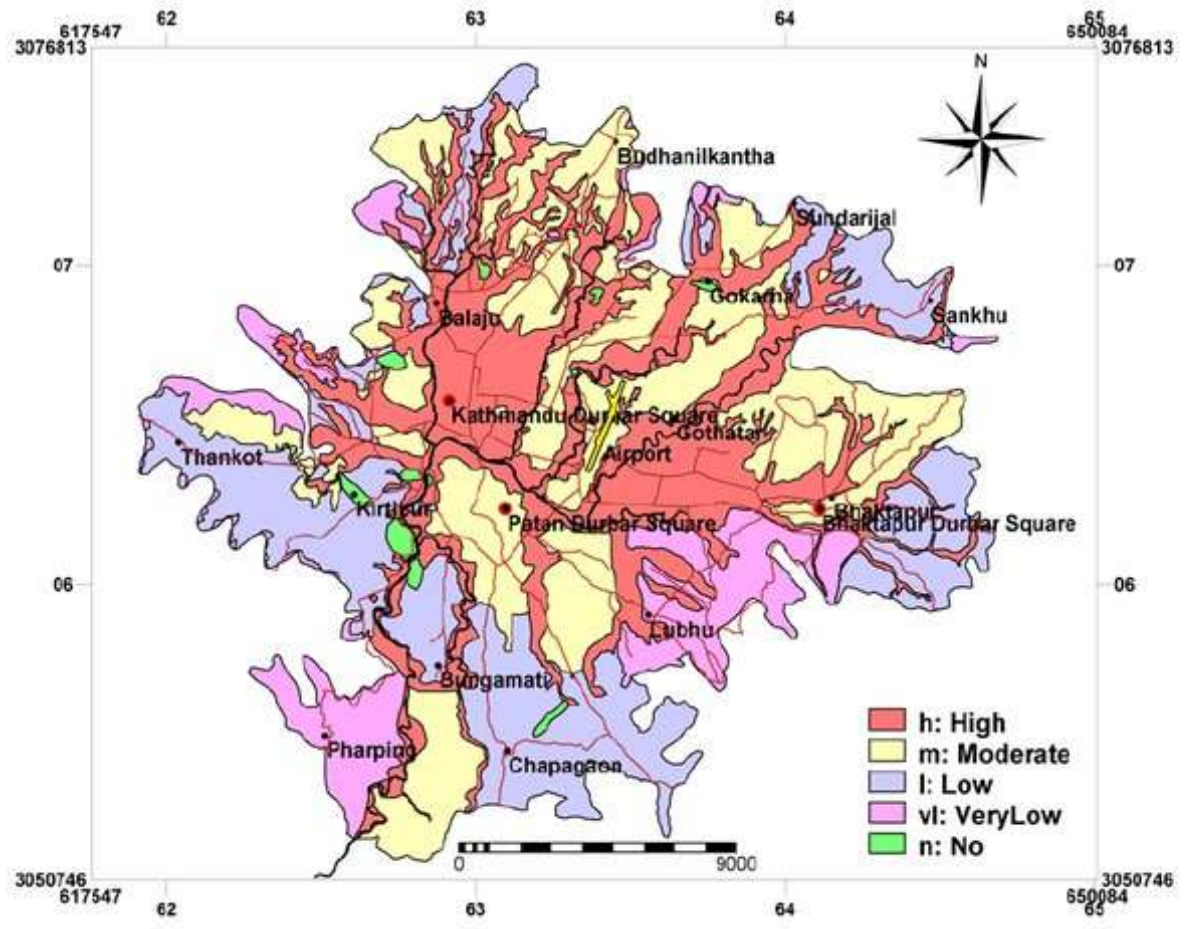
Besides landslides, riverbank erosion is another notable geomorphological hazard affecting the valley. Rivers such as the Bagmati and Manohara frequently experience bank erosion, especially during the monsoon when river discharge and flow velocity increase sharply. This erosion threatens agricultural land, residential areas, and infrastructure situated close to riverbanks. The combined effects of landslides and riverbank erosion not only cause direct damage to property and livelihoods but also contribute to sedimentation in river channels, which can increase flooding risks downstream. Effective hazard mapping, reforestation, slope stabilization, and careful land-use planning are necessary to mitigate these geomorphological hazards and protect communities in the Kathmandu Valley (Dhital, 2015).

4.3.4.6 Urban Geology and Infrastructure Planning

Kathmandu Valley is covered by thick layers of soft sediments like clay, sand, and gravel, which can make earthquake shaking much stronger than in areas with hard rock. Because of this, many parts of the city, especially in the central and northern areas, are at high risk of liquefaction, a process where water-filled soils lose strength and behave like liquid during an earthquake, causing buildings and roads to sink or collapse. Therefore, it is very important for city planners and engineers to design buildings and infrastructure that can withstand strong shaking and ground failure. A study by JICA and Nepal's Ministry of Urban Development (2012) emphasized the need to map these hazardous zones and use this information for planning new developments to reduce damage and protect people. Understanding the valley's geology and carefully planning urban growth is essential to build a safer city and reduce earthquake risks.

4.3.4.7 Liquefaction

The liquefaction susceptibility map (Figure 4.3-6) of the Kathmandu Valley, developed by Piya et al. (2004), is a pivotal resource for understanding seismic risks in the region.



Source : Piya et al., 2004

Figure 4.3-6: Liquefaction susceptibility map of the Kathmandu Valley

This map was created using data from 185 deep boreholes (ranging from 35 to 575 meters) and 328 shallow boreholes (less than 30 meters deep). The study categorized the valley's sediments into three primary layers: fluvial deposits, lacustrine deposits, and overlying fluvial and anthropogenic materials. By analyzing the Standard Penetration Test (SPT) N-values and groundwater depths, the researchers assessed the liquefaction potential across different zones of the valley. The resulting map highlights areas with varying degrees of susceptibility, providing essential information for urban planning and disaster mitigation efforts.

4.4 Social Environment

4.4.1 Socio-Economic Statistics

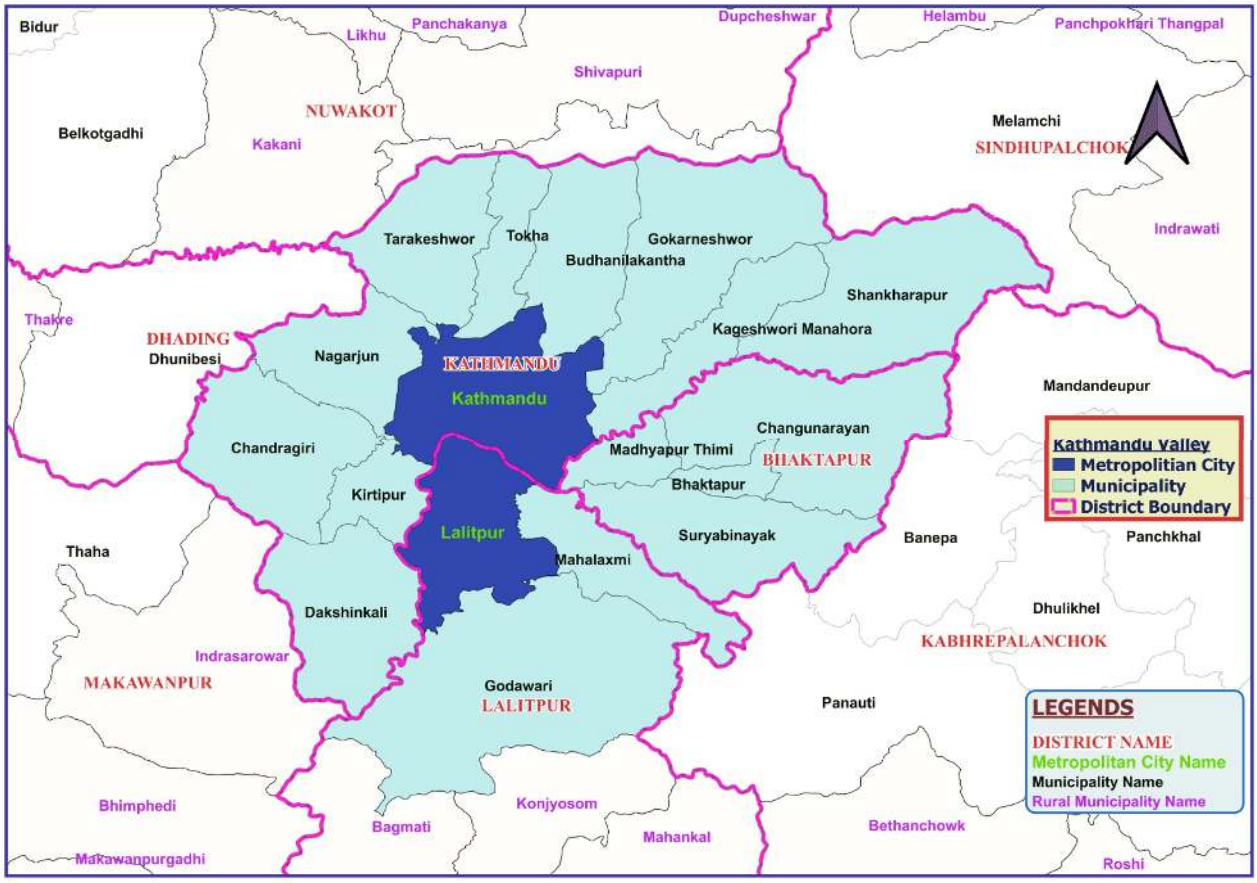
4.4.1.1 Administrative Boundary in Study area

Kathmandu Valley consists of three districts namely Kathmandu, Bhaktapur and Lalitpur. In these three districts, there are total of 18 local levels (Kathmandu 11, Bhaktapur 4 and Lalitpur 3) respectively. Among the 18 local level there are two Metropolitan Cities and Sixteen Municipalities. Similarly, Kathmandu Metropolitan City of Kathmandu District has the maximum number of wards followed by 29 wards of the Lalitpur Metropolitan City. The details of the local level along with the wards has been presented in Table 4.4-1 below.

Table 4.4-1: Details of Local Level in Kathmandu Valley

S. No.	Name of District	Name of Local Level	Number of wards
1	Kathmandu	Kathmandu Metropolitan City, Office of Municipal Executive, Kamaladi, Kathmandu	32
2		Kageshwori Manohara Municipality, Office of Municipal Executive, Danchhi, Kathmandu	9
3		Kirtipur Municipality, Office of Municipal Executive, Barkhahiti, Nayabajar, Kirtipur, Kathmandu	10
4		Gokarneshwor Municipality, Office of Municipal Executive, Jorpati, Kathmandu	9
5		Chandragiri Municipality, Office of Municipal Executive, Balambu, Kathmandu	15
6		Tokha Municipality, Office of Municipal Executive, Maijuhiti, Kathmandu	11
7		Tarkeshwor Municipality, Office of Municipal Executive, Dharmasthali, Kathmandu	11
8		Dakshinkali Municipality, Office of Municipal Executive, Pharping, Kathmandu	9
9		Nagarjun Municipality, Office of Municipal Executive, Harisiddhi, Sitapaila, Kathmandu	10
10		Budhanilkantha Municipality, Office of Municipal Executive, Hattigauda, Kathmandu	13
11		Shankharapur Municipality, Office of Municipal Executive, Sankhu Buspark, Kathmandu	9
12	Bhaktapur	Changunarayan Municipality, Office of Municipal Executive, Kharipati, Bhaktapur	9
13		Bhaktapur Municipality, Office of Municipal Executive, Byasi, Bhaktapur	10
14		Madhyapur Thimi Municipality, Office of Municipal Executive, Thimi, Bhaktapur	9
15		Suryabinayak Municipality, Office of Municipal Executive, Katunje, Bhaktapur	10
16	Lalitpur	Lalitpur Metropolitan City, Office of Municipal Executive, Pulchowk, Lalitpur	29
17		Godawari Municipality, Office of Municipal Executive, Bajrabarahi, Lalitpur	14
18		Mahalakshmi Municipality, Office of Municipal Executive, Kamalpokhari, Lalitpur	10

Source : https://sthaniya.gov.np/gis/
Note: Konjyosom, Bagmati, and Mahankal Rural Municipalities (Lalitpur District) are not included in the KVUTSMP, as these are located at a considerable distance from the core area



Source : JICA Expert Team

Figure 4.4-1: Local Levels Considered in Kathmandu Valley for the KVUTSMP

4.4.1.2 Population and Population Density

i. Kathmandu District

The district as a whole has a total of 544,867 households and a population of 2,041,587, with a male-to-female ratio of 50.73% males to 49.27% females. Among the different local levels of Kathmandu District, the highest number of households and population is recorded in Kathmandu Metropolitan City, with 238,966 households and 862,400 individuals, making it the most highly populated and densely inhabited area. In contrast, Dakshinkali Municipality has the lowest number of households and population, with only 6,489 households and 26,372 individuals, indicating it as a more rural and less densely populated local level. The population density varies significantly across the municipalities, with Kathmandu Metropolitan City having the highest density at 17,440 individuals per square kilometer, while Shankharapur Municipality has the lowest at 487 individuals per square kilometer. These figures highlight the concentration of population in the urban center and the contrast between the city and its surrounding areas. The details of the population and its density in each local level of Kathmandu district has been represented in Table 4.4-2.

Table 4.4-2: Population and Population Density in Kathmandu District

S.No.	Kathmandu District								
	Local Level	Number of Wards	Number of Household	Male		Female		Total	Population Density
				No.	%	No.	%		
1	Shankharapur Municipality	9	7,140	14,433	0.71	14,885	0.73	29,318	487
2	Kageshwori Manahara Municipality	9	33,764	65,031	3.19	65,402	3.20	130,433	4764
3	Gokarneshwor Municipality	9	39,771	73,235	3.59	76,131	3.73	149,366	2553
4	Budhanilkantha Municipality	13	46,930	87,337	4.28	90,220	4.42	177,557	5102
5	Tokha Municipality	11	37,025	66,532	3.26	67,223	3.29	133,755	7817
6	Tarkeshwor Municipality	11	41,362	75,281	3.69	76,198	3.73	151,479	2757
7	Nagarjun Municipality	10	31,301	57,596	2.82	57,841	2.83	115,437	3867
8	Kathmandu Metropolitan City	32	238,966	438,256	21.47	424,144	20.78	862,400	17440
9	Kirtipur Municipality	10	24,150	43,247	2.12	38,331	1.88	81,578	5527
10	Chandragiri Municipality	15	35,994	68,303	3.35	68,557	3.36	136,860	3116
11	Dakshinkali Municipality	9	6,489	12,955	0.63	13,417	0.66	26,372	618
12	Institutional	-	1,975	33,520	1.64	13,512	0.66	47,032	-
Total		**138**	**544,867**	**1,035,726**	**50.73**	**1,005,861**	**49.27**	**2,041,587**	

Source: National Population and Housing Census, 2021
Note: Institutional Households: If individuals reside collectively in an institution such as a prison, orphanage, mental hospital, military or police barracks, children's home, hostel, elderly care home, rehabilitation center, etc., their details must be recorded under institutional Households.

ii. Bhaktapur District

The district as a whole has a total of 108,503 households and a population of 432,132, with a male-to-female ratio of 50.54% males to 49.46% females. Among the different local levels of Bhaktapur District, the highest number of households and population is recorded in Suryabinayak Municipality, with 35,865 households and 140,085 individuals, making it the most highly populated area in the district. In contrast, the lowest number of households and population is found in Bhaktapur Municipality, with 18,987 households and 79,136 individuals. Population density varies significantly across the municipalities. Bhaktapur Municipality has the highest population density at 11,486 individuals per square kilometer, reflecting its urban concentration, while Changunarayan Municipality has the lowest density at 1,339 individuals per square kilometer, indicating a more suburban or rural settlement pattern. These figures showcase the contrast between the urbanized areas and the more sparsely populated regions within Bhaktapur District. The details of the population and its density in each local level of Bhaktapur district has been represented in Table 4.4-3.

Table 4.4-3: Population and Population Density in Bhaktapur District

Bhaktapur District									
S. No.	Local Level	Number of wards	Number of Household	Male		Female		Total	Population Density
				No.	%	No.	%		
1	Changunarayan Municipality	9	21,588	43,674	10.11	44,409	10.28	88,083	1,339

Bhaktapur District									
S. No.	Local Level	Number of wards	Number of Household	Male		Female		Total	Population Density
				No.	%	No.	%		
2	Bhaktapur Municipality	10	18,987	39,755	9.20	39,381	9.11	79,136	11,486
3	Madhyapur Thimi Municipality	9	31,966	60,746	14.06	59,010	13.66	119,756	10,441
4	Suryabinayak Municipality	10	35,865	69,915	16.18	70,170	16.24	140,085	3,300
5	Institutional	-	97	4,328	1.00	744	0.17	5,072	-
Total		**38**	**108,503**	**218,418**	**50.54**	**213,714**	**49.46**	**432,132**	

Source: National Population and Housing Census, 2021
Note: Institutional Households: If individuals reside collectively in an institution such as a prison, orphanage, mental hospital, military or police barracks, children's home, hostel, elderly care home, rehabilitation center, etc., their details must be recorded under institutional Households

iii. Lalitpur District

Out of six local levels in Lalitpur district, three municipalities were considered which have a total of 133,547 households and a population of 523,203, with a male-to-female ratio of 50.26% males to 49.74% females. Among the three municipalities of Lalitpur District, the highest number of households and population is recorded in Lalitpur Metropolitan City, with 77,159 households and 294,098 individuals, making it the most highly populated area in the district with a density of 8,142 individuals per square kilometer. In contrast, the lower number of households and population is found in Godawari Municipality, with 24, 045 households and 97, 633 individuals with population density of 1016 individuals per square kilometre. The details of the population and its density in each local level of Lalitpur district has been represented in Table 4.4-4.

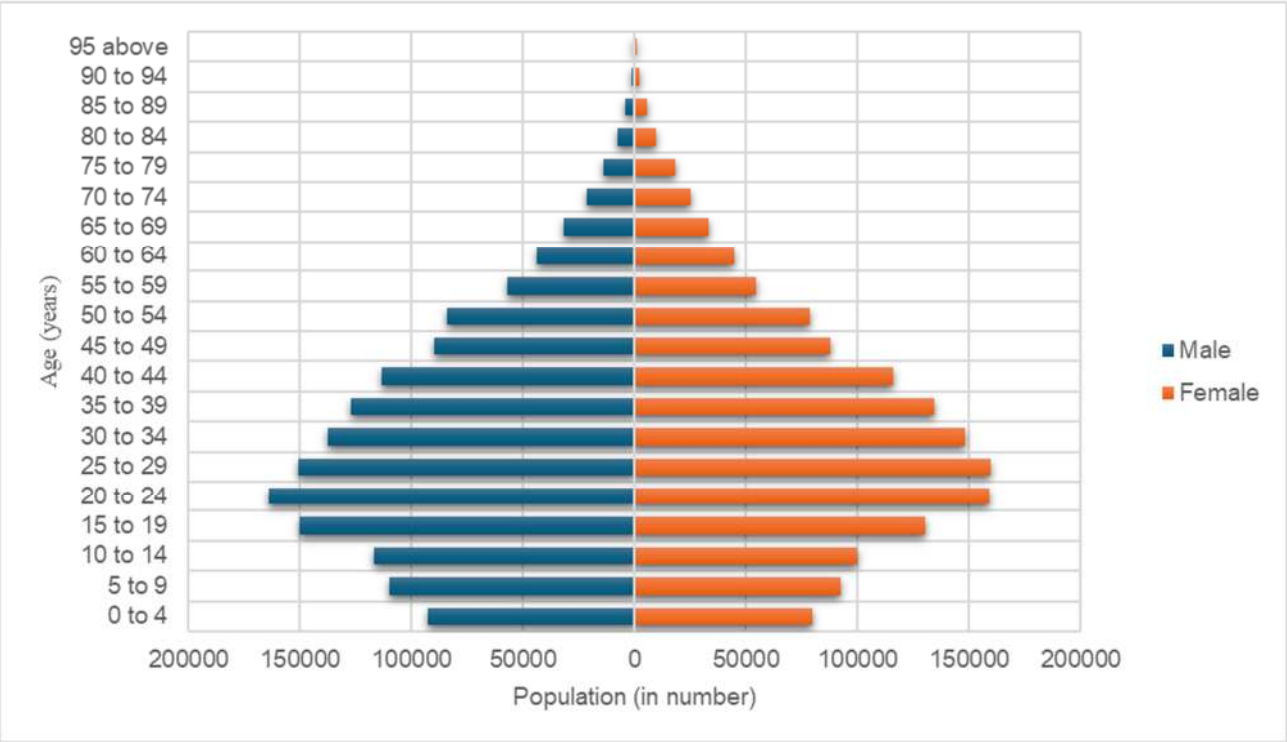
Table 4.4-4: Population and Population Density in Lalitpur District

Lalitpur District									
S.No.	Local Level	Number of wards	Number of Household	Male		Female		Total	Population Density
				No.	%	No.	%		
1	Mahalaxmi Municipality	10	32,106	62,399	11.31	60,717	11.01	123,116	4,644
2	Lalitpur Metropolitan City	29	77,159	146,730	26.60	147,368	26.71	294,098	8,142
3	Godawari Municipality	14	24,045	48,140	8.73	49,493	8.97	97,633	1,016
4	Institutional	-	237	5,692	1.03	2,664	0.48	8,356	-
	Total	**53**	**133,547**	**262,961**	**50.26**	**260,242**	**49.74**	**523,203**	

Source: National Population and Housing Census, 2021
Note: Institutional Households: If individuals reside collectively in an institution such as a prison, orphanage, mental hospital, military or police barracks, children's home, hostel, elderly care home, rehabilitation center, etc., their details must be recorded under institutional Households

iv. Population Distribution by Age Group in Kathmandu Valley

In the Kathmandu Valley, the largest age group is 20-24 years, with 322,799 individuals, followed by the 15-19 age group, with 280,440 individuals. These two groups make up a significant portion of the population, indicating a large young population. The 10-14 and 5-9 age groups also show notable numbers, suggesting a youthful demographic that will contribute to the workforce in the future. The elderly population, particularly those 65 and older, is relatively small, with only about 5.88% of the population in this category.



Source: National Population and Housing Census, 2021

Figure 4.4-2: Population Distribution of Kathmandu Valley by Age Group and Sex

When comparing the districts, Kathmandu has the highest population in the 20-24 and 25-29 age groups, with 226,660 and 215,120 individuals, respectively. Bhaktapur follows a similar trend, with 44,335 individuals in the 25-29 age group and 43,372 individuals in the 20-24 age group, reflecting a youthful population, though smaller in comparison to Kathmandu. Lalitpur also mirrors this pattern, with 52,767 individuals in the 20-24 age group and 50,570 individuals in the 25-29 age group. Overall, all three districts show a concentration of young people in the 20-24 age and 25-29 age group range, highlighting a vibrant potential workforce for the region's future growth. The elderly population is relatively smaller in all three districts, pointing to a predominantly young and economically active population across the Kathmandu Valley. The details of the population distribution by age group has been represented in Table 4.4-5.

Table 4.4-5: Population distribution of Kathmandu Valley by Age Group

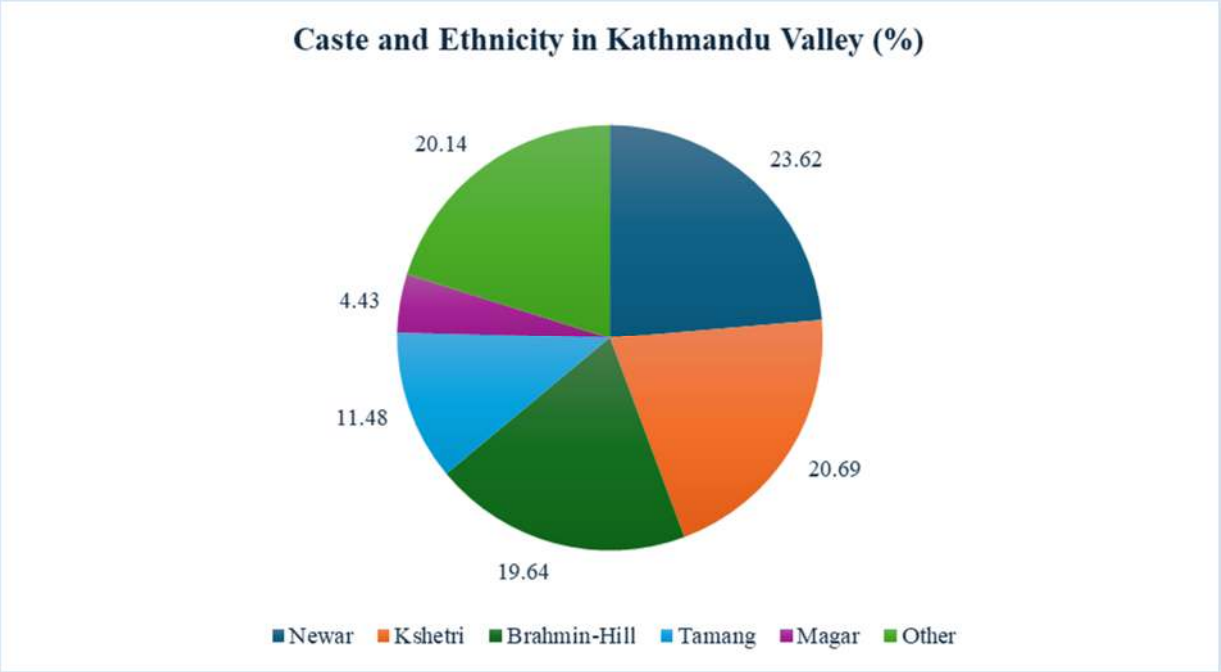
Age Group (years)	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
	Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
0-4	62,088	3.04	53,325	2.61	115,413	15,067	3.49	12,940	2.99	28,007	15,239	2.91	13,161	2.52	28,400	92,394	3.08	79,426	2.65	171,820	5.73
5-9	75,286	3.69	62,826	3.08	138,112	16,527	3.82	13,653	3.16	30,180	18,048	3.45	15,775	3.02	33,823	109,861	3.67	92,254	3.08	202,115	6.74
10-14	80,326	3.93	68,093	3.34	148,419	16,744	3.87	14,378	3.33	31,122	19,864	3.80	17,459	3.34	37,323	116,934	3.90	99,930	3.33	216,864	7.24
15-19	105,984	5.19	91,043	4.46	197,027	19,775	4.58	17,381	4.02	37,156	24,349	4.65	21,908	4.19	46,257	150,108	5.01	130,332	4.35	280,440	9.36
20-24	114,788	5.62	111,872	5.48	226,660	22,091	5.11	21,281	4.92	43,372	26,910	5.14	25,857	4.94	52,767	163,789	5.47	159,010	5.31	322,799	10.77
25-29	104,411	5.11	110,709	5.42	215,120	21,519	4.98	22,816	5.28	44,335	24,658	4.71	25,912	4.95	50,570	150,588	5.02	159,437	5.32	310,025	10.34
30-34	93,815	4.60	102,044	5.00	195,859	20,198	4.67	21,572	4.99	41,770	23,256	4.44	24,681	4.72	47,937	137,269	4.58	148,297	4.95	285,566	9.53
35-39	86,685	4.25	91,053	4.46	177,738	18,825	4.36	19,351	4.48	38,176	21,434	4.10	23,630	4.52	45,064	126,944	4.24	134,034	4.47	260,978	8.71
40-44	76,587	3.75	77,524	3.80	154,111	16,297	3.77	16,921	3.92	33,218	20,647	3.95	21,431	4.10	42,078	113,531	3.79	115,876	3.87	229,407	7.65
45-49	59,999	2.94	58,111	2.85	118,110	13,121	3.04	13,063	3.02	26,184	16,865	3.22	16,706	3.19	33,571	89,985	3.00	87,880	2.93	177,865	5.93
50-54	55,738	2.73	51,703	2.53	107,441	12,262	2.84	11,710	2.71	23,972	16,043	3.07	15,042	2.87	31,085	84,043	2.80	78,455	2.62	162,498	5.42
55-59	37,953	1.86	35,567	1.74	73,520	8,318	1.92	8,176	1.89	16,494	10,926	2.09	10,589	2.02	21,515	57,197	1.91	54,332	1.81	111,529	3.72
60-64	29,096	1.43	29,550	1.45	58,646	6,154	1.42	6,515	1.51	12,669	8,514	1.63	8,879	1.70	17,393	43,764	1.46	44,944	1.50	88,708	2.96
65-69	20,898	1.02	21,822	1.07	42,720	4,495	1.04	4,940	1.14	9,435	6,196	1.18	6,676	1.28	12,872	31,589	1.05	33,438	1.12	65,027	2.17
70-74	14,202	0.70	16,472	0.81	30,674	2,920	0.68	3,634	0.84	6,554	4,360	0.83	5,053	0.97	9,413	21,482	0.72	25,159	0.84	46,641	1.56
75-79	9,132	0.45	11,825	0.58	20,957	2,172	0.50	2,764	0.64	4,936	2,887	0.55	3,708	0.71	6,595	14,191	0.47	18,297	0.61	32,488	1.08
80-84	4,833	0.24	6,445	0.32	11,278	1,084	0.25	1,373	0.32	2,457	1,534	0.29	1,999	0.38	3,533	7,451	0.25	9,817	0.33	17,268	0.58
85-89	2,596	0.13	3,782	0.19	6,378	596	0.14	837	0.19	1,433	821	0.16	1,139	0.22	1,960	4,013	0.13	5,758	0.19	9,771	0.33
90-94	967	0.05	1,457	0.07	2,424	188	0.04	294	0.07	482	286	0.05	411	0.08	697	1,441	0.05	2,162	0.07	3,603	0.12
95+	342	0.02	638	0.03	980	65	0.02	115	0.03	180	124	0.02	226	0.04	350	531	0.02	979	0.03	1,510	0.05
Total	1,035,726		1,005,861		2,041,587	218,418		213,714		432,132	262,961		260,242		523,203	1,517,105	50.62	1,479,817	49.38	2,996,922	100

Source: National Population and Housing Census, 2021

4.4.1.3 Caste and Ethnicity

a. Population distribution by Caste and Ethnicity

As the capital city of Nepal is located within the Kathmandu Valley, the region has experienced major migration from across the country as people search for better opportunities Hence, though Newari community are considered as ethnic group of the valley and their population is also major in the valley, there are more than 131 ethnic and caste groups that reside in different parts of the valley. . Following the Newars, the predominant caste and ethnic populations in the region comprise Chhetris, Hill Brahmins, and Tamangs



Source: National Population and Housing Census, 2021

Figure 4.4-3: Population Distribution of Kathmandu Valley by Caste and Ethnicity

In Kathmandu Valley, the most populous ethnic group is the Newar community, with a total population of 708,015 (23.62%), while the Kewarat community is the least represented, with only 11 individuals. The other in the above chart includes 128 ethnic and caste groups with population less than 2% which combined comprise the total of 20.14% of the total population Among the districts, Kathmandu has the highest population of Brahman-Hill at 448,319 (21.96 %), making it the most dominant group, whereas the Kewarat community is the smallest, with just 11 people. In Bhaktapur, the Newar community is the most prevalent, totaling 153,857 individuals (35.60 %), while the Kewarat group has no recorded population, making it the least represented. Similarly, in Lalitpur, the Newar community remains the largest, with 162,896 people (31.13 %), whereas the Kewarat community is also absent, marking it as the least represented. This comparison highlights the Newar community's strong presence in Bhaktapur and Lalitpur, while Kathmandu has a significant Brahman-Hill population. The Kewarat community remains the least represented across all three districts, showing a stark contrast in demographic distribution. The details of the population distribution by caste and ethnicity has been represented in Table 4.4-6.

Table 4.4-6: Population of Kathmandu Valley by Caste and Ethnicity

S.No.	Caste and Ethnicity	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
1	Kshetri	214,673	10.52	209,499	10.26	424,172	47,711	11.04	47,099	10.90	94,810	50,545	9.66	50,400	9.63	100,945	312,929	10.44	306,998	10.24	619,927	20.69
2	Brahman-Hill	228,600	11.20	219,719	10.76	448,319	37,704	8.73	36,474	8.44	74,178	33,728	6.45	32,431	6.20	66,159	300,032	10.01	288,624	9.63	588,656	19.64
3	Magar	45,542	2.23	47,309	2.32	92,851	6,622	1.53	6,249	1.45	12,871	13,214	2.53	13,925	2.66	27,139	65,378	2.18	67,483	2.25	132,861	4.43
4	Tharu	12,383	0.61	9,400	0.46	21,783	1,638	0.38	1,141	0.26	2,779	4,739	0.91	3,645	0.70	8,384	18,760	0.63	14,186	0.47	32,946	1.10
5	Tamang	120,681	5.91	125,095	6.13	245,776	21,996	5.09	22,801	5.28	44,797	26,224	5.01	27,293	5.22	53,517	168,901	5.64	175,189	5.85	344,090	11.48
6	Newa:(Newar)	192,649	9.44	198,613	9.73	391,262	76,585	17.72	77,272	17.88	153,857	79,913	15.27	82,983	15.86	162,896	349,147	11.65	358,868	11.97	708,015	23.62
7	Bishwokarma	18,111	0.89	15,959	0.78	34,070	2,800	0.65	2,521	0.58	5,321	4,936	0.94	4,532	0.87	9,468	25,847	0.86	23,012	0.77	48,859	1.63
8	Musalman	10,696	0.52	6,111	0.30	16,807	1,032	0.24	521	0.12	1,553	1,694	0.32	896	0.17	2,590	13,422	0.45	7,528	0.25	20,950	0.70
9	Yadav	6,391	0.31	2,972	0.15	9,363	982	0.23	484	0.11	1,466	2,598	0.50	1,515	0.29	4,113	9,971	0.33	4,971	0.17	14,942	0.50
10	Rai	21,899	1.07	25,322	1.24	47,221	3,553	0.82	4,083	0.94	7,636	8,590	1.64	9,938	1.90	18,528	34,042	1.14	39,343	1.31	73,385	2.45
11	Gurung	24,296	1.19	27,597	1.35	51,893	1,034	0.24	1,139	0.26	2,173	2,904	0.56	3,367	0.64	6,271	28,234	0.94	32,103	1.07	60,337	2.01
12	Pariyar	12,206	0.60	11,655	0.57	23,861	1,920	0.44	1,805	0.42	3,725	2,206	0.42	2,203	0.42	4,409	16,332	0.54	15,663	0.52	31,995	1.07
13	Thakuri	11,884	0.58	10,997	0.54	22,881	1,332	0.31	1,085	0.25	2,417	2,449	0.47	2,359	0.45	4,808	15,665	0.52	14,441	0.48	30,106	1.00
14	Yakthung/Limbu	6,559	0.32	7,038	0.34	13,597	1,019	0.24	1,113	0.26	2,132	3,184	0.61	3,622	0.69	6,806	10,762	0.36	11,773	0.39	22,535	0.75
15	Mijar	5,857	0.29	5,605	0.27	11,462	1,227	0.28	1,224	0.28	2,451	2,070	0.40	2,183	0.42	4,253	9,154	0.31	9,012	0.30	18,166	0.61
16	Teli	3,134	0.15	1,793	0.09	4,927	447	0.10	254	0.06	701	1,532	0.29	969	0.19	2,501	5,113	0.17	3,016	0.10	8,129	0.27
17	Chamar/Harijan/Ram	571	0.03	330	0.02	901	43	0.01	17	0.004	60	140	0.03	65	0.01	205	754	0.03	412	0.01	1,166	0.04
18	Koiri/Kushwaha	1,592	0.08	758	0.04	2,350	217	0.05	135	0.03	352	581	0.11	336	0.06	917	2,390	0.08	1,229	0.04	3,619	0.12
19	Musahar	175	0.01	139	0.01	314	41	0.01	16	0.004	57	40	0.01	55	0.01	95	256	0.01	210	0.01	466	0.02
20	Kurmi	641	0.03	330	0.02	971	89	0.02	34	0.01	123	198	0.04	132	0.03	330	928	0.03	496	0.02	1,424	0.05
21	Sanyasi/Dasnami	5,627	0.28	5,469	0.27	11,096	1,772	0.41	1,766	0.41	3,538	940	0.18	882	0.17	1,822	8,339	0.28	8,117	0.27	16,456	0.55
22	Dhanuk	928	0.05	482	0.02	1,410	124	0.03	66	0.02	190	320	0.06	184	0.04	504	1,372	0.05	732	0.02	2,104	0.07
23	Dusadh/Pasawan/Pasi	382	0.02	254	0.01	636	63	0.01	27	0.01	90	64	0.01	30	0.01	94	509	0.02	311	0.01	820	0.03
24	Mallaha	324	0.02	166	0.01	490	35	0.01	17	0.004	52	53	0.01	17	0.00	70	412	0.01	200	0.01	612	0.02
25	Kewat	233	0.01	157	0.01	390	72	0.02	45	0.01	117	65	0.01	44	0.01	109	370	0.01	246	0.01	616	0.02
26	Kathabaniyan	351	0.02	265	0.01	616	63	0.01	41	0.01	104	120	0.02	80	0.02	200	534	0.02	386	0.01	920	0.03
27	Brahman-Tarai	5,950	0.29	4,515	0.22	10,465	1,155	0.27	915	0.21	2,070	2,160	0.41	1,797	0.34	3,957	9,265	0.31	7,227	0.24	16,492	0.55
28	Kalwar	2,399	0.12	1,699	0.08	4,098	194	0.04	144	0.03	338	884	0.17	609	0.12	1,493	3,477	0.12	2,452	0.08	5,929	0.20
29	Kanu	646	0.03	397	0.02	1,043	70	0.02	38	0.01	108	165	0.03	96	0.02	261	881	0.03	531	0.02	1,412	0.05
30	Kumal	993	0.05	908	0.04	1,901	104	0.02	78	0.02	182	238	0.05	199	0.04	437	1,335	0.04	1,185	0.04	2,520	0.08
31	Gharti/Bhujel	2,530	0.12	2,460	0.12	4,990	865	0.20	811	0.19	1,676	674	0.13	660	0.13	1,334	4,069	0.14	3,931	0.13	8,000	0.27
32	Hajam/Thakur	2,127	0.10	1,351	0.07	3,478	474	0.11	272	0.06	746	522	0.10	355	0.07	877	3,123	0.10	1,978	0.07	5,101	0.17
33	Rajbansi	566	0.03	474	0.02	1,040	85	0.02	57	0.01	142	208	0.04	173	0.03	381	859	0.03	704	0.02	1,563	0.05
34	Sherpa	15,478	0.76	16,219	0.79	31,697	294	0.07	381	0.09	675	527	0.10	637	0.12	1,164	16,299	0.54	17,237	0.58	33,536	1.12
35	Dhobi	348	0.02	209	0.01	557	39	0.01	15	0.003	54	54	0.01	19	0.00	73	441	0.01	243	0.01	684	0.02
36	Tatma/Tatwa	352	0.02	201	0.01	553	42	0.01	12	0.003	54	67	0.01	44	0.01	111	461	0.02	257	0.01	718	0.02
37	Lohar	564	0.03	377	0.02	941	100	0.02	61	0.01	161	272	0.05	190	0.04	462	936	0.03	628	0.02	1,564	0.05
38	Khatwe	159	0.01	119	0.01	278	42	0.01	27	0.01	69	40	0.01	16	0.00	56	241	0.01	162	0.01	403	0.01

S.No.	Caste and Ethnicity	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
39	Sundi	1,066	0.05	732	0.04	1,798	249	0.06	184	0.04	433	533	0.10	407	0.08	940	1,848	0.06	1,323	0.04	3,171	0.11
40	Danuwar	798	0.04	715	0.04	1,513	158	0.04	135	0.03	293	791	0.15	725	0.14	1,516	1,747	0.06	1,575	0.05	3,322	0.11
41	Haluwai	403	0.02	283	0.01	686	87	0.02	79	0.02	166	104	0.02	98	0.02	202	594	0.02	460	0.02	1,054	0.04
42	Majhi	2,633	0.13	2,696	0.13	5,329	525	0.12	479	0.11	1,004	830	0.16	815	0.16	1,645	3,988	0.13	3,990	0.13	7,978	0.27
43	Baraee	317	0.02	238	0.01	555	36	0.01	30	0.01	66	94	0.02	68	0.01	162	447	0.01	336	0.01	783	0.03
44	Bin	118	0.01	77	0.00	195	25	0.01	7	0.002	32	21	0.00	4	0.00	25	164	0.01	88	0.00	252	0.01
45	Nuniya	198	0.01	104	0.01	302	21	0.005	12	0.003	33	27	0.01	21	0.00	48	246	0.01	137	0.00	383	0.01
46	Chepang/Praja	546	0.03	507	0.02	1,053	46	0.01	57	0.01	103	109	0.02	104	0.02	213	701	0.02	668	0.02	1,369	0.05
47	Sonar	1,612	0.08	1,368	0.07	2,980	100	0.02	78	0.02	178	284	0.05	226	0.04	510	1,996	0.07	1,672	0.06	3,668	0.12
48	Kumhar	232	0.01	121	0.01	353	44	0.01	31	0.01	75	88	0.02	44	0.01	132	364	0.01	196	0.01	560	0.02
49	Sunuwar	4,188	0.21	4,346	0.21	8,534	584	0.14	556	0.13	1,140	1,218	0.23	1,238	0.24	2,456	5,990	0.20	6,140	0.20	12,130	0.40
50	Bantar/Sardar	111	0.01	80	0.00	191	32	0.01	17	0.004	49	50	0.01	24	0.00	74	193	0.01	121	0.00	314	0.01
51	Kahar	113	0.01	82	0.00	195	5	0.001	5	0.001	10	22	0.00	23	0.00	45	140	0.00	110	0.00	250	0.01
52	Santhal	99	0.00	102	0.00	201	17	0.004	10	0.002	27	29	0.01	34	0.01	63	145	0.00	146	0.00	291	0.01
53	Marwadi	4,182	0.20	3,693	0.18	7,875	33	0.01	31	0.01	64	540	0.10	494	0.09	1,034	4,755	0.16	4,218	0.14	8,973	0.30
54	Kayastha	825	0.04	746	0.04	1,571	148	0.03	126	0.03	274	493	0.09	426	0.08	919	1,466	0.05	1,298	0.04	2,764	0.09
55	Rajput	652	0.03	478	0.02	1,130	107	0.02	63	0.01	170	243	0.05	162	0.03	405	1,002	0.03	703	0.02	1,705	0.06
56	Badi	89	0.00	97	0.00	186	-	0.000	-	0.00	-	9	0.00	7	0.00	16	98	0.00	104	0.00	202	0.01
57	Oraon/Kudukh	96	0.00	70	0.00	166	-	0.00	-	0.00	-	28	0.01	24	0.00	52	124	0.00	94	0.00	218	0.01
58	Gangai	43	0.00	43	0.00	86	8	0.002	3	0.001	11	-	-	-	-	-	51	0.00	46	0.00	97	0.00
59	Lodh	28	0.00	23	0.00	51	-	0.00	-	0.00	-	-	-	-	-	-	28	0.00	23	0.00	51	0.00
60	Badhaee/Badhee	380	0.02	232	0.01	612	39	0.01	39	0.01	78	39	0.01	23	0.00	62	458	0.02	294	0.01	752	0.03
61	Thami	689	0.03	700	0.03	1,389	231	0.05	214	0.05	445	253	0.05	218	0.04	471	1,173	0.04	1,132	0.04	2,305	0.08
62	Kulung	485	0.02	465	0.02	950	14	0.003	11	0.003	25	47	0.01	48	0.01	95	546	0.02	524	0.02	1,070	0.04
63	Bangali	318	0.02	182	0.01	500	14	0.003	8	0.002	22	46	0.01	28	0.01	74	378	0.01	218	0.01	596	0.02
64	Gaderi/Bhediyar	70	0.00	48	0.00	118	21	0.005	8	0.002	29	16	0.00	7	0.00	23	107	0.00	63	0.00	170	0.01
65	Dhimal	282	0.01	316	0.02	598	41	0.01	42	0.01	83	37	0.01	37	0.01	74	360	0.01	395	0.01	755	0.03
66	Yakkha	167	0.01	200	0.01	367	13	0.003	16	0.004	29	113	0.02	108	0.02	221	293	0.01	324	0.01	617	0.02
67	Ghale	1,981	0.10	2,282	0.11	4,263	66	0.02	70	0.02	136	187	0.04	211	0.04	398	2,234	0.07	2,563	0.09	4,797	0.16
68	Tajpuriya	126	0.01	106	0.01	232	8	0.002	7	0.002	15	21	0.00	18	0.00	39	155	0.01	131	0.00	286	0.01
69	Khawas	154	0.01	172	0.01	326	20	0.005	22	0.01	42	36	0.01	51	0.01	87	210	0.01	245	0.01	455	0.02
70	Darai	143	0.01	157	0.01	300	7	0.002	5	0.001	12	33	0.01	32	0.01	65	183	0.01	194	0.01	377	0.01
71	Mali	70	0.00	49	0.00	119	11	0.003	4	0.001	15	24	0.00	32	0.01	56	105	0.00	85	0.00	190	0.01
72	Dhunia	43	0.00	34	0.00	77	-	0.000	-	0.00	-	-	-	-	-	-	43	0.00	34	0.00	77	0.00
73	Pahari	270	0.01	287	0.01	557	128	0.03	116	0.03	244	2,120	0.41	2,015	0.39	4,135	2,518	0.08	2,418	0.08	4,936	0.16
74	Rajdhob	74	0.00	55	0.00	129	17	0.004	9	0.002	26	56	0.01	49	0.01	105	147	0.00	113	0.00	260	0.01
75	Bhote	1,255	0.06	1,079	0.05	2,334	24	0.01	28	0.01	52	32	0.01	37	0.01	69	1,311	0.04	1,144	0.04	2,455	0.08
76	Dom	49	0.00	49	0.00	98	-	0.00	-	0.00	-	-	-	-	-	-	49	0.00	49	0.00	98	0.00
77	Thakali	1,275	0.06	1,394	0.07	2,669	4	0.001	10	0.002	14	169	0.03	202	0.04	371	1,448	0.05	1,606	0.05	3,054	0.10
78	Kori	72	0.00	52	0.00	124	17	0.004	11	0.003	28	7	0.00	8	0.00	15	96	0.00	71	0.00	167	0.01

S.No.	Caste and Ethnicity	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
79	Chhantyal/Chhantel	591	0.03	653	0.03	1,244	-	0.00	-	0.00	-	22	0.00	27	0.01	49	613	0.02	680	0.02	1,293	0.04
80	Hyolmo/Yholmopa	1,572	0.08	1,689	0.08	3,261	36	0.01	29	0.01	65	15	0.00	10	0.00	25	1,623	0.05	1,728	0.06	3,351	0.11
81	Bote	154	0.01	154	0.01	308	4	0.001	9	0.002	13	9	0.00	4	0.00	13	167	0.01	167	0.01	334	0.01
82	Rajbhar	26	0.00	28	0.00	54	-	0.00	-	0.00	-	6	0.00	6	0.00	12	32	0.00	34	0.00	66	0.00
83	Baram/Baramu	255	0.01	228	0.01	483	-	0.00	-	0.00	-	8	0.00	7	0.00	15	263	0.01	235	0.01	498	0.02
84	Punjabi/Sikh	181	0.01	145	0.01	326	-	0.00	-	0.00	-	24	0.00	21	0.00	45	205	0.01	166	0.01	371	0.01
85	Nachhiring	107	0.01	116	0.01	223	-	0.00	-	0.00	-	14	0.00	17	0.00	31	121	0.00	133	0.00	254	0.01
86	Yamphu	57	0.00	42	0.00	99	-	0.00	-	0.00	-	20	0.00	20	0.00	40	77	0.00	62	0.00	139	0.00
87	Gaine	145	0.01	164	0.01	309	18	0.004	14	0.003	32	8	0.00	5	0.00	13	171	0.01	183	0.01	354	0.01
88	Chamling	402	0.02	425	0.02	827	60	0.01	72	0.02	132	121	0.02	138	0.03	259	583	0.02	635	0.02	1,218	0.04
89	Aathpahariya	24	0.00	24	0.00	48	-	0.00	-	0.00	-	10	0.00	17	0.00	27	34	0.00	41	0.00	75	0.00
90	Jirel	371	0.02	358	0.02	729	46	0.01	44	0.01	90	75	0.01	87	0.02	162	492	0.02	489	0.02	981	0.03
91	Dura	171	0.01	212	0.01	383	-	0.00	-	0.00	-	29	0.01	45	0.01	74	200	0.01	257	0.01	457	0.02
92	Sarbaria	14	0.00	15	0.00	29	-	0.00	-	0.00	-	-	-	-	-	-	14	0.00	15	0.00	29	0.00
93	Meche	19	0.00	10	0.00	29	-	0.00	-	0.00	-	6	0.00	5	0.00	11	25	0.00	15	0.00	40	0.00
94	Bantawa	171	0.01	252	0.01	423	15	0.003	24	0.01	39	84	0.02	83	0.02	167	270	0.01	359	0.01	629	0.02
95	Raji	10	0.00	6	0.00	16	-	0.00	-	0.00	-	-	-	-	-	-	10	0.00	6	0.00	16	0.00
96	Dolpo	246	0.01	201	0.01	447	-	0.00	-	0.00	-	-	-	-	-	-	246	0.01	201	0.01	447	0.01
97	Byasi/Sauka	171	0.01	124	0.01	295	-	0.00	-	0.00	-	12	0.00	9	0.00	21	183	0.01	133	0.00	316	0.01
98	Amat	139	0.01	75	0.00	214	15	0.003	6	0.001	21	34	0.01	17	0.00	51	188	0.01	98	0.00	286	0.01
99	Thulung	159	0.01	184	0.01	343	19	0.004	15	0.003	34	26	0.00	37	0.01	63	204	0.01	236	0.01	440	0.01
100	Lepcha	52	0.00	72	0.00	124	-	0.00	-	0.00	-	41	0.01	38	0.01	79	93	0.00	110	0.00	203	0.01
101	Pattharkatta/Kushwadiya	28	0.00	14	0.00	42	-	0.00	-	0.00	-	-	-	-	-	-	28	0.00	14	0.00	42	0.00
102	Mewahang	48	0.00	52	0.00	100	-	0.00	-	0.00	-	5	0.00	8	0.00	13	53	0.00	60	0.00	113	0.00
103	Bahing	121	0.01	148	0.01	269	48	0.01	41	0.01	89	36	0.01	38	0.01	74	205	0.01	227	0.01	432	0.01
104	Hayu	47	0.00	45	0.00	92	10	0.002	13	0.003	23	21	0.00	23	0.00	44	78	0.00	81	0.00	159	0.01
105	Lhopa	25	0.00	26	0.00	51	-	0.00	-	0.00	-	-	-	-	-	-	25	0.00	26	0.00	51	0.00
106	Munda	13	0.00	8	0.00	21	-	0.00	-	0.00	-	-	-	-	-	-	13	0.00	8	0.00	21	0.00
107	Dev	231	0.01	189	0.01	420	8	0.002	7	0.002	15	61	0.01	50	0.01	111	300	0.01	246	0.01	546	0.02
108	Dhandi	17	0.00	15	0.00	32	-	0.00	-	0.00	-	-	-	-	-	-	17	0.00	15	0.00	32	0.00
109	Kamar	37	0.00	23	0.00	60	6	0.001	6	0.001	12	-	-	-	-	-	43	0.00	29	0.00	72	0.00
110	Kisan	19	0.00	12	0.00	31	-	0.00	-	0.00	-	-	-	-	-	-	19	0.00	12	0.00	31	0.00
111	Sampang	59	0.00	75	0.00	134	-	0.00	-	0.00	-	26	0.00	36	0.01	62	85	0.00	111	0.00	196	0.01
112	Koche	11	0.00	13	0.00	24	-	0.00	-	0.00	-	-	-	-	-	-	11	0.00	13	0.00	24	0.00
113	Lhomi	74	0.00	87	0.00	161	-	0.00	-	0.00	-	14	0.00	8	0.00	22	88	0.00	95	0.00	183	0.01
114	Khaling	188	0.01	202	0.01	390	10	0.002	11	0.003	21	45	0.01	47	0.01	92	243	0.01	260	0.01	503	0.02
115	Topkegola	7	0.00	8	0.00	15	-	0.00	-	0.00	-	-	-	-	-	-	7	0.00	8	0.00	15	0.00
116	Chidimar	13	0.00	7	0.00	20	-	0.00	-	0.00	-	-	-	-	-	-	13	0.00	7	0.00	20	0.00
117	Walung	87	0.00	98	0.00	185	-	0.00	-	0.00	-	-	-	-	-	-	87	0.00	98	0.00	185	0.01
118	Loharung	29	0.00	30	0.00	59	-	0.00	-	0.00	-	-	-	-	-	-	29	0.00	30	0.00	59	0.00

S.No.	Caste and Ethnicity	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
119	Kalar	45	0.00	26	0.00	71	-	0.00	-	0.00	-	13	0.00	9	0.00	22	58	0.00	35	0.00	93	0.00
120	Kusunda	25	0.00	22	0.00	47	4	0.001	6	0.001	10	-	-	-	-	-	29	0.00	28	0.00	57	0.00
121	Ranatharu	158	0.01	106	0.01	264	-	0.00	-	0.00	-	9	0.00	3	0.00	12	167	0.01	109	0.00	276	0.01
122	Bhumihar	298	0.01	212	0.01	510	64	0.01	42	0.01	106	105	0.02	69	0.01	174	467	0.02	323	0.01	790	0.03
123	Chumba/Nubri	147	0.01	120	0.01	267	-	0.00	-	0.00	-	-	-	-	-	-	147	0.00	120	0.00	267	0.01
124	Mugal/Mugum	113	0.01	169	0.01	282	-	0.00	-	0.00	-	-	-	-	-	-	113	0.00	169	0.01	282	0.01
125	Pun	28	0.00	31	0.00	59	-	0.00	-	0.00	-	-	-	-	-	-	28	0.00	31	0.00	59	0.00
126	Rauniyar	634	0.03	501	0.02	1,135	20	0.005	15	0.003	35	91	0.02	72	0.01	163	745	0.02	588	0.02	1,333	0.04
127	Baniyan	699	0.03	474	0.02	1,173	40	0.01	23	0.01	63	161	0.03	122	0.02	283	900	0.03	619	0.02	1,519	0.05
128	Karmarong	138	0.01	49	0.00	187	-	0.00	-	0.00	-	-	-	-	-	-	138	0.00	49	0.00	187	0.01
129	Chai/Khulaut	7	0.00	3	0.00	10	-	0.00	-	0.00	-	-	-	-	-	-	7	0.00	3	0.00	10	0.00
130	Kewarat	6	0.00	5	0.00	11	-	0.00	-	0.00	-	-	-	-	-	-	6	0.00	5	0.00	11	0.00
131	Others	35	0.00	29	0.00	64	83	0.02	58	0.01	141	290	0.06	190	0.04	480	408	0.01	277	0.01	685	0.02
132	Foreigner	21,617	1.06	10,631	0.52	32,248	1,402	0.32	501	0.12	1,903	3,827	0.73	1,977	0.38	5,804	26,846	0.90	13,109	0.44	39,955	1.33
133	Notstated	936	0.05	831	0.04	1,767	25	0.01	15	0.003	40	86	0.02	48	0.01	134	1,047	0.03	894	0.03	1,941	0.06
Total		**1,035,726**		**1,005,861**		**2,041,587**	**218,418**		**213,714**		**432,132**	**262,961**	**50.26**	**260,242**	**49.74**	**523,203**	**1,517,105**	**50.62**	**1,479,817**	**49.38**	**2,996,922**	**100**

Source: National Population and Housing Census, 2021; Retrieved on 3/6/2025; https://censusnepal.cbs.gov.np/results/downloads/caste-ethnicity?type=data

4.4.2 Economic Activities

Out of the total population of Kathmandu Valley (2,996,922 individuals), the population of individuals involved in economic activity is only 1,418,116 individuals which is 47.32 % out of the total population. Out of which male population is 822,026 which is 57.97 % out of the total male population in Kathmandu Valley. Similarly, the female population involved in economic activity is 596,090 which is 42.03 % out of the total female population in Kathmandu Valley.

Under various economic activities that the Kathmandu Valley population are involved, the highest number of individuals are involved in the "Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles" sector, with a total of 304,565 individuals (21.48%), while the least employment is in the "Industry Not Stated" category, with only 602 individuals (0.04%). In Kathmandu district, the largest number of individuals involved in "Wholesale and Retail Trade," employing 205,713 individuals (11.49% male and 10.50% female), whereas "Industry Not Stated" has the lowest employment, with only 184 workers (0.01%). In Bhaktapur, the “Agriculture, Forestry and Fishing " sector dominates with 47,278 individuals (9.05% male and 12.07% female), while "Industry Not Stated" is the least represented, with just 162 workers (0.03%). Similarly, in Lalitpur, the "Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles " sector has the highest number of individuals of 56,578 (11.67% male and 10.20% female), whereas "Industry Not Stated" remains the lowest, with 256 workers (0.06% male and 0.04% female). There is a dominance of trade-related employment across all three districts, while the least recorded employment category remains consistent across Kathmandu Valley. The details of the Economic activities are presented in Table 4.4-7.

Table 4.4-7: Economic Activity and Population Involvement in the Kathmandu Valley

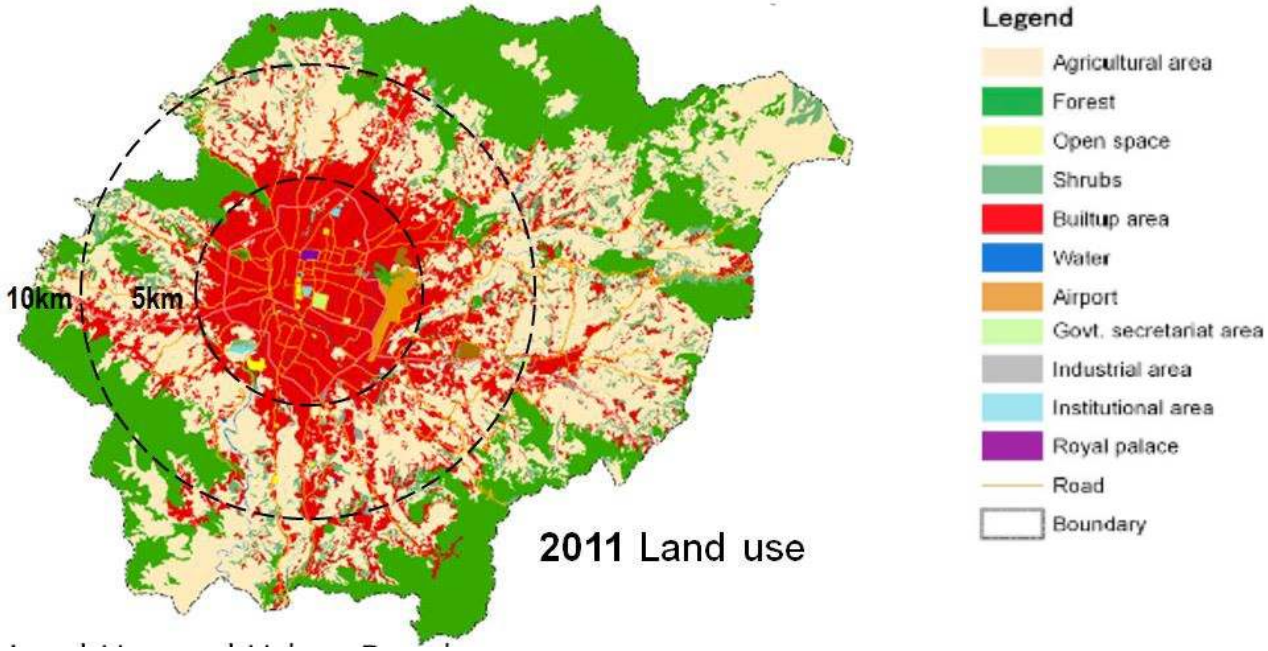
S. No.	Industry	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No	%
1	Agriculture, forestry and fishing	43,673	4.67	51,295	5.48	94,968	20,257	9.05	27,021	12.07	47,278	16,328	6.31	19,961	7.72	36,289	80,258	5.66	98,277	6.93	178,535	12.59
2	Mining and quarrying	2,782	0.30	994	0.11	3,776	371	0.17	149	0.07	520	632	0.24	260	0.10	892	3,785	0.27	1,403	0.10	5,188	0.37
3	Manufacturing	39,157	4.19	21,971	2.35	61,128	14,224	6.35	10,213	4.56	24,437	14,222	5.50	9,032	3.49	23,254	67,603	4.77	41,216	2.91	108,819	7.67
4	Electricity, gas, steam and air conditioning supply	6,049	0.65	1,205	0.13	7,254	1,001	0.45	253	0.11	1,254	1,264	0.49	352	0.14	1,616	8,314	0.59	1,810	0.13	10,124	0.71
5	Water supply; sewerage, waste mgmt. and remediation activities	3,914	0.42	1,293	0.14	5,207	785	0.35	287	0.13	1,072	1,151	0.44	440	0.17	1,591	5,850	0.41	2,020	0.14	7,870	0.55
6	Construction	54,049	5.78	35,020	3.74	89,069	15,184	6.78	7,379	3.30	22,563	17,295	6.69	9,599	3.71	26,894	86,528	6.10	51,998	3.67	138,526	9.77
7	Wholesale and retail trade; repair of motor vehicles and motorcycles	107,466	11.49	98,247	10.50	205,713	22,135	9.88	20,139	8.99	42,274	30,186	11.67	26,392	10.20	56,578	159,787	11.27	144,778	10.21	304,565	21.48
8	Transportation and storage	36,017	3.85	2,309	0.25	38,326	8,267	3.69	552	0.25	8,819	9,570	3.70	833	0.32	10,403	53,854	3.80	3,694	0.26	57,548	4.06
9	Accommodation and food services activities	31,712	3.39	18,383	1.97	50,095	4,657	2.08	3,018	1.35	7,675	6,141	2.37	3,920	1.52	10,061	42,510	3.00	25,321	1.79	67,831	4.78
10	Information and communication	12,490	1.34	4,262	0.46	16,752	2,785	1.24	937	0.42	3,722	4,277	1.65	1,619	0.63	5,896	19,552	1.38	6,818	0.48	26,370	1.86
11	Financial and insurance activities	20,640	2.21	19,430	2.08	40,070	4,540	2.03	4,885	2.18	9,425	5,748	2.22	5,417	2.09	11,165	30,928	2.18	29,732	2.10	60,660	4.28
12	Real estate business activities	6,532	0.70	761	0.08	7,293	1,698	0.76	182	0.08	1,880	1,810	0.70	219	0.08	2,029	10,040	0.71	1,162	0.08	11,202	0.79
13	Professional, scientific and technical activities	17,015	1.82	6,436	0.69	23,451	2,915	1.30	965	0.43	3,880	3,673	1.42	1,444	0.56	5,117	23,603	1.66	8,845	0.62	32,448	2.29
14	Administrative and support service activities	16,855	1.80	7,895	0.84	24,750	1,511	0.67	590	0.26	2,101	2,688	1.04	1,247	0.48	3,935	21,054	1.48	9,732	0.69	30,786	2.17
15	Public administration and defense	30,512	3.26	6,112	0.65	36,624	9,531	4.26	2,084	0.93	11,615	7,286	2.82	2,020	0.78	9,306	47,329	3.34	10,216	0.72	57,545	4.06
16	Education	19,972	2.13	24,054	2.57	44,026	5,644	2.52	7,019	3.13	12,663	6,622	2.56	8,251	3.19	14,873	32,238	2.27	39,324	2.77	71,562	5.05
17	Human health and social work activities	13,645	1.46	17,065	1.82	30,710	2,816	1.26	4,487	2.00	7,303	4,129	1.60	5,752	2.22	9,881	20,590	1.45	27,304	1.93	47,894	3.38
18	Arts, entertainment and recreation	13,212	1.41	5,488	0.59	18,700	2,181	0.97	882	0.39	3,063	6,272	2.42	2,141	0.83	8,413	21,665	1.53	8,511	0.60	30,176	2.13
19	Other service activities	64,126	6.85	52,891	5.65	117,017	4,264	1.90	6,344	2.83	10,608	5,922	2.29	8,848	3.42	14,770	74,312	5.24	68,083	4.80	142,395	10.04
20	Activities of households as employers	6,402	0.68	9,516	1.02	15,918	352	0.16	813	0.36	1,165	1,099	0.42	2,549	0.99	3,648	7,853	0.55	12,878	0.91	20,731	1.46
21	Activities of extra-territorial organizations and bodies	2,748	0.29	1,728	0.18	4,476	288	0.13	176	0.08	464	967	0.37	832	0.32	1,799	4,003	0.28	2,736	0.19	6,739	0.48
22	Industry not stated	110	0.01	74	0.01	184	103	0.05	59	0.03	162	157	0.06	99	0.04	256	370	0.03	232	0.02	602	0.04
	Total	549,078		386,429		935,507	125,509		98,434		223,943	147,439		111,227		258,666	822,026	57.97	596,090	42.03	1,418,116	100

Source: National Population and Housing Census, 2021

4.4.3 Land use

4.4.3.1 Land Use in 2011

The map below shows the land use pattern in the Kathmandu Valley for 2011. It is evident from the map that land use in the Kathmandu Valley is predominantly urbanized within approximately a 5-kilometer radius from the central city of Kathmandu. In the belt spanning 5 to 10 kilometers from the city center, urban areas extend outward from the central core, primarily along major roads. However, a significant portion of the land in this zone remains designated for agricultural and open space purposes. Beyond roughly 10 kilometers from the city center, the landscape is characterized by mountains and hills, resulting in a substantial portion of the land being covered by forests.



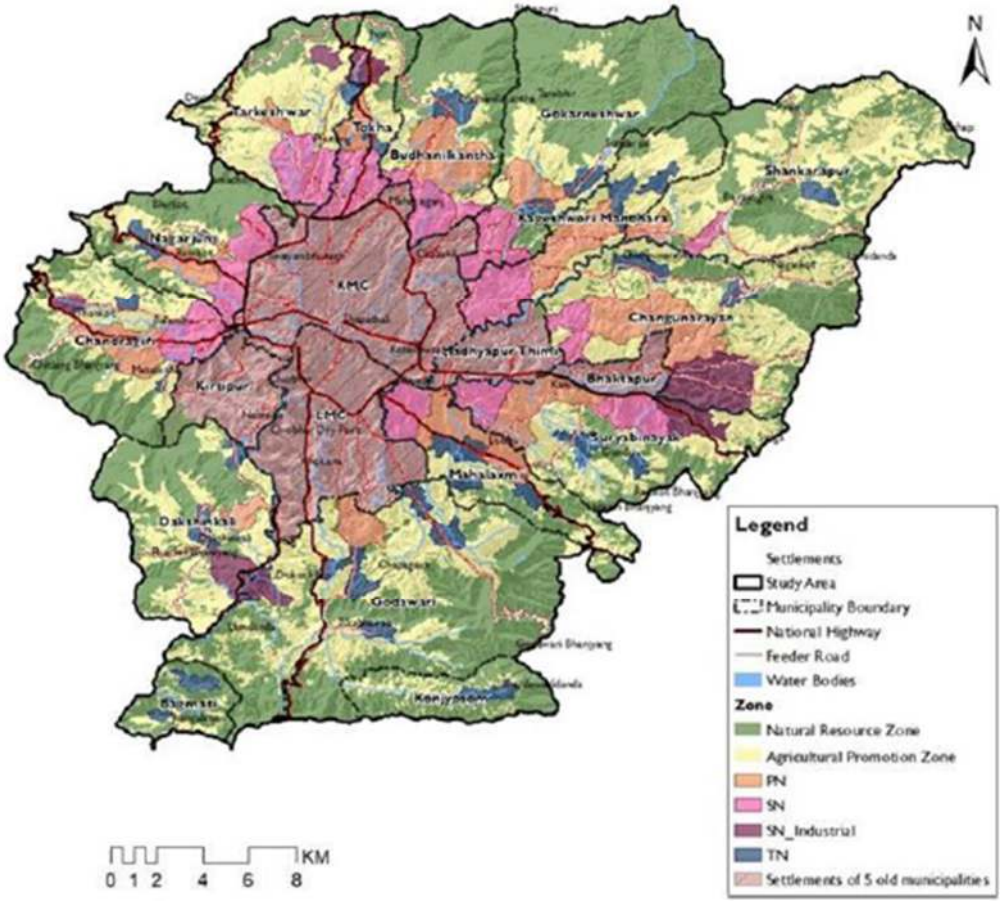
Source: JICA Study Team 2012(2011)

Figure 4.4-4: Land Use in the Kathmandu Valley (2011)

4.4.3.2 Land Use Plan

KVDA MP proposes a land use plan based on the concept of nodal development. Six types of nodes are set up throughout the Kathmandu Valley as follows:

- Primary Node (PN): high density, central business district in each Municipality
- Secondary Node (SN): middle density, existing built-up area
- Industrial Node (SN_IND): located at four corners of the valley near the highways
- Tertiary Node (TN): low density, service providing zone around scattered residential
- Nature promotion zone (N): exclusively includes forest, wet land and water bodies
- Agricultural promotion zone (A): all other available land outside of nodes



Source: KVDA MP

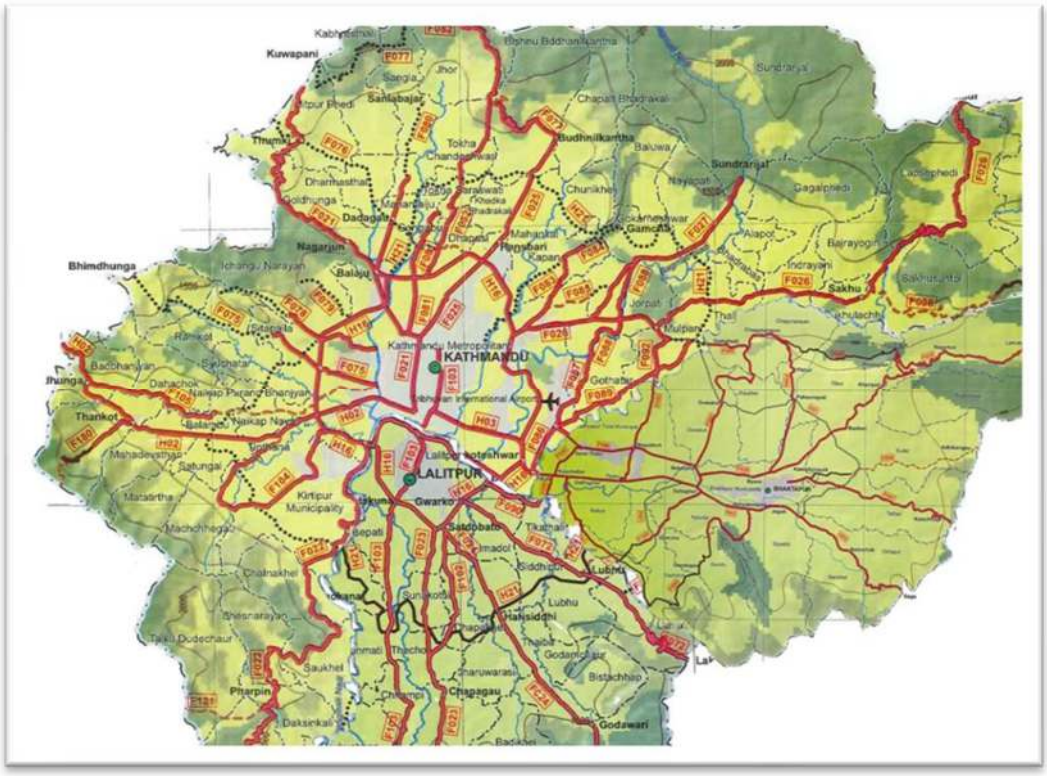
Figure 4.4-5: Proposed Nodes in Municipalities (KVDA MP)

KVDA MP states that the proposed land use plan will be able to fully accommodate the future population increase projected in their master plan.

4.4.4 Transportation Infrastructure and Traffic-related Incidences

4.4.4.1 Road Network

The figure shows the main road network in the Kathmandu Valley. Nepal's roads are divided into the Strategic Road Network (SRN) managed by the Department of Roads (DOR) and the Local Road Network (LRN). The Kathmandu Valley features a radial skeletal axis formed by the east-west axes—the Tribhuvan Highway and the Arniko Highway—along with the north-south axis comprising Rajinpat Road and Pulkaul Road.

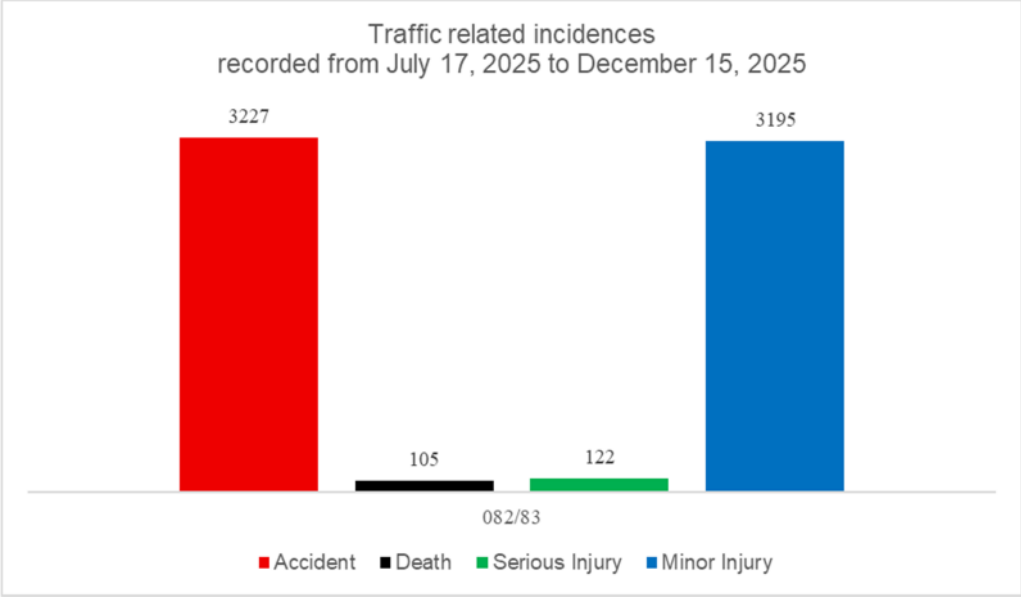


Source: SSRN, DOR

Figure 4.4-6: Major Road Network in the Kathmandu Valley

4.4.4.2 Traffic related accidents

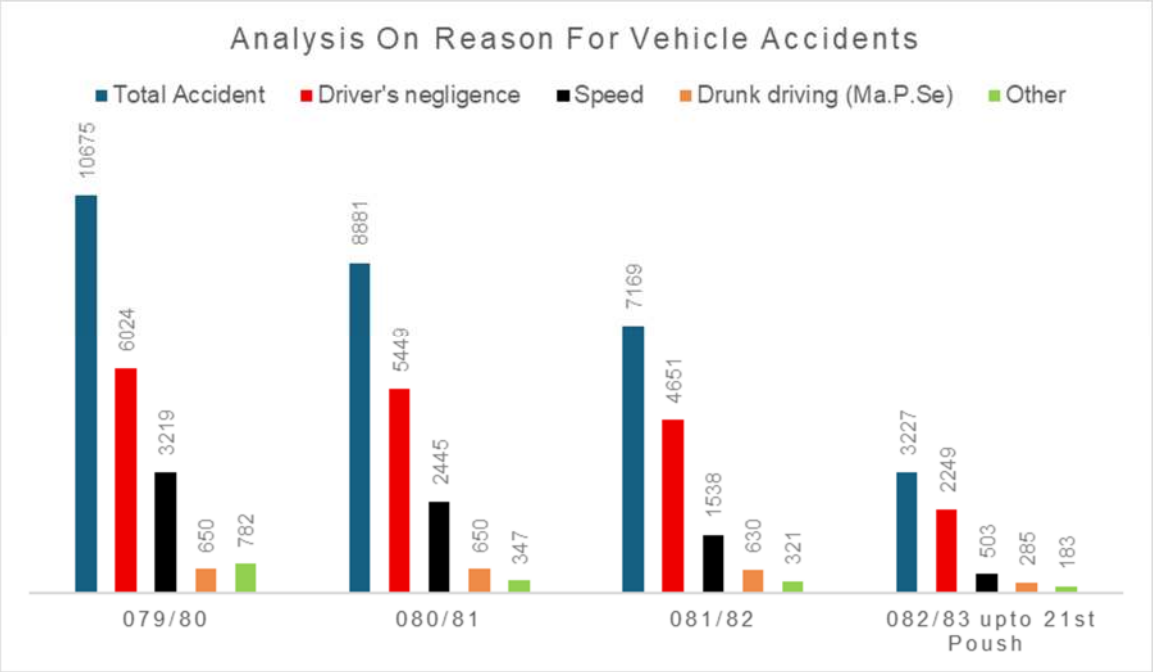
As of the current fiscal year 2082/83 data recorded by Kathmandu Valley Traffic Police Office, the number of accident and minor injuries incurred have exceeded 3000. The data is represented in the following diagram.



Source: Kathmandu Valley Traffic Police Office, Ramshahpath,2026

Figure 4.4-7: Traffic Accidental Incidents in Kathmandu Valley

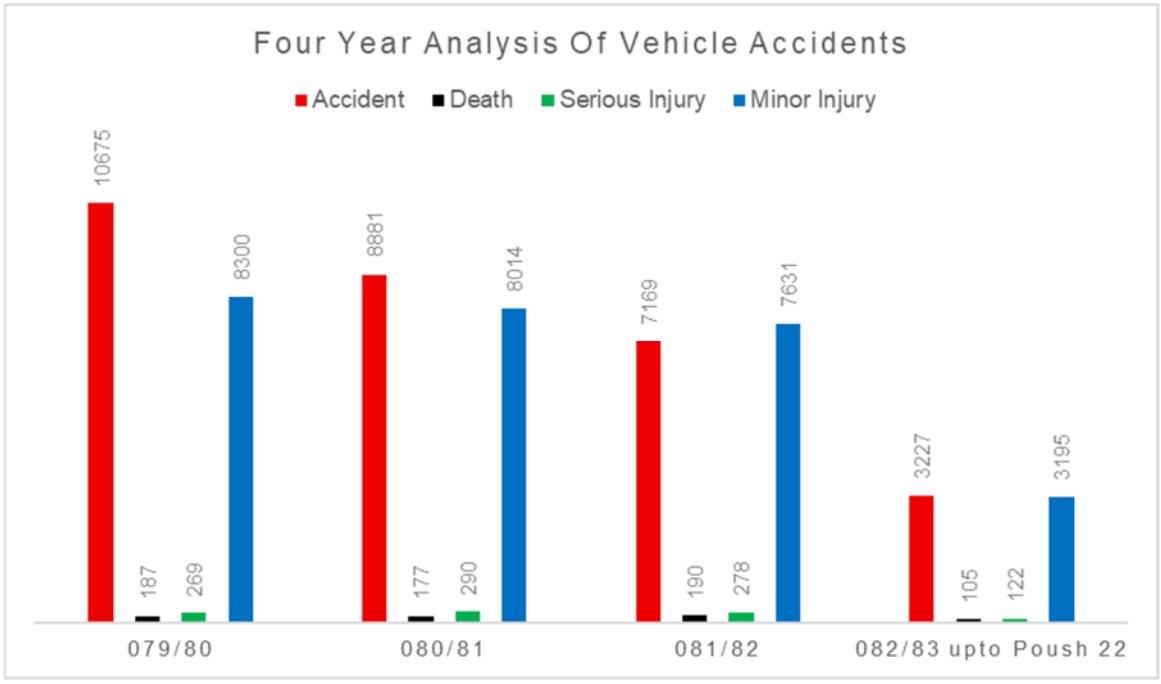
Similarly, as per the analysis done by the office over the four fiscal years on the reason behind vehicle accidents, driver's negligence has been the main reason. The other main reason involving vehicle accidents has been drunk driving (Ma.P.Se) averaging 608 number of such cases over the past 4 years. However, the record also shows the decreasing trend on the number of accidents in the valley over the years. This may have been due to the proper implementation of traffic rules and regulations as well as infrastructure and technology developments related to road safety.



Source: Kathmandu Valley Traffic Police Office, Ramshahpath,2026

Figure 4.4-8: Cause of Vehicle Accidents

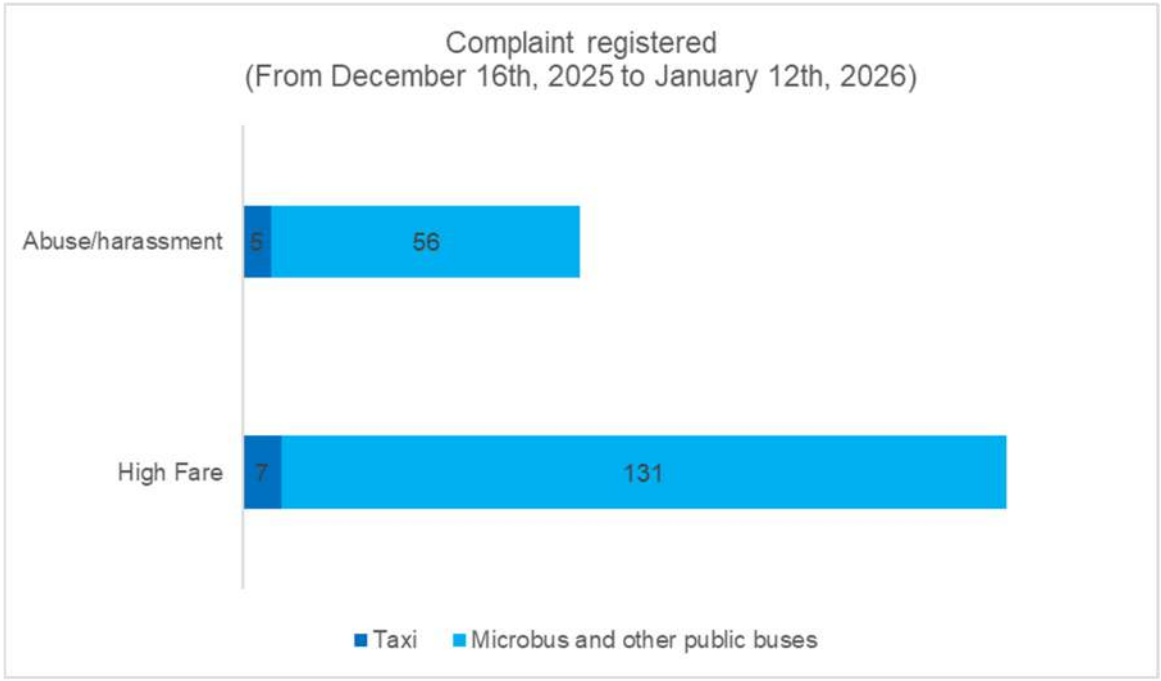
From the four-year analysis of vehicle accidents recorded in Kathmandu Valley, the trend is decreasing. In other words, the number of vehicle accidents is in decreasing trend while there are no such significant differences on the recorded number of death and serious injury incurred by the accidents. The details are presented below in the diagram.



Source: Kathmandu Valley Traffic Police Office, Ramshahpath, 2026

Figure 4.4-9: Vehicle Accidents recorded in Kathmandu Valley

In between the time period of approximately a month (December 16th, 2025 to January 12th, 2026), the number of complaint cases registered against abuse and harassment in public transportation were 61 and complaint filed against public transportation charging high fare were 138. Moreover, during the last fiscal year, 2,153 persons were taken under control and proceeded against legally for using foul language and harassing women in public vehicles (Source: Nepal Police, Women, Children and Senior Citizen Service Directorate, July 2026)



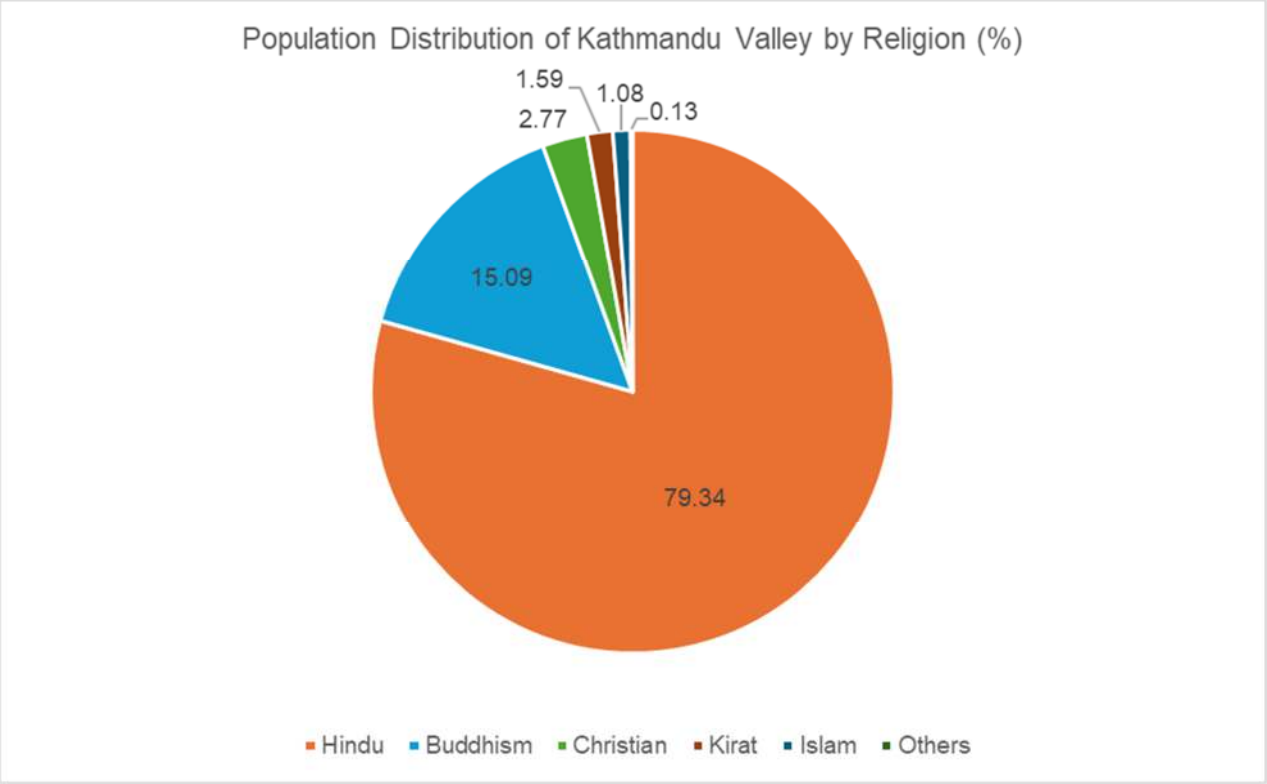
Source: Kathmandu Valley Traffic Police Office, Ramshahpath, 2026

Figure 4.4-10: Complaints Registered in Vehicles in Kathmandu Valley

4.4.5 Culture

4.4.5.1 Religion

The religious composition of the Kathmandu Valley is predominantly Hindu, with 2,377,806 individuals (79.34 %) of the total population, accounting for 40.36 % of males and 38.98% of females. Buddhism follows as the second-largest religion, comprising 15.09 % of the total population. The remaining religions, including Christianity (2.77%), Kirat (1.59%), Islam (1.08%), and smaller groups like Prakriti, Bon, Jain, Bahai, and Sikh, account for much smaller proportions of the overall populations.



Source: National Population and Housing Census, 2021

Figure 4.4-11: Population Distribution of Kathmandu Valley by Religion

In Kathmandu District, Hinduism dominates with 40% of males and 38.49% of females. Buddhism is also prevalent, with 7.99% of males and 8.29% of females practicing it. Bhaktapur District also has a similar trend, with 43.82% of males and 42.58% of females following Hindus, while Buddhism has a higher percentage, with 4.88% of males and 5.04% of females. Lalitpur District shows a maximum follower of Hindus, 38.90 % of males and 37.94 % of females, while Buddhism again makes up a higher percentage, with 7.23 % of males and 7.47 % of females after Hindus. Islam and Kirat have a minor presence across all three districts, with Islam being slightly higher in Kathmandu. Overall, the Valley, and particularly Kathmandu, has a higher concentration of Hindu followers, with Buddhism also showing significant representation in all three districts, while other religions like Kirat, Islam, and Christianity represent smaller but notable portions of the population. The details of the religion followed by the individuals in the Kathmandu Valley has been presented in Table 4.4-8.

Table 4.4-8: Religion followed by individuals in Kathmandu Valley

S.No.	Religion	Kathmandu					Bhaktaur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No	%	No.	%
1	Hindu	816,627	40.00	785,750	38.49	1,602,377	189,377	43.82	184,005	42.58	373,382	203,535	38.90	198,512	37.94	402,047	1,209,539	40.36	1,168,267	38.98	2,377,806	79.34
2	Bouddha	163,085	7.99	169,255	8.29	332,340	21,102	4.88	21,798	5.04	42,900	37,804	7.23	39,083	7.47	76,887	221,991	7.41	230,136	7.68	452,127	15.09
3	Islam	17,775	0.87	8,564	0.42	26,339	1,458	0.34	644	0.15	2,102	2,791	0.53	1,247	0.24	4,038	22,024	0.73	10,455	0.35	32,479	1.08
4	Kirat	14,235	0.70	15,056	0.74	29,291	2,371	0.55	2,570	0.59	4,941	6,400	1.22	7,114	1.36	13,514	23,006	0.77	24,740	0.83	47,746	1.59
5	Christian	22,454	1.10	25,672	1.26	48,126	4,055	0.94	4,657	1.08	8,712	12,123	2.32	13,952	2.67	26,075	38,632	1.29	44,281	1.48	82,913	2.77
6	Prakriti	513	0.03	550	0.03	1,063	29	0.01	18	0.00	47	107	0.02	123	0.02	230	649	0.02	691	0.02	1,340	0.04
7	Bon	581	0.03	594	0.03	1,175	25	0.01	21	0.00	46	114	0.02	130	0.02	244	720	0.02	745	0.02	1,465	0.05
8	Jain	339	0.02	348	0.02	687	1	0.0002	1	0.0002	2	33	0.01	32	0.01	65	373	0.01	381	0.01	754	0.03
9	Bahai	11	0.001	10	0.0005	21	-	0.00	-	0.00	-	5	0.001	6	0.001	11	16	0.00	16	0.00	32	0.00
10	Sikha	106	0.01	62	0.003	168	-	0.00	-	0.00	-	49	0.01	43	0.01	92	155	0.01	105	0.00	260	0.01
Total		1,035,726		1,005,861		2,041,587	218,418		213,714		432,132	262,961		260,242		523,203	1,517,105	50.62	1,479,817	49.38	2,996,922	100

Source: National Population and Housing Census, 2021

4.4.5.2 Language

In the Kathmandu Valley, Nepali language is the most widely spoken language, with a majority of the population 56.75% (28.61% male and 28.14% female) followed by Nepal bhasa (Newari) 19.94% (9.84% male and 10.11% female). This is followed by Tamang language which is spoken by 9.55%, Magar Dhut spoken by 2.10% and Maithali by 2.05% of the Kathmandu Valley population. Other ethnic languages such as Bhojpuri, Rai and Sherpa are spoken by smaller groups, but these languages make up less than 10% of the valley population. The details of the language spoken by the individuals has been presented in Table 4.4-9.

Table 4.4-9: Mother tongue as language spoken by individuals in Kathmandu Valley

S.No.	Language	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
1	Nepali	629159	30.82	617662	30.25	1246821	110410	25.55	108049	25.00	218459	121568	23.24	121095	23.14	242663	861137	28.73	846806	28.26	1707943	56.99
2	Maithili	24462	1.20	14598	0.72	39060	4061	0.94	2466	0.57	6527	9498	1.82	6454	1.23	15952	38021	1.27	23518	0.78	61539	2.05
3	Bhojpuri	20260	0.99	10138	0.50	30398	2086	0.48	1040	0.24	3126	4021	0.77	2094	0.40	6115	26367	0.88	13272	0.44	39639	1.32
4	Tharu	8787	0.43	6586	0.32	15373	1150	0.27	806	0.19	1956	3625	0.69	2843	0.54	6468	13562	0.45	10235	0.34	23797	0.79
5	Tamang	96505	4.73	99992	4.90	196497	20193	4.67	20979	4.85	41172	23861	4.56	24807	4.74	48668	140559	4.69	145778	4.86	286337	9.55
6	Nepalbhasha (Newari)	151525	7.42	156277	7.65	307802	70413	16.29	70969	16.42	141382	72876	13.93	75672	14.46	148548	294814	9.84	302918	10.11	597732	19.94
7	Bajjika	1413	0.07	627	0.03	2040	218	0.05	86	0.02	304	736	0.14	354	0.07	1090	2367	0.08	1067	0.04	3434	0.11
8	Magar Dhut	20998	1.03	21548	1.06	42546	3220	0.75	2996	0.69	6216	6894	1.32	7248	1.39	14142	31112	1.04	31792	1.06	62904	2.10
9	Doteli	2941	0.14	1731	0.08	4672	253	0.06	138	0.03	391	531	0.10	359	0.07	890	3725	0.12	2228	0.07	5953	0.20
10	Urdu	1431	0.07	974	0.05	2405	121	0.03	59	0.01	180	275	0.05	147	0.03	422	1827	0.06	1180	0.04	3007	0.10

S.No.	Language	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
11	Avadhi	715	0.04	563	0.03	1278	76	0.02	48	0.01	124	151	0.03	117	0.02	268	942	0.03	728	0.02	1670	0.06
12	Yakthung/ Limbu	4399	0.22	4601	0.23	9000	788	0.18	852	0.20	1640	2488	0.48	2808	0.54	5296	7675	0.26	8261	0.28	15936	0.53
13	Gurung	12891	0.63	14627	0.72	27518	429	0.10	465	0.11	894	1628	0.31	1877	0.36	3505	14948	0.50	16969	0.57	31917	1.06
14	Baitadeli	98	0.005	101	0.005	199	10	0.002	14	0.003	24	27	0.01	24	0.005	51	135	0.00	139	0.00	274	0.01
15	Rai	9383	0.46	10993	0.54	20376	1663	0.38	1911	0.44	3574	4236	0.81	4852	0.93	9088	15282	0.51	17756	0.59	33038	1.10
16	Achhami	77	0.004	77	0.004	154	6	0.001	7	0.002	13	25	0.005	23	0.004	48	108	0.00	107	0.00	215	0.01
17	Bantawa	976	0.05	1147	0.06	2123	155	0.04	177	0.04	332	658	0.13	740	0.14	1398	1789	0.06	2064	0.07	3853	0.13
18	Rajbanshi	317	0.02	259	0.01	576	56	0.01	38	0.01	94	116	0.02	77	0.01	193	489	0.02	374	0.01	863	0.03
19	Sherpa	13272	0.65	13880	0.68	27152	227	0.05	276	0.06	503	370	0.07	444	0.08	814	13869	0.46	14600	0.49	28469	0.95
20	Hindi	10467	0.51	6538	0.32	17005	623	0.14	265	0.06	888	1798	0.34	919	0.18	2717	12888	0.43	7722	0.26	20610	0.69
21	Chamling	1420	0.07	1563	0.08	2983	447	0.10	488	0.11	935	710	0.14	803	0.15	1513	2577	0.09	2854	0.10	5431	0.18
22	Bajhangi	87	0.004	85	0.004	172	4	0.001	7	0.002	11	6	0.001	8	0.002	14	97	0.00	100	0.00	197	0.01
23	Santhali	31	0.002	25	0.001	56	7	0.002	6	0.001	13	4	0.001	8	0.002	12	42	0.00	39	0.00	81	0.003
24	Chepang	279	0.01	232	0.01	511	26	0.01	33	0.01	59	63	0.01	58	0.01	121	368	0.01	323	0.01	691	0.02
25	Danuwar	321	0.02	296	0.01	617	44	0.01	35	0.01	79	598	0.11	566	0.11	1164	963	0.03	897	0.03	1860	0.06
26	Sunuwar	1721	0.08	1864	0.09	3585	330	0.08	292	0.07	622	648	0.12	679	0.13	1327	2699	0.09	2835	0.09	5534	0.18
27	Magahi	128	0.01	67	0.003	195	29	0.01	14	0.003	43	30	0.01	26	0.005	56	187	0.01	107	0.00	294	0.01
28	Uranw/Urau	69	0.003	32	0.002	101	0	0.00	0	0.00	0	17	0.003	13	0.002	30	86	0.00	45	0.00	131	0.004
29	Kulung	626	0.03	619	0.03	1245	20	0.005	25	0.01	45	68	0.01	58	0.01	126	714	0.02	702	0.02	1416	0.05
30	Magar Kham	486	0.02	518	0.03	1004	21	0.005	29	0.01	50	74	0.01	92	0.02	166	581	0.02	639	0.02	1220	0.04
31	Marwadi	2571	0.13	2322	0.11	4893	8	0.002	10	0.002	18	360	0.07	317	0.06	677	2939	0.10	2649	0.09	5588	0.19
32	Majhi	660	0.03	618	0.03	1278	174	0.04	156	0.04	330	246	0.05	232	0.04	478	1080	0.04	1006	0.03	2086	0.07
33	Thami	465	0.02	452	0.02	917	133	0.03	116	0.03	249	156	0.03	143	0.03	299	754	0.03	711	0.02	1465	0.05
34	Bhujel	255	0.01	260	0.01	515	62	0.01	52	0.01	114	50	0.01	53	0.01	103	367	0.01	365	0.01	732	0.02
35	Bangla	2724	0.13	671	0.03	3395	117	0.03	34	0.01	151	224	0.04	101	0.02	325	3065	0.10	806	0.03	3871	0.13
36	Thulung	600	0.03	660	0.03	1260	98	0.02	110	0.03	208	168	0.03	204	0.04	372	866	0.03	974	0.03	1840	0.06
37	Yakkha	152	0.01	159	0.01	311	14	0.003	15	0.003	29	95	0.02	102	0.02	197	261	0.01	276	0.01	537	0.02
38	Dhimal	185	0.01	195	0.01	380	20	0.005	20	0.005	40	17	0.003	18	0.003	35	222	0.01	233	0.01	455	0.02
39	Tajpuriya	61	0.003	46	0.002	107	6	0.001	7	0.002	13	20	0.004	14	0.003	34	87	0.00	67	0.00	154	0.01
40	Angika	9	0.0004	7	0.0003	16	0	0.00	0	0.00	0	0	0.00	0	0.00	0	9	0.00	7	0.00	16	0.001
41	Sampang	186	0.01	221	0.01	407	31	0.01	27	0.01	58	145	0.03	163	0.03	308	362	0.01	411	0.01	773	0.03
42	Khaling	424	0.02	464	0.02	888	28	0.01	24	0.01	52	89	0.02	87	0.02	176	541	0.02	575	0.02	1116	0.04
43	Wambule	208	0.01	205	0.01	413	25	0.01	26	0.01	51	232	0.04	244	0.05	476	465	0.02	475	0.02	940	0.03
44	Kumal	155	0.01	134	0.01	289	10	0.002	7	0.002	17	30	0.01	28	0.01	58	195	0.01	169	0.01	364	0.01
45	Darai	62	0.003	54	0.003	116	67	0.02	78	0.02	145	15	0.003	14	0.003	29	144	0.00	146	0.00	290	0.01
46	Bahing/ Bayung	291	0.01	328	0.02	619	0	0.00	0	0.00	0	130	0.02	140	0.03	270	421	0.01	468	0.02	889	0.03
47	Bajureli	12	0.001	13	0.001	25	0	0.00	0	0.00	0	0	0.00	0	0.00	0	12	0.00	13	0.00	25	0.001

S.No.	Language	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
48	Hyolmo/ Yholmo	1643	0.08	1706	0.08	3349	29	0.01	21	0.005	50	15	0.003	10	0.002	25	1687	0.06	1737	0.06	3424	0.11
49	Nachhiring	213	0.01	261	0.01	474	8	0.002	9	0.002	17	33	0.01	41	0.01	74	254	0.01	311	0.01	565	0.02
50	Yamphu/ Yamphe	82	0.004	88	0.004	170	6	0.001	11	0.003	17	34	0.01	32	0.01	66	122	0.00	131	0.00	253	0.01
51	Bote	327	0.02	376	0.02	703	0	0.00	0	0.00	0	9	0.002	7	0.001	16	336	0.01	383	0.01	719	0.02
52	Ghale	995	0.05	1153	0.06	2148	51	0.01	56	0.01	107	85	0.02	102	0.02	187	1131	0.04	1311	0.04	2442	0.08
53	Dumi	184	0.01	199	0.01	383	26	0.01	23	0.01	49	66	0.01	70	0.01	136	276	0.01	292	0.01	568	0.02
54	Lapcha	14	0.001	19	0.001	33	0	0.00	0	0.00	0	19	0.004	12	0.002	31	33	0.00	31	0.00	64	0.002
55	Puma	31	0.002	38	0.002	69	14	0.003	17	0.004	31	22	0.004	28	0.01	50	67	0.00	83	0.00	150	0.01
56	Dungmali	23	0.001	14	0.001	37	0	0.00	0	0.00	0	17	0.003	23	0.004	40	40	0.00	37	0.00	77	0.003
57	Darchuleli	8	0.0004	13	0.001	21	0	0.00	0	0.00	0	0	0.00	0	0.000	0	8	0.00	13	0.00	21	0.001
58	Athpahariya	24	0.001	20	0.001	44	0	0.00	0	0.00	0	16	0.003	22	0.004	38	40	0.00	42	0.00	82	0.003
59	Thakali	613	0.03	638	0.03	1251	0	0.00	0	0.00	0	65	0.01	75	0.01	140	678	0.02	713	0.02	1391	0.05
60	Jirel	237	0.01	249	0.01	486	30	0.01	35	0.01	65	63	0.01	67	0.01	130	330	0.01	351	0.01	681	0.02
61	Mewahang	53	0.003	43	0.002	96	8	0.002	6	0.001	14	18	0.003	23	0.004	41	79	0.00	72	0.00	151	0.01
62	Sign Language	94	0.005	73	0.004	167	6	0.001	5	0.001	11	0	0.000	0	0.000	0	100	0.00	78	0.00	178	0.01
63	Tibetan	1146	0.06	1125	0.06	2271	28	0.01	7	0.002	35	149	0.03	173	0.03	322	1323	0.04	1305	0.04	2628	0.09
64	Meche	0	0.00	0	0.00	0	0	0.00	0	0.00	0	0	0.000	0	0.000	0	0	0.00	0	0.00	0	0.00
65	Chhantyal	254	0.01	272	0.01	526	0	0.00	0	0.00	0	10	0.002	10	0.002	20	264	0.01	282	0.01	546	0.02
66	Raji	13	0.001	12	0.001	25	0	0.00	0	0.00	0	0	0.00	0	0.00	0	13	0.00	12	0.00	25	0.001
67	Lohorung	47	0.002	51	0.002	98	7	0.002	3	0.001	10	32	0.01	26	0.00	58	86	0.00	80	0.00	166	0.01
68	Ganagai	23	0.001	7	0.0003	30	0	0.00	0	0.00	0	0	0.00	0	0.00	0	23	0.00	7	0.00	30	0.001
69	Pahari	65	0.003	59	0.003	124	37	0.01	38	0.01	75	1740	0.33	1592	0.30	3332	1842	0.06	1689	0.06	3531	0.12
70	Lhopa	24	0.001	26	0.001	50	0	0.00	0	0.00	0	0	0.00	0	0.00	0	24	0.00	26	0.00	50	0.002
71	Dura	85	0.004	93	0.005	178	0	0.00	0	0.00	0	27	0.005	34	0.01	61	112	0.00	127	0.00	239	0.01
72	Koche	17	0.001	17	0.001	34	0	0.00	0	0.00	0	0	0.00	0	0.00	0	17	0.00	17	0.00	34	0.001
73	Chhiling	42	0.002	122	0.01	164	0	0.00	0	0.00	0	0	0.000	0	0.000	0	42	0.00	122	0.00	164	0.01
74	English	170	0.01	152	0.01	322	19	0.004	19	0.004	38	160	0.03	150	0.03	310	349	0.01	321	0.01	670	0.02
75	Jero/Jerung	27	0.001	31	0.002	58	0	0.00	0	0.00	0	0	0.00	0	0.00	0	27	0.00	31	0.00	58	0.002
76	Khash	641	0.03	485	0.02	1126	80	0.02	46	0.01	126	80	0.02	82	0.02	162	801	0.03	613	0.02	1414	0.05
77	Sanskrit	1167	0.06	833	0.04	2000	78	0.02	53	0.01	131	94	0.02	76	0.01	170	1339	0.04	962	0.03	2301	0.08
78	Dolpali	26	0.001	48	0.002	74	0	0.00	0	0.00	0	0	0.00	0	0.00	0	26	0.00	48	0.00	74	0.002
79	Hayu/Vayu	50	0.002	28	0.001	78	2	0.0005	8	0.002	10	5	0.001	5	0.001	10	57	0.00	41	0.00	98	0.003
80	Tilung	81	0.004	67	0.003	148	0	0.00	0	0.00	0	0	0.00	0	0.00	0	81	0.00	67	0.00	148	0.005
81	Koyee	46	0.002	42	0.002	88	0	0.00	0	0.00	0	14	0.003	17	0.003	31	60	0.00	59	0.00	119	0.004
82	Waling/ Walung	84	0.004	84	0.004	168	7	0.002	7	0.002	14	0	0.00	0	0.00	0	91	0.00	91	0.00	182	0.01
83	Musalman	201	0.010	153	0.01	354	14	0.003	12	0.003	26	10	0.002	5	0.001	15	225	0.01	170	0.01	395	0.01

S.No.	Language	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
84	Hariyanwi	8	0.0004	8	0.0004	16	0	0.00	0	0.00	0	0	0.00	0	0.00	0	8	0.00	8	0.00	16	0.001
85	Jumli	4	0.0002	13	0.001	17	0	0.00	0	0.00	0	0	0.00	0	0.00	0	4	0.00	13	0.00	17	0.001
86	Punjabi	118	0.01	86	0.004	204	0	0.00	0	0.00	0	56	0.01	42	0.01	98	174	0.01	128	0.00	302	0.01
87	Lhomi	85	0.004	99	0.005	184	0	0.00	0	0.00	0	13	0.002	9	0.002	22	98	0.00	108	0.00	206	0.01
88	Sindhi	14	0.001	14	0.001	28	0	0.00	0	0.00	0	0	0.00	0	0.00	0	14	0.00	14	0.00	28	0.001
89	Byansi	37	0.002	31	0.002	68	0	0.00	0	0.00	0	5	0.001	5	0.001	10	42	0.00	36	0.00	78	0.003
90	Manange	398	0.02	460	0.02	858	0	0.00	0	0.00	0	0	0.000	0	0.000	0	398	0.01	460	0.02	858	0.03
91	Balkura/ Baram	84	0.004	76	0.004	160	0	0.00	0	0.00	0	0	0.000	0	0.000	0	84	0.00	76	0.00	160	0.01
92	Magar Kaike	10	0.0005	8	0.0004	18	0	0.00	0	0.00	0	6	0.001	6	0.001	12	16	0.00	14	0.00	30	0.001
93	Bhote	762	0.04	516	0.03	1278	16	0.004	22	0.01	38	12	0.002	10	0.002	22	790	0.03	548	0.02	1338	0.04
94	Chum/Nubri	119	0.01	110	0.01	229	0	0.00	0	0.00	0	0	0.00	0	0.00	0	119	0.00	110	0.00	229	0.01
95	Nar-Phu	15	0.001	7	0.0003	22	0	0.00	0	0.00	0	0	0.00	0	0.00	0	15	0.00	7	0.00	22	0.001
96	Ranatharu	16	0.001	11	0.001	27	0	0.00	0	0.00	0	0	0.00	0	0.00	0	16	0.00	11	0.00	27	0.001
97	Karmarong	116	0.01	20	0.001	136	0	0.00	0	0.00	0	0	0.00	0	0.00	0	116	0.00	20	0.00	136	0.005
98	Mugali	103	0.01	160	0.01	263	0	0.00	0	0.00	0	0	0.00	0	0.00	0	103	0.00	160	0.01	263	0.01
99	Kewarat	6	0.0003	5	0.0002	11	0	0.00	0	0.00	0	0	0.00	0	0.00	0	6	0.00	5	0.00	11	0.0004
100	Others	809	0.04	601	0.03	1410	73	0.02	64	0.01	137	497	0.09	355	0.07	852	1379	0.05	1020	0.03	2399	0.08
101	Not stated	8	0.0004	10	0.0005	18	0	0.00	0	0.00	0	12	0.002	8	0.002	20	20	0.00	18	0.00	38	0.001
	Total	**1,035,726**		**1,005,861**		**2,041,587**	**218,418**		**213,714**		**432,132**	**262,961**		**260,242**		**523,203**	**1,517,105**	**50.62**	**1,479,817**	**49.38**	**2,996,922**	**100**

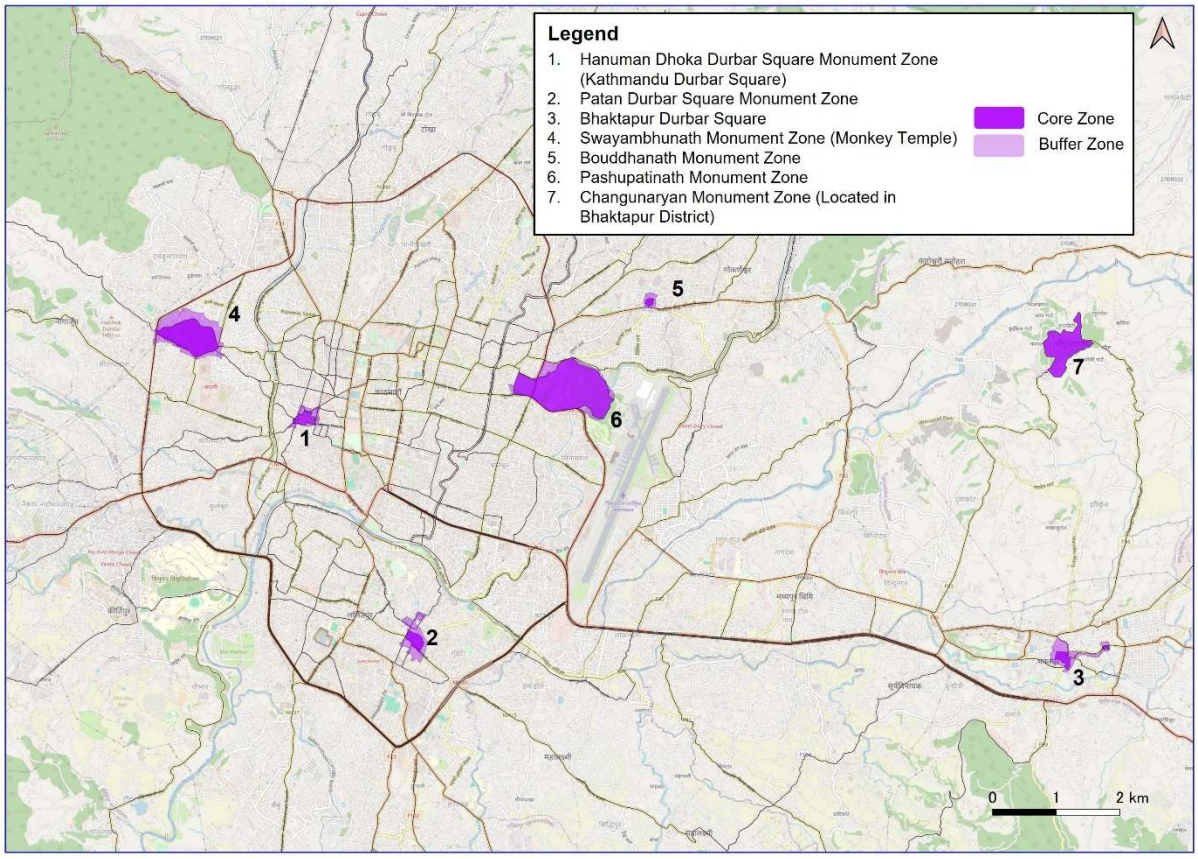
Source: National Population and Housing Census, 2021

4.4.6 Cultural Heritage

4.4.6.1 UNESCO World Heritage Sites in Kathmandu Valley

Kathmandu Valley comprises of three ancient cities namely Kathmandu, Lalitpur (Patan) and Bhaktapur which were ruled by Malla kings from 12th to 18th centuries. Thus, these three cities house seven groups of monuments and buildings which are listed as UNESCO World Heritage sites, as shown in Figure 4.4-12. These seven include three different Durbar Squares in Kathmandu, Lalitpur and Bhaktapur districts, two different Buddhist Stupas in Kathmandu district (Swayambhu and Boudhanath) and two Hindu temples in Kathmandu (Pasupatinath) and Bhaktapur (Changunarayan) districts. These monuments and buildings represent the co-existence and amalgamation of rich and unique Hinduism and Buddhism traditions and rituals. Also, they represent the unique cultural traditions of Newar community who settled in the valley over the past two millennia (https://whc.unesco.org/en/list/121/).

Among seven of the UNESCO World Heritage sites, four are located in Kathmandu district. **Swayambhu**, meaning "Self-created" and also known as Monkey temple among the tourists, holds the mix of Buddhist and Hindu architecture, imagery and traditions. Thus, it holds significance to both Hindu and Buddhist religion. It is located at top of a hill on the northwest side of the valley and consists of a stupa, variety of shrines and temples dating back to Licchavi period. **Pasupatinath**, another world heritage site is an oldest Hindu temple in Kathmandu dedicated to a form of Shiva and is located on the bank of Bagmati river. The temple area consists of ashrams, as many as 518 temples of various Hindu deities and inscriptions. The temple is visited by Hindu pilgrimage from various parts of the country as well as those from India and Hindus across the world. **Boudhanath**, another world heritage site, is a largest spherical stupa in Nepal and considered as one of the largest in the world. This stupa is highly regarded by Tibetan Buddhist community and Tibetan diaspora who resides around the vicinity of the stupa and across the Kathmandu Valley. There are many monasteries built or established around the stupas area which resides Buddhist monks, nuns and host numerous Buddhist pilgrimage and enthusiasts from around the world. **Changunarayan**, another Hindu temple in the list of world heritage site and one of the oldest Hindu temples in the country, was built in 4th century Lichacchavi period and is the temple dedicated to the Hindu god Bishnu. It is located on the top of a hill in Bhaktapur district. The main courtyard of the temple includes several other temples and statues of various deities. The temple receives large number of Hindu pilgrims during four months period in a year marking Harishayani Ekadashi and Haribodhini Ekadashi. **Patan Durbar Square**, one of the three durbar squares located in the valley, covers around 18.85 hectares land area in Lalitpur district. There around 55 major temples and 136 courtyards or "bahals" covering the square. It was considered to built around 1600s during the reign of Malla kings. Similar to this durbar square, **Bhaktapur Durbar Square** which is located in Bhaktapur district was also constructed during Malla reign in the late 13th century and covers the area of 6.65 square km. The people of Bhaktapur (majority from Newar community) consider the square as their heritage where the architecture and monuments are part of their daily lives and intertwines with their religious and culture traditions. Last but not least from the list of UNESCO World Heritage sites in Kathmandu Valley, **Kathmandu Durbar Square** also boasts rich cultural history and traditions and is also considered as living heritage. Sprawling in the area of 167.37 hectare, this durbar square construction begun from 3rd century with different temples and structures constructed during 16th century during the reign of Malla kings. Like the two durbar squares mentioned earlier, Kathmandu Durbar Square has buildings and temples inspired by Newari architecture. There are about 50 temples among which Taleju temple is considered to be the tallest structure built in the area.



Source: UNESCO (WHC)

Figure 4.4-12:Location Map of UNESCO World Heritage sites

4.4.6.2 Intangible Cultural Heritage: Feasts and Festivals in Kathmandu Valley

Kathmandu Valley is not just the capital city of Nepal but is also rich in heritage, vibrant feasts, and festivals. Additionally, one of the main highlights of the city is the beautiful feasts (Jatras) of the Kathmandu Valley. The term 'Jatra' is derived from the Newar language of Kathmandu, meaning festival or procession. These are more than just celebrations, as their roots trace back centuries. Jatras are believed to have originated during the Malla Period (12th to 18th century), when they were conducted as royal festivities in which the royal family would gather to appease gods and goddesses. Jatras also provide a major platform for the conservation of arts, as traditional artists, local craftsmen, and cultural performers showcase their skills while keeping the cultural heritage of the valley alive and intact (Ace the Himalaya, 2024). In the Kathmandu Valley, some of the most widely celebrated feasts (Jatras) include the following :

Indra Jatra is the biggest Jatra of the Kathmandu Valley. Indra Jatra (locally known as Yenya Punhi) is considered the most significant of all Jatras and is celebrated in honour of Lord Indra, the King of Heaven and the god of rain. The celebration of this Jatra often marks the end of the monsoon season in Nepal and is held every year in September or October. According to mythological narrative, Indra once visited Earth in search of a rare flower for his mother but was captured by the locals. This Jatra is celebrated to mark his visit and subsequent release. A variety of rituals, elaborate chariot processions, and masked dances are performed. Additionally, a main attraction of this Jatra is the appearance of the Goddess Kumari, the Living Goddess of Nepal. Marking the beginning of the Jatra, a ceremonial pole called Yosin is erected at Kathmandu Durbar Square. After that, Goddess Kumari is paraded through the streets of the valley in a chariot, accompanied by other deities. Traditional dances such as Pulu Kisi (elephant dance) and Lakhey Dance are performed, creating a vibrant and festive atmosphere. This Jatra is truly an unforgettable spectacle for both locals and tourists alike.

Bisket Jatra is primarily celebrated in Bhaktapur. It marks the Nepalese New Year and is observed in the month of April. There are many myths associated with it, but the most popular relates to the tale of the Hindu deity Bhairab and a deadly serpent. Bisket Jatra symbolizes the triumph of good over evil and is dedicated to Lord Bhairab and Goddess Bhadrakali. Massive chariots carrying the images of these deities are pulled through the narrow lanes of Bhaktapur by enthusiastic locals. At the beginning of the festival, a large ceremonial pole called a lingo is erected in different areas of Bhaktapur. During this nine-day festival, two lingos are erected on New Year's Day, and one additional lingo is erected on the fourth day of the festival. A thrilling tug-of-war also takes place between the upper and lower parts of the town, in which locals enthusiastically participate, pulling the chariot with great strength in a spirit of celebration, adding to the electrifying atmosphere

Rato Machhindranath Jatra marks the commencement of the monsoon season in Nepal and is the longest chariot festival in the country. It honors Rato Machhindranath, the rain-bringing deity revered by both Hindus and Buddhists. There is an old myth that when the Kathmandu Valley was facing a severe drought, Rato Machhindranath was brought into the valley, and his presence brought rain, ending the long dry period. During this Jatra, an elaborate chariot procession takes place in which a large chariot carrying the idol of Rato Machhindranath is pulled from Patan to Bungamati over several weeks. This long route makes it the longest Jatra in Nepal. The chariot, which is approximately 32 feet tall, is constructed in Pulchowk and is pulled through different areas, including Jawalakhel.

Seto Machhindranath Jatra is a smaller and white version of the Rato Machhindranath Jatra, carried out in the Kathmandu Valley to worship Seto Machhindranath, who is considered a protector against natural calamities. A similar but smaller chariot procession carries the idol of the deity, which is paraded through the streets of Kathmandu Valley while various rituals are performed to invoke the deity's blessings and protection. The idol is first taken from the Seto Machhindranath Temple to Durbar Marg, where the procession begins. It is then pulled through Jamal and Asan, where the chariot rests overnight. On the second day, it is taken through Indra Chowk and Kathmandu Durbar Square. On the final day, the procession returns to the temple, locally known as Jana Baha Dyo Temple. This Jatra embodies the deep faith of the Newar community in their deities and fosters a sense of religious harmony and communal unity within the community.

Gai Jatra is observed to honor family members who have passed away in the previous year. This Jatra is believed to help the deceased find peace and also provides solace to their loved ones. During this festival, children are dressed as cows to symbolize the spirit of the departed and to depict the impermanence of life. It is believed that Gai Jatra was started by King Pratap Malla after the death of his son, Chakravartendra Malla, which left the queen deeply saddened. The king initiated this festival to console her. To celebrate Gai Jatra, cows are decorated and led through the streets by families who have lost a loved one, with the belief that the cows will guide the departed souls toward a peaceful afterlife. Additionally, satirical performances are conducted in the streets, where people humorously critique long-standing social and political issues, delivering both entertainment and social messages. The festival thus combines somber remembrance of the deceased with humor and reflects resilience in the face of loss

Bhoto Jatra is celebrated to mark the conclusion of the more elaborate Rato Machhindranath Jatra and showcases a cultural and religious celebration that highlights the unity of the local community. The term Bhoto translates to "vest," and this Jatra is therefore known as the "festival of the vest." As the name suggests, the main highlight of Bhoto Jatra is the public display of a vest. The festival is associated with a vest adorned with jewels, which was reportedly presented to a farmer by a serpent king but was later stolen by a Lakhey (a fire-breathing demon). The dispute over the vest was eventually settled by a king. The vest was then offered to the deity, and every year it is displayed to the public on the final day of the Rato Machhindranath Jatra, symbolizing justice and divine protection. Historically, the King of Nepal

would attend this Jatra, making it a highly significant event. Catching a glimpse of the Bhoto is believed to bring good fortune to locals.

Ghode Jatra is held at the central ground of the Kathmandu Valley, Tundikhel. It is also termed the "Festival of Horses" and is celebrated every year around April, when a grand horse parade organized by the Nepal Army is showcased at the ground. This Jatra is linked to a legend of a demon who was defeated by the gods in the valley, and it is believed that the horse racing and parade each year help to suppress the spirit of the same demon. Besides its historical and cultural significance, Ghode Jatra also features an impressive display of horsemanship and the military skills of the Nepal Army. Additionally, various traditional dances and performances are presented at Tundikhel during this festival.

4.4.6.3 Cultural and Natural Heritage: Sacred Rivers of Kathmandu Valley

The **Bagmati River** winds through the lush Kathmandu Valley, passing ancient temples and iconic heritage sites, and holds profound cultural, ecological, and political importance in Nepal. Revered as sacred in both Hindu and Buddhist traditions, it has been closely linked to the development and identity of the capital region for centuries. Originating in the Shivapuri range, the river's once pristine waters now pass through rapidly urbanized areas, supporting over three million people across Kathmandu, Lalitpur, and surrounding watersheds. Due to pollution and encroachment, restoring the river's ecology has become essential for environmental health and sustainable development in the valley. The Bagmati region, now officially known as Bagmati Province under Nepal's federal structure, includes important heritage sites such as Pashupatinath Temple (a UNESCO World Heritage Site), Guhyeshwari Temple, and various other shrines. The river also flows through significant ritual sites such as Sankhamul Ghat and Teku Dovan before joining the Bishnumati River, and it plays a central role in religious practices ranging from daily rituals to major festivals like Maha Shivaratri, as well as cremation ceremonies at Aryaghat along its banks (Nepal Desk, 2025)

The **Bishnumati River** meaning "beloved of Vishnu" is associated with the Hindu god Vishnu and is also considered sacred in Newar Buddhism particularly near Swayambhunath Stupa where monks and pilgrims perform ritual ablutions. It is one of the major tributaries of the Bagmati River and an important source of water for urban Kathmandu flowing from north to south through densely populated core areas and holding cultural and religious significance for nearby communities. The river originates from Shivapuri Hill at an elevation of about 2,481 meters in the northern Kathmandu Valley and merges with the Bagmati River at the Teku confluence after traveling over 17 km. It has six feeder tributaries namely Shivapuri Khola, Shangla Khola, Mahadev Khola, Samakhusi Khola, Bhachakusi Khola and Manamati Khola and passes through heavily urbanized areas where roads line both banks with limited natural vegetation and agriculture. Downstream areas include densely settled communities including slums and squatter settlements (Shrestha, 2009). Important heritage sites near the river include Swayambhunath, Kankeshwari Temple, and Pachali Bhairav Temple, while the cremation ghats at Teku are used for last rites ceremonies (Top Nepal Information, 2025).

Other sacred streams include **Hanumante Khola** in the Bhaktapur area, **Nakkhu Khola**, **Tukucha Khola**, and the **Dhobikhola (Rudramati)** Khola, all of which hold local cultural and environmental significance within the Kathmandu Valley.

4.4.7 Education

In Kathmandu Valley, the Intermediate & equivalent level (20.97%) has the highest number of individuals, followed by Primary education (17.26%) and SLC./SEE & equivalent (13.59%), while the lowest proportions are in Early childhood education (2.86%) and other education categories (0.16%). Among the three districts, Kathmandu leads in all education levels due to its larger population, with the Intermediate level being the most achieved, followed by Primary

and S.L.C./SEE. Bhaktapur and Lalitpur follow a similar pattern, with Intermediate education being the highest, followed by Primary and S.L.C./SEE. Higher education levels, such as Graduate & Postgraduate, have lower proportions across all districts. The details of the education level have been presented in Table 4.4-10.

As of the latest available data, the Kathmandu Valley, encompassing Kathmandu, Bhaktapur, and Lalitpur districts, hosts a diverse range of educational institutions registered under the Government of Nepal's Ministry of Education, Science, and Technology. There are about 600 community and some 1,500 private schools in the Kathmandu Valley (MyRepublica, n.d.).

Table 4.4-10: Education level achieved by the individuals of Kathmandu Valley

S. No.	Education Level	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
		Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
1	Early childhood	27025	1.58	21842	1.28	48867	6065	1.71	4868	1.38	10933	6,415	1.47	5,416	1.24	11,831	39,505	1.58	32,126	1.28	71,631	2.86
2	Primary	149806	8.76	134056	7.84	283862	36284	10.25	31984	9.04	68268	41,580	9.51	37,920	8.67	79,500	227,670	9.11	203,960	8.16	431,630	17.26
3	Lower secondary	119930	7.02	101746	5.95	221676	27857	7.87	22091	6.24	49948	32,410	7.41	27,085	6.19	59,495	180,197	7.21	150,922	6.04	331,119	13.24
4	Upper secondary	87256	5.11	78940	4.62	166196	22352	6.31	18368	5.19	40720	28,184	6.44	25,211	5.77	53,395	137,792	5.51	122,519	4.90	260,311	10.41
5	S.L.C./ SEE & equivalent	131915	7.72	111083	6.50	242998	25875	7.31	20370	5.75	46245	27,352	6.25	23,155	5.29	50,507	185,142	7.40	154,608	6.18	339,750	13.59
6	Intermediate & equivalent	189232	11.07	176204	10.31	365436	36883	10.42	33936	9.59	70819	45,444	10.39	42,560	9.73	88,004	271,559	10.86	252,700	10.11	524,259	20.97
7	Graduate & equivalent	123038	7.20	104981	6.14	228019	21297	6.02	18352	5.18	39649	29,665	6.78	25,429	5.81	55,094	174,000	6.96	148,762	5.95	322,762	12.91
8	Post graduate equivalent & above	71268	4.17	49068	2.87	120336	11731	3.31	7903	2.23	19634	18,165	4.15	13,200	3.02	31,365	101,164	4.05	70,171	2.81	171,335	6.85
9	Other	1797	0.11	1603	0.09	3400	106	0.03	216	0.06	322	109	0.02	159	0.04	268	2,012	0.08	1,978	0.08	3,990	0.16
10	No level	9048	0.53	12728	0.74	21776	1739	0.49	3901	1.10	5640	1,876	0.43	3,345	0.76	5,221	12,663	0.51	19,974	0.80	32,637	1.31
11	Level not stated	3287	0.19	3332	0.19	6619	792	0.22	993	0.28	1785	1,195	0.27	1,434	0.33	2,629	5,274	0.21	5,759	0.23	11,033	0.44
Total		913,602		795,583		1,709,185	190,981		162,982		353,963	232,395		204,914		437,309	1,336,978	53.47	1,163,479	46.53	2,500,457	100

Source: National Population and Housing Census, 2021

4.4.8 Health and Safety

The health status of a population is influenced by various factors, including life expectancy, nutritional status, and the prevalence of diseases. Maternal and child health are essential indicators of the overall health system, while chronic diseases and mental health conditions pose ongoing challenges. Healthcare infrastructure, such as the distribution, availability, and quality of services, plays a critical role in delivering effective care. The healthcare workforce's capacity, along with access to health insurance and financial protection, are fundamental in ensuring equitable healthcare access. However, barriers to access, whether due to geographic, economic, or social factors, can hinder proper healthcare delivery. Addressing key health challenges and meeting health needs require careful planning and budgeting to ensure the sustainability and improvement of the healthcare system

Vehicular emissions significantly contribute to respiratory illnesses in Kathmandu Valley. Continuous monitoring from February 2014 to February 2015 showed that $PM_{2.5}$ and NO_2 levels frequently exceeded the National Ambient Air Quality Standards (NAAQS), with $PM_{2.5}$ daily averages reaching 3-5 times the standard. The data from major hospitals indicated that 39.49% of respiratory hospitalizations were due to Chronic obstructive pulmonary disease (COPD), 29.13% due to pneumonia, and 15.33% due to acute respiratory infections (ARI). The elderly (50+ years) and children (0-9 years) were the most affected groups. Statistical models linked $PM_{2.5}$ exposure to a 1 - 4.7% increase in hospitalizations per 10 µg/m³ rise. The study emphasizes the urgent need for policies to curb vehicular emissions and improve air quality management in Kathmandu Valley. (Nepal Health Research Council, 2015).

Vehicular emissions in Kathmandu Valley are a major contributor to air pollution, particularly $PM_{2.5}$ and NO_X, leading to severe respiratory illnesses. Trucks, despite comprising only 2.3% of vehicles, are responsible for 80% of vehicular emissions, significantly impacting air quality. Transport emissions contribute to around 30% of PM_{10} levels in the valley. Health data analysis reveals a strong link between air pollution from transport and respiratory diseases such as COPD, pneumonia, and acute respiratory infections. A study estimated that improving public transport and introducing cleaner vehicle technologies could prevent up to 15,722 pollution-related deaths. The report underscores the urgent need for sustainable transport policies, including promoting electric vehicles, cycling, and walking, to mitigate health risks. (Clean Energy Nepal, 2022)

In Kathmandu Valley, vehicular emissions significantly contribute to respiratory illnesses, with $PM_{2.5}$ levels exceeding WHO and national standards by over five times. Diesel trucks, despite constituting only 2.3% of vehicles, account for 80% of vehicular emissions. Health data indicates that among respiratory hospitalizations, 39.49% were due to COPD, 29.13% due to pneumonia, and 15.33% due to acute respiratory infections (ARI), disproportionately affecting children (25.5%) and the elderly (55%). Research estimates that improving transport policies such as introducing Euro VI vehicle standards, electric buses, and promoting non-motorized transport could prevent up to 15,722 pollution-related deaths. (Shrestha, 2018)

Vehicular emissions in Kathmandu Valley significantly contribute to respiratory illnesses, with $PM_{2.5}$ levels remaining 3-4 times higher than WHO guidelines despite recent reductions. The study estimates that 6%-13% of respiratory morbidities, including COPD, acute respiratory infections (ARI), and pneumonia, are directly attributable to $PM_{2.5}$ exposure. In numerical terms, this corresponds to approximately 3,273 COPD cases, 11,056 ARI cases, and 5,499 pneumonia cases annually. The valley has witnessed a sharp rise in vehicle numbers, with over 440,000 new vehicle registrations annually as of 2017/18, of which 78% are two-wheelers. If $PM_{2.5}$ levels are reduced by 35% by 2030, avoidable respiratory burdens could range from 1,870 COPD cases, 6,304 ARI cases, and 3,106 pneumonia cases, with 80 to 245 annual deaths preventable depending on pollution control measures. These findings highlight the critical need for stricter vehicular emission regulations and sustainable urban mobility policies (Shrestha, Mudu, & DeCarlo, 2021).

In Kathmandu, Bhaktapur and Lalitpur districts, there is a total of 54 public hospitals and 1,536 non-public facilities. Non-public facilities include private and community hospitals, nursing homes, and clinics. The details of Hospitals have been presented in Table 4.4-11.

Table 4.4-11: Number of Health Facilities

Health Facility Type	Number of Facilities
Public Hospitals	54
Primary Healthcare Centers (PHCCs)	40
Health Posts	643
Private Facilities	1,536
Basic Health Service Centers (BHSCs)	1,303

Source: Nepal Health Facility Registry (MOHP, n.d.); Public Health Update (2021)

4.4.9 Social Vulnerability

Social Vulnerability refers to individuals or groups who face increased risks and challenges due to factors such as economic disadvantage, social exclusion, and marginalization. This includes women, children, senior citizens, Dalit communities, indigenous peoples (Janajati), religious minorities, persons with disabilities, and those living in poverty. These groups often experience limited access to resources, opportunities, and services, making them more susceptible to various forms of exploitation and abuse (Ministry of Women, Children, and Senior Citizens (MOWCSC), Government of Nepal. https://mowcsc.gov.np)

Their status can be described through their population distribution in Kathmandu Valley. In the table given below shows the total population of people with disabilities, one of the socially vulnerable group, who resides in Kathmandu Valley. Although they comprise of 1.47% of the total population of Kathmandu Valley, they largely use public transportation as the main commute and other public infrastructures for which such infrastructures and the public means of transportation must be disability friendly. Also, due to transportation and mobility accessibility, access to health services, education and job opportunities, many families of individuals with disabilities have migrated from different parts of the country where such access is limited or none. Hence, the population is comparatively high than rest of the districts in Nepal.

Table 4.4-12: Population of people with disabilities along with types of disability in Kathmandu Valley

Types of Disability	Kathmandu					Bhaktapur					Lalitpur					Kathmandu Valley					
	Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total	
	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	No.	%
Physical disability	6,082	19.82	4,821	15.71	10,903	1,310	21.94	961	16.10	2,271	1,483	20.14	1,104	14.99	2,587	8,875	20.16	6,886	15.64	15,761	35.80
Low vision	2,955	9.63	3,082	10.04	6,037	362	6.06	377	6.31	739	583	7.92	581	7.89	1,164	3,900	8.86	4,040	9.18	7,940	18.04
Blind	720	2.35	626	2.04	1,346	230	3.85	198	3.32	428	321	4.36	291	3.95	612	1,271	2.89	1,115	2.53	2,386	5.42
Deaf	953	3.11	960	3.13	1,913	183	3.07	188	3.15	371	313	4.25	290	3.94	603	1,449	3.29	1,438	3.27	2,887	6.56
Hard of hearing	1,252	4.08	1,328	4.33	2,580	255	4.27	289	4.84	544	279	3.79	250	3.39	529	1,786	4.06	1,867	4.24	3,653	8.30
Deaf and Blind	167	0.54	156	0.51	323	27	0.45	24	0.40	51	44	0.60	45	0.61	89	238	0.54	225	0.51	463	1.05
Speech problem	932	3.04	721	2.35	1,653	163	2.73	134	2.24	297	195	2.65	154	2.09	349	1,290	2.93	1,009	2.29	2,299	5.22
Mental	785	2.56	800	2.61	1,585	178	2.98	126	2.11	304	182	2.47	200	2.72	382	1,145	2.60	1,126	2.56	2,271	5.16
Intellectual disability	388	1.26	341	1.11	729	80	1.34	49	0.82	129	68	0.92	75	1.02	143	536	1.22	465	1.06	1,001	2.27
Hemophilia	232	0.76	181	0.59	413	53	0.89	80	1.34	133	60	0.81	74	1.00	134	345	0.78	335	0.76	680	1.54
Autism	311	1.01	184	0.60	495	35	0.59	43	0.72	78	42	0.57	37	0.50	79	388	0.88	264	0.60	652	1.48
Multiple disability	1,429	4.66	1,281	4.17	2,710	341	5.71	284	4.76	625	311	4.22	383	5.20	694	2,081	4.73	1,948	4.43	4,029	9.15
Population with disability	16,206	0.79	14,481	0.71	30,687	3,217	0.74	2,753	0.64	5,970	3,881	0.74	3,484	0.666	7,365	23,304	0.778	20,718	0.69	44,022	1.47
Population with no Disability	1,019,501	49.94	991,373	48.56	2,010,874	215,180	49.79	210,950	48.82	426,130	259,058	49.51	256,730	49.07	515,788	1,493,739	49.84	1,459,053	48.69	2,952,792	98.53
Not stated	19	0.001	7	0.0003	26	21	0.005	11	0.003	32	22	0.004	28	0.005	50	62	0.002	46	0.002	108	0.004
Total Population	1,035,726	50.73	,005,861	49.27	2,041,587	218,418	50.54	213,714	49.46	432,132	262,961	50.26	260,242	49.74	523,203	23,366	50.62	1,479,817	49.38	2,996,922	100

Source: National Population and Housing Census, 2021

4.4.10 Gender

4.4.10.1 Access to education (enrollment rates, dropout for boys and girls; access to quality education)

As shown in table below, the proportion of education attainment of girls and women population living in Kathmandu Valley from early childhood to post graduate and above is found to be 45.41% which is lower as compared with the boys and men proportion (52.67%).

Table 4.4-13: Education attainment of male and female population of Kathmandu Valley (Kathmandu, Lalitpur and Bhaktapur districts)

S. No.	Education Level	Kathmandu Valley					
		Male		Female		Total	
		No.	%	No.	%	No.	%
1	Early childhood	39793	1.58	32397	1.29	72190	2.86
2	Primary	231479	9.19	206977	8.21	438456	17.40
3	Lower secondary	182573	7.24	152876	6.07	335449	13.31
4	Upper secondary	139161	5.52	123634	4.91	262795	10.43
5	S.L.C./ SEE & equivalent	185976	7.38	155241	6.16	341217	13.54
6	Intermediate & equivalent	272832	10.83	253898	10.07	526730	20.90
7	Graduate & equivalent	174312	6.92	149074	5.92	323386	12.83
8	Post graduate equivalent & above	101332	4.02	70268	2.79	171600	6.81
9	Other	2014	0.08	1979	0.08	3993	0.16
10	No level	12865	0.51	20250	0.80	33115	1.31
11	Level not stated	5354	0.21	5831	0.23	11185	0.44
Total		1347691	53.48	1172425	46.52	2520116	100.00

Source: National Population and Housing Census, 2021

4.4.10.2 Ownership Status of Assets

The data on ownership of fixed assets in the Kathmandu Valley shows that a significant proportion of female-headed households, do not own either a housing unit or land, which may disproportionately affect women who often have limited access to property, which may disproportionately affect women who often have limited access to property. Gender disparities in asset ownership are also reflected in the lower rates of joint ownership of both housing units and land, suggesting potential inequalities in access to economic resources between men and women.

Table 4.4-14: Number of households by female ownership of fixed assets, NPHC 2021

Ownership of fixed assets	Kathmandu		Bhaktapur		Lalitpur		Kathmandu Valley	
	No.	%	No.	%	No.	%	No.	%
Housing unit only	23483	4.33	5581	5.15	6275	4.48	35339	4.47
Land only	58356	10.75	10180	9.39	11960	8.53	80496	10.17
Both (housing unit & land)	78642	14.49	12552	11.58	17987	12.84	109181	13.80
Neither housing unit nor land	380278	70.05	79376	73.22	102130	72.88	561784	70.98
Not stated	2133	0.39	717	0.66	1778	1.27	4628	0.58
Total	**542892**	**100**	**108406**	**100**	**140130**	**100.00**	**791428**	**100.00**

Source: National Population and Housing Census, 2021

4.4.10.3 Occupational Status

As for the total population of individuals involved in various economic activities, the table below shows that 42.13% of female population are only involved in various income generating activities. This female population involved economic activity only comprise of 40.50% out of the total female population in Kathmandu Valley.

Table 4.4-15: Population of individuals employed or involved in various occupation or industry in Kathmandu Valley

S.No.	Industry	Kathmandu Valley					
		Male		Female		Total	
		No.	%	No.	%	No	%
1	Agriculture, forestry and fishing	87136	6.07	105917	7.37	193053	13.44
2	Mining and quarrying	3791	0.26	1407	0.10	5198	0.36
3	Manufacturing	67790	4.72	41312	2.88	109102	7.60
4	Electricity, gas, steam and air conditioning supply	8326	0.58	1815	0.13	10141	0.71
5	Water supply; sewerage, waste mgmt. and remediation activities	5867	0.41	2022	0.14	7889	0.55
6	Construction	86934	6.05	52149	3.63	139083	9.68
7	Wholesale and retail trade; repair of motor vehicles and motorcycles	160372	11.17	145306	10.12	305678	21.28
8	Transportation and storage	54136	3.77	3709	0.26	57845	4.03
9	Accommodation and food services activities	42563	2.96	25354	1.77	67917	4.73
10	Information and communication	19562	1.36	6822	0.47	26384	1.84
11	Financial and insurance activities	30969	2.16	29766	2.07	60735	4.23
12	Real estate business activities	10052	0.70	1164	0.08	11216	0.78
13	Professional, scientific and technical activities	23622	1.64	8856	0.62	32478	2.26
14	Administrative and support service activities	21061	1.47	9737	0.68	30798	2.14
15	Public administration and defense	47460	3.30	10245	0.71	57705	4.02
16	Education	32556	2.27	39575	2.76	72131	5.02
17	Human health and social work activities	20630	1.44	27367	1.91	47997	3.34
18	Arts, entertainment and recreation	21681	1.51	8513	0.59	30194	2.10
19	Other service activities	74422	5.18	68229	4.75	142651	9.93
20	Activities of households as employers	7858	0.55	12887	0.90	20745	1.44
21	Activities of extra-territorial organizations and bodies	4005	0.28	2740	0.19	6745	0.47
22	Industry not stated	376	0.03	233	0.02	609	0.04
	Total	**831169**	**57.87**	**605125**	**42.13**	**1436294**	**100.00**

Source: National Population and Housing Census, 2021

4.4.10.4 Status of Health and well-being (access to healthcare and services, reproductive health, maternal health, mental health)

Regarding number of deaths among female of various age category recorded as per NPHC 2021 data is 997 with different causes. Number of deaths due to pregnancy and within 6 weeks of delivery is 29 which shows the status of maternal health of Kathmandu Valley despite the access to health services and technology.

Table 4.4-16: Number of female deaths by broad age group of the deceased and their status at death, NPHC 2021

Status at death/ Age Group	Kathmandu							Bhaktapur							Lalitpur							Kathmandu Valley							
	15 - 24 Years		25 - 34 Years		35 - 49 Years		Total	15 - 24 Years		25 - 34 Years		35 - 49 Years		Total	15 - 24 Years		25 - 34 Years		35 - 49 Years		Total	15 - 24 Years		25 - 34 Years		35 - 49 Years		Total	
	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	No.	%
Pregnancy	2	0.30	2	0.30	3	0.45	7	0	0	0	0	0	0	0	0	0	1	0.54	1	0.54	2	2	0.20	3	0.30	4	0.40	9	0.90
Delivery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Within 6 weeks of delivery	0	0	9	1.36	3	0.45	12	1	0.68	0	0	1	0.68	2	1	0.54	3	1.61	2	1.08	6	2	0.20	12	1.20	6	0.60	20	2.01
Other	81	12.20	150	22.59	414	62.35	645	13	8.84	35	23.81	97	65.99	145	23	12.37	52	27.96	103	55.38	178	117	11.74	237	23.77	614	61.58	968	97.09
Total	**83**		**161**		**420**		**664**	**14**		**35**		**98**		**147**	**24**		**56**		**106**		**186**	**121**	**12.14**	**252**	**25.28**	**624**	**62.59**	**997**	**100**

Source: National Population and Housing Census 2021

4.4.10.5 Status of Gender-Based Violence and Protection (rates of domestic violence, sexual violence and other forms of abuse; support system- shelters, police protection and access to justice and legal process)

As per annual fact sheet on gender-based violence between July/ August 2021 to June/ July 2022 published by Nepal Police, there were 417 cases of sexual violence registered in Kathmandu Valley as compared with the total of 3,461 cases registered in the country. Also, there were 3,058 cases of domestic violence registered in Kathmandu Valley as compared with the total of 17,000 cases registered across the country. There were 526 cases of suicide registered in the valley as compared with the total of 6,792 cases registered in the country.

Table 4.4-17: Number of different types of crime cases registered in Nepal and Kathmandu Valley

S.No.	Crime	Total registered cases	Kathmandu Valley
1.	Rape	2380	323
2.	Attempt to Rape	655	37
3.	Child Sexual Abuse	314	55
4.	Unnatural Intercourse	31	1
5.	Abduction and rape	72	1
6.	Murder and Rape	9	0
7.	Polygamy	809	91
8.	Child Marriage	52	2
9.	Domestic Violence	17000	3058
10.	Witchcraft Allegation	49	1
11.	Human Trafficking	145	20
12.	Illegal Abortion	37	2
13.	Caste-based Discrimination and Untouchability	15	1

Source: Nepal Police, Annual Fact Sheet on Gender-Based Violence (2022)

4.4.10.6 Political Representation

The data on elections in Kathmandu Valley shows a significant underrepresentation of women in political leadership roles, with fewer female candidates holding positions such as Mayor, Deputy Mayor, or Ward Chairperson. This highlights the need for greater efforts to promote gender equality and increase female participation in local politics, ensuring diverse representation in decision-making processes. Following tables shows political representation of women at local level.

Table 4.4-18: Number of Elected women in Kathmandu District

S.No.	Municipalities	Local Election 2079 B.S. (2017A.D.)			Total Wards
		Mayor/ Chairperson	Deputy Mayor/ Chairperson	Ward chairperson	
1	Kathmandu Metropolitan		1		32
2	Kageshwori		1		9
3	Kirtipur		1	1	10
4	Gokarneshwor		1		9
5	Chandragiri		1		15
6	Tokha		-	1	11
7	Tarakeshwor		1		11
8	Dakshankali		1		9
9	Nagarjun		1		10
10	Budhanilkantha		1	1	13
11	Shankharapur		1		9
Total			10	3	138

Source: Election Commission Nepal, 2022

Table 4.4-19: Number of Elected women in Bhaktapur District

S.No.	Municipalities	Local Election 2079 B.S. (2017A.D.)			Total wards
		Mayor/ Chairperson	Deputy Mayor/ Chairperson	Ward chairperson	
1	Chagunarayan				9
2	Bhaktapur		1		10
3	MadhyapurThimi				9
4	Suryabinayak		1		10
Total			**2**		**38**

Source: Election Commission Nepal, 2022

Table 4.4-20: Number of Elected women in Lalitpur District

S.No.	Municipalities	Local Election 2079 B.S. (2017A.D.)			Total wards
		Mayor/ Chairperson	Deputy Mayor/ Chairperson	Ward chairperson	
1	Lalitpur Metropolitan		1		29
2	Godawari Municipality		1		14
3	Mahalaxmi Municipality		1		10
Total			**3**		**53**

Source: Election Commission Nepal, 2022

As shown in the above tables, none of the three districts in Kathmandu Valley has female Mayor or Chairperson leading municipalities or rural municipalities office. In Kathmandu district altogether 10 women are in the role of Deputy Mayor of municipalities or Deputy Chairperson of rural municipalities. While in Bhaktapur and Lalitpur district, there are 2 Deputy Mayor or Deputy Chairperson each. The number of female representatives in such position being high is due to the constitution arrangement and Local Government Operation Act 2017 which provision for the representation of female political representatives in the position. However, in overall number of positions in local government, number of female political representatives are in less number.

4.5 Disaster

4.5.1 Earthquakes

A Total of 20 earthquake of magnitude between 4 and 4.7 has been recorded in Kathmandu Valley (Kathmandu, Bhaktapur and Lalitpur) from 2015/01/01A.D. to till date. The details of the recorded earthquake incidents are presented in the Table 4.5-1.

Table 4.5-1: Record of Earthquake Incidents Observed in Kathmandu Valley

S.No.	(Date in AD and time in UTC)		Latitude	Longitude	Magnitude	Epicenter
	Date	Time				
1.	4/26/2015	10:08	27.67	85.3	4	Lalitpur
2.	4/26/2015	12:43	27.71	85.43	4.6	Bhaktapur
3.	4/26/2015	06:00	27.67	85.28	4	Kathmandu
4.	4/26/2015	05:25	27.69	85.25	4	Kathmandu
5.	4/27/2015	09:36	27.67	85.29	4.5	Kathmandu
6.	5/1/2015	2:56 AM	27.68	85.3	4	Kathmandu
7.	5/13/2015	2:07	27.68	85.3	4.2	Kathmandu
8.	5/16/2015	09:35	27.45	85.31	4.2	Lalitpur
9.	5/20/2015	02:47	27.52	85.26	4.4	Lalitpur
10.	5/26/2015	08:00	27.54	85.43	4.3	Lalitpur
11.	6/5/2015	08:31	27.7	85.22	4	Kathmandu
12.	6/17/2015	00:13	27.68	85.28	4.4	Kathmandu
13.	6/26/2015	09:00	27.58	85.39	4.1	Lalitpur
14.	7/22/2015	16:29	27.7	85.32	4.6	Kathmandu
15.	8/11/2015	04:57	27.7	85.29	4.3	Kathmandu
16.	10/8/2015	07:15	27.57	85.31	4	Lalitpur
17.	11/30/2015	00:25	27.78	85.39	4.1	Kathmandu
18.	4/9/2016	13:20	27.65	85.31	4.5	Lalitpur
19.	2/16/2019	14:49	27.68	85.27	4	Kathmandu
20.	6/10/2022	20:51	27.7	85.41	4.7	Bhaktapur

Source: Seismological Center Nepal, Earthquake database search (Gorkha, 2015–2025), accessed 18 Oct 2025.

4.5.2 Flood and Landslide

This Preliminary Loss and damage Assessment of the September 2024 flood and landslides provides an initial finding of the loss and damage caused by the floods and landslides that occurred during 26 to 28 September 2024, presenting an analysis of the damage across multiple sectors. The total estimated loss is **NPR. 46,684,318,550** reflecting significant disruptions to physical infrastructure sector, social sectors, and the productive sector, highlighting the urgent need for recovery and reconstruction efforts. The details of the loss and damages in different sectors has been represented in the table below:

Table 4.5-2: Details of loss and damages

Sectors	Loss and Damage Data				Total Estimated Loss (NPR)
Physical Infrastructure	Numbers Affected		Estimated Loss		
Bridges	44		1,042,000,000		
Telecommunication	446		152,305,000		
Water Supply and Sanitation	1678		5,906,000,000		
Hydropower	26		3,018,000,000		38,923,435,000
Roads	41		27,980,000,000		
Public Transportation	84		72,98,80,000		
Public Buildings	-		95,000,000		
Total	-		38,923,435,000		
Social Sector	Damage		Affected Population		
	Fully Destroyed	Partially Destroyed	Displaced families	Affected Families	-
Housing and Human Settlements	5996	13049	10807	16241	-
Health	6	33	-	-	2,17,00,000
Education	6	136	-	-	70,250,000
Productive Sector	Area	Number of	Estimated Loss		-

Sectors	Loss and Damage Data			Total Estimated Loss (NPR)
	(Hectare)	Livestock		
Agriculture and Livestock	65,380	26,698	5,882,812,500	5,882,812,500
	Number of Irrigation projects		Estimated Loss	
Irrigation	7		1,350,000,000.00	1,350,000,000.00
Total Economic Loss in NPR				**46,684,318,550**

Source: National Disaster Risk Reduction and Management Authority (NDRRMA, 2024)

In late September 2024, Nepal experienced unprecedented rainfall that led to severe flooding and landslides across the country. Continuous rainfall from September 26 to 28 resulted in widespread devastation, claiming numerous lives and causing significant infrastructure damage. This preliminary report aims to assess the loss and damage incurred from these events, providing essential insights for recovery and future disaster preparedness. The Department of Hydrology and Meteorology (DHM) reported that out of 222 rainfall measurement stations across Nepal, 77 recorded heavy rainfall, with some areas receiving over 200 millimeters in just 24 hours. Notably, Kathmandu experienced its highest rainfall on record, surpassing previous measurements set in 2002. The Tribhuvan International Airport station recorded 239.7 millimeters of rain, highlighting the intensity of the weather system affecting the region.

The damage caused by floods and landslides to the social sector, specifically housing and human settlements, is presented in Table 4.5-3. These impacts by floods and landslides include the destruction of homes, displacement of residents, and damage to community infrastructure. In many cases, affected families lose not only their shelter but also access to basic services such as water, sanitation, and electricity. The disruption often leads to long-term socio-economic challenges, including loss of livelihood and increased vulnerability to future disaster.

Table 4.5-3: Destroyed houses and affected families

S. No.	Province	District	Fully Destroyed Houses	Partially Destroyed Houses	Displaced Families	Affected Families
1.	Bagmati	Kathmandu	0	0	0	0
2.		Lalitpur	302	1040	10	504
3.		Bhaktapur	0	0	0	0
Total			**302**	**1040**	**10**	**504**

Source: National Disaster Risk Reduction and Management Authority (NDRRMA, 2024)

The human impact and emergency response overview by district show that the Valley Region, comprising Kathmandu, Lalitpur, and Bhaktapur, faced a heavy toll, with 70 deaths, 37 injuries, and 6 missing persons. Notably, Kathmandu reported 1,442 rescues and 3,060 police operations, highlighting the extensive rescue and relief efforts in the nation's capital

Table 4.5-4: Details on diverse level of impact across Kathmandu Valley

S.No.	Province	District	Human Impact				
			Dead	Injured	Missing	Rescued	Police force Operation
1.	Bagmati	Kathmandu	19	18	1	1442	3060
2.		Lalitpur	46	16	5	660	1100
3.		Bhaktapur	5	3	0	56	350
Total			**70**	**37**	**6**	**2158**	**4510**

Source: National Disaster Risk Reduction and Management Authority (NDRRMA, 2024)

In Kathmandu Valley, Lalitpur also experienced a significant impact on educational institutions, with 31 schools affected. Many schools suffered structural damage, making some buildings unsafe for students and staff. This disruption led to the temporary closure of several schools, affecting the continuity of education of many children.

Table 4.5-5: Details of Educational Institution affected

S.No.	Province	District	Affected Municipalities/ Rural Municipality	Number of Affected Schools
1.	Bagmati	Kathmandu	-	0
2.		Lalitpur	Mahalaxmi Municipality, Lalitpur Metropolitan City, Godawari Municipality	31
3.		Bhaktapur	-	0
Total				**31**

Source: National Disaster Risk Reduction and Management Authority (NDRRMA, 2024)

In Kathmandu Valley, Lalitpur District faced partial damage to six bridges of various types, which are critical infrastructure; however, the financial loss has not been specified.

Table 4.5-6: Details of Bridge affected

S.No.	Province	District	River/ Stream	Number of Bridges	Status	Loss (NPR)
1.	Bagmati	Kathmandu	-	0	-	-
2.		Lalitpur	Various	6	Partial damage	-
3.		Bhaktapur	-	0	-	-
Total				**6**	**-**	**-**

Source: National Disaster Risk Reduction and Management Authority (NDRRMA, 2024)

4.6 Climate Change

4.6.1 Urban Heat Island (UHI)

The study analyzes urban heat variation and temperature lapse rates in Kathmandu Valley, highlighting the impact of rapid urbanization on temperature rise. Using in-situ and satellite data, the research found that the urban core is significantly warmer than surrounding areas, with an average temperature difference of 4.07°C between 1990 and 2020. The highest temperature recorded in the city was 32.86°C in August 2020, while the lowest was 3.67°C in January 2020. Satellite data from 2000-2020 confirmed that urban heat intensity is highest in the core city, with urban heat island (UHI) values ranging from 21.06 to 26.09. The study also assessed temperature lapse rates, revealing a normal temperature decline with increasing altitude, with the highest lapse rate of -12°C/km in Godavari and the lowest at -2.74°C/km in Machhegau. The findings emphasize Kathmandu Valley's increasing urban heat and highlight the need for further research and mitigation strategies to address urban heat island effects and temperature inversion risks. (Thapa, et al., 2023).

The Kathmandu Valley is experiencing the Urban Heat Island (UHI) effect, where urban areas exhibit higher temperatures than their rural surroundings due to factors like dense construction, heat-absorbing materials, and waste heat from human activities. On June 10, 2024, temperatures in the valley reached 34.4°C, underscoring this phenomenon. Research indicates that administrative units such as Kathmandu, Bhaktapur, and Lalitpur have higher average land surface temperatures (LST), ranging from 22.1°C to 36.9°C in March and June, respectively. Additionally, studies have observed a 5°C temperature difference between forested and developed lands in the valley, with an annual increase of 0-2°C over 18 years. To mitigate UHI effects, strategies like implementing green roofs, using lighter-colored building materials, and enhancing urban green spaces are recommended. (Bajracharya, Mukhia Ph.D, & Sharma, 2024)

The study analyzes the Urban Heat Island (UHI) effect in Kathmandu Valley using the Local Climate Zone (LCZ) classification, Landsat satellite imagery, and GIS-based techniques. It highlights the impact of rapid urbanization, where built-up areas exhibit higher land surface temperatures (LST) than surrounding natural landscapes. Findings indicate temperature differences of 2-4°C within urban zones and 5-10°C between built-up and land cover types, confirming the presence of UHI. Compact low-rise and mid-rise areas have the highest LST,

while forests and water bodies remain the coolest. The study emphasizes the need for sustainable urban planning, green spaces, and climate-sensitive policies to mitigate rising urban temperatures in Kathmandu Valley. (Thapa Chettri, Deo, & Regmi, 2022)

The study examines urban climate change in Kathmandu Valley, highlighting the significant impact of rapid and unmanaged urbanization on land use and temperature. From 1990 to 2021, the built-up area expanded by 30.7%, while agricultural land declined by 33.59%, leading to a temperature increase of 0.038°C per year. Green spaces have decreased, with the Normalized Difference Vegetation Index (NDVI) dropping from 35.59% to 29.17%, intensifying the Urban Heat Island (UHI) effect, particularly in urban centers like Tribhuvan International Airport, Patan Industrial Area, Kritipur, and Kalanki. The study correlates rising land surface temperatures (LST) with decreased vegetation, emphasizing that urban expansion has transformed Kathmandu into a heat island. The findings suggest the urgent need for mitigation strategies, including increasing green spaces, promoting low-carbon infrastructure, and improving urban planning to counteract the negative environmental and health impacts of climate change. (Pantha, Aryal, & Shrestha, 2024)

4.6.2 Groundwater Resources

The study examines the impact of climate change on groundwater resources in Kathmandu Valley, highlighting concerns over over-extraction and declining groundwater levels. Using climate models and hydrological simulations, the research projects a decrease in groundwater recharge, with reductions ranging from 3.3 to 50.7 mm/year under RCP 4.5 and 19 to 102.1 mm/year under RCP 8.5 scenarios. The study found that the central areas of Kathmandu Valley are more vulnerable to groundwater depletion, while the northern and southern regions show higher resilience. The research emphasizes the urgent need for sustainable groundwater management strategies, including monitoring, conservation, and policy interventions to mitigate the negative effects of climate change on water availability in the valley. (Shrestha, Neupane, Mohanasundaram, & Pandey, 2020)

4.6.3 Rainfall

The study analyzes rainfall variability in Kathmandu Valley from 1971 to 2013 using data from 18 meteorological stations. Findings reveal significant spatial and temporal fluctuations, with monsoon contributing 80% of annual rainfall, while winter, pre-monsoon, and post-monsoon seasons contribute 2.8%, 13.6%, and 3.6%, respectively. The highest rainfall occurs in July (447.8 mm), while November sees the lowest (6.5 mm). Rainfall distribution varies with elevation, with upper regions receiving more precipitation than lower valley areas. The study observes a declining trend in annual rainfall, averaging a decrease of 0.96 mm per year. The results emphasize the increasing risk of water scarcity in non-monsoon months, highlighting the need for better water resource management. (Bagale, Devkota, Adhikari, & Aryal, 2023)

The study classifies and analyzes climate variations in Kathmandu Valley from 1976 to 2006 using data from nine meteorological stations. It identifies "C" (humid mesothermal) as the dominant climate type, with subtypes "Cwa" (subtropical monsoon) and "Cwb" (tropical upland) varying across locations. The valley has experienced a warming trend exceeding global averages, with a temperature increase of 0.8°C per decade. Seasonal precipitation patterns are uneven, with Kakani receiving the highest summer rainfall and Thankot experiencing the most winter precipitation. Climate type alterations were minimal over 30 years, occurring mainly in Godavari, Khumaltar, Panipokhari, and Thankot. These findings suggest that while warming is evident, its impact on climate classification in Kathmandu Valley has been limited (Kattel, 2008)

4.6.4 Flood

In early March 2025, Kathmandu Valley witnessed one of the most devastating flood events in over a decade. Torrential rainfall triggered widespread flooding and landslides, causing severe damage to life and property. As reported by *The Himalayan Times* on March 7, 2025, 49 people

lost their lives nationwide, with 21 fatalities recorded in Kathmandu Valley alone. According to Nepal Police, Kathmandu and Lalitpur each recorded 9 deaths, while 3 people died in Bhaktapur. Additionally, 728 individuals were rescued from various affected locations. The situation became critical as major rivers, including the Bagmati, Bishnumati, and Dhobikhola, swelled beyond danger levels, reaching the edges of roads and residential areas. The Home Ministry advised people living along the riverbanks to immediately relocate to safer zones (*Subedi, 2025*).

A key contributor to the disaster was a midnight flash flood that began at around 2:00 AM, lasting for nearly four hours. This sudden and intense downpour inundated about 400 houses located in low-lying areas along rivers such as Bagmati and Bishnumati, resulting in property damage worth millions. Areas most severely affected included Macchapokhari, Dallu, Teku, Tahachal, Balkhu, Jorpati, Sankhamul, Thapathali, and Anamnagar, where floodwaters entered densely populated and often unplanned urban settlements. The Department of Hydrology and Meteorology reported 121.5 mm of rainfall at Tribhuvan International Airport, the highest single-day rainfall in Kathmandu since 2008. Other locations also recorded dangerously high rainfall, including Nagarkot (122.8 mm) and Sankhu (101.2 mm), confirming the widespread intensity of the storm (Satyal, 2025).

In Lalitpur, the situation mirrored the crisis in Kathmandu. The Bagmati River overflowed its banks, especially in the southern parts of the city, threatening nearby settlements. The floodwaters caused damage to homes and infrastructure and forced emergency teams to evacuate residents. Poor drainage systems and dense urbanization worsened the effects of the flooding in Lalitpur. The local authorities worked in coordination with national rescue services to manage evacuations and prevent further loss of life. The impact in Lalitpur was part of the wider emergency that spanned all three districts in the valley (Subedi, 2025).

In Bhaktapur, the Hanumante River breached its banks after 14 hours of continuous rain, flooding over 650 houses, especially in vulnerable riverside slum settlements. Areas such as Hanuman Ghat, Ram Mandir in Suryabinayak, Shanti Niketan Secondary School in Barahisthan, and neighboring localities were submerged. The flooding followed a familiar annual pattern, as areas like Radheradhe, Balkot, Chardobato, and Jadibuti along the Hanumante and Manohara Rivers were again affected. The Department of Hydrology and Meteorology warned of further risk in Changunarayan and Suryabinayak, where landslides could occur due to saturated soil. Residents were urged to remain alert and follow evacuation notices to minimize casualties and damage (Nepal Khabar, 2025).

More recently, on 4 October 2025, continuous rainfall caused flooding along the Bagmati River and other river corridors in Kathmandu Valley, particularly affecting Balkhu, Teku, Sanepa, Manohara, and Chyasal. Among the nine automatic flood monitoring stations in the area, the Bagmati–Khokana station recorded a water level of 3.58 m, exceeding the warning level of 3.50 m, while the Manohara–Balkumari station recorded 4.43 m, exceeding the critical threshold of 4.40 m and continuing to rise. The increasing water levels affected residential areas and public spaces, while residents, vehicles, and property in vulnerable areas were moved to safer locations. Government agencies, local authorities, and security forces were mobilized for evacuation and emergency response. The event highlights the continuing flood vulnerability of riverbank settlements and infrastructure in Kathmandu Valley and the importance of early warning, flood monitoring, preparedness, and timely evacuation measures (RSS, 2025)

Chapter 5: Scoping of Key Environmental and Social Issues

5.1 Identification of Potential Strategic Impacts

5.1.1 Typical Project Factors

The master plan to mitigate traffic congestion in Kathmandu Valley includes the hard mitigation measure and the soft mitigation measures. The proposed projects of hard mitigation measure including improvement of road, winding road, construction of new flyover or bridge, other traffic management projects, and installing mass transit will establish transportation structures such as embankment, winding, flyover, river bridge, rail and stations for mass transportation.

i. Potential New Infrastructure:

- Bus-exclusive lane development (elevated)
- Bus park development
- AGT (Automated Guideway Transit) development (elevated)
- MRT (Mass Rapid Transit) development (elevated)
- Yard development
- Station-area redevelopment related to Transit-Oriented Development (TOD)

ii. Improvement of Existing Facilities:

- Road improvements related to BRT (Bus Rapid Transit) implementation (including road widening)
- Road improvements related to LRT (Light Rail Transit) implementation (including road widening)
- Intersection improvements (including flyover construction)

Typical Project Factors, which will cause negative impact on environmental and social condition due to the implementation of specific projects proposed in the MP, are listed as follows.

a. Pre-Construction/ Construction Stage

- Land clearing, excavation, and earthwork
- Operation of construction machinery and heavy equipment
- Transportation of construction materials
- Installation of temporary facilities (construction yard, camp, access roads)
- Groundwater abstraction and dewatering
- Generation and management of construction waste
- Worker camp operation
- Soil erosion and sediment runoff
- Emission of dust, noise, and vibration
- Vegetation removal and habitat modification

b. Operation Stage

- Facility operation resulting in emissions and effluents

- Increase in traffic and users
- Energy consumption and greenhouse gas emissions
- Maintenance and repair activities
- Operational noise, vibration, and lighting
- Induced development (ancillary facilities, commercial activities)

5.1.2 Scoping

In consideration of the characteristic of environmental and social condition in the study area and the project factors, items which will be environmental and social negative impact are identified. When the potential impacts on pollution, natural environment, and social environment are expected due to the implementation of the project activities, the items are marked as "✓". Expected impacts shall be assessed based on the case that avoidance and mitigation measures are not taken.

[Evaluation of Scoping Stage]

"✓" : Some potential impacts are expected and/or impacts are not unknown at this moment, need more investigations.

Blank : Positive Impact, No negative impacts or impacts are negligible, no further study required.

Preliminary scoping was carried out based on the potential impacts by implementation of the urban transport project, as shown in Table 5.1-1. These impacts were evaluated in each of the three stages separately, namely: Pre-Construction Stage [PCS], Construction Stage [CS], and Operation Stage [OS].

Table 5.1-1 Preliminary Scoping Matrix

S.No.	Item	Selection Status		Reasons for Selection
		PCS/ CS	OS	
Pollution Control				
1	Air Quality	✓		[CS] Construction vehicles may cause air pollution temporarily. [OS] An improvement in air quality due to a reduction in vehicle emissions and particulate matter resulting from the increased use of public transportation is expected.
2	Water Quality	✓	✓	[CS] Construction activities including the soil runoff from the works of embankment and cutting, construction vehicles, camp yards may cause water pollution. [OS] Discharge water from the facilities in the stations and parking areas may cause water pollution in water bodies
3	Waste	✓	✓	[CS] Construction waste, soil and trees to be cut may be generated through construction activities. There is a possibility of domestic waste from labor camp, If any. [OS] Waste from stations and parking areas will be generated.
4	Soil Contamination	✓		[CS] There is a possibility of soil contamination by oil leakage from the construction machines. In case the soil at project areas is already contaminated, the construction works may diffuse contaminated soil. [OS] Operation of roads, bridge and mass transit may not cause soil contamination, both directly and indirectly.
5	Noise and Vibration	✓	✓	[CS] Construction heavy vehicles and equipment may cause noise and vibration temporarily. [OS] Ambient noise and vibration along a road, a bridge and a mass transit may cause negative impact on sensitive receivers such as residential area, school, and hospital.
6	Ground Subsidence	✓	✓	[CS/OS] There is a possibility of ground subsidence due to the groundwater down in the underground section and cut and cover section.
7	Offensive Odor	✓		[CS] There is a possibility of occurrence of offensive odor by construction activities. [OS] Operation of roads, bridge and mass transit may not cause offensive

S.No.	Item	Selection Status		Reasons for Selection
		PCS/ CS	OS	
				odor, both directly and indirectly.
8	Bottom Sediment			[CS] Basically, there are no activities causing impact on bottom sediment, such as impact on the river bottom sediment by flown soil caused by earthwork. [OS] Operation of roads, bridge and mass transit may not cause bottom sediment, both directly and indirectly.
Natural Environment				
9	Protected Area			[CS] There is one national park named the Shivapuri Nagarjun National Park in north of Kthmandu Valley. In case of projects traversing in or around the protected areas, construction works, such as cutting of trees or changing land use may cause impact to the protected area. Since the location is outside of area where some improvement projects are installed, it is expected that there is no potential impact on protected areas. [OS] There are no protected areas affected.
10	Ecosystem	✓	✓	[CS] The project may cause impact on ecosystem due to the change of habitat conditions along the project site, such as cutting trees, [OS]There is a possibility that the change of the surrounding environmental conditions, such air quality, noise/vibration and lighting, would influence the surrounding ecosystem due to the change of traffic condition.
11	Hydrology	✓	✓	[CS/OS] There is a possibility of changes in hydrology because the project may cross some rivers.
12	Topography and Geology	✓		[CS] Topography might change caused by excavation and filling works, land slide and erosion of land surface due to construction works. [OS] Operation of roads, bridges and mass transit may not cause geographical and topographical changes, both directly and indirectly.
Social Environment				
13	Land Acquisition and Resettlement	✓		[PCS] Land acquisition and resettlement are required to secure land for roads, bridges, mass transit and other facilities/structures. [CS/OS] No additional resettlement is expected.
14	Poverty	✓		[PCS/CS] Vulnerable groups including poor households may be targets of resettlement. Some of them may get or lose their livelihood during construction phase. [OS] No additional impact on poverty groups.
15	Ethnic Minority and Indigenous People	✓	✓	[PCS/CS/OS] Ethnic minority are living along the project area.
16	Local Economy such as Employment and Livelihood	✓		[PCS] Land acquisition and resettlement may have impact on livelihood. [CS] Employment opportunity can be created due to the construction of the project. [OS] No additional impact is expected during operation stage.
17	Land Use and Usage of Local Resources	✓		[PCS] Land use and local resources, such as forests of the target areas for land acquisition may change. [OS] Projects may contribute to rural development along the area with changes of land use.
18	Water Usage	✓	✓	[CS] River water and/or ground water may be affected by earthworks. In addition, existing social infrastructure including irrigation system or wells may be affected by land acquisition and construction. [OS] Operation of roads, bridge and mass transit may cause impact on water usage both, directly and indirectly.
19	Existing Social Infrastructure and Services	✓	✓	[PCS/CS] Existing social infrastructure including water supply and sewerage network, electricity distribution line, gas-pipeline, irrigation system or wells may be affected physically by land acquisition and construction. [OS] New roads, bridges or mass transit may bring positive impact on exiting road networks around the area. On the other hand, there is a possibility of physical community diversion in case a new mass transit traverses in a community.
20	Social Institutions such as Socially Related Capital and Decision-making	✓	✓	[PCS/CS] Disadvantages due to physical diversion of a community caused by construction of a new road, bridge, or mass transit may effect on decision-making or socially- related capital. [OS] There would be no impact on social capital or local decision-making organizations

S.No.	Item	Selection Status		Reasons for Selection
		PCS/ CS	OS	
	Organizations			
21	Misdistribution of Benefit and Damage	✓	✓	[PCS/CS] Construction of a new road or bridge may cause disadvantages originating from physical diversion of a community.
22	Local Conflicts of Interest	✓	✓	[CS] Conflict caused by imbalance between PAPs on land acquisition and those who may obtain job opportunities related to projects. [OS] Conflict caused by imbalance of development opportunities along the road
23	Cultural Heritage	✓	✓	[PCS/CS] Due to the presence of seven major archaeological sites and numerous cultural facilities deeply rooted in the Kathmandu Valley, which are registered with UNESCO, it is essential to be mindful of the potential negative impact on these cultural heritage sites and facilities resulting from the project. There is concern about the potential impact on cultural heritage and related events due to access control measures associated with the construction activities. [OS] The negative impact on significant cultural heritage and facilities is limited. If the structures are constructed adjacent to the cultural heritage, indirect negative impacts would be concerned due to some environmental change such as in the movement of people or wind.
24	Landscape	✓	✓	[CS/OS] When constructing structures such as a flyover or elevated structures for railways in urban areas, there is concern about the potential impact on the landscape as a cultural heritage city.
25	Gender	✓		[CS] While construction generates positive impact on gender by providing work opportunities for both sexes, there is a possibility that working conditions or wage may be different by gender. [OS] Improved access by the project may cause positive impact on gender.
26	Children's Right	✓		[CS] There is a possibility of child labor. [OS] Due to the improvement of traffic congestion of existing road, travel time to schools and hospitals will become faster and safer.
27	Infectious Diseases such as HIV/AIDS	✓		[CS] Infectious diseases are possible to be spread due to inflow of construction workers. [OS] Operation of the Project may not cause impact on infectious diseases, both directly and indirectly.
28	Labor Environment including Safety	✓		[CS] Due to construction activities, labor environment may be affected. [OS] Operation of the project may not cause impact on labor environment, both directly and indirectly.
Others				
29	Accident	✓		[CS] The increase in construction-related vehicle traffic may raise the likelihood of accidents involving construction workers and residents in the vicinity. [OS] Pedestrian safety will be ensured through the effective management of traffic flow as a result of improvement in the urban transportation system.
30	Transboundary Impact and Climate Change		✓	[CS] Significant deforestation is not expected in this project and construction period and areas are limited. [OS] The improvement of the urban transportation system is expected to lead to a decrease in greenhouse gas emissions, as it ensures a smooth road traffic environment.

Project Stage; PC: Pre-Construction Stage, CS: Construction Stage, OS: Operation Stage Impact Rating;
✓: Some negative impacts are expected and/or impacts are not unknown at this moment, need more investigations.
Blank : No impacts or impacts are negligible, no further study required (under the general situation)
Source: JICA Expert Team

5.1.3 TOR of Impact Assessment

As the results of scooping, items evaluated as negative impact (i.e. "✓" in the column of Impact Check) in Table 5.1-1 will need further examination. Table 5.1-2 shows the TOR for SEA. Basically, survey for environmental and social considerations is carried out based on collected

secondary data and key informant interview. Possible impact caused by project implementation will be evaluated qualitatively based on existing secondary data, interview of concerned parties and examining project design.

Table 5.1-2 TOR for Environmental and Social Considerations Survey

Environmental Items	Survey Items	Survey Methods
Pollution Control		
Air quality	· Environmental standards · Current air quality condition · Traffic Condition in the future · Examining possible impact at the construction and operation phases	· Collecting the latest secondary data · Confirming the contents of MP and proposed project · Qualitative evaluation based on collected data
Water quality	· Environmental standards · Current water quality condition · Location of Water body and Water use · Examining possible impact at the construction and operation phases	· Collecting the latest secondary data · Confirming the contents of MP and proposed project · Qualitative evaluation based on collected data
Waste	· Examining mitigation measures for waste generated by construction activities	· Confirming the project design and general construction activities · Qualitative evaluation based on collected data
Soil Contamination	· Environmental standards · Examining mitigation measures for soil contamination caused by construction activities	· Confirming the project design and general construction activities · Qualitative evaluation based on project design
Noise and vibration	· Environmental standards · Current noise and vibration condition · Traffic Condition in the future · Examining possible impact at the construction and operation phases	· Collecting the latest secondary data · Confirming the contents of MP and proposed project · Qualitative evaluation based on collected data
Offensive odor	· Examining possible impact at the construction and operation phases	· Confirming the general construction activities · Qualitative evaluation based on collected data
Natural Environment		
Flora, fauna and biodiversity	· Examining possible impact at the construction and operation phases	· Collecting existing information on considerable species such as listed species on IUCN Red list · Qualitative evaluation based on collected data and interview results
Hydrological situation	· Examining possible impact at the construction and operation phases	· Collecting existing information
Topography and geographical features	· Examining possible impact at the construction and operation phases	· Collecting existing information · Confirming the general construction activities · Qualitative evaluation based on collected data
Social Environment		
Land Acquisition and Resettlement	· Law and regulation · Examining possible impact due to implementation of the project	· Check the satellite image · Qualitative evaluation based on collected data
Poverty	· Examining possible impact due to implementation of the project	· Collecting existing information · Interview of concerned agencies · Qualitative evaluation based on collected data and interview results
Ethnic people	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data and interview results

Environmental Items	Survey Items	Survey Methods
Local economy such as employment and livelihood	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Land use and utilization of local resources	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Water Usage	· Examining possible impact due to implementation of the project	· Collecting existing information · Confirming the general construction activities · Qualitative evaluation based on collected data
Social institutions such as local decision-making institutions	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Existing Social Infrastructure and Services	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Misdistribution of benefit and damage	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Local Conflicts of Interest	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Cultural Heritage	· Confirming location of cultural heritage · Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data and interview results
Landscape	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Gender	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Children's Right	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Infectious Diseases such as HIV/AIDS	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Labor environment including safety	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Others		
Accident	· Examining possible impact due to implementation of the project	· Collecting existing information · Qualitative evaluation based on collected data
Transboundary impact and climate change	· Examining possible impact due to implementation of the project	· Collecting existing information · Confirming the general construction activities · Qualitative evaluation based on collected data

Source: JICA Expert Team

Chapter 6: Environmental and Social Impact Assessment

6.1 Identification of Potential Strategic Impacts

6.1.1 Derivative, secondary, and cumulative impacts and impacts associated with indivisible projects

JICA Guidelines for Environmental and Social Considerations, 2022, required that in addition to the direct and immediate impacts of projects, the derivative, secondary, and cumulative impacts as well as impacts associated with indivisible projects are also to be examined and assessed, so far as it is rational. As a result of the analysis of derivative impacts, secondary impacts, cumulative impacts, and impacts related to inseparable projects in the SEA, the impacts on the KVUTS-MP are summarized in the table below.

Table 6.1-1 Consideration of Derivative, secondary, and cumulative impacts and impacts associated with indivisible projects in SEA on KVUTS-MP

Impact to be Considered	Description
Derivative, secondary, and cumulative impacts	Based on the information currently available and within the scope of impacts that can reasonably be considered, no significant derivative or secondary impacts associated with the implementation of the KVUTS-MP have been identified. In addition, based on the projects and plans currently known, no specific projects or other activities have been identified that would warrant particular consideration in terms of cumulative impacts.
Impacts associated with indivisible projects	Since this master plan is for the urban transportation system, forecasts of future transportation demand took into account projected population growth, urbanization trends, planned new town developments, and the anticipated urban structure of the Kathmandu Valley, while also considering development projects proposed by relevant agencies. The 2050 transportation demand forecast takes into account the population growth associated with the aforementioned developments. Consequently, the impacts of future development in the Kathmandu Basin have been considered as far as indivisible project

Source: JICA Expert Team

Continuous and comprehensive baseline data covering the entire study area are not yet fully available. As a result, there are certain limitations in quantitatively assessing the combined or cumulative impacts of all sub-projects proposed in KVUTS-MP in a fully integrated manner.

In light of this, the assessment focuses on those impacts that can be reasonably examined based on the information currently available. In particular, trends in traffic volumes and the road sections where improvements in congestion are anticipated can be identified with a reasonable degree of confidence. Accordingly, the potential reduction in CO_2 emissions is presented as a representative indicator of the broader regional environmental effects that may be associated with implementation of the Master Plan. The reduction in CO2 is explained in Section 6.2.1 of this report.

6.1.2 Environmental and Social Impact Assessment Matrix

The result of environmental and social impact assessment is illustrated in the following tables. The impacts in Pre-Construction Stage [PCS]/ Construction Stage [CS], and Operation Stage [OS], respectively were classified as A to D for the items with ✓ in the scoping matrix table, in accordance with the following criteria,:

A+/-: Significant positive/negative impact is expected. B+/-: Positive/negative impact is expected to some extent. C: Extent of impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses) D: No impact is expected at this stage.

Table 6.1-2 Result of Environmental and Social Impact Assessment

S.No.	Item	Scoping		SEA		Current Condition (Regional Environmental and Social Characteristics)	Expected Potential Impact
		PCS/ CS	OS	PCS/ CS	OS		
Pollution Control							
1	Air Quality	✓		B-	B+/-	**Exceedance of Standards:** Data from seven monitoring stations show that PM2.5, PM10, and TSP widely exceed National Ambient Air Quality Standards (NAAQS). In the city core (Ratnapark), PM2.5 exceeded standards on approximately 67% of measured days (179/268) and PM10 on 44% (119/269). Regarding other parameters, there is no continuous monitoring data available for pollutants such as NOx, SOx, and CO from relevant secondary data sources. National Ambient Air Quality Standards for Nepal, 2026 is published. **Seasonal Variation:** Pollution peaks during the pre-monsoon (April–May) and decreases sharply during the monsoon (June–August). For example, PM2.5 at Bhaisipati reached 123.6 µg/m³ in May but dropped to 41.8 µg/m³ in June. **Vehicular Impact:** Approximately 30.2% of diesel vehicles failed emission inspections. While trucks make up only 2.3% of the vehicle fleet, they contribute approximately 80% of vehicular emissions. **Health Impact:** Respiratory hospitalizations consist of COPD (39.5%), pneumonia (29.1%), and ARI (15.3%), with children and the elderly being the most affected.	[CS] In consideration of current residential land use in Kathmandu City, temporary negative impacts are expected on air quality due to exhaust gas and dust generated from construction activities. Exhaust gas such as NOx, SOx, CO TSP, PM10, PM2.5 will be generated from construction machines, equipment and traffic congestion around the construction yard due to the temporary traffic restriction. And dust will be generated by earth work including foundation excavation for piers, tunnels, transporting of earth-and-sand, etc. [OS] Ambient air quality along existing roads is already impacted by current traffic exhaust gas. Since it is expected that traffic flow will be smoother by improvement road network and shifting vehicles from existing roads to new mass transportation, air quality along the road will be improved. On the other hand, there is a possibility of increasing vehicles. In that case, air quality along the road might get worse than the current condition.
2	Water Quality	✓	✓	B-	B-	**River Pollution:** The seven major rivers in the city (Bagmati, Bishnumati, etc.) are severely polluted by untreated sewage, industrial effluents, and solid waste. Many urban sections show Dissolved Oxygen (DO) levels below 2 mg/L and BOD exceeding 50 mg/L. **Upstream vs. Downstream:** Upstream quality (e.g., near Dhap Dam) is relatively good, but downstream areas (e.g., Balkhu, Chovar) show extreme pollution with high COD and microbial loads. **Pond Contamination:** Ponds like Rani Pokhari show alarming levels of fecal contamination and high alkalinity. Most ponds in Kathmandu Valley have degraded water quality because of urbanization, sewage intrusion, and poor management. High levels of organic and microbial contamination, consequently posing public health risks and highlighting the need for improved pollution control and pond restoration. **Standard**: National Drinking Water Quality Standard, 2022	[CS] Construction activities, especially near river corridors, including the soil runoff from the works of embankment and cutting, construction vehicles, camp yards may cause water pollution, because of the turbid water generated from excavation areas due to surface run-off or the improper management of wastewater. Additionally, domestic wastewater may be discharged from the labor camps [OS] No serious impacts are expected, because there is no plan of service / parking area for road project. However, discharged wastewater from the facilities in the stations of mass transit and parking areas, if any, may cause water pollution in water bodies.

S.No.	Item	Scoping		SEA		Current Condition (Regional Environmental and Social Characteristics)	Expected Potential Impact
		PCS/ CS	OS	PCS/ CS	OS		
3	Waste	✓	✓	B-	B-	**Generation and Composition:** Kathmandu Metropolitan City (KMC) generates approximately 235 tons of waste per day, of which 75.2% is organic and 24.8% is inorganic (plastics, paper, etc.). The average daily per capita waste generation is 210g. **Management:** Waste is generally collected in a mixed state with limited segregation at the source. **Final Disposal:** The Sisdol landfill has reached its capacity. Since May 2022, the Banchare Danda sanitary landfill has been operational, serving 16 municipalities and designed to last up to 100 years if proper waste segregation is practiced. **Rule:** Solid Waste Management Rule, 2013.	[CS] Construction waste, including waste soil, muck waste from tunnels, asphalt mass and cutting trees are expected through construction activities. There is a possibility of domestic waste from labor camp, If any. [OS] Waste from stations and depot of mass transit projects may be generated.
4	Soil Contamination	✓		B-	D/B-	There is no public secondary quantitative baseline data (e.g., heavy metal concentrations)	[CS] There is a possibility of soil contaminant by oil leakage from the construction machines, wastewater from tunneling work / piling construction/excavation process, if wastewater is discharged /leaked due to the unexpected leakage/ mishandling of oil and other chemicals. If the soil in the project areas is already contaminated, the construction works may diffuse contaminated soil. [OS] There is no factor in occurring the soil contamination by road projects. However, there is a possibility of soil contaminant caused by oil leakage during maintenance work at depot for mass transportation.
5	Noise and Vibration	✓	✓	B-	B+/-	**Standard Exceedance:** National Sound Quality Standard, 2012 and WHO standards are exceeded in almost all commercial, residential, and silent zones. Amrit Campus in a silent zone recorded an average of 80.46 dB(A), far exceeding the national daytime standard of 50 dB(A). **Sources:** The primary sources are identified as vehicular traffic and loudspeakers. **Vibration:** There is no public secondary quantitative baseline data. There is no national standard for vibration.	[CS] In consideration of current land use temporary negative impacts are expected on ambient noise due to higher noise and vibration generated from construction machines and equipment. [OS] Ambient noise and vibration along existing roads is already impacted by current vehicle traveling. Though it is expected that traffic flow is smooth by shifting from existing road to new bypass, noise and vibration level might increase because of the increase in traffic and travelling speed of vehicles as well as installing new mass transit facilities.
6	Ground Subsidence	✓	✓	B-	B-/C	**Risk Factors:** High dependence on groundwater for drinking and domestic use has led to a continuous decline in water tables. Climate change scenarios predict a decrease in annual recharge by up to 102.1 mm (under RCP 8.5), raising concerns about future land subsidence from a geological perspective. **Risk of Ground Shaking :**The Kathmandu Valley is covered	[CS/OS] Basically, there are no activities causing ground subsidence, such as large-scale groundwater pumping. The extent of impact is unknown, because there is no detail amount of ground water and geographical test data, and no decided proposed ROW and tunnel excavation methodology at this moment. In case of large amount of discharge water and/or worse ground foundation than

S.No.	Item	Scoping		SEA		Current Condition (Regional Environmental and Social Characteristics)	Expected Potential Impact
		PCS/ CS	OS	PCS/ CS	OS		
						by thick, soft lacustrine sediments, including clay, sand, and gravel. These geological conditions may amplify ground shaking during earthquakes and increase the risk of liquefaction.	expectations, there is a possibility of ground subsidence, due to the tunnel construction. To clarify the baseline condition of geographic mechanism including ground water level and geological test shall be conducted along with the proposed alignment during the feasibility study.
7	Offensive Odor	✓		B-	D	**Current Status:** There is no public secondary quantitative baseline data. There is no national standard for offensive odor. Odors originate from severely polluted rivers with high organic loads and low DO, improper solid waste management, and the disposal of animal carcasses along roadsides.	[CS] There are no direct project-related activities that can generate offensive odor due to the general road construction; however, impact of construction basecamp operations may have temporary impact, if any. [OS] Operation of roads, bridge and mass transit may not cause offensive odor, both directly and indirectly.
8	Bottom Sediment			D	D	**Current Status:** As for the river sediment, the results of sediment monitoring in the Bagmati River indicate that sediment concentrations tend to rise during July, August, and September, which correspond to the monsoon season in Kathmandu. There is no other public secondary quantitative baseline data of bottom sediment, but the long-term discharge of untreated sewage and industrial effluents into rivers has likely led to the accumulation of pollutants in sediments. Disturbance of these sediments during river widening or bridge construction is recognized as a strategic concern.	[CS] Basically, there are no activities causing impact on bottom sediment, such as impact on the river bottom sediment by flown soil caused by earthwork. [OS] Operation of roads, bridge and mass transit may not cause bottom sediment, both directly and indirectly.
Natural Environment							
9	Protected Area			D	D	Shivapuri Nagarjun National Park (SNNP): A 159 km² reserve in the north (960–2732m altitude) featuring pine, oak, and rhododendron forests. It hosts Himalayan black bears and leopards, serves as the Bagmati River's source, and contains significant religious sites.	[CS] In case of projects traversing in or around the protected areas, construction works, such as cutting of trees or changing land use may cause impact to the protected area. Since the location is outside of area where some improvement projects are installed, it is expected that there is no potential impact on protected areas. [OS] There are no protected areas affected.
10	Ecosystem	✓	✓	B-	B+/-	**Flora**: Vegetation varies by altitude: Schima-Castanopsis at lower levels, Quercus at middle, and pure oak at high altitudes. Forest patches like Pashupati and Gokarna exist in the valley floor. **Fauna**: Includes the endemic Spiny Babbler, endangered Red Panda, Leopard, Sambar Deer, and Himalayan Tahr. Within the city, there are plantings along roadsides, along rivers, and in parks.	[CS] Construction activities and existence of road structures may have some impact, such as damage of existing road/river side trees and vegetation on surrounding ecosystem along the project alignment. Though there is no reserved forest within the urban area most of existing trees within ROW will be cut down or replanted depending on the final design and construction process. [OS]There is a possibility that the change of the surrounding environmental conditions, such air quality,

S.No.	Item	Scoping		SEA		Current Condition (Regional Environmental and Social Characteristics)	Expected Potential Impact
		PCS/ CS	OS	PCS/ CS	OS		
							noise/vibration and lighting, would influence the surrounding ecosystem due to the change of traffic conditions.
11	Hydrology	✓	✓	B-	B-	**Observation**: 13 stations monitor systems like Bagmati, Bishnumati, and Manohara. Khokana station has the largest drainage area (606.06 km²). All rivers merge into the Bagmati and exit via Chovar. Urbanization-driven impervious surfaces increase runoff and flash flood risks. **Water Level**: The results of monthly river water level average indicate that water level is changing between 0.1 m to 1.8m, and tend to rise during July, August, and September, which correspond to the monsoon season in Kathmandu.	[CS/OS] There is a possibility of unexpected discharge of ground water due to the tunnel excavation. To clarify the baseline condition of geographic mechanisms including groundwater level and flow, geological tests shall be conducted along with the proposed alignment during the feasibility study. The amount of water use and source during construction, construction methodology and road structures shall be clarified during the feasibility study. Many of the proposed projects are in areas that have already been developed and include the renovation and expansion of sections where existing roads are congested. However, in areas where new above ground and underground structures will be built, the impact on urban green spaces including roadside trees, and groundwater infiltration capacity may be impacted.
12	Topography and Geology	✓		B-	D	**Formation**: Originates from a paleo-lake (late Pliocene to early Pleistocene) filled with up to 600m of fluvial/lacustrine sediments. **Risks**: The soft sedimentary layers amplify seismic waves and pose high liquefaction risks, especially in clay-dominated areas like Thimi and Gongabu. **Rules**: Soil and Watershed Conservation Rule, 1986 has been framed in exercising the power conferred by the Soil and Watershed Conservation Act, 1982.	[CS] Topography might change caused by excavation and filling works, land slide and erosion of land surface due to construction works. There is a possibility of topsoil erosion in the construction site during monsoon season (July-September). [OS] Operation of roads, bridges and mass transit may not cause geographical and topographical changes, both directly and indirectly.
Social Environment							
13	Land Acquisition and Resettlement	✓		B-	B+	**Sensitivity**: Extremely difficult and socially sensitive due to high density and soaring land prices in urban areas. Land acquisition issues at major intersections and urban centers are recognized as potential barriers to implementation.	[PCS] Land acquisition and resettlement are required to secure land for roads, bridges, mass transit and other facilities/structures. To clear the project affected people, their assets and compensation, identification of landowner, socio-economic survey, inventory survey and market value survey for preparation of the Resettlement Action Plan shall be conducted during the feasibility survey. [CS/OS] No additional resettlement is expected.
14	Poverty	✓		B+/-	D	**Asset Scarcity**: ~71% of female-headed households, in the Valley own neither land nor a house, representing a	[PCS/CS] The project may bring positive impact on local economy through construction activities and rural

S.No.	Item	Scoping		SEA		Current Condition (Regional Environmental and Social Characteristics)	Expected Potential Impact
		PCS/ CS	OS	PCS/ CS	OS		
						population highly vulnerable to physical and economic displacement from development. **Impact on Vulnerable:** Squatters (Sukumbasi) along river corridors face high risks of exclusion from compensation and loss of livelihood due to lack of legal land titles. (as of February 2026)	development. Some poor groups may be negatively affected by the project if their properties are acquired and/or their livelihood is lost by the project. [OS] No additional impact on poverty groups.
15	Ethnic Minority and Indigenous People	✓	✓	B-/C	B-/C	**Diversity**: Home to 131+ ethnic/caste groups. Newars (23.6% total) maintain strong cultural roots, particularly in Bhaktapur (35.6%) and Lalitpur (31.1%).	[PCS/CS/OS] Ethnic minorities are living along the project area. The extent of impact is unknown, because the project location and affected areas are not decided yet. There might be ethnic minority and/or indigenous people in and around the project site and they might be affected by the project. The location and relation between ethnic/caste groups living area and the project site shall be verified through the feasibility study.
16	Local Economy such as Employment and Livelihood	✓		B+/-	B+	**Economic Hub**: Wholesale/retail/auto repair (21.5%) is the main industry. The Valley contributes ~31% to national GDP, though productivity is hindered by inefficient transport systems.	[PCS] land acquisition and resettlement may have impact on livelihood. [CS] Employment opportunities can be created due to the construction of the project. [OS] No additional impact is expected during operation stage. It is expected that the public transport reform will generate new operational and/or engineering jobs.
17	Land Use and Usage of Local Resources	✓		B-	B+	**Urban Sprawl:** Highly urbanized within 5km, with sprawl along roads in 5-10km. KVDA is planning "Nodal Development" and "Ishan New Town" to accommodate growth.	[CS] Loss of farmland and forests for new roads are expected, and land use may be changed along the road. Land and local resources such as trees of project affected households are also affected by resettlement activities. [OS] Improved transportation access is expected to lead to the more effective use of land and local resources. At the same time, the project has the potential to contribute to development along the route through changes in land use.
18	Water Usage	✓	✓	B-	D	**Groundwater Dependence:** Main source for domestic needs but faces declining levels due to over-extraction and pollution risks from untreated urban drainage.	[CS] River water and/or ground water may be affected by earthworks. In addition, existing social infrastructure including irrigation system or wells may be affected by land acquisition and construction. There is a possibility of unexpected discharge of ground water due to the tunnel excavation. To clarify the baseline condition of underground water use around the project area, inventory survey for wells shall be conducted during the during the feasibility study. Though water sources during construction is not decided at this moment, water use

S.No.	Item	Scoping		SEA		Current Condition (Regional Environmental and Social Characteristics)	Expected Potential Impact
		PCS/ CS	OS	PCS/ CS	OS		
							permission in line with regulation shall be approved by relevant agencies prior to the construction to avoid conflict with water users. The amount of water use and source during construction shall be clear during the feasibility study. [OS] Operation of roads, bridges and mass transit will not cause impact on water usage both, directly and indirectly.
19	Existing Social Infrastructure and Services	✓	✓	B-	D	**Barriers to Access**: Schools/hospitals are core-centric, but a lack of universal design in transport hinders access for PWDs (1.47%). Traffic congestion significantly delays ambulances.	[PCS/CS] There are many existing utilities (transmission lines, telecom lines, water lines, etc.) along the existing road. These infrastructures shall be protected and/or diverted before construction work. Inconvenient access to services due to traffic congestion by work vehicles. [OS] New roads, bridges or mass transit may bring positive impact on exiting road networks around the area.
20	Social Institutions such as Socially Related Capital and Decision-making Organizations	✓	✓	B-	D	**Complex Governance:** Multi-layered authority among federal, provincial, and 18 local governments over transport (e.g., FCCPTA disputes) complicates coordinated implementation.	[PCS/CS] Disadvantages due to temporary physical diversion caused by construction of proposed new road, bridge, or mass transit may affect decision-making or socially- related capital without any measures. [OS] There would be no impact on social capital or local decision-making organizations.
21	Misdistribution of Benefit and Damage	✓	✓	D	D	**Impact on Vulnerable:** Squatters (Sukumbasi) along river corridors face high risks of exclusion from compensation and loss of livelihood due to lack of legal land titles. (as of February 2026)	[PCS/CS/OS] Since this master plan is a plan to improve the urban transportation system throughout the Kathmandu Valley based on future transportation demand and land development, there will be no disparities in the benefits derived from addressing these issues.
22	Local Conflicts of Interest	✓	✓	B-	D	**Stakeholder Tension**: Conflicts exist over land acquisition and the transition from small private micro-operators to modern mass transit systems.	[CS] Conflict caused by imbalance between PAPs on land acquisition and those who may obtain job opportunities related to projects. [OS] In consideration of the purpose of the master Plan, local conflicts of interest are not expected.
23	Cultural Heritage	✓	✓	B-	B-	**Heritage:** Seven UNESCO sites, numerous temples, and "Jatras" are core to life. Sacred rivers like the Bagmati host ritual cremation, representing key cultural practices. Small temples and sacred trees are scattered throughout the town—in the middle of roads, on sidewalks, and at the foot of bridges. **HIA:** Heritage Impact Assessment (HIA) is a tool to ensure that development and conservation activities around heritage	[PCS/CS/OS] Due to the presence of seven major archaeological sites and numerous cultural facilities deeply rooted in the Kathmandu Valley, which are registered with UNESCO, it is essential to be mindful of the potential negative impact on these cultural heritage sites and facilities resulting from the project through Heritage Impact Assessment. There is concern about the potential impact on cultural

S.No.	Item	Scoping		SEA		Current Condition (Regional Environmental and Social Characteristics)	Expected Potential Impact
		PCS/ CS	OS	PCS/ CS	OS		
						properties do not cause unacceptable negative impacts, It requires legal justification and integration into official procedures.	heritage and related events due to access control measures associated with the construction activities. The negative physical impact on significant cultural heritage and facilities might be limited during operation of improved road network. If the structures are constructed adjacent to the cultural heritage, indirect negative impacts would be concerned due to some environmental change such as in the movement of people or wind.
24	Landscape	✓	✓	B-	B+/-	**Visual Integrity:** Traditional townscapes are key tourism assets.	[CS/OS] When constructing structures such as a flyover or elevated structures for railways in urban areas of capital city, there is concern about the potential impact on the landscape as a cultural heritage city. A key challenge is achieving harmony between the landscape of new urban structures and historic buildings.
25	Gender	✓		B+/-	B+	**Gender Barrier**: Female employment (42%) lags behind male. Harassment on public transport and neglect of "trip-chaining" patterns are major barriers to women's mobility.	[CS]: Temporary inconvenience to residents, commuters, and pedestrians because of construction activities is expected. On the one hand, the Project can provide additional employment opportunities during this phase, which women can take advantage of. However, there might be gaps on working conditions such as wage between men and women when local employment is considered. [OS] Improved access by the project may have positive impact on gender.
26	Children's Right	✓		B-	B+	**Child Welfare**: A youthful population makes children highly vulnerable to respiratory illnesses from air pollution. Traffic safety on school routes remains a critical issue. **Rules:** Child Labor (Prohibition and Regulation) Rules, 2006	[CS] There is a possibility of child labor. [OS] Due to the improvement of traffic congestion of existing roads, travel time to schools and hospitals will become faster and safer.
27	Infectious Diseases such as HIV/AIDS	✓		B-	D	**Health Risks:** High mobility at transport hubs and overcrowding in public vehicles pose risks for the spread of communicable diseases, requiring hygiene measures.	[[CS] Infectious diseases such as HIV/AIDS are possible to be spread due to inflow of construction workers. Furthermore, changes in the ground caused by cutting, excavation, and backfilling could result in unsanitary water conditions and, during the rainy season, create breeding grounds for mosquitoes that may transmit dengue fever and other waterborne diseases. [OS] Operation of the Project may not cause impact on infectious diseases, both directly and indirectly.
28	Labor Environment including Safety	✓		B-	D	**Worker Hardship:** Transport workers endure long hours (4am-8pm) in air/noise pollution. Lack of sanitation at bus stops leads to health risks like kidney problems. **Rules**: Labor	[CS] Due to construction activities, labor environment may be affected. Basically, safety must be ensured in compliance with domestic laws and regulations.

S.No.	Item	Scoping		SEA		Current Condition (Regional Environmental and Social Characteristics)	Expected Potential Impact
		PCS/ CS	OS	PCS/ CS	OS		
						Rule, 2018	[OS] Operation of the project may not impact on labor environment, both directly and indirectly.
Others							
29	Accident	✓		B-	B+	**Surge in Accidents**: Traffic crashes in the Valley have surged by 289% over the past decade, accounting for 44% of all accidents in Nepal. Major Causes: As of 2026, the primary causes are driver negligence (55%) and speeding (33%), with drunk driving (Ma.P.Se) averaging 608 cases annually. Recent Statistics: Between July and December 2025, 3,227 accidents were recorded, resulting in 105 deaths and 122 serious injuries. **Infrastructure Vulnerability**: Fatalities are especially concentrated on the high-speed Ring Road where the lack of median strips increases risks for pedestrians.	[CS] The increase in construction-related vehicle traffic may raise the likelihood of accidents involving construction workers and residents in the vicinity. [OS] Traffic and pedestrian safety will be ensured through the effective management of traffic flow as a result of improvement in the urban transportation system.
30	Transboundary Impact and Climate Change		✓	B-	B+	**Urban Heat Island (UHI):** The urban core is 4.07°C warmer than surroundings, with a decadal warming trend of 0.8°C and an annual increase of 0.038°C. Rainfall Variability: Annual rainfall is declining by 0.96mm/year, but 80% is concentrated in the monsoon, increasing risks of both water scarcity and floods. **Severe Flooding:** In March 2025, a record 121.5mm daily rainfall caused flash floods killing 21 people and submerging 400 houses in low-lying riverside areas. Impact on **Groundwater:** Projections suggest a decline in groundwater recharge by up to 102.1 mm/year under the RCP 8.5 scenario, threatening future water security. **Flood:** Flush floods occur in March and October 2025 in Kathmandu Valley.	[CS] Significant deforestation is not expected in this project and construction period and areas are limited. [OS] The improvement of the urban transportation system is expected to lead to a decrease in greenhouse gas emissions, as it ensures a smooth road traffic environment.

Note 1; Project Stage
PC: Pre-Construction Stage, CS: Construction Stage, OS: Operation Stage
Note 2; Impact Rating
[Scoping Stage]
✓ : Some negative impacts are expected and/or impacts are not unknown at this moment, need more investigations.
Blank : No impacts or impacts are negligible, no further study required (under the general situation)
[SEA staget]
A+/- : Significant positive/negative impact is expected.
B+/- : Positive/negative impact is expected to some extent.
C : Extent of impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)
D : No impact is expected at this stage.

Source: JICA Expert Team

6.2 Identification and approach of the Key Impact

6.2.1 Reduction of Greenhouse Gas (GHG)

Due to the implementation of sub-project of KVUTS MP including the improvement of existing road network and exiting road and installing new urban transport facilities, the traffic flow, speed will be improved and the traffic congestion problem will be solved. Therefore, the development of sub-project of KVUTS MP will make the reduction of air pollutant /Greenhouse gas from the vehicles.

6.2.1.1 Basic Formula for calculating emissions reductions

The emission reduction from the project activity is determined as the differences between the Emission of baseline scenario (e.g. continuation of the use of existing road network) and project scenario (realization of traffic congestion mitigation through road development, bridge construction, double track)

The basic formula for calculating emissions reductions is shown below. The weight of pollutants is calculated by multiplying fuel consumption by the emission intensity per unit of fuel for each type of fuel.

ERy = BEy - PEy

ERy : GHG emission reduction through the project in year (ton-CO2e/year)

BEy : GHG Emission from the baseline scenario in year (ton-CO2e /year)

PEy : GHG Emission from the project scenario in year (ton-CO2e /year)

6.2.1.2 Traffic Amount and Average Speed

Traffic volumes and average speeds based on traffic demand forecast (with project / without project) is shown in Table 6.2-1 and Table 6.2-2 respectively.

The most significant differences between the “with Project” and “without Project” scenario cases are the reduction in the number of buses, and the increase in average speed by the project. The decrease in the number of buses reflects the introduction of the Mass-transit system, the implementation of bus rationalization measures to improve operational efficiency, and the replacement of medium-sized buses with large ones. Meanwhile, the increase in average travel speed reflects the implementation of congestion-relief measures such as the addition of lanes through road widening in various locations and the grade-separated interchanges.

Table 6.2-1 Traffic Volumes and Average Speeds in 2050 (with Project)

Items	Motorcycles	Passenger cars	Buses	Large Trucks
A: Daily Mileage (PCU) by Vehicle Type	7,707,639	3,034,302	1,112,434	1,259,126
B: PCU Factor	0.3	1.0	2.1	2.5
C: Daily Vehicle-Kilometers by Vehicle Type	25,692,130	3,034,302	529,730	503,650
D: Annual Vehicle-Kilometers by Vehicle Type	9,377,627,450	1,107,520,230	193,351,624	183,832,396
E: Average Speed (km/hour)	16.7	14.7	17.9	25.4

Source: JICA Expert Team

Table 6.2-2 Traffic Volumes and Average Speeds in 2050 (without Project)

Items	Motorcycles	Passenger cars	Buses	Large Trucks
A: Daily Mileage (PCU) by Vehicle Type	7,776,225	2,989,939	2,549,788	1,267,972
B: PCU Factor	0.3	1.0	2.1	2.5
C: Daily Vehicle-Kilometers by Vehicle Type	25,920,750	2,989,939	1,214,185	507,189
D: Annual Vehicle-Kilometers by Vehicle Type	9,461,073,750	1,091,327,735	443,177,438	185,123,912
E: Average Speed (km/hour)	7.4	6.7	8.4	12.9

Source: JICA Expert Team

6.2.1.3 Emission Factor

According to the JICA Climate-FIT Version 7.0, March 2026, the emission intensity values utilized are based on the “Grounds for the Calculation of Motor Vehicle Emission Factors using Environment Impact Assessment of Road Project etc., National Institute for Land and Infrastructure Management, and, Ministry of Land, Infrastructure, Transport and Tourism, Japan (2012)” and “ Table 6, Appendices of JICA Climate-FIT Version 7.0, March 2026)”.

Table 6.2-3 CO2 Emission Factors by Vehicle Type

Average Travel Speed [km/h]	Gasoline Vehicles				Diesel Vehicles			
	Passenger Cars [g/km]	Trucks			Passenger Cars [g/km]	Trucks		
		Light-weight vehicles [g/km・t]	Medium-weight vehicles [g/km・t]	Heavy-weight vehicles [g/km・t]		Light-weight vehicles [g/km・t]	Medium-weight vehicles [g/km・t]	Heavy-weight vehicles [g/km・t]
5.0	233.0	233.2	272.5	272.5	414.5	229.2	227.7	115.3
10.0	172.3	180.4	210.8	210.8	321.1	177.6	176.4	96.3
15.0	121.2	135.4	158.2	158.2	242.5	134.1	133.2	77.2
20	117.0	120.6	140.9	140.9	217.7	120.4	119.6	71.3
25	103.4	109.3	129.2	129.2	193.7	107.1	107.8	65.0
30	93.9	100.9	120.5	120.5	175.1	97.4	99.0	59.7
35	86.7	94.4	113.8	113.8	160.1	90.0	92.2	55.3
40	81.3	89.4	108.6	108.6	148.0	84.1	86.9	51.7
45	77.2	85.4	104.6	104.6	138.2	79.5	83.0	48.9
50	74.2	82.5	101.5	101.5	130.4	75.9	80.2	46.7
55	72.1	80.4	99.4	99.4	124.5	73.2	78.4	45.3
60	70.7	79.1	98.2	98.2	120.2	71.2	77.6	44.5
65	70.1	78.5	97.7	97.7	117.6	70.0	77.7	44.4
70	70.2	78.6	98.0	98.0	116.5	69.5	78.7	44.9
75	70.9	79.5	98.9	98.9	116.9	69.5	80.6	46.1
80	72.2	81.0	100.7	100.7	118.9	70.2	83.4	48.0
85	74.1	83.1	103.1	103.1	122.2	71.5	86.9	50.5
90	76.5	85.9	106.1	106.1	127.1	73.4	91.3	53.6
95	79.5	89.3	109.9	109.9	133.3	75.8	96.6	57.4
100	83.1	93.3	114.3	114.3	140.9	78.8	102.6	61.8
105	87.2	98.0	119.4	119.4	150.0	82.3	109.4	66.9
110	91.8	103.2	125.1	125.1	160.4	86.4	117.0	72.6

Source : Grounds for the Calculation of Motor Vehicle Emission Factors using Environment Impact Assessment of Road Project etc., National Institute for Land and Infrastructure Management, and, Ministry of Land, Infrastructure, Transport and Tourism, Japan (2012)

Table 6.2-4 CO2 Emission Factors by Motorbike

Type	Unit	Emission Factor
Motorcycle	g- CO2 /passenger-km)	50

Source : Ministry of Land, Infrastructure, Transport and Tourism, Japan (2019) and Sustainable Transport : A Sourcebook for Policy-makers in Developing Cities (GTZ, 2007), Table 6 of Appendices of JICA Climate-FIT Version 7.0, March 2026)

6.2.1.4 Result of estimation of Greenhouse Gas (GHG)

The reduction in GHG emission is estimated as follows. Total 159,244 -CO2 will be reduced due to the implementation of KVTUS Master plan. Compared to the without project scenario, it will contribute to approximately 21 % reduction in GHG emissions.

Furthermore, in the “Project Implementation” scenario, while the number of passenger cars will increase, improvements in driving speed will lead to moderate fuel efficiency, resulting in a reduction in CO_2 emissions.

As with buses, the number of motorcycles decreases while their speeds improve. However, since the relationship between CO_2 emissions and speed changes for motorcycles has not been adequately modelled, this estimate assumes a constant CO_2 emission rate regardless of speed. If an appropriate emission coefficient model were adopted, greenhouse gas emissions from motorcycles are expected to decrease even further than the values calculated in the “Project Implementation” scenario shown below.

It should be noted that the projections below provide only a rough estimate of the effects of KVUTS MP. Therefore, further GHG reductions can be expected if policies such as increasing the share of electric vehicles and introducing high-quality fuels are implemented.

Table 6.2-5 Reduction of Greenhouse Gas (GHG) due to the implementation of MP

Classification / Case	CO2 emission (ton-CO2e/year)				Total ton-CO2e/year
	Motorcycles	Passenger cars	Buses	Large Trucks	
BEy 2050 (without)	434,263	228,414	83,726	27,689	774,091 (79.4%)
PEy 2050 (with)	430,433	140,827	23,928	19,660	614,847 (100%)
ERy 2050 (Without-with)	3,830	87,587	59,798	8,029	159,244 (20.6%)

Note:
BEy : GHG Emission from the baseline scenario in year (ton-CO2e /year)
PEy : GHG Emission from the project scenario in year (ton-CO2e /year)
ERy : GHG emission reduction through the project in year (ton-CO2e/year)
ton-CO2e/year : metric ton-carbon dioxide equivalent per year
Source: JICA Expert Team

6.2.2 Heritage Impact Assessment (HIA)

The Kathmandu Valley is home to seven major UNESCO World Heritage Sites as well as many important cultural facilities. To ensure the successful implementation of the proposed KVUTS Master Plan, including its subprojects, and to develop a well-functioning urban transport system, it is essential to carefully assess any potential adverse impacts of each project on these cultural heritage sites and facilities through the Heritage Impact Assessment (HIA). The purpose of the HIA and an outline of its procedures are presented below.

6.2.2.1 Procedure of HIA

Heritage Impact Assessment (HIA) is a tool to ensure that development and conservation activities around heritage properties do not cause unacceptable negative impacts. It requires legal justification and integration into official procedures to be effective (Department of Archaeology [DoA], 2021).

There are no standard procedures for assessing the impact of development and conservation works on cultural heritage. Previously, this task was dealt with by a component of an Environmental Impact Assessment (EIA). This was not satisfactory, particularly since the EIA procedure was not linked to the governance system for cultural heritage. To address this disparity HIA has been promoted particularly by the World Heritage Committee and the advisory bodies International Council on Monuments and Sites (ICOMOS) and International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM). The HIA procedure has been established not only to cater to World Heritage, but also to be used as standard procedure for all identified cultural heritage sites (DOA, 2021).

HIA is in the process of being embedded in the legislation of the Department of Archaeology. The draft of the sixth amendment of the Ancient Monument Preservation Act (AMPA 1956) has included provisions for HIA. The Act will only mention the establishment of HIA, leaving the details to be formulated separately. This gives the Department of Archaeology the authority to demand HIA wherever it is found necessary and defined by respective regulation (DOA, 2021).

The entire Heritage Impact Assessments process has three main components, which are (1) defining the need for the HIA, (2) carrying out the HIA and (3) monitoring and enforcing the HIA. (DOA, 2021), as shown in Figure 6.2-1.

The HIA procedure has been established with the following objectives to safeguard cultural heritage in the broad categories of heritage sites, monuments, historic buildings and cultural objects:

- To provide a permit system to control impact of proposed projects and activities on heritage.
- To mitigate the impact of past or ongoing projects or activities through assessments and recommendations for rectification.
- To plan measures to control risk of future projects or activities that could potentially impact heritage.

The involved parties in the HIA process include:

Actor	The person or legal body that carries out actions that could impact heritage
DOA	Department of Archaeology (Focal Authority) under the Ministry of Culture, Tourism and Civil Aviation. The DOA will be represented by the HIA Committee chaired by the Director General

Consultant	Professional with adequate experience and training to carry out HIA to be listed in a roster prepared by DOA
Advisory Body	A body of experts to advise the authorities on HIA to be decided by the Department of Archaeology. For issues concerning the World Heritage properties, ICOMOS Nepal is the suitable expert body.

Within the Department of Archaeology, a HIA Committee has been established, chaired by the Director General and with representation of each section within the DOA. The HIA Committee of DOA is the official authority taking the final decisions based on the recommendations of the HIA consultants and the advisory body.

The HIA procedure has been established as a tool to safeguard heritage in the broad categories of heritage sites, built structures and cultural objects. Furthermore, these categories can be also extended to the natural context and the associated intangible heritage. Should any activity threaten the value, authenticity or integrity of the heritage, a HIA can be considered necessary to find a means of halting or adapting the activities to bring the impact to an acceptable level.

The HIA process can only be initiated through the decision of the HIA Committee of the Department of Archaeology, and it is up to this HIA Committee to take the final decision on whether or not to have an HIA prepared. However, the HIA Committee can be informed on planned activities or ongoing activities that might impact heritage.

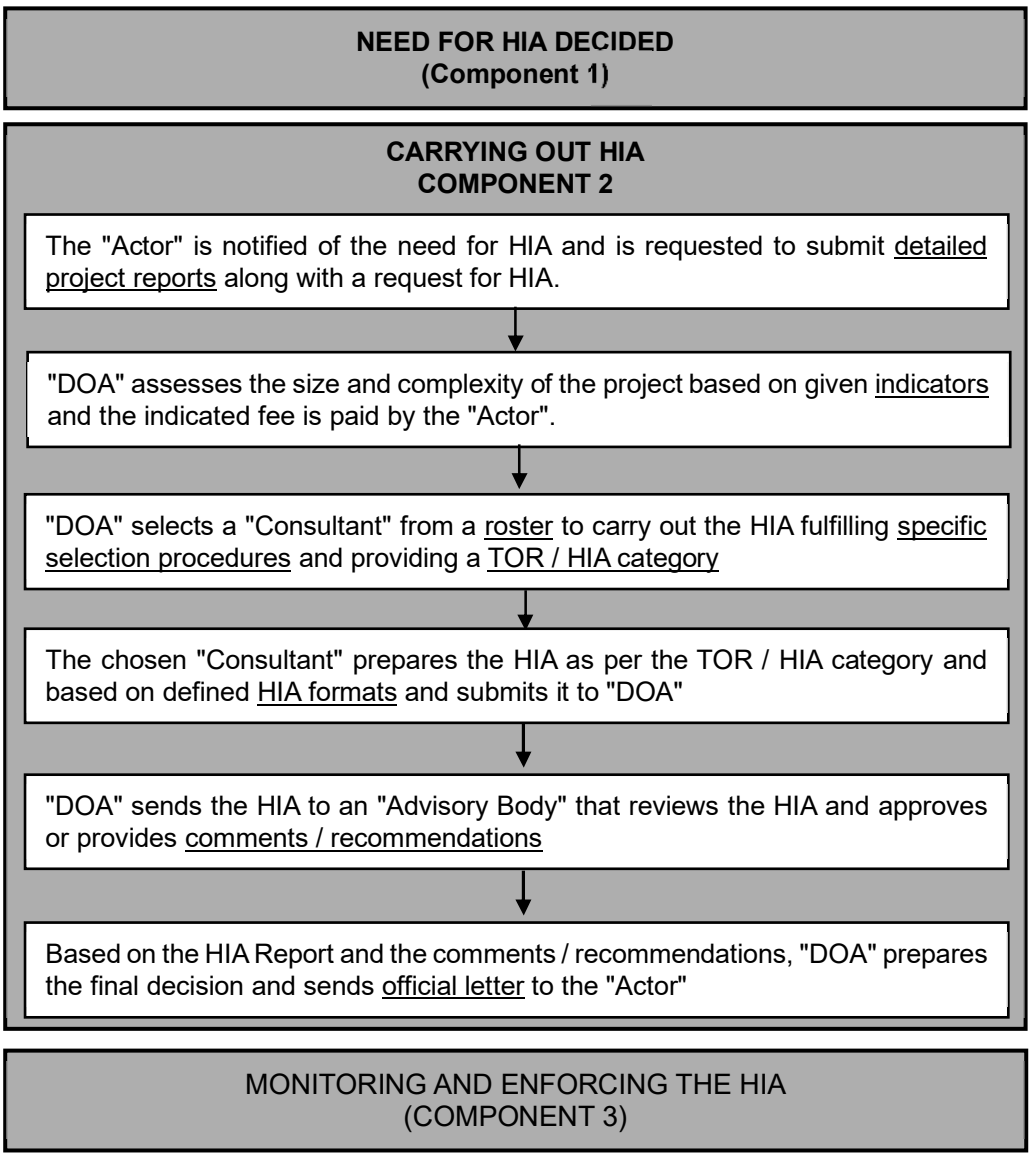
- HIA can be requested by the Actor, whether a private person, institution, government agency or international organization, in respect to planned activity in or around heritage that might be affected through their actions.
- HIA can be based on information provided by any person with sufficient justification of planned or ongoing activities that might impact of might be impacting heritage.
- HIA can be required by the courts for any legal case in respect to the protection of heritage, particularly related to private or community heritage.

Once the need for HIA has been identified, a clear process will be followed which is integrated into the system of governance and justified by legislation. During the process of carrying out the HIA, a full moratorium will be enforced on any activities linked to the given case. Such notification will be made to the Actor when requesting for detailed information on the planned or ongoing activities.

For the preparation of a Heritage Impact Assessment the following processes will be required.

- Process for Submitting the Detail Project Report for the HIA
- Process for Selection of Consultant by DOA
- Process of preparation and review of HIA
- Recourse process for Actors

Once the need of the HIA is decided, the Department of Archaeology notifies the Actor. Th actor then submits detailed project reports and the Department of Archaeology assesses the project / activity based on indicators. The Actors then needs to pay the relevant fees for carrying out the HIA. This then becomes the basis for selection of Consultants by DOA.



Refference: Heritage Impact Assessment in Nepal: Establishing Heritage Impact Assessment (HIA) in Nepal (Draft, 15 December 2021). Department of Archaeology, Ramshahpath, Kathmandu, Nepal

Citation: Department of Archaeology, 2021

Figure 6.2-1:Heritage Impact Assessment Procedure

6.2.2.2 Preliminary Screening of HIA

Based on the advice from relevant organizations through stakeholder meetings (Chapter 12), it is suggested that HIA should be conducted at the Pre-Feasibility Study (Pre-F/S) or Feasibility Study (F/S) stage for projects located within or in the vicinity of UNESCO World Heritage sites, monument protection zones, areas of archaeological significance, traditional urban landscapes, and major cultural processional routes.

During the feasibility study (FS) phase, the need for HIA screening must be reassessed in consultation with the DoA, taking into account the latest project status, including any underground excavation, construction of large-scale structures as well as the surrounding conditions and local customs. At this moment, we have determined that an HIA is particularly necessary for the proposed projects listed below.

Table 6.2-6 Preliminary Screening of HIAs for Proposed Projects in the KVUTS MP

No	Project	Remarks to be considered on Cultural Heritage
2	Chabahil-Gaushala Underground Tunnel	UNESCO world heritage area, Hydrology and Geoand Underground Section
3	Chabahil-Bagmati River Elevated Highway	Land Scape (Elevated Section)
4	Bishnumati River Corridor Elevated Highway	Land Scape (Elevated Section)
5	Widening Ring Road (Gaushala-Tinkune)	UNESCO world heritage area
6	New River Corridor (Thapathali-Tripureshwor)	Land Scape (Elevated Section), Temples
9	New Bridge (Bishnumati River)	Temple
15	Balaju Bishnumati River Corridor	Temple
17	Car Free Zone	Considering the reduction of traffic emission gases that impact cultural heritage, these measures are expected to be effective when implemented simultaneously
18	Cycling path	
22	Installation of Off-street Parking	
-	Mass Transit E-W line	Land Scape (Elevated Section), Temples

Source: JICA Expert Team

6.2.2.3 Challenges and Proposes on HIA procedures

Since there is insufficient experience with their implementation within Nepal, it is necessary to establish and implement HIA Terms of Reference (TOR) by referring to international practices based on the World Bank's ESS8, guidance from organizations such as UNESCO, and examples of HIA implementation in other countries. Additionally, it is required to conduct an HIA for proposed project in KVUTS MP that takes the following points into consideration.

- To address the methods for surveys to be conducted before and during construction, including hydrological and geological surveys, test excavations, and a Chance Find Procedure, as well as the procedures to be followed if buried cultural heritage is identified.
- To recommend measures to avoid, minimize, and mitigate impacts, as well as appropriate monitoring measures.
- To assess both tangible and intangible cultural heritage, and

To establish a coordination mechanism involving the DOA, PADT, and local authorities to help establish, coordinate, and review the HIA process and ensure its appropriate implementation.

6.2.3 Risk of Natural Disasters in the Kathmandu Valley

6.2.3.1 Key baseline information regarding Natural Disasters Risk

The Draft SEA report has already addressed flood and natural disaster risks in the Kathmandu Valley in detail, using hydrological characteristics (4.3.3), key natural hazard including earthquake-induced liquefaction, landslides, riverbank erosion, and flash floods (4.3.4), and recent flash-flood damage areas (4.6.4).

Based on the secondary baseline data mentioned above, it is summarized as follows.

The Kathmandu Valley is covered by thick, soft lacustrine sediments, including clay, sand, and gravel. These geological conditions may amplify ground shaking during earthquakes and increase the risk of liquefaction. In addition, rapid urbanization has increased impervious surfaces such as roads and buildings, resulting in increased stormwater runoff and a very high risk of flash floods during intense monsoon rainfall.

6.2.3.2 Consideration of Natural Disasters Risk

Considering the key baseline information of natural hazard risks, the following two groups of proposed projects in KVUTS MP require particular attention due to their structural and geographical conditions.

- Group1: Maharajgunj Underpass (No. 1), Chabahil-Gaushala Underground Tunnel (No. 2) and the underground section of the East-West Mass Transit Line
- Group 2. Bishnumati River Corridor Elevated Highway (No. 4) and other bridge and road projects along rivers （No. 3, 6, 7, 8～13, 15）

The proposed underground projects arerequired to conduct the hydrological survey and geological survey to finalize the locations, typed of structures, and construction methodology during Feasibility Study. In case of near heritage area, the result should be reflected in the HIA.

The proposed river corridor projects and bridge projects (Group2) are based on the premise that existing river structures and the watershed will not be altered and are designed around the concept of maximizing the use of existing roadside areas. With regard to the impact on the existing river ecosystem, the top priority is to select construction methods that do not directly alter it. Furthermore, in light of recent urban flooding incidents, the project will implement appropriate conservation measures to prevent turbid water from flowing into the river during construction, such as during the timing of construction work or due to topsoil erosion.

Additionally, as proposed in Chapter 7 of the Environmental Management Plan (EMP), the design will take geological, hydrological, and meteorological conditions into account to ensure that infrastructure structures are resilient to disasters.

Chapter 7: Environmental and Social Management Plan (ESMP) and Environmental and Social Monitoring Plan (ESMoP)

7.1 Environmental and Social Management Plan (ESMP)

7.1.1 Requirement of ESMP

The primary purpose of the ESMP is a fundamental operational tool designed to preserve positive impacts, mitigate adverse impacts, and address environmental and social concerns across all project phases. It includes specific measures to safeguard the environment and local communities, and procedures within an institutional framework for implementation and monitoring.

The core objectives of the ESMP include:

- Impact Response: Identifying specific, cost-effective responses to potential environmental and social risks.
- Resource Prioritization: Defining the means and resources required to meet regulatory and project requirements while prioritizing high-risk areas.
- Compliance Assurance: Ensuring strict adherence to national regulations and international standards.
- Verification and Feedback: Verifying environmental performance through systematic monitoring and establishing feedback loops for continual improvement and adaptive management in response to site changes.
- Budgetary Integration: Allocating sufficient resources within the project budget to ensure all mitigation measures are actionable.

7.1.2 Proposed ESMP

The proposed environmental and social mitigation measures should be practical and feasible. Table 7.1-1 presents the recommended mitigation measures for the typical environmental and social impacts of transportation projects during both the construction and operation phases. These are conservation measures for impacts anticipated from general construction activities and operations, as shown in the table below; however, they are not limited to these. Details will need to be reevaluated during the feasibility study (F/S) stage in accordance with the project's progress. This table serves as a kind of "framework" to ensure that key issues are not overlooked when conducting future detailed ESIA/IEE studies in the Kathmandu Valley. Since the Implementing/Responsible Organization filled in this Table are tentatively as a framework at this moment, they are to be clarified during the preparation in the EIA /IEE report.

In large-scale projects, depending on the severity of the impacts, specific individual plans may be required for areas such as labor management, occupational health and safety (OHS), pollution prevention, resettlement, biodiversity management, Indigenous Peoples' Development Programs (IPDPs), Gender Development Programs (GDPs), and cultural heritage management. Since Nepal lacks specific national standards or indicators for some of these areas, it is necessary to refer to international practices established by organizations such as the World Bank (WB), the Asian Development Bank (ADB), and the Japan International Cooperation Agency (JICA).

The Environmental Impact Assessment report provides the basis for the ESMP. Its successful implementation requires close coordination between the project's engineering and environmental teams to integrate mitigation measures into the detailed design.

All environmental and social management costs must be included as part of the project construction cost and clearly specified in the Bill of Quantities to ensure proper implementation. Key pre-construction activities, including land acquisition, RAP implementation, and forest clearance, should be completed before construction to avoid delays. Adequate funding should also be secured for long-term environmental measures, such as compensatory plantation and its required five-year maintenance under EPR 2020.

Table 7.1-1 Proposed General Environmental and Social Mitigation Plan

No.	Items (Impacts)	Expected Negative Impact	Proposed Mitigation Measures	Implementing Organization	Responsible Organization	Cost
Construction Stage						
1	Air Quality	- Dust dispersion caused by excavation work - Worsening air pollution caused by exhaust emissions from construction machinery and construction vehicles	- Water sprinkling to reduce particulate matter - Routine / periodic maintenance and washing of construction machinery and vehicles to minimize air pollutants - Preparation of traffic management plan - Develop and implement a construction traffic management plan - Announcement of construction work to surround resident - In the event of complaints from residents, review the additional mitigation measures including the construction schedule or location of heavy vehicles through communication with local people - Periodical monitoring to identify the change from baseline	Contractor	MOID	To be determined (TBD)
2	Water Quality	- Soil runoff from the works of embankment and cutting, construction vehicles, camp yards may cause water pollution.	- Preparation of adequate wastewater treatment plant - Installing sedimentation tank to reduce discharged turbid water - Cover exposed earth especially before heavy rains are expected. - Installing septic tanks for origin of polluted water such as camp yard - Periodical monitoring to identify the change from baseline	Contractor	MOID	TBD
3	Waste	- Construction waste, soil and trees to be cut may be generated through construction activities.	- Prepare Waste Management Program in consideration with LGU's waste management system - Education on waste treatment for workers - Separation of Hazardous waste and bring out to appropriate treatment facilities	Contractor	MOID	TBD
4	Soil Contamination	- Oil contamination by oil leakage from the construction machines. In case the soil at project areas is already contaminated, the construction works may diffuse contaminated soil.	- Necessary laboratory test to identify contaminated soil and mock for special cares - Find feasible treatment facilities or filling area in earlier stage of the project such as F/S - Periodical monitoring to identify the change from baseline	Contractor	MOID	TBD
5	Noise and Vibration	- Noise and vibration are generated by the operation of construction machinery and the movement of construction vehicles	- Develop and implement a construction traffic management plan - To avoid disturbance of daily life, construction time shall be set within daytime, especially residential condense areas. - Apply low-noise and vibration machinery as much as possible nearby - Provide the temporary noise barrier and/or fence around the construction yard near residential area, if necessary - Announcement of construction work to surround resident - In the event of complaints from residents, review the additional mitigation measures including the construction schedule or location of heavy vehicles through communication with local people - Periodical monitoring to identify the change from baseline	Contractor	MOID	TBD

No.	Items (Impacts)	Expected Negative Impact	Proposed Mitigation Measures	Implementing Organization	Responsible Organization	Cost
6	Ground Subsidence	- Ground subsidence caused by a drop in the groundwater level resulting from earthwork construction	- Soil investigation and evaluation of necessary ground improvement measures - Avoid extraction of ground water for construction - Applying replacement methods for soft soil areas based on further studies and discussion in F/S. - Monitoring to identify early symptoms of subsidence	Contractor	MOID	TBD
7	Offensive Odor	- Offensive odor from labor camps.	- Education and instruction of rules in camp yards to keep good hygiene	Contractor	MOID	TBD
8	Bottom Sediment	- Since no excavation work will be conducted on the riverbed or river structures, no impact is anticipated	- Examine construction methods and structures that do not affect river structures - Avoid the excavation work near river structure during rainy season	Contractor	MOID	TBD
9	Protected Area	- Since the sites for each project are located a sufficient distance from the protected area, no impact is expected.	- Clarify the boundary and buffers zone and core zone of protected area. - Communicate with MOAFE appropriately, and conduct the mitigation measures in line with the advice from relevant agencies	Contractor	MOID / MOAFE	TBD
10	Ecosystem	- Damage to existing roadside and riverside trees and vegetation due to construction activities. - Disturbance to surrounding ecosystems caused by removal or modification of existing vegetation. - Potential habitat alteration for local flora and fauna along the project alignment.	- Minimize tree cutting and vegetation removal through appropriate project design and construction planning. - Replant trees and restore vegetation in accordance with the final design and environmental management plan. - Implement measures to protect remaining vegetation and avoid unnecessary disturbance. - Monitor ecosystem conditions during construction and implement additional measures if significant impacts occur.	Contractor	MOID / MOAFE	TBD
11	Hydrology	- Unexpected groundwater discharge due to tunnel excavation. - Changes to groundwater levels and groundwater flow caused by tunnel excavation. - Increased pressure on water resources due to water use during construction. - Disturbance or alteration of river flow caused by riverbank construction for the river corridor project. - Impacts on the hydrological	- Avoid the excavation work during rainy season - Conduct geological and hydrogeological investigations along the proposed tunnel alignment during the feasibility study. - Establish baseline conditions for groundwater levels, groundwater flow, and geological characteristics before construction. - Clarify construction water demand and identify sustainable water sources during the feasibility study. - Select construction methods and road/tunnel structures that minimize impacts on groundwater and surface water. - Design and implement riverbank construction measures to minimize disturbance to natural river flow. - Monitor groundwater levels, groundwater flow, and river flow during and after construction, and implement corrective measures if significant impacts are observed.	Contractor	MOID	TBD

No.	Items (Impacts)	Expected Negative Impact	Proposed Mitigation Measures	Implementing Organization	Responsible Organization	Cost
		environment resulting from changes in river flow.				
12	Topography and Geology	- Changes in topography due to excavation and filling works. - Landslides caused by construction activities. - Land surface erosion resulting from construction works. - Topsoil erosion at construction sites during the monsoon season (July–September).	- Minimize excavation and filling works where practicable. - Implement slope stabilization and landslide prevention measures. - Apply erosion and sediment control measures, especially during the monsoon season. - Protect exposed topsoil and promptly restore disturbed areas through revegetation or other appropriate methods. - Monitor slope stability and erosion throughout the construction period.	Contractor	MOID	TBD
13	Land Acquisition and Resettlement	- Land acquisition for roads, bridges, mass transit, and other project facilities. - Physical and/or economic displacement of project-affected people. - Loss of land, housing, assets, and livelihoods due to resettlement. - Social and economic impacts associated with involuntary resettlement.	- Alignment discussion should be carefully done during F/S study to avoid and minimize resettlement - Preparation of appropriate RAP consistently with domestic and development partner's policies. - Preparation and implementation of livelihood restoration program measures in accordance with the RAP. - Continuous stakeholder meeting	Consultant, MOID, Local Government Units	MOID	TBD
14	Poverty	- Loss of property due to land acquisition. - Loss of livelihoods for affected households. - Disproportionate adverse impacts on poor and vulnerable groups.	- Appropriate RAP including livelihood restoration program (LRP) must be prepared consistently with domestic and development partner's policies. - Monitor the effectiveness of livelihood restoration and support programs.	Consultant, MOID, Local Government Units	MOID	TBD
15	Ethnic Minority and Indigenous People	- Potential impacts on ethnic minorities and/or Indigenous Peoples living in or around the project area.	- Identify ethnic minorities and/or Indigenous Peoples in and around the project area during the feasibility study. - Avoid or minimize impacts through project design where feasible. - Assess potential social and cultural impacts through appropriate surveys and consultations.	Consultant, MOID, Local Government Units	MOID	TBD
16	Local Economy such as Employment and Livelihood	- land acquisition and resettlement may have impact on livelihood. - Due to fleet consolidation and vehicle replacement, current bus drivers may be concerned about	- Appropriate RAP including livelihood restoration program (LRP) must be prepared consistently with domestic and development partner's policies with assistance for business disturbances. - Since the public transportation reform is expected to create new jobs in the operational and/or technical fields, it is necessary to provide appropriate vocational training and to implement the reform in a	Consultant, Contractor, MOID, Local Government Units	MOID	TBD

No.	Items (Impacts)	Expected Negative Impact	Proposed Mitigation Measures	Implementing Organization	Responsible Organization	Cost
		losing their jobs	systematic and phased manner.			
17	Land Use and Usage of Local Resources	- Changes in land use along the project corridor. - Loss of land and local natural resources (e.g., trees) owned by project-affected households.	- Appropriate RAP must be prepared consistently with domestic and development partner's policies. - Optimize the road alignment to reduce land use change and resource loss. - Provide fair compensation for affected land, trees, and other assets.	Local Government Units	LGUs	TBD
18	Water Usage	- Deterioration of river water and groundwater quality due to earthworks. - Impacts on existing water infrastructure, including irrigation systems and wells, caused by land acquisition and construction. - Unexpected groundwater discharge due to tunnel excavation. - Increased demand for water resources during construction.	- Avoid large amounts of extraction of ground water - Conduct an inventory survey of wells to establish baseline groundwater use during the feasibility study. - Assess construction water demand and identify appropriate water sources during the feasibility study. - Protect existing irrigation systems, wells, and other water infrastructure during construction. - Implement measures to control groundwater discharge during tunnel excavation. - Reuse of groundwater during construction projects - Monitor surface water, groundwater, and water use during construction and operation, and take corrective actions if necessary.	Contractor	MOID	TBD
19	Existing Social Infrastructure and Services	- Damage to existing utilities (e.g., transmission lines, telecom lines, water lines) during construction activities. - Disruption of utility services due to construction works. - Temporary inconvenience and reduced access to public services caused by utility relocation or diversion. - Traffic congestion caused by construction vehicles, affecting access and mobility.	- Preparation of Infrastructure Diversion Plan - Identify and map existing utilities before construction begins. - Protect, relocate, or divert existing utilities in coordination with relevant utility providers. - Implement construction plans to minimize disruption to utility services. - Appropriate / agreed compensation for owners of infrastructures to recover, divert, and replace. - Provide alternative access routes and maintain access to essential services during construction. - Develop traffic management plans to reduce congestion and minimize impacts from construction vehicles.	MOID, Local Government Units	MOID	TBD
20	Social Institutions such as Socially Related Capital and Decision-making Organizations	- Temporary disruption of access and mobility due to road, bridge, or mass transit construction works. - Potential impacts on social and economic activities due to limited connectivity and accessibility.	- Detour for securing reasonable accessibility to social institutions - Install clear signage and provide information on temporary traffic diversions. - Coordinate construction schedules to reduce impacts on daily activities and social services. - Restore normal access conditions promptly after completion of construction works.	Contractor	MOID	TBD
21	Misdistribution of	- Since the project is intended to	- Not applicable			

No.	Items (Impacts)	Expected Negative Impact	Proposed Mitigation Measures	Implementing Organization	Responsible Organization	Cost
	Benefit and Damage	improve traffic management in the Kathmandu Valley, no impact is expected.				
22	Local Conflicts of Interest	- Conflict caused by imbalance between PAPs on land acquisition and those who may obtain job opportunities related to projects.	- By developing and implementing a RAP based on international standards, transparent explanations and fair compensation payments will be ensured. - Conduct several times consultation meetings to clear the project boundary and the contents of RAP, to avoid misunderstanding of PAPs and to provide Livelihood Restoration Program to persons who require during FS	Consultant, MOID, Local Government Units	MOID	TBD
23	Cultural Heritage	- Potential adverse impacts on UNESCO-listed cultural heritage sites and cultural facilities - Possible physical damage or deterioration of cultural heritage structures - Impacts on cultural events and traditional activities due to access restrictions - Indirect impacts on cultural heritage sites due to environmental changes caused by nearby infrastructure development.	- Conduct a Heritage Impact Assessment (HIA) screening to identify and evaluate potential impacts on cultural heritage sites through consultation with the DoA - Avoid or minimize construction activities near significant cultural heritage sites where feasible. - Develop appropriate protection measures for heritage structures during construction. - Maintain access to cultural heritage sites and facilities during construction through proper traffic and access management. - Consult with relevant heritage authorities and local communities regarding protection measures. - Monitor cultural heritage sites during construction and operation, and implement corrective actions if impacts are identified.	MOID, DoA, Local Government Units, Contractor	MOID	TBD
24	Landscape	- Visual and landscape impacts caused by the construction of flyovers or elevated railway structures in urban areas. - Conflict between new urban infrastructure and existing historic buildings or heritage areas. - Reduced aesthetic value and sense of place due to inappropriate integration of new structures with the surrounding environment.	- Conduct landscape and visual impact assessments during the project planning stage. - Design new structures to harmonize with the existing urban landscape and historic surroundings. - Consider architectural design, scale, materials, and colors that are compatible with cultural heritage areas. - Consult with relevant heritage authorities and local communities during the design process.	MOID, DoA, Local Government Units, Contractor	MOID	TBD
25	Gender	- Disruption of daily activities and mobility caused by construction works. - Potential unequal employment	- Provide safe pedestrian access and alternative routes during construction. - Ensure equal employment opportunities for both men and women. - Establish fair and transparent wage policies regardless of gender.	Contractor	MOID	TBD

No.	Items (Impacts)	Expected Negative Impact	Proposed Mitigation Measures	Implementing Organization	Responsible Organization	Cost
		opportunities or wage gaps between men and women in local employment. - Risk of inadequate working conditions for local workers, including women.	- Ensure compliance with labor standards and provide safe working conditions for all workers. - Monitor employment conditions and address any gender-based disparities during project implementation.			
26	Children's Right	- Risk of child labor involvement in project-related activities.	- Restrict child labor in contract with punishment - Report list of workers with their age information	Contractor	MOID	TBD
27	Infectious Diseases such as HIV/AIDS	- Increased risk of infectious disease transmission (e.g., HIV/AIDS) due to the influx of construction workers. - Increased mosquito breeding grounds during the rainy season due to stagnant water, leading to risks of dengue fever and other vector-borne diseases. - Increased risk of waterborne diseases due to poor sanitation conditions at construction sites.	- Implement health and safety management measures for construction workers, including disease prevention programs. - Provide awareness training on HIV/AIDS and other infectious diseases for workers and local communities. - Ensure access to adequate sanitation facilities, clean water, and waste management at construction sites and worker camps. - Prevent stagnant water accumulation through proper drainage and site management, especially during the rainy season. - Implement mosquito control measures, including regular site inspections and vector management. - Monitor public health conditions and coordinate with local health authorities when necessary.	Contractor	MOID	TBD
28	Labor Environment including Safety	- Potential deterioration of the labor environment due to construction activities. - Increased risk of occupational accidents and injuries among construction workers.	- Ensure compliance with national labor laws, occupational health and safety regulations, and relevant standards. - Develop and implement an Occupational Health and Safety (OHS) management plan. - Provide appropriate personal protective equipment (PPE) and safety training for workers. - Conduct regular safety inspections and risk assessments at construction sites. - Establish emergency response procedures and accident reporting systems. - Monitor contractors' compliance with labor safety requirements throughout the construction period.	Contractor	MOID	TBD
29	Accident	- Increased risk of traffic accidents involving construction workers and nearby residents - Potential safety hazards caused by movement of heavy vehicles and construction equipment. - Disturbance to local traffic conditions and pedestrian safety around construction areas.	- Develop and implement a construction traffic management plan. - Establish designated routes and schedules for construction vehicles to minimize impacts on local traffic. - Install appropriate traffic signs, barriers, and safety measures around construction areas. - Provide traffic safety training for drivers and construction workers. - Ensure safe pedestrian access and crossings near construction sites. - Conduct regular monitoring of traffic conditions and accident risks	Contractor	MOID	TBD

No.	Items (Impacts)	Expected Negative Impact	Proposed Mitigation Measures	Implementing Organization	Responsible Organization	Cost
			during construction. - Design of Structures Resistant to Natural Disasters - In bridge design and drainage facilities, high water levels and maximum rainfall must be considered. - For construction projects near rivers, construction plans should take into account the possibility of flash floods (such as avoiding excavation work during the rainy season).			
30	Transboundary Impact and Climate Change	- Limited impacts on forest areas due to small construction areas and a short construction period. - Possible disturbance to local ecosystems in areas where vegetation is removed.	- Minimize vegetation clearing and avoid unnecessary deforestation during construction. - Restore disturbed areas through replanting or revegetation after construction. - Monitor vegetation loss and implement additional mitigation measures if unexpected impacts occur.	Contractor	MOID	TBD
Operational Stage						
1	Air Quality	- Increase in air pollutant emissions if traffic volume growth exceeds the expected benefits from improved road networks and mass transportation.	- Implement traffic management measures to maintain smooth traffic flow and reduce vehicle emissions. - Conduct regular ambient air quality monitoring along the road network. - Encourage the use of low-emission vehicles and environmentally friendly transport options.	MOID	MOID	TBD
2	Water quality	- Potential water pollution caused by wastewater discharge from mass transit station facilities and parking areas, if such facilities are developed. - Deterioration of surface water quality due to improper management of wastewater from operational facilities.	- Install and properly operate wastewater treatment and drainage systems at mass transit stations and parking facilities. - Ensure wastewater discharge complies with applicable environmental standards and regulations. - Conduct regular monitoring of wastewater quality and receiving water bodies.	MOID	MOID	TBD
3	Waste	- Generation of waste from mass transit stations and depot	- Implement proper waste collection, segregation, storage, and disposal systems at stations and depot. - Ensure regular waste collection and maintenance of facilities. - Promote waste reduction, recycling, and reuse practices where applicable. - Monitor waste management practices and ensure compliance with relevant regulations.	MOID	MOID	TBD
4	Soil contamination	- Potential soil contamination due to oil leakage from maintenance activities at mass transportation depots	- Implement proper storage, handling, and disposal procedures for oil and other hazardous materials at depots. - Install spill prevention and control systems in maintenance areas.	MOID	MOID	TBD

No.	Items (Impacts)	Expected Negative Impact	Proposed Mitigation Measures	Implementing Organization	Responsible Organization	Cost
5	Noise and Vibration	- Potential increase in noise and vibration levels due to increased traffic volume and higher vehicle speeds. - Additional noise and vibration impacts from the operation of new mass transit facilities.	- Conduct regular noise and vibration monitoring along roads and near mass transit facilities. - Implement noise reduction measures, such as noise barriers or sound insulation where necessary. - Apply appropriate maintenance practices for roads, vehicles, and mass transit facilities to minimize noise and vibration. - Restriction of maximum speed	MOID	MOID	TBD
6	Ground Subsidence	- Ground subsidence caused by a drop in the groundwater level resulting from earthwork construction	- Avoid extraction of ground water for construction - Applying replacement methods for soft soil areas based on further studies and discussion in F/S. - Monitoring to identify early symptoms of subsidence	MOID	MOID	TBD
7	Ecosystem	- Potential impacts on surrounding ecosystems due to changes in environmental conditions caused by altered traffic patterns.	- Monitor changes in air quality, noise, vibration, and lighting conditions around environmentally sensitive areas. - Implement measures to minimize noise, vibration, and light disturbance where necessary. - Conduct ecological monitoring and implement additional mitigation measures if significant impacts are identified.	MOID	MOID	TBD
8	Hydrology	- Unexpected groundwater discharge due to tunnel excavation. - Changes to groundwater levels and groundwater flow caused by tunnel excavation. - Increased pressure on water resources due to water use during construction. - Disturbance or alteration of river flow caused by riverbank construction for the river corridor project. - Impacts on the hydrological environment resulting from changes in river flow.	- Avoid large amounts of extraction of ground water - Avoid the excavation work during rainy season - Conduct geological and hydrogeological investigations along the proposed tunnel alignment during the feasibility study. - Establish baseline conditions for groundwater levels, groundwater flow, and geological characteristics before construction. - Clarify construction water demand and identify sustainable water sources during the feasibility study. - Select construction methods and road/tunnel structures that minimize impacts on groundwater and surface water. - Design and implement riverbank construction measures to minimize disturbance to natural river flow. - Monitor groundwater levels, groundwater flow, and river flow during and after construction, and implement corrective measures if significant impacts are observed.	MOID	MOID	TBD
9	Ethnic Minority and Indigenous People	- Potential impacts on ethnic minorities and/or Indigenous Peoples living in or around the project area.	- Identify ethnic minorities and/or Indigenous Peoples in and around the project area during the feasibility study. - Avoid or minimize impacts through project design where feasible. - Assess potential social and cultural impacts through appropriate surveys and consultations.	MOID, Local Government Units	MOID	TBD
10	Cultural Heritage	- Potential adverse impacts on UNESCO-listed cultural heritage sites and cultural facilities	- Ensure that appropriate mitigation measures are implemented based on the Cultural Heritage Impact Assessment (HIA). - Consult with relevant heritage authorities and local communities	MOID, DoA, Local Government	MOID	TBD

No.	Items (Impacts)	Expected Negative Impact	Proposed Mitigation Measures	Implementing Organization	Responsible Organization	Cost
		- Possible physical damage or deterioration of cultural heritage structures - Impacts on cultural events and traditional activities due to access restrictions - Indirect impacts on cultural heritage sites due to environmental changes caused by nearby infrastructure development.	regarding protection measures. - Monitor cultural heritage sites during operation, and implement corrective actions if impacts are identified.	Units		
11	Landscape	- Visual and landscape impacts caused by the construction of flyovers or elevated railway structures in urban areas. - Conflict between new urban infrastructure and existing historic buildings or heritage areas. - Reduced aesthetic value and sense of place due to inappropriate integration of new structures with the surrounding environment.	- Conduct landscape and visual impact assessments during the project planning stage. - Design new structures to harmonize with the existing urban landscape and historic surroundings. - Consider architectural design, scale, materials, and colors that are compatible with cultural heritage areas. - Consult with relevant heritage authorities and local communities during the design process.	MOID, DoA, Local Government Units	MOID	TBD

Note: Since the Implementing/Responsible Organization filled in this Table are tentatively as a framework at this moment, they are to be clarified during the preparation in the EIA /IEE report. To ensure the ESMP, estimated cost for proposed mitigation measures are to be determined during EIA/IEE report, and to be included in the Project Cost for tender.
Source: JICA Expert Team

7.2 Environmental and Social Monitoring Plan (ESMoP)

The environmental monitoring framework for transportation projects involves three levels of monitoring: baseline monitoring, compliance monitoring, and impact monitoring. As for the baseline monitoring, there is no public continuous secondary baseline data such as air quality, water quality, noise, hydrology, groundwater recharge, flooding, geological hazards, ecosystem in the Kathmandu Valley to grasp the trend of baseline conditions.

Rule 45 of the EPR 2020 requires project proponents to submit self-environmental monitoring reports every six months to the relevant department and MOID. The International donor also needed to submit the periodically monitoring report, which is a condition of financial agreement. As for the JICA project, the project proponent required to submit every three-month monitoring report during construction and until two-year operation period.

The specific description, and technical details, of monitoring measures, including the parameters to be measured, location of monitoring and methods to be used are follow the national standard and/or international standard, as well as the approved EIA report including ESMoP.

Table 7.2-1 proposes the general/typical Environmental and Social Monitoring Plan (ESMoP) for mitigating the negative impact. ESMoP shall be studied further during the Feasibility Study in accordance with the project's progress. This table serves as a kind of "framework" to ensure that key issues are not overlooked when conducting future detailed ESIA/IEE studies in the Kathmandu Valley. Since the Implementing/Responsible Organization filled in this Table are tentatively as a framework at this moment, they are to be clarified during the preparation in the EIA /IEE report.

Additionally, the Environmental and Social Management Framework (ESMF), 2023, Department of Road, MOID, introduces the specific description, and technical details, of monitoring measures, including the parameters to be measured, location of monitoring and methods for the baseline, compliance and impact monitoring. For reference, the contents of the ESMF 2023 are presented in Table 7.2-2, Table 7.2-3, and Table 7.2-4, respectively. These tables illustrate typical monitoring matrices for use as a reference in feasibility studies in Nepal.

Table 7.2-1 Proposed General Environmental and Social Monitoring Plan

No	Environmental Item	Method/Parameter	Location	Frequency	Responsible agent	Supervisor	Cost
Pre-Construction / Construction Stage							
1	Air Quality	PM10, PM2.5, SO2, CO, NO2	Construction sites, major access routes to the construction sites	Once a month	Contractor	MOID	TBD
2	Water Quality	BOD5, COD, Oil and Grease, pH, Total Coliform, Total Nitrogen, Total Phosphorous, Total suspended solids, Turbidity, Arsenic, Iron, Sulphate	Rivers, drainages, camp yards, wells, springs	Once every three-month	Contractor	MOID	TBD
3	Waste	Types and amount of waste	Temporal waste storage	Once every three-month	Contractor	MOID	TBD
4	Soil Contamination	Soil quality test in accordance with the baseline survey and existing land use, Monitoring accident, maintenance record of machineries and vehicles, site observation	Construction sites and camp yards	Once a month	Contractor	MOID	TBD
5	Noise and Vibration	Sound level and vibration. 24hours	Construction sites, major access routes to the construction sites	Once a month	Contractor	MOID	TBD
6	Ground Subsidence	Visible observation on markers and gauges	Surrounding structures of construction sites	Once a week	Contractor	MOID	TBD
7	Offensive Odor	Types and amount of waste, other specific cases such as oil leakage	Temporal waste storage	Once every three-month	Contractor	MOID	TBD
8	Bottom Sediment	Visible observation of rivers and drainage from construction sites	Construction sites and rivers	Once every three-month	Contractor	MOID	TBD
10	Ecosystem	Field confirmation by experts	Construction sites and surrounding areas	Once a year	Contractor	MOID	TBD
11	Hydrology	Visible observation, interview, measurement of water volume and water level (surface water and groundwater)	River, spring, well, etc.	Once every three-month	Contractor	MOID	TBD
12	Topography and Geology	Visible observation, reviewing of cut and fill plan, tree cutting plan with certification	Forest, hilly areas	Once every three-month	Contractor	MOID	TBD
13	Land Acquisition and Resettlement	Internal / External monitoring report defined in RAP, grievance records	Project Areas	Following RAP	LGUs, Other relevant bodies	MOID	TBD
14	Poverty	Internal / External monitoring report defined in RAP, grievance records	Project Areas	Following RAP	LGUs, Other relevant bodies	MOID	TBD

No	Environmental Item	Method/Parameter	Location	Frequency	Responsible agent	Supervisor	Cost
15	Ethnic Minority and Indigenous People	Internal / External monitoring report defined in RAP, grievance records, IPP, if any	Project Areas	Following RAP and IPP	LGUs, Other relevant bodies	MOID	TBD
16	Local Economy such as Employment and Livelihood	Internal / External monitoring report defined in RAP, grievance records, income restoration program (IRP)	Project Areas	Following RAP, IRP	LGUs, Other relevant bodies	MOID	TBD
17	Land Use and Usage of Local Resources	Construction plan including lease land, grievance records	Project Areas	Once every three-month	Contractor	MOID	TBD
18	Water Usage	Water volume, visible observation, interview, grievance records	Water usage areas	Once a month	Contractor	MOID	TBD
19	Existing Social Infrastructure and Services	Visible observation, interview, grievance records	Project Areas	Once every three-month	Contractor	MOID	TBD
20	Social Institutions such as Socially Related Capital and Decision-making Organizations	Visible observation, interview, grievance records	Project Areas	Once every three-month	Contractor	MOID	TBD
21	Cultural Heritage	Visible observation, interview, grievance records	Project Areas	Once every three-month	Contractor	MOID	TBD
22	Landscape	Visible observation, interview, grievance records	Project Areas	Once every three-month	Contractor	MOID	TBD
23	Gender	Visible observation, interview, grievance records, list of construction worker, record of education, number of facilities for women in construction site and camp yard	Project Areas	Once a month	Contractor	MOID	TBD
24	Children's Right	Visible observation, interview, grievance records, list of construction worker, record of education	Construction sites	Once a month	Contractor	MOID	TBD
25	Infectious Diseases such as HIV/AIDS	Visible observation, interview, grievance records, record of education	Construction sites	Once a month	Contractor	MOID	TBD
26	Labor Environment including Safety	Visible observation, interview, grievance records, record of education, record of safety patrol, sign boards	Construction sites	Once a month	Contractor	MOID	TBD
27	Accident	Record of accident, record of education, sign boards	Construction sites and surrounding areas	Once a month, on demand	Contractor	MOID	TBD
28	Transboundary Impact and Climate Change	Record of maintenance of machinery and vehicles, sign boards	Construction sites	Once a year	Contractor	MOID	TBD
Operational Stage							
1	Air Quality	PM10, PM2.5, SO_2, CO, NO_2	Residential area, junctions, tunnels,	Once a year	MOID Project Office(PO)	MOID	TBD

No	Environmental Item	Method/Parameter	Location	Frequency	Responsible agent	Supervisor	Cost
			etc.				
2	Noise and Vibration	Sound level and vibration.	Junctions, tunnels and residential areas	Once a year	PO	MOID	TBD
3	Ground Subsidence	Visible observation on markers and gauges	Surrounding structures of construction sites	Once a year	PO	MOID	TBD
4	Hydrology	Visible observation, interview, measurement of water volume	River, spring, well, etc.	Once a year	PO	MOID	TBD
5	Ethnic Minority and Indigenous People	Interview, observation, socio-economic survey, if needed	Project Areas	Once a year	PO	MOID	TBD
21	Cultural Heritage	Visible observation, interview, grievance records	Project Areas	Once every three-month	PO	MOID	TBD
22	Landscape	Visible observation, interview, grievance records	Project Areas	Once every three-month	PO	MOID	TBD

Note: Since the Responsible agent and Super filled in this Table are tentatively as a framework at this moment, they are to be clarified during the preparation in the EIA /IEE report. To ensure the ESMoP, estimated cost for proposed mitigation measures are to be determined during EIA/IEE report, and to be included in the Project Cost for tender.
Source: JICA Expert Team

Table 7.2-2 Baseline Monitoring based on EDMF 2023

Aspects	Monitoring Indicator	Monitoring Location	Monitoring Method	Monitoring Period	Responsibility
Disturbance and damage to public structures	Number of public utility structures disturbed or damaged and relocated replaced	Road alignment, tunnel exits, spoil disposal sites, borrow pit sites, camps, storage facilities etc.	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants
Land use changes	Area of land acquired for labor camp, material storage, etc.	Road alignment, tunnel exits, spoil disposal sites, borrow pit sites, camps, storage facilities etc.•	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants
Air quality	Particulate matter concentration in the air. TSP, PMIO and PM	Settlements located within 100m from the road and borrow pit and quarry sites	As per National Ambient Air Quality Standards, Nepal	Before start of construction works	Project Office/ Supervision Consultants
Water Quality A. Streams and River	Generic Standard Part I: Tolerance Limits for Industrial Effluents to be Discharged into Inland Surface Waters, Nepal, will be used for monitoring indicators	a. Upstream and downstream bridge location, b. Receiving water bodies close to borrow pit/quarry c. Receiving water bodies close to spoil placement sites	As per Generic Standard Part I: Tolerance Limits for Industrial Effluents to be Discharged into Inland Surface Waters, Nepal, (Annex 4.3)	Before start of construction works	Project Office/ Supervision Consultants
B. Water supply sources	Drinking Water Quality Standards of Nepal 2079	Water supply sources within 200m from the road, borrow pit quarry sites and solid waste disposal, mixing plant, storage yard and spoil placement sites	As per Drinking Water Quality Standards, Nepal (Annex 42)	Before start of construction works	Project Office/ Supervision Consultants
C. Aquatic ecosystem	Water quality guidelines for the protection of the ecosystem ,2008	Protected aquatic ecosystem area	As per guideline values	Before start of construction works	Project Office/ Supervision Consultants
Noise and vibration	Noise levels at various points around the construction site. Frequency and intensity of vibrations. Leq (dBA)	Settlements less than 100m from the road, bridge, tunnel and borrow pit and quarry sites Construction sites and labor camps	Type I and type 2 sound level meters meeting standards (Annex 4.5)	Before start of construction works	Project Office/ Supervision Consultants
Natural Hazards	Number of slope failures or landslides during construction. Incidents of subsidence or liquefaction	Road alignment, tunnel exits, spoil disposal sites, borrow pit sites, camps, storage facilities etc.	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants
Erosion and Sedimentation	Rate of soil erosion. Amount of sedimentation in downstream areas.	Road alignment, tunnel exits, spoil disposal sites, borrow pit sites, camps, storage facilities	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants

Aspects	Monitoring Indicator	Monitoring Location	Monitoring Method	Monitoring Period	Responsibility
		etc.			
Traffic Management and Road Safety	Number of traffic disruptions. Incidents of road accidents during construction	Road alignment, access roads used for construction works	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants
Loss of Top Soil	Depth and extent of topsoil loss. Impact on agricultural productivity	Agricultural area to be temporarily and permanently used by project	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants
Hydrological Impacts	Changes in stream flow regime. Alterations in water discharge and velocity.	Water bodies and natural drainage system disturbed due to the project	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants
Solid and Hazardous Wastes	Quantity of solid and liquid wastes generated. Incidents of waste pollution in water bodies.	Project construction sites, labor camps, stores, parking areas	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants
Landscape and Visual Impacts	Changes in visual amenity ratings. Impacts on key features and protected areas.	ROW, project activity sites, quarry sites	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants
Clearance of Forest and Vegetation	Forest and vegetation cleared along the proposed right of way/formation width.	Road alignment, tunnel exits, road and bridge diversions and areas used for construction purposes.	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants
Quantification of habitat loss for endangered species and wildlife.	Number of wildlife accidents recorded Assessment of changes of species affected by the project.	Forest area locations along road alignment and project activity locations	Direct observation and mapping	Before start of construction works	Project Office/ Supervision Consultants
Impacts on Wetlands	Assessment of impacts on the local community dependent on wetlands and biodiversity within wetland ecosystems	Wetlands and other water bodies that *all in project settings and other areas impacted during project pre-construction and constructor.	Direct observation and mapping	Before start of construction works	Project Office/ Supervision Consultants
Impact on Natural and Critical Habitats	Assessment of invasive species presence and its impact on native biodiversity.	Habitat locations of species along road alignment especially in forest areas.	Direct observation and mapping	Before start of construction works	Project Office/ Supervision Consultants
Wildlife Habitats, Corridor, and Movements	Assessment of effectiveness of wildlife corridors in mitigating habitat fragmentation.	Habitat locations of species along road alignment especially in forest areas.	Direct observation and mapping	Before start of construction works	Project Office/ Supervision Consultants

Aspects	Monitoring Indicator	Monitoring Location	Monitoring Method	Monitoring Period	Responsibility
Human and Wildlife Conflict	Frequency and severity of human-wildlife conflicts reported in project vicinity.	Settlement area along road alignment	Direct observation and mapping	Before start of construction works	Project Office/ Supervision Consultants
Land Acquisition	Number of households relocated and provided with adequate housing and resources	Private land to be acquired by the project	Direct observation, field survey and mapping	Before start of construction works	Project Office/ Supervision Consultants
Settlements	Number of households affected by involuntary displacement.	Private land to be acquired by the project	Direct observation, household surveys and mapping		Project Office/ Supervision Consultants
Livelihoods Impacts	Effectiveness of compensation and livelihood replacement programs.	Project affected families and vulnerable community groups in project area locations	Direct observation and mapping and field surveys	Before start of construction works	Project Office/ Supervision Consultants
Markets	No Hotels/Tea stalls and Restaurants	Campsite, and settlements within 100m from the road alignment, tunnel portal and bridge site	Direct enumeration	Before start of construction works	Project Office/ Supervision Consultants
Consumer price	Price of local and imported consumer items	Campsite, and settlements within 200m from the road alignment, tunnel portal and bridge site	Market survey and documentation	Before start of construction works	Project Office/ Supervision Consultants
Impacts on Community Values, Health, Safety, and Wellbeing	Incidence of health issues such as stress, noise pollution-related ailments, and spread of diseases	People residing along road alignment and within project nearby vicinity	Direct observation, field survey and mapping	Before start and during of construction works	Project Office/ Supervision Consultants
Institutions and Services:	Adequacy of health and education services in catering to increased demand	Project influence area	Direct observation and field survey	Before start of construction works	Project Office/ Supervision Consultants
Vulnerable Groups	Effectiveness of measures to mitigate impacts on vulnerable communities.	Project affected households	Direct observation and mapping in the appropriate scale map	Before start of construction works	Project Office/ Supervision Consultants
Workforce and Working Conditions	Compliance with labor laws and regulations.	Construction sites and labor camps	Direct observation and mapping in the appropriate scale map	During construction period	Project Office/ Supervision Consultants
Sanitation	No. of households having toilets, waste disposal systems.	Settlements within 200m from the road alignment, tunnel portal and bridge site	Field survey and documentation,	Before start of construction works	Project Office/ Supervision Consultants

Source: Environmental and Social Management Framework (ESMF),2023, Department of Road, MOPIT

Table 7.2-3 Compliance Monitoring based on EDMF 2023

Aspects	Monitoring Indicator	Monitoring Location	Monitoring Method	Monitoring Period	Responsibility
ESMP Mitigation Measures	All mitigation actions listed in Mitigation Management Plan for Pre-construction and construction phase, all the various on-site and standalone management plans implementation	Construction sites, borrow pit and quarry sites, spoil placement sites and construction camps	Direct supervision and documentation, Consultation with the people	Daily, weekly and trimesterly	Supervision Consultants
ESMP Permits and Approvals	All permits and approvals stipulated in the ESMP such as permission to enter the site, permits to fell trees, permits and approval in case of obstruction of the service facilities (water supply, drains, irrigation canals, telecommunication cables, electricity lines etc.)	All construction and ancillary facility sites	Direct observation Consultation with the local communities	In the beginning of construction works	Project Office/DoR/ GESU
Disturbance and Damage to Public Utility Structures	Number of public utility structures affected or damaged	All construction and ancillary facility sites	Count the instances of disturbance or damage to public utility structures and track the actions taken for relocation or replacement	As and when it is reported/complaint otherwise once in a month In normal circumstance	Supervision Consultant/ Project Office
Land Use Changes	Changes in land cover types within the project area	Same location as baseline monitoring	Calculate land area acquired for labor camps, material storage, etc., compared to the total area and monitor any changes in land use patterns	Trimesterly	Supervision Consultant/ Project Office
Air Quality	TSP, PM_{10} and $PM_{2.5}$	Same location as baseline monitoring	As per National Ambient Air Quality Standards, Nepal (Annex 4.4)	Trimesterly	Supervision Consultants
Water Quality: A. Streams and River	Generic Standard Part I: Tolerance Limits for Industrial Effluents to be Dischar ed into Inland Surface Waters, Nepal, WII be used for monitoring indicators	Some loation as baseline monitoring	As per Generic Standard Part I: Tolerance Limits for Industrial Effluents to be Discharged into Inland Surface Waters, Nepal, (Annex 4.3)	Trimesterly	Supervision Consultants
B. Water supply sources	Drinking Water Quality Standards of Nepal	Same location as baseline monitoring	As per Drinking Water Quality Standards, Nepal (Annex 4.2)	Trimesterly	Supervision Consultants

Aspects	Monitoring Indicator	Monitoring Location	Monitoring Method	Monitoring Period	Responsibility
C. Water taps	Drinking Water Quality Standards of Nepal	Water supplies all types of construction camps	As per Drinking Water Quality Standards, Nepal (Annex 4.2)	Trimesterly	Supervision Consultants
D. Effluent discharge	Wastewater discharge from the tunnel — tolerance limns for effluent discharge	Waste water from tunnel portals mixing plants	As per Generic Standard Part I: Tolerance Limits for Industrial Effluents to be Discharged into Inland Surface Waters, Nepal, (Annex 4.3)	Trimesterly	Supervision Consultants
E. Aquatic ecosystem	Water quality guidelines for the protection of the aquatic ecosystem	12. Water from aquatic ecosystem area ponds, swaps	As per Water Quality Guidelines for Protection of Aquatic Ecosystem, 2008	Trimesterly	Supervision Consultants
Noise level	Leq (dBA)	Same location as baseline monitoring	Type 1 and type 2 sound level meters meeting standards (Annex 4.5)	Trimesterly	Supervision Consultants
Project Vehicles	As per the limits stipulated in Nepal Vehicle Mass Emission Standards	Vehicles used in Project	Certifications of the vehicles	Yearly	Supervision Consultants
Diesel Generators sets	As per the exhaust Emission standards far diesel generating sets	Project area	Certification of the suppliers	Trimesterly	Supervision Consultants
Natural Hazards	Frequency and severity of geo-hazards	Project area	Keep records of geohazard occurrences and evaluate their impacts	At the time of occurrence	Supervision Consultants
Slope Failure and Scil Pollution	Number of slope failures and soil erosion rates	Project area	Monitor occurrences of slope failures and erosion events, quantify soil pollution levels	Daily during rainy season and trimesterly	Supervision Consultants
Erosion and Sedimentation	Rate of soil erosion and sediment deposition	Project area	Assess sedimentation levels in downstream areas, monitor erosion prone sites,	Daily during rainy season and trimesterly	Supervision Consultants
Clearance of Forest and Vegetation	Extent and rate and vegetation clearance along the proposed right of way.	Project area	Periodic surveys, and ground-truthing to assess changes in forest cover.	Trimesterly	Supervision Consultants
Flora and Fauna:	Degree of disturbance critical terrestrial and riparian habitats during construction	Forest area in project locations	Regular site inspections, and biodiversity surveys	Once a year	Supervision Consultants
Natural and Critical Habitats	Loss and fragmentation of natural and critical habitats due to construction activities.	Forest area in project locations	Habitat survey and ecological mapping	Trimesterly	Supervision Consultants
Land Acquisition	Number of households affected by land acquisition and their socioeconomic	Land acquired by the project	Field observation and survey	After land acquisition process completed	Supervision Consultants

Aspects	Monitoring Indicator	Monitoring Location	Monitoring Method	Monitoring Period	Responsibility
	status.				
Settlements	Population influx n major road head townships and villages during construction.	Project area	Field observation and survey	Trimestely during construction	Supervision Consultants
Involuntary Displacement and Resettlement Impacts	Number of affected households and individuals.	Project area	Field observation and survey	Trimestely during construction	Supervision Consultants
Occupational health and safety	Use of PPE. health Checkup facilities and emergency response measures Worksite safety measures — barricading, warning signals etc.	Construction work sites and camps	Field observation and review of records and documentation of contractors	Weekly/Monthly	Supervision Consultants/ Project Office/GESU
Wage payments	Equal wage for equal works Daily wage is paid at least once a month and not less than the minimum wage fixed by the government	Construction workers	Interactions with laborers, verification of wage receipts, records and documents	Monthly	Supervision Consultants/ Project Office
Land and property compensation	Interaction with affected families, record and documentations, agreements and receipts of payments. Complaints lodged through Grievance Redress Mechanism	Directly project affected and displaced families	Field observation and interaction with project-affected and displaced families.	Trimesterly	Project Office/GESU
Solid Waste Management	Segregation of toxic and non-toxic wastes Treatment and disposal of non-toxic waste at designated sites using standard methods as approved by the environmental specialist of the project, Proper storage of toxic wastes until it is transported to the	Non-toxic waste Treatment facility and disposal sites. Toxic waste Generation sites, handling, packaging and storage sites. Transportation, and treatment and disposal.	Non-toxic waste Field observation, treatment facility and disposal method adopted by the contractor. Sampling and testing of generated waste on a trimester basis. Toxic waste Field observation, mode of transport dispatch to authorized agencies either for treatment or disposal.	Daily/weekly observation Testing on trimester basis	Supervision Consultants

Aspects	Monitoring Indicator	Monitoring Location	Monitoring Method	Monitoring Period	Responsibility
	authorized agency by the transporter either for treatment of safe disposal with prior verification of the project environmentalist.				

Source: Environmental and Social Management Framework (ESMF), 2023, Department of Road, MOPIT

Table 7.2-4 Impact Monitoring based on EDMF 2023

Aspect	Monitoring Indicator	Monitoring Location	Monitoring Method
Landslides and erosion	Number of landslides/ debris flows/gully formation sites marked and indicated in suitable maps	Road alignment, Spoil disposal sites, borrow pit sites, camps, storage facilities etc.	*Direct observation and mapping in the appropriate scale map*
Air Quality	TSP, PM_{10} and PM $_{2.5}$	Same location as baseline monitoring	As per National Ambient Air Quality Standards, Nepal
Water Quality: A. Streams and River	Generic Standard Part I: Tolerance Limits for Industrial Effluents to be Discharged into Inland Surface Waters, Nepal, will be used for monitoring indicators	Same location as baseline monitoring	As per Generic Standard Part I: Tolerance Limits for Industrial Effluents to be Discharged into Inland Surface Waters, Nepal
B. Water supply sources	Drinking Water Quality Standards of Nepal	Same location as baseline monitoring	As per Drinking Water Quality
C. Water taps	Drinking Water Quality Standards of Nepal	Water supplies all types of construction camps	As per Drinking Water Quality
D. Aquatic ecosystem	Water quality guidelines for the protection of the aquatic ecosystem	Protected aquatic ecosystem locations	As per Water Quality Guidelines for Protection of Aquatic Ecosystem 2008
Noise level	Leq (dBA)	Same location as baseline monitoring	Type I and type 2 sound level meters meeting standards
Forest Ecology	Forest Status in terms of coverage, species present		Three sample plots in each area
	Photographic documentation showing the forest area from a fixed distant spot (locate the sample plot and photograph taken spot in the map)		Photography
Wildlife / Wildlife status	Wildlife status in terms of species present and reported, Raider wildlife	a. All along the road alignment, b. Tunnel portal location site c. Bridge site	Consultation with locals, note season of raiding, frequency of raiding, and the place raided
Faunal and floral diversity	Status of faunal and floral diversity	All remaining forests after forest clearance	Field survey
Aquatic ecology	Fish types available	Monitoring locations as per Baseline survey EIA report	Consultation with the local fisherman
	Photographic documentation showing the forest area from a fixed distant spot (locate the sample plot and photograph taken spot in the map)		Photography
People affected by land and property acquisition	Satisfaction with the resettlement and rehabilitation packages	All project sites	Grievances records, consultation with the affected households
People affected by land and property acquisition	Economic and social status of the displaced households	Displaced households of the project	Sampling survey of the displaced households
Markets	Number of Hotels/Tea stalls and Restaurants	Same sites as baseline monitoring	Direct enumeration
Consumer price	Price of local and imported consumer items such as rice, wheat, maize, millet, milk, meat (chicken, mutton, buff), sugar, kerosene, LPG, vegetables, food/person with meat and without meat, rental for night stay etc. Labor cost/day (male	Same site as baseline monitoring	Market survey and documentation

Aspect	Monitoring Indicator	Monitoring Location	Monitoring Method
	and female)		
Sanitation	No of households having toilets, Practice of sanitation (Child defecation, solid waste disposal), Source of water (Piped, springs, river etc.)	Same sites as baseline monitoring	Field survey and documentation, Photographs

Source: Environmental and Social Management Framework (ESMF-2023), Department of Road, MOPIT

Chapter 8: Land Acquisition and Resettlement

8.1 Possibility of Land Acquisition and Resettlement

When it comes to urban infrastructure development, not all projects can be carried out entirely on public land; for example, road widening or the construction of new transportation facilities often affect private property. This is particularly true in areas where urban expansion is occurring rapidly, such as the Kathmandu Valley, where the affected land is frequently used for residential purposes. In such cases, since resident resettlement and land acquisition are required, project implementers must prepare land acquisition, and resettlement action plans (RAP) in accordance with domestic law and the donor's safeguard policies.

8.2 Land Acquisition and Resettlement System in Nepal

The Resettlement Policy Framework (RPF) is a foundational document for infrastructure projects, designed to mitigate adverse social impacts such as land acquisition, loss of shelter, assets, and livelihoods. It harmonizes Government of Nepal (GoN) legislation, including the Land Acquisition Act 1977, with international development partner standards. The core principle of the RPF is that involuntary resettlement should be avoided or minimized by exploring alternative designs. When displacement is unavoidable, the project ensures that all Project Affected Persons (PAPs), regardless of their legal land titles, are assisted in restoring their livelihoods and maintaining or improving their pre-project living standards.

8.3 Analysis of Legal Gap between Nepalese Legislation and International Safeguard policies in Land Acquisition and Resettlement Frameworks

Comparative Matrix of International Safeguard Polices, JICA Guidelines for Environmental and Social Considerations 2022 or World Bank ESS5, and Nepalese Legislation is summarized in Table 8.3-1.

Nepalese national legislation exhibits significant structural gaps when evaluated against international standards. Key differences include: (1) Exclusion of Non-Titleholders: Nepalese law compensates only registered landowners and official tenants, providing no legal rights or assistance to informal occupants, squatters, or encroachers. (2) Depreciation Deduction: Statutory rules (Land Acquisition Rules 1969) enforce mandatory depreciation deductions when valuing buildings, violating the full replacement cost principle. (3) Absence of Economic Rehabilitation: National laws focus strictly on direct asset acquisition without providing post-displacement transitional allowances, business disruption support, or livelihood restoration programs. (4) Vulnerable Groups & Gender: No statutory provisions exist for poor, female-headed, elderly, or disabled households. (5) Consultation & Grievance Redress: Statutory procedures rely on formal gazette notices rather than meaningful two-way consultation, and judicial appeal channels are slow and burdensome.

Table 8.3-1 Comparative Matrix of JICA Guidelines / WB ESS5 and Nepalese Legislation

Item No.	JICA Guidelines / World Bank ESS5 Requirements	Nepalese Legislation (LAA 1977, LRA 1964, PRA 1974)	Gaps between JICA GL / ESS5 & Nepalese Laws	Proposed measures to bridge gaps
1	Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. (JICAGL)	Land Acquisition Act 2034 (1977) Sec. 3 permits acquisition for any 'public purpose'. It contains no legal obligation or mechanism to analyze design alternatives to avoid or minimize land acquisition/displacement.	Gap exists. Nepalese laws prioritize compulsory acquisition for public interest without mandating alternative analysis during planning.	Compare multiple alternatives during planning and design to avoid or minimize resettlement and asset loss as far as possible.
2	Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. If avoidance is not possible, effective measures to minimize impacts and compensate for losses must be taken upon agreement with affected people. (JICAGL)	Public Road Act 2031 (1974) Sec. 3 & LAA 1977 establish government RoW authority and asset acquisition rules, but lack a systematic impact minimization hierarchy or formal agreement protocols.	Gap exists. Legislation focuses on expropriation rather than minimizing social impacts or establishing binding mutual agreements on mitigation.	Maintain continuous consultation with affected people and implement agreed mitigation and livelihood restoration measures.
3	Project affected people, such as people to be resettled involuntarily and/or people who may lose their livelihoods by the project, must be provided sufficient compensations and supports by the project proponents in a timely manner. (JICAGL)	LAA 1977 Sec. 9 & 13 provide cash compensation for acquired assets. However, disbursement is often delayed, and no statutory timeline or broader resettlement support is mandated.	Partial gap. National law covers basic asset compensation but fails to guarantee comprehensive support or strict pre-displacement payment timelines.	Pay full compensation and applicable allowances before physical displacement and the start of construction.
4	Compensations must be calculated at full replacement cost as much as possible, and	LAA Sec. 13 establishes the Compensation Determination Committee (CDC). Land	Significant gap. Mandatory statutory depreciation deduction directly violates the	CDC shall determine compensation at replacement cost without depreciation, including market prices,

Item No.	JICA Guidelines / World Bank ESS5 Requirements	Nepalese Legislation (LAA 1977, LRA 1964, PRA 1974)	Gaps between JICA GL / ESS5 & Nepalese Laws	Proposed measures to bridge gaps
	provided in advance. (JICAGL)	Acquisition Rules 2026 (1969) Rule 5 mandates depreciation deduction based on building age and material type.	international full replacement cost standard.	materials, labor, and transaction costs.
5	Project proponents must make efforts for the affected people to improve or at least restore their standards of living, income opportunities and production levels to pre-project levels. (JICAGL)	Nepalese legislation provides one-off monetary compensation for physical assets but contains no provisions for post-displacement economic rehabilitation or livelihood restoration.	Significant gap. LAA 1977 treats land acquisition as a static real estate transaction, ignoring long-term livelihood recovery.	Provide livelihood restoration support to small businesses, low-income households, and others through training, business interruption allowances, and preferential employment.
6	Compensation standards are disclosed and consistently applied. The project affected persons need to be aware of the compensation standards. (JICAGL)	LAA Sec. 9 & 18 mandate public notices in newspapers and local offices regarding acquisition and compensation lists. However, district rates vary and comprehensive entitlement matrices are not published.	Partial gap. While acquisition notices are mandatory, clear proactive disclosure of complete entitlement criteria is lacking.	Disclose compensation and assistance standards, including the Entitlement Matrix, in local languages and apply them consistently to all affected people.
7	In principle, the contents of the individual compensation to be agreed are explained to the project affected persons in writing, and the project affected persons can confirm the contents at any time. (JICAGL)	LAA Sec. 18 requires posting a public list of compensated persons at district offices, but does not require individual written compensation notices or calculation statements.	Partial gap. No statutory requirement to provide individual PAPs with written, itemized compensation agreements.	Provide written asset valuations and compensation details in advance and make payments after the affected person's confirmation and agreement.
8	For projects that result in large-scale involuntary resettlement, a Resettlement Action Plan (RAP) must be prepared and made available to the public prior to	LAA 1977 does not require a RAP. Land Acquisition, Rehabilitation and Resettlement Policy 2071 (2015) outlines RAP principles for major projects, but lacks	Gap exists. RAP preparation and public disclosure are not legally binding statutory obligations under LAA 1977.	Prepare a RAP compliant with the JICA Guidelines for Environmental and Social Considerations and World Bank ESS5 and disclose it in local languages and English after approval.

Item No.	JICA Guidelines / World Bank ESS5 Requirements	Nepalese Legislation (LAA 1977, LRA 1964, PRA 1974)	Gaps between JICA GL / ESS5 & Nepalese Laws	Proposed measures to bridge gaps
	the resettlement and provision of compensation and support. (JICAGL)	enforceable statutory regulations.		
9	In preparing the RAP, consultations must be held with the project affected people and communities, based on sufficient information made available to them in advance. (JICAGL)	LAA Sec. 9 allows 7 days for affected landowners to file objections to the Ministry of Home Affairs, but requires no proactive public consultation during project design.	Gap exists. National procedures rely on formal administrative notices rather than proactive, iterative community consultation.	Disclose project impacts and compensation policies from the RAP preparation stage and continue public consultations with affected communities.
10	When consultations are held, explanations must be given in languages and forms that are understandable to the project affected people. (JICAGL)	Official notices under LAA Sec. 9 are published in formal legal Nepali in the Gazette and national daily newspapers, which may not be accessible to illiterate or local language speakers.	Gap exists. Law contains no provisions regarding language accessibility or culturally appropriate communication formats.	Use locally understood languages and accessible oral explanations and summaries for persons with limited literacy and vulnerable groups.
11	Appropriate participation of the project affected people and their communities must be promoted in the planning, implementation and monitoring of measures against involuntary resettlement and loss of livelihood. (JICAGL)	Nepalese legal frameworks provide no role for affected persons or community representatives in asset valuation, CDC proceedings, or resettlement monitoring.	Gap exists. Community involvement is legally restricted to filing objections or receiving compensation checks.	Include representatives of affected people and local governments in CDC subcommittees and GRCs to ensure participation in implementation and monitoring.
12	A mechanism for handling concerns and grievances from people and communities affected by the project's environmental and social impacts must be in place. (JICAGL)	LAA 1977 permits appeals to the Ministry of Home Affairs (Sec. 11/25.7) or District Court (Sec. 40). These formal processes are bureaucratic, slow (35+ days), expensive, and exclude non-titleholders.	Significant gap. Absence of accessible, field-level, non-judicial grievance redress mechanisms.	Establish accessible, no-cost grievance committees at local and central levels, separate from administrative and judicial procedures, for prompt resolution.

Item No.	JICA Guidelines / World Bank ESS5 Requirements	Nepalese Legislation (LAA 1977, LRA 1964, PRA 1974)	Gaps between JICA GL / ESS5 & Nepalese Laws	Proposed measures to bridge gaps
13	The Borrower will, as part of the environmental and social assessment, conduct a census to identify affected persons, establish an inventory of land/assets, determine eligibility, and establish a Cut-off Date to discourage ineligible opportunistic settlers. (ESS5 para 20)	LAA Sec. 9 notice legally freezes property transactions and asset alterations. However, comprehensive socio-economic census surveys and baseline inventories are not legally mandated.	Partial gap. Legal transaction freeze exists via notice, but formal socio-economic census methodology is absent in law.	Conduct asset and census surveys and set the land acquisition notice date or census completion date as the Cut-off Date for eligibility.
14	PAPs classified as: (a) formal legal rights, (b) recognizable claims under national law, (c) no recognizable legal right (non-titleholders/squatters/encroachers). Non-titleholders receive replacement cost compensation for lost non-land assets and resettlement assistance. (ESS5 para 10, 12)	LAA 1977 and Land Reform Act 1964 recognize only registered land titleholders and official tenants (50% split). Informal occupants, squatters, encroachers, and undocumented tenants receive ZERO legal compensation or assistance.	Critical gap. Nepalese legislation completely excludes non-titleholders and informal settlers from compensation and resettlement benefits.	Provide non-titleholders with replacement-cost compensation for affected structures, shifting and business interruption allowances, and livelihood training.
15	Where livelihoods of displaced persons are land-based, or where land is collectively owned, the Borrower will offer the displaced persons an option for replacement land unless equivalent land is unavailable. (ESS5 para 14)	LAA Sec. 14 provides discretionary option for land-for-land swap if government land is available, but it is rarely exercised and not legally enforceable.	Partial gap. Land-for-land option is permitted under law but lacks compulsory application or standardized operational criteria.	Prioritize replacement land for land-based livelihoods; if unavailable, provide replacement-cost compensation and alternative livelihood support.
16	Transitional support will be provided as necessary to all economically displaced persons,	Nepalese law contains no provision for transitional allowances, moving stipends, or	Gap exists. Statutory compensation covers physical property only, leaving	Provide transitional support to physically or economically displaced households, including shifting and

Item No.	JICA Guidelines / World Bank ESS5 Requirements	Nepalese Legislation (LAA 1977, LRA 1964, PRA 1974)	Gaps between JICA GL / ESS5 & Nepalese Laws	Proposed measures to bridge gaps
	based on a reasonable estimate of the time required to restore their income-earning capacity, production levels, and standards of living. (ESS5 para 36)	temporary rental assistance during the post-displacement recovery phase.	PAPs unsupported during transitional displacement.	business displacement allowances based on relevant wage standards.
17	Particular attention will be paid to gender aspects and the needs of the poor and the vulnerable (women-headed HHs, disabled, elderly, landless). (ESS5 para 26)	Nepalese land acquisition legislation contains no gender-specific provisions or special compensation packages for vulnerable social categories.	Gap exists. National legal frameworks treat all titleholders uniformly without special measures for vulnerable or disadvantaged groups.	Identify vulnerable households through a vulnerability assessment and provide additional allowances, preferential employment, and vocational training.
18	To address the issues identified in the environmental and social assessment, the Borrower will prepare a plan proportionate to the risks and impacts associated with the project. (ESS5 para 21)	Nepalese law mandates static acquisition procedures under LAA 1977 regardless of project risk scale, lacking risk-proportionate resettlement planning frameworks.	Gap exists. Absence of legal framework requiring resettlement instruments proportional to environmental and social risk levels.	Prepare a RAP reflecting social risks and displacement scale and manage institutional arrangements, financing, and monitoring in an integrated manner.

Source: JICA Expert Team

8.4 Major Challenges in conducting Resettlement

Environmental and Social Management Framework (ESMF 2023, DOR) mentions the challenges and mitigation measures, as follows.

Involuntary resettlement introduces complex socio-economic risks:

Heightened Vulnerability: Groups such as Dalits, female-headed households, indigenous peoples, and squatters face disproportionate impacts due to existing social and economic marginalization.

Legal vs. International Standards: While domestic laws may focus on formal title holders, international frameworks require compensation and assistance for those without recognizable legal claims, posing an implementation challenge.

Cultural Disruption for IPs: For Indigenous Peoples (IPs), the loss of access to traditional lands and resources can lead to the erosion of cultural identity and traditional livelihood systems.

8.5 Mitigation measures to address the challenges

To address these challenges, the project proponent employs a comprehensive set of strategies:

Eight-Step RAP Preparation: The process includes resettlement screening, walk-through surveys, cadastral mapping, establishment of a formal cut-off date, inventory of loss, socio-economic surveys, stakeholder consultations, and asset valuation.

Full Replacement Cost: Compensation for land, structures, and crops is determined based on current market rates plus transaction costs to ensure PAPs can rebuild or replace their assets without financial loss.

Livelihood Restoration Programs: Beyond monetary compensation, the project provides relocation allowances, skill development training, and micro-credit opportunities to enhance earning capacities.

Specialized Development Plans (IPDP & VCDP): Preparing Indigenous Peoples Development Plans (IPDP) based on Free, Prior, and Informed Consent (FPIC) and Vulnerable Community Development Plans (VCDP) ensures that benefits are culturally appropriate and inclusive.

Institutional Redress: A three-tiered Grievance Redress Committee (GRC) is established to resolve disputes locally and efficiently. The Compensation Determination Committee (CDC) oversees the valuation process to ensure transparency.

Others: Continuous monitoring and evaluation are performed at two stages (mid-term and project completion) by internal units like GESU and external third-party agencies to ensure compliance with the social safeguards.

Chapter 9: Gender Equality, Disability and Social Inclusion (GEDSI)

9.1 GEDSI-related Risks and Opportunities

9.1.1 GEDSI-related Risks associated with KVUTS

While the specific interventions to be included in KVUTS are yet to be identified, large-scale transport infrastructure development inherently requires land acquisition. This could pose severe risks to the livelihoods and assets of vulnerable populations. Likewise, the design of physical infrastructure determines the accessibility and safety of the system. Failure to mandate inclusive design standards transforms infrastructure into a tool of exclusion, particularly for PWDs, the elderly, and pregnant women.

KVUTS may also include soft interventions such as streamlined bus operations, changes in ticketing, route planning, and human resource policies. Efficient transport operations must deliver equitable access, meaning systems must be affordable and reliable for all users, particularly those who rely on public transport due to financial constraints. Also, safety and security, particularly the threat of Gender-Based Violence (GBV) and sexual harassment, are critical determinants of women's mobility patterns and access to public transport. These GEDSI-related risks associated with KVUTS is summarised in Table 9.1-1 below.

To discuss key GEDSI issues and challenges, for consideration in the SEA of KVUTSMP, separate discussions—in the form of KIIs and FGDs—with representatives of organizations and agencies that provide support to socially vulnerable groups, such as people with disabilities and the elderly, as well as other GEDSI stakeholders, were held apart from the stakeholder consultations. The meeting minutes are provided in Appendix 7.

Table 9.1-1 GEDSI-related Risks Associated with KVUTS

S.No.	Cause	Risks
Hard Interventions (Physical Infrastructure)		
1	Land Acquisition, Resettlement, and Livelihoods	Structural Omissions in LAR Frameworks
2		Disproportionate Impact on Women's Assets
3		Forced Acquisition and Erosion of Trust
4	Exclusionary Design and Physical Barriers	Systemic Non-Compliance with Universal Design
5		Diverse Accessibility Needs and Lack of Training
Soft Intervention (Operations, Services and Policy)		
6	Safety, Security, and Gender-Based Violence (GBV)	Prevalence and Normalization of Harassment
7		Inadequate Accountability and Personnel Training
8	Economic and Service Exclusion	Affordability Barriers
9		Neglecting Trip Chaining and Off-Peak Needs
10		Digital and Information Exclusion

Source: JICA Expert Team

Risk 1: Structural Omissions in LAR Framework

The core legal document guiding land acquisition and resettlement in Nepal, the Land Acquisition Act, 1977, primarily focuses on compensating titleholders for public purposes. Crucially, the subsequent Land Acquisition, Resettlement and Rehabilitation Policy (2015) is also largely silent or vague regarding explicit gender and inclusion issues. This regulatory omission creates a profound vulnerability where the compensation and livelihood restoration needs of non-titleholders, especially women and marginalized groups, are often overlooked.

Risk 2: Disproportionate Impact on Women's Assets

The lack of gender-sensitive LAR policies disproportionately affects women. Due to existing structural barriers to inheritance and property ownership, women frequently lack formal land titles. Consequently, when land is acquired, compensation tends to flow to male titleholders, bypassing women who may rely on informal use rights or who operate micro-enterprises (such as street vending) near the transport corridor. The acquisition process thus risks eroding women's already precarious economic security and their assets.

Risk 3: Forced Acquisition and Erosion of Trust

Infrastructure projects carry the risk of social conflict and legal resistance if land acquisition proceeds without adherence to robust social safeguards. Experience from other infrastructure projects in Nepal demonstrates that forcible land acquisition and failure to conduct adequate environmental and social assessment lead to community resistance and demands for suspension of work. The Master Plan must adopt a LAR framework that explicitly mitigates the loss of livelihood/income sources, residential structures, and community buildings.

Risk 4: Systemic Non-Compliance with Universal Design

Despite existing policy intentions, systemic non-compliance with universal design (UD) remains a major barrier in Kathmandu. Advocacy groups emphasize that poor road conditions, inadequate transport infrastructure, and the general behaviors of drivers hinder the ability of PWDs to travel safely and independently. This failure is often attributed to the lack of coordination between government agencies and a severe implementation deficit regarding existing disability-friendly infrastructure standards. Even minor design oversights, such as the height of a counter or the step of a bus, can become insurmountable physical barriers.

Risk 5: Diverse Accessibility Needs and Lack of Training

Accessibility requirements are diverse. Beyond physical mobility (wheelchairs, pregnant women), the Master Plan must address the needs of those with cognitive, mental, or hearing impairments, who require specialized orientation aids, visual contrast, and simple, navigable environments. According to a 2025 study on mobility gap in Kathmandu's public transport, 72% of commuters who responded to the survey consider the level of accessibility to public transport inadequate[3]. Compounding this problem, the deficiency in implementing UD standards is intrinsically linked to a lack of capacity and mandatory training among technical personnel. Simply adopting standards is insufficient; engineers, municipal officials, and contractors must be comprehensively trained on Universal Design of streets and public facilities.

Risk 6: Prevalence and Normalization of Harassment

Harassment and mistreatment remain entrenched challenges in Kathmandu's public transport system, significantly undermining service effectiveness and discouraging public transport usage, especially for female passengers. While there are awareness campaigns and police hotlines (e.g., 103 or 9851295100), justice and accountability for victims of sexual harassment often remain elusive. The systemic issue is not just the lack of reporting, but the underlying culture that permits such behaviour.

The prevalence of harassment acts as a structural constraint on mobility. Fear of crime and security concerns directly influence women's travel decisions, often compelling them to avoid specific routes, forgo travel at certain times of the day, or abandon public transit entirely. This forced restriction directly limits access to educational, health, and employment opportunities, especially those requiring travel during non-standard hours, thereby hindering women's potential for economic empowerment.

[3] Measuring Mobility Gaps: A Quantitative Study of Affordability, Reliability and Safety Issues in Kathmandu's Public Transport System, NPRC Journal of Multidisciplinary Research Volume 2, Issue 6, June, 2025

Risk 7: Inadequate Accountability and Personnel Training

An effective anti-sexual harassment framework requires robust accompanying procedures. Currently, there is a recognized gap in the training of public transportation personnel (drivers, conductors, and administrative staff) regarding sexual harassment response protocols. Without this mandatory training, GEDSI responsibilities become marginalized as "additional tasks" for staff lacking capacity.

Risk 8: Affordability Barriers

Public transport is the primary mobility source for low-income residents in the Kathmandu Valley. The cost of fares presents a substantial financial burden, with a significant proportion of commuters (28.4%) reporting financial strain, particularly students and those in low-income groups[4]. While local buses offer low monetary costs, the true cost of travel for vulnerable groups is much higher due to the substantial opportunity costs associated with delays, unreliability, and safety risks. This high time and psychological cost further limit access to better-paying jobs located far from residential areas. If the Master Plan's efficiency improvements lead to cost recovery models that prioritize profitability over social equity, the risk that the system will fail to achieve the goal of class equality would increase.

Risk 9: Neglecting Trip Chaining and Off-Peak Needs

Transport planning has historically failed to routinely address the differences in travel needs between men and women, often lacking sex-disaggregated data on trip patterns. Women frequently perform complex, multi-stop journeys (known as trip chaining) to fulfill care economy responsibilities, often traveling during off-peak hours or late evenings. If soft interventions focus solely on addressing peak-hour congestion (typically male commuter patterns), the system will perpetuate unreliability and limited service frequency outside those hours.

Risk 10: Digital and Information Exclusion

While digitization (smart cards, apps, real-time tracking) offers efficiency opportunities, over-reliance on technology introduces risks of digital exclusion. The cost of access devices, data plans, and digital literacy training creates a barrier for low-income groups. Furthermore, lack of awareness of available schemes and structural challenges in obtaining necessary identification documents (citizenship or marriage documentation) particularly afflict marginalized women, potentially restricting their access to digitally facilitated services or fare subsidies.

9.1.2 GEDSI-related Opportunities associated with KVUTS

The Master Plan represents a significant opportunity to address the severe underrepresentation of women in the transport sector workforce, which currently stands at only about 12% globally and much less in Nepal. Active efforts to promote equal employment opportunities and wages for women and men in all project phases – from infrastructure construction to operations, technical, and leadership roles – are essential. This diversification yields economic, environmental, and social gains; increasing female participation enhances decision-making capabilities, drives innovation, and improves service delivery for diverse users. MOPIT's guidelines already encourage the recruitment of women drivers and conductors. Investment in training and capacity building focused on new technologies and skills can assist women and men in reducing their work burdens and enhancing their capabilities. The Master Plan can enhance the positive transformation by explicitly ensuring that women, poor, and disadvantaged groups receive opportunities to participate in the project's financial and employment benefits.

[4] Ibid.

Chapter 10: Grievance Redress Mechanism (GRM)

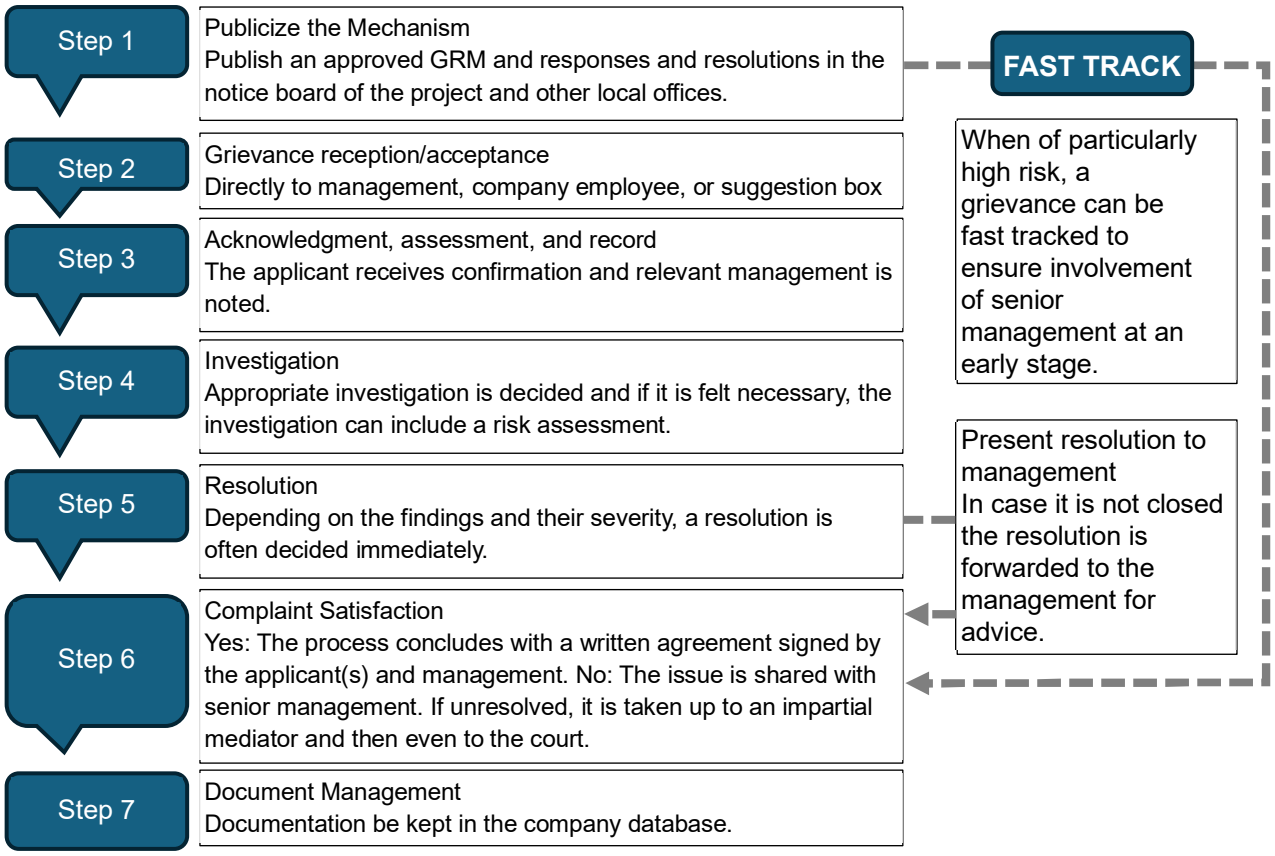
10.1 Necessity of Grievance Redress Mechanism

A Grievance Redress Mechanism (GRM) enables project-affected communities and stakeholders to raise concerns, seek remedies, and resolve disputes related to environmental and social impacts. It helps mitigate risks, comply with legal requirements, and maintain positive relationships with communities throughout the project lifecycle. The GRM should be established during the feasibility stage and remain active through environmental assessment, resettlement planning (RAP), and implementation of environmental and social management measures. It provides affected people with accessible, transparent, equitable, and time-bound procedures for submitting complaints and obtaining fair resolutions.

A multi-tier Grievance Redress Committee (GRC) should be established, including project representatives, local authorities, and community members, with balanced participation of affected people. Committee members should receive training on grievance procedures and periodic refresher sessions.

The GRM should receive grievances in both oral and written forms, record and assess them, and ensure timely resolution through a transparent process. Depending on the nature of the grievance, resolution methods include discussion, negotiation, mediation, and legal remedies when necessary. This structured approach promotes conflict resolution, reduces project delays,

An example of a grievance handling process cycle is presented in Figure 10.1-1.



Source: Environmental and Social Management Framework (ESMF-2023), Department of Road, MOPIT

Figure 10.1-1 Grievance Handling Process Cycle

The Grievance Resolution Procedure establishes a transparent, accessible, gender-responsive, and culturally appropriate process for addressing complaints from project-affected persons (PAPs) at no cost and without retaliation. Complaints may be submitted orally or in writing, and all grievances must be recorded, processed, and resolved within defined timelines.

A grievance mechanism must also be available for direct and contracted workers to report workplace concerns safely and without reprisal. The mechanism should be proportional to project risks, accessible to all workers—including women, migrants, and persons with disabilities—and should not replace existing legal or workplace grievance procedures.

Consultations and grievance communications should be conducted in the native or preferred language of affected persons. Safeguard officers should ensure grievances can be submitted through multiple channels, including in person, by telephone, or online, while protecting complainants from intimidation or retaliation.

Chapter 11: Implementation Structure of ESMP and ESMoP

11.1 Roles and Responsibility for ESMP Implementation

Implementation of Environmental and Social Management Plan (ESMP) and Environmental and Social Implementation Plan (ESMoP) requires coordination among MOID, MOAFE, the National Planning Commission, the Ministry of Finance, provincial and local governments, and other sectoral agencies responsible for forests, environment, water, energy, archaeology, land administration, and protected areas. Implementation Division Offices and Project Management Offices are responsible for day-to-day ESMP implementation, supervision, stakeholder coordination, grievance handling, and compensation activities.

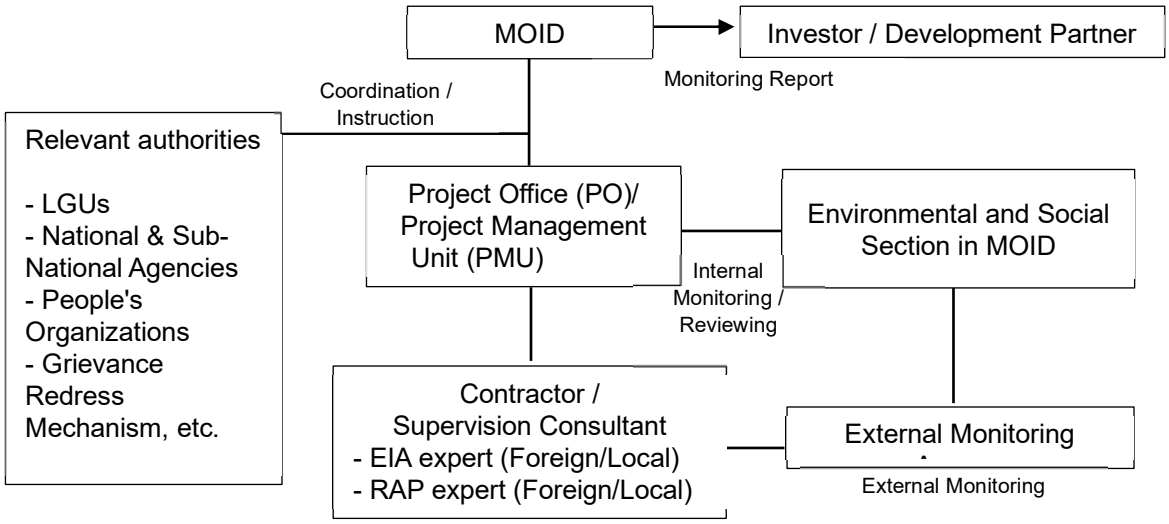
Consultants, contractors, NGOs, community organizations, and local governments support environmental and social safeguard implementation through technical assistance, construction management, public consultation, and community participation.

11.2 Challenges for ensuring ESMP implementation

The following challenges need to be addressed to ensure effective implementation.

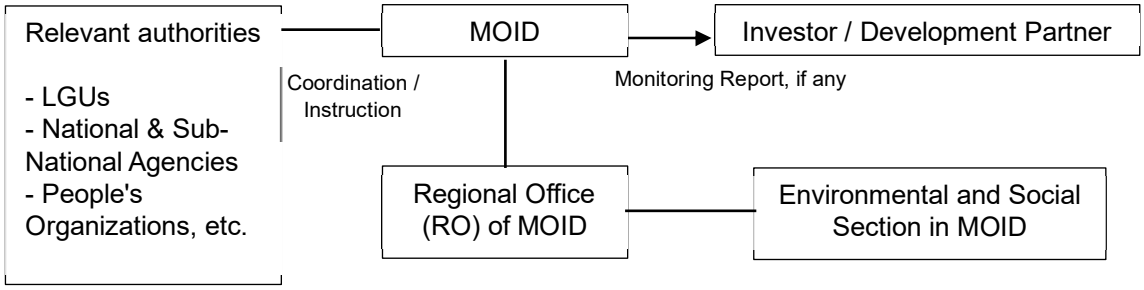
- Government offices have limited institutional capacity due to insufficient staffing and its heavy involvement in planning-stage environmental assessments, reducing its ability to conduct effective implementation-stage monitoring.
- Government Offices and Project Management Offices face shortages of qualified personnel, refresher training, and financial resources, limiting effective ESMP implementation.
- Effective environmental and social management depends on coordination among many agencies, making institutional coordination and communication challenging.
- Effective implementation of the ESMP and ESMoP requires strong coordination among government agencies, departments, project offices, and development partners.

Implementation structure for CCR will be established based on the country's legal frameworks with reporting/discussion channels to investors/development partners. Figure 11.2-1 and Figure 11.2-2 show a simplified typical implementation structure of environmental and social consideration.



Source: JICA Expert Team

Figure 11.2-1: Implementation Structure of Environmental and Social Considerations During Construction Stage



Source: JICA Expert Team

Figure 11.2-2: Implementation Structure of Environmental and Social Considerations During Operation Stage

Chapter 12: Stakeholder Engagement and Information Disclosure

12.1 Identification of Key Stakeholders

Urban transport in the Kathmandu Valley involves a multi-layered structure of federal, provincial, and local government agencies, along with powerful private associations, international donors, and NGOs representing diverse social groups.

12.1.1 Government Agencies

The mandates of government agencies are derived from regulatory authority and project implementation capacity, though boundaries are often blurred during Nepal's transition to federalism.

Table 12.1-1 List of Stakeholders (Government Agencies)

Agency	Mandate and Primary Responsibilities	Existing Activities/Projects Related to Master Plan
Ministry of Infrastructure Development (MOID)	Transport policy, planning, management of national strategic roads, and overall project coordination.	Nagdhunga Tunnel construction, Strategic Road Connectivity and Trade Improvement Project (SRCTIP).
Department of Roads (DOR)	Planning, construction, and maintenance of the Strategic Road Network (SRN).	Ring Road expansion, development of corridor roads along major rivers.
Department of Transport Management (DOTM)	Vehicle registration, driver licensing, route permit issuance, and fare regulation.	Regulation of 20-year-old vehicles, operation of the RA-IMS accident data system.
Department of Railways (DORW)	Planning and development of railways, subways, and monorails.	Feasibility studies for Kathmandu-Kerung and Raxaul-Kathmandu railways.
Federal Capital City Public Transport Authority (FCCPTA)	Integrated management of public transport within the Kathmandu Valley (est. 2022).	Development of real-time bus tracking apps, bus stop improvement plans.
Ministry of Urban Development (MOUD)	Urban planning, housing policy, and overall development strategy for the Kathmandu Valley.	Promotion of the National Urban Development Strategy (NUDS).
Kathmandu Valley Development Authority (KVDA)	Authority to plan and regulate the Kathmandu Valley as a single unit.	Formulation of the 20-year Strategic Development Master Plan (SDMP 2015-2035).
Ministry of Agriculture, Forests and Environment (MOAFE)	Environmental protection, climate change, and review/approval of SEA/EIA.	Air and water quality monitoring, climate change policy formulation.
Bagmati Provincial Government (Ministry of Labour, Employment and Transport)	Transport management authority within the province (based on Schedule 6 of the Constitution).	Formulation of Ride-Sharing (Regulation and Management) Guidelines 2025.
Kathmandu Metropolitan City (KMC)	Local planning, waste management, local roads, and social services.	Car-free zones in Thamel, river water quality analysis.
Lalitpur Metropolitan City (LMC)	Heritage conservation, pedestrian space improvement, and bicycle lane installation.	Development of 4.7km of bicycle lanes, pedestrianization around Patan Durbar Square.

Agency	Mandate and Primary Responsibilities	Existing Activities/Projects Related to Master Plan
Kathmandu Valley Traffic Police Office (KVTPO)	Traffic regulation, signal management, accident investigation, and law enforcement.	Automation of signals at major intersections, RA-IMS data collection.
Investment Board Nepal (IBN)	Facilitation of foreign and private investment in large-scale infrastructure.	Investment consultations for innovative technologies like Podways (string-based transport).

Source: JICA Expert Team

12.1.2 Private Sector and Transport Operators

Public transport in Nepal has historically been dominated by powerful private operator associations (syndicates). Any reform that undermines their interests may face resistance.

Table 12.1-2 List of Stakeholders (Private Sector and Transport Operators)

Agency	Mandate and Primary Responsibilities	Existing Activities/Projects Related to Master Plan
Federation of Nepalese National Transport Entrepreneurs (FNNTE)	Protecting private investments, maintaining route rights, and fare adjustments.	Protests against the 2018 syndicate abolition, fare negotiations due to fuel price hikes.
Sajha Yatayat	Public transport cooperative promoting large and electric buses.	Operation of 40 electric buses, pilot testing of ICT (GPS, IC cards).
Digo Sarbajanik Yatayat	Joint venture of small operators. Operator of the S5 route (Gongabu-Sinamangal).	Providing modern services using 17 large diesel buses.
Ride-Sharing Platforms (Pathao, InDrive, etc.)	On-demand transport using digital technology. Seeking legal recognition.	Rapid spread of motorcycle and taxi hailing services.
Kathmandu Podway Pvt. Ltd.	Private company aiming to introduce string-rail podway technology.	Pre-feasibility studies in the Valley, submission of reports to the Department of Railways.

Source: JICA Expert Team

12.1.3 NGOs and Civil Society

These actors represent civil rights, environment, traffic safety, and the voices of vulnerable groups.

Table 12.1-3 List of Stakeholders (NGOs and Civil Society)

Agency	Mandate and Primary Responsibilities	Existing Activities/Projects Related to Master Plan
Swatantrata Abhiyan Nepal (SAN)	Addressing road safety as a human right, promoting safe school zones.	Formation of the National Road Safety Alliance, school zone projects in Lalitpur.
Digo Bikas Institute (DBI)	Advocacy for sustainable cities, pedestrian/cyclist priority, and climate justice.	Tactical urbanism, "Sensory Walks" in Ason and Hadigaun.
Lumanti Support Group for Shelter	Improving housing and protecting the rights of the urban poor and Sukumbasi (landless person).	Small-scale infrastructure and community-based housing improvements in riverside settlements.

Agency	Mandate and Primary Responsibilities	Existing Activities/Projects Related to Master Plan
National Federation of the Disabled Nepal (NFDN)	Monitoring and advocacy for accessibility (universal design) in transport infrastructure.	Advocacy for compliance with disability-friendly standards for sidewalks and bus stops.

Source: JICA Expert Team

12.2 Stakeholder Mapping

These stakeholders can be categorized based on two axes: "Influence" (authority, funding, mobilization power) and "Interest" (magnitude of benefits or losses), which are vital for the Master Plan's success.

Table 12.2-1 Stakeholder Matrix

Influence / Interest	High Interest	Low Interest
High Influence	Key Players: MOID, DOR, DOTM, KVDA, Bagmati Province, International Donors (JICA, ADB, WB). They hold the key to the plan's implementation.	Context Setters: MOAFE, Investment Board Nepal (IBN). They influence the legal and investment frameworks.
Medium Influence	Market Shapers: FNNTE, FCCPTA, Sajha Yatayat, KMC, LMC. Cooperation or resistance during implementation is critical.	Regulators & Enforcers: Traffic Police (KVTPO), Ministry of Home Affairs. Responsible for order and safety on the ground.
Low Influence	Subjected Groups: informal settlers, People with Disabilities (PWDs), low-income commuters. They face the most impact but have the least decision-making power.	General Public: Suburban municipalities, shopkeepers away from corridors. Limited direct impact but interested in economic spillover.

Source: JICA Expert Team

It is important to note that those who have low influence but are likely to be negatively affected by the Master Plan are most vulnerable. The SEA process will pay extra attention to engage these groups to capture the opinions of these "silent high-interest groups", in order to ensure that the Master Plan is inclusive and benefits all.

12.3 Potential Conflicts of Interest

Given the complex and often overlapping mandate of various stakeholders in various levels, interests of some stakeholders may conflict with others, creating potential bottlenecks to implementation. Three primary conflict structures were identified from legal, institutional, and economic perspectives during the implementation of KVUTS MP.

12.3.1 Federal vs. Provincial Jurisdiction: Confusion over FCCPTA

The "Urban Area Public Transport (Management) Authority Act" passed by the federal government in 2022 established the FCCPTA specifically for the three districts of the Kathmandu Valley, but this has triggered a fierce jurisdictional dispute with the Bagmati Provincial Government. Bagmati Province argues that transport management is its exclusive authority under Schedule 6 of the Constitution and has challenged the federal law in the Supreme Court as unconstitutional.

The impact of this conflict is severe. While FCCPTA was established by the federal government, its operation is intended to be led by local government heads. This contradictory structure, with a massive council of 36 members (including 16 municipal mayors), has made decision-making

extremely difficult. Consequently, the issuance of new route permits and operational regulations has stalled, leaving it unclear who will execute the route restructuring proposed by the Master Plan.

12.3.2 Command Center Rivalry: KVDA vs. Local Municipalities

While the Kathmandu Valley Development Authority (KVDA) has the mandate to plan and regulate the Valley as a single unit, local governments like KMC and LMC are wary of KVDA's intervention as an infringement on their autonomy. KVDA's push for forced building demolition in road widening projects, in particular, has created political friction with municipalities closer to the residents. Close coordination between these entities is essential for land-use regulation and Transit-Oriented Development (TOD).

12.3.3 Modernization vs. Right to Livelihood: Syndicates and Small Operators

The Master Plan proposes introduction of Mass Transit System as well as consolidation of thousands of small vehicles (microbuses, tempos). While this benefits commuters, it is a matter of survival for small-scale operators represented by FNNTE. Vulnerable groups, such as female owners of Safa Tempos and microbus drivers who rely on limited assets, are at high risk of being "losers" excluded from the market by larger capital interests like Sajha Yatayat.

12.3.4 Potential Winners and Losers

In this context, the implementation of the Master Plan would create winners and losers. Potential losers who have strong influence may try to stall the implementation of the Master Plan. Losers without such political power may simply be marginalised without proper mitigation measures. Potential winners and losers are presented below.

Table 12.3-1 Potential Winners of the Master Plan Implementation

Winners	Impacts
Public Transport Users (General Citizens)	Huge social and economic benefits from reduced congestion, shorter travel times, and improved punctuality.
Large-scale Transport Operators	Consolidation of routes and subsidies (especially for electric bus conversion) enable a stable business model
Residents Exposed to Pollution	Lower tailpipe emissions reduce the risk of respiratory diseases (e.g., COPD). Currently, PM2.5 in the Valley often exceeds national standards, severely affecting children and the elderly.
Tourism Industry and Heritage Site Shopkeepers	Pedestrianization of areas like Thamel and Durbar Square improves the environment, increasing tourist stay duration.

Source: JICA Expert Team

Table 12.3-2 Potential Losers of the Master Plan Implementation

Losers	Impacts
Informal Settlers (Sukumbasi)	Corridor road construction along rivers (Bishnumati, Dhobi Khola, etc.) is likely to involve forced evictions of Sukumbasi who have lived there for years. Since they lack legal titles, they are often left out of proper compensation schemes.
Small-scale Vehicle Owners and Workers	If microbuses and tempos are excluded as "inefficient," thousands of families will lose their income. For this group, already hit by COVID-19, the devaluation of their assets (vehicles) is catastrophic
Small-scale Roadside Vendors	Road widening and access control may sever traditional customer flows. Unregistered roadside shops, in particular, risk being excluded from compensation.
Digitally Excluded Groups	If smart cards or apps become mandatory for fares, the poor and elderly without smartphones may face "digital exclusion" from services

Source: JICA Expert Team

12.4 Ongoing Stakeholder Engagement

12.4.1 Stakeholder List

In consultation with MOPIT and MOFE, the list of stakeholders to be invited to Stakeholder Meetings (SHM) was developed. The list builds on the stakeholder list used during the previous SEA conducted in conjunction with 2017 Master Plan study but is expanded and refined to capture broader and emerging environmental and social issues including GEDSI. The list of stakeholders invited to SHM is shown in the table below.

Table 12.4-1 Invitation List of Stakeholders

No.	Agency
A.	**Ministries and Government Offices**
1.	Office of Prime Minister and Council of Ministers, Singhadurbar, Kathmandu
2.	Ministry of Forests and Environment, Singhadurbar, Kathmandu
3.	Ministry of Urban Development, Singhadurbar, Kathmandu
4.	Ministry of Women, Children and Senior Citizens, Singhadurbar, Kathmandu
5.	Ministry of Agriculture and Livestock Development, Singhadurbar, Kathmandu
6.	Ministry of Water Supply, Singhadurbar, Kathmandu
7.	Ministry of Industry, Commerce and Supplies, Singhadurbar, Kathmandu
8.	Ministry of Health and Population, Ramshahpath, Kathmandu
9.	Ministry of Land Management, Cooperatives and Poverty Alleviation, Singhadurbar, Kathmandu
10.	Government of Bagmati Province, Ministry of Physical Infrastructure Development Hetauda, Makawanpur
11.	National Planning Commission, Singhadurbar, Kathmandu
12.	National Human Rights Commission-Nepal Hariharbhawan, Laitpur
13.	National Women Commission, Bhadrakali Plaza, Kathmandu
14.	High Powered Committee for Integrated Development of Bagmati Civilization (HPCIDBC), Guheshwori, Kathmandu
15.	National Disaster Risk Reduction and Management Authority, Singhadurbar, Kathmandu
16.	National Dalit Commission, Kupondole, Lalitpur
17.	Department of Environment, Babarmahal, Kathmandu
18.	Department of Roads, Babarmahal, Kathmandu
19.	Department of Transport Management, Minbhawan, Kathmandu
20.	Department of Railway, Bishalnagar, Kathmandu
21	Department of Hydrology and Meterology, Babarmahal, Kathmandu
22.	Department of Urban Development and Building Construction, Babarmahal, Kathmandu
23.	Department of Local Infrastructure Development, Shree Mahal, Pulchowk, Lalitpur
24.	Department of Forests and Soil Conservation, Babarmahal, Kathmandu
25.	Department of Mines and Geology, Lainchaur, Kathmandu
26.	Department of Plant Resources, Thapathali, Kathmandu
27.	Department of Archaeology, Ramshahpath, Kathmandu
28.	Department of Land Management and Archive, Babarmahal, Kathmandu
29.	Department of Water Supply and Sewerage Management, Panipokhari, Kathmandu
30.	Department of Health Services, Teku, Kathmandu
31.	Kathmandu Valley Development Authority, Anamnagar, Kathmandu, Nepal
32.	Civil Aviation Authority of Nepal, Babarmahal, Kathmandu
33.	Nepal Electricity Authority, Durbarmarg Kathmandu Nepal
34.	Investment Board of Nepal, New Baneshwor, Kathmandu
35.	Kathmandu Valley Traffic Police Office, Ramsahpath Kathmandu
36.	Kathmandu-Terai/Madhesh Fast Track (Expressway) Road Project, Nepal Army, Jangi Adda, Bhadrakali, Kathmandu

No.	Agency
37.	Nepal Telecom, Central Office, Bhadrakali, Kathmandu
38.	Kathmandu Valley Water Supply Management Board, Bhaisepati, Lalitpur
39.	Pashupati Area Development Trust, Gaushala Kathmandu, Nepal
40.	Kathmandu Metropolitan City, Office of Municipal Executive, Kathmandu Plaza, Kathmandu
41.	Kirtipur Municipality, Office of Municipal Executive, Kirtipur, Kathmandu
42.	Kageshwori Manohara Municipality, Office of Municipal Executive, Danchhi, Kathmandu
43.	Gokarneshwor Municipality, Office of Municipal Executive, Jorpati, Kathmandu
44.	Chandragiri Municipality, Office of Municipal Executive, Balambu, Kathmandu
45.	Tokha Municipality, Office of Municipal Executive, Maijuhiti, Kathmandu
46.	Tarkeshwor Municipality, Office of Municipal Executive, Dharmasthali, Kathmandu
47.	Dakshinkali Municipality, Office of Municipal Executive, Pharping, Kathmandu
48.	Nagarjun Municipality, Office of Municipal Executive, Harisiddhi, Sitapaila, Kathmandu
49.	Budhanilkantha Municipality, Office of Municipal Executive, Hattigauda, Kathmandu
50.	Shankharapur Municipality, Office of Municipal Executive, Sankhu Buspark, Kathmandu
51.	Lalitpur Metropolitan City, Office of Municipal Executive, Pulchowk, Lalitpur
52.	Godawari Municipality, Office of Municipal Executive, Bajrabarahi, Lalitpur
53.	Mahalakshmi Municipality, Office of Municipal Executive, Kamalpokhari, Lalitpur
54.	Bhaktapur Municipality, Office of Municipal Executive, Byasi, Bhaktapur
55.	Madhyapur Thimi Municipality, Office of Municipal Executive, Thimi, Bhaktapur
56.	Changunarayan Municipality, Office of Municipal Executive, Kharipati, Bhaktapur
57.	Suryabinayak Municipality, Office of Municipal Executive, Katunje, Bhaktapur
B.	**Development Partners**
58.	Japan International Cooperation Agency
C.	**Non-Governmental Organizations, Academics, and Others**
59.	International Centre for Integrated Mountain Development (ICIMOD), Khumaltar, Kathmandu
60.	Federation of Nepalese National Transport Entrepreneurs, Kathmandu
61.	National Federation of the Disabled Nepal (NFD-N), Bhrikutimandap, Kathmandu
62.	Feminist Dalit Organization (FEDO), Kupondol, Lalitpur
63.	Nepal Environment Society, Kathmandu
64.	Solid Waste Management Association of Nepal, Ratopul, Kathmandu
65.	Tribhuvan University, Central Department of Environmental Science, Kirtipur, Kathmandu
66.	Kathmandu University, Department of Environmental Science and Engineering, Dhulikhel, Kavrepalanchowk
D.	**Media**
67.	Rastriya Samachar Samiti, Nepal (National News Agency, Nepal)
68.	Radio Nepal, Singhadurbar, Kathmandu
69.	Gorkhapatra National Daily, Dharmapath, Kathmandu
70.	Kantipur National Daily Central Business Park, Thapathali, Kathmandu
71.	Nepal Forum of Environmental Journalists-NEFEJ, Bhanimandal, Ring Road, Lalitpur

Source: JICA Expert Team

12.4.2 1st Stakeholder Meeting

The first Stakeholder Meeting (1st SHM) for the Strategic Environmental Assessment of the KVUTS MP was held on August 3, 2025, at the Himalayan Hotel, Kathmandu, with attendance of 80 participants including honourable Ministers from the Ministry of Physical Infrastructure and Transport, and the Ministry of Forests and Environment. The specific objectives of this first SHM were to: i) Inform stakeholders about the commencement of the SEA study; ii) Present the outline of the Project (purpose, background, contents, schedule); iii) Notify stakeholders about the objective and activities of the SEA; iv) Elaborate on the Environmental and Social Conditions of Kathmandu Valley; and v) Discuss environmental and social priorities related to the KVUTS-MP.

The highlights of the presentations, discussions and feedback from stakeholders are presented in below. The minutes of the 1st SHM are included in the Appendix 1 of this Report.

Table 12.4-2 Key Discussion Points and Presenter Highlights in the 1st SHM

S.No.	Key Point	Summary
1	Urgency of Action	Joint Secretary Mr. Bhimarjun Adhikari (MOPIT) noted that traffic condition and pollution are major challenges, necessitating long, mid, and short-term plans to manage excessive motorization.
2	Current Traffic Situation	Director General Mr. Rajeev Pokharel (Department of Transport Management) reported alarmingly high vehicle density (868 vehicles per kilometre) and low average vehicle speeds (13.6 km/h morning, 10.6 km/h evening), emphasizing the need for mass transit expansion.
3	Approach to the SEA	JICA Expert Team explained that the SEA will be carried out in accordance with JICA Guidelines for Environmental and Social Considerations (2022) and in the spirit of Nepal's Environment Protection Act (EPA) 2019 and Environment Protection Rules (EPR) 2020.
4	Recommendation for Mass Transit	Secretary Mr. Keshab Kumar Sharma (MOPIT) stated the Master Plan should recommend appropriate modes of transport, including sustainable non-motorized options, and aim to replace small vehicles with larger public transport like Bus Rapid Transit (BRT), envisioning the possibility of metro, monorail, or cable cars.
5	Stakeholder Consultation	JICA Expert Team will collect concerns and suggestions through Stakeholder Meetings and incorporate them into the Master Plan. The Master Plan, including the SEA Report, will require approval by the Council of Ministers.

Source: JICA Expert Team

Table 12.4-3 Summary of Stakeholder Feedback and Concerns

S.No.	Theme	Summary
1	Social Inclusion	Establishing an inclusive transportation system, addressing Gender Equality, Disability, and Social Inclusion (GEDSI) and disability-friendly infrastructure, and promoting a human rights-based development approach.
2	Cultural Heritage	Including Heritage Impact Assessment (HIA) in the SEA for developments near heritage sites, considering sensitive ecological and archaeological areas, water recharge, and waste management (including using plastic in roads).
3	Infrastructure & Planning	Constructing underpasses/overpasses, prioritizing cycle lanes and sidewalks, promoting collective transportation and electric vehicles, and connecting mass transit routes to key public places and city peripheries.
4	Coordination	Stressing the need for coordination with agencies like the Department of Archaeology and Traffic Police, and coordinating efforts on drinking water, sewage, and electricity infrastructure.

Source: JICA Expert Team

12.4.3 2nd Stakeholder Meeting

The Second Stakeholder Meeting (2nd SHM) on Strategic Environmental Assessment for the Project on Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP) was held at Himalayan Hotel, Lalitpur dated February 4, 2026 to provide an overview of the Master Plan and to collect opinions and suggestions from various stakeholders on the environmental and social aspects of the Draft Scoping Report prepared for the SEA of the Master Plan, as well as the upcoming activities. A total of 82 participants attended the Second Stakeholder Meeting, including 63 males and 19 females. The participants comprised 42 stakeholders representing ministries, commissions, departments, local governments, and academic institutions, including the Honourable Minister from the Ministry of Physical Infrastructure and Transport and the Ministry of Forest and Environment. The specific objectives of the Second Stakeholder Meeting for SEA are: (i) to identify potential issues and impacts of the proposed Draft MP; (ii) to present

and discuss the Draft Scoping Report with stakeholders; and (iii) to incorporate stakeholders' opinions and suggestions into the Draft Scoping Report.

The highlights of the presentations, discussions and feedback from stakeholders are presented below. The minutes of the 2nd SHM are included in the Appendix 2 of this Report.

Table 12.4-4: Key Discussion Points and Presenter Highlights in the 2nd SHM

S.No.	Key Point	Summary
1	Purpose and significance of SEA	Mr. Ram Hari Pokharel, Joint Secretary (MoPIT), explained the purpose and significance of the Strategic Environmental Assessment (SEA) for the Master Plan, noting that it has been conducted in line with JICA Guidelines for Environmental and Social Considerations, 2022 and aligned with Nepal's Environmental Protection Rules (EPR), 2020, and that conducting SEA at the Master Plan level would facilitate and streamline environmental approval processes for individual projects by identifying potential environmental issues, risks, and sensitivities in advance.
2	Early impact assessment for sustainable development.	Dr. Rajendra K.C., Joint Secretary, MoFE, stressed that the Master Plan and SEA should assess and address potential irreversible environmental damage or permanent loss from proposed projects, emphasizing that early identification and effective mitigation of such impacts are essential for sustainable development, with key consideration of ecologically sensitive and productive land, water resources and drainage, energy consumption, road safety, and pollution control.
3.	Selection of alternatives based on balanced	Mr. Keshab Kumar Sharma, Secretary (MOPIT) emphasized identifying and presenting suitable alternatives within the Master Plan, with the selection of the preferred alternative guided by a balanced evaluation of technical feasibility, social acceptability, economic practicality, and environmental soundness.
4.	Conservation, people-centered approach, social and cultural sustainability, and policy alignment	Honorable Minister Mr. Madhav Prasad Chaulagain, MoPIT and MoFE emphasized Kathmandu Valley as a complex social, cultural, and ecological system, emphasizing that the Master Plan should balance infrastructure development with conservation of cultural heritage, ecosystems, and traditional settlements, adopt a people-centered approach prioritizing safety, well-being, and inclusiveness, ensure social and cultural sustainability, and identify regulatory hurdles with necessary policy revisions for effective implementation.
5.	Master Plan Development and Scoping Overview	JET explained the future urban structure, traffic demand forecast, and proposed Master Plan projects and interventions, including 18 priority projects categorized into short, medium, and long-term phases, while the Scoping Report identifies and prioritizes key environmental and social issues through early stakeholder consultation based on project characteristics
6.	Stakeholder Consultation	The JICA Expert Team will collect concerns and suggestions through stakeholder meetings and incorporate them, as relevant, into the Master Plan, Scoping Report, and SEA Report, which will require approval from the Council of Ministers

Source: JICA Expert Team

Table 12.4-5: Summary of Stakeholder Feedback and Concerns

S.No.	Theme	Summary
1	Heritage Impact Assessment	Consideration of the Heritage Impact Assessment, taking into account designated monument zones for each heritage site in the Valley and potential impacts on tangible and intangible heritage values
2	Land Acquisition and Resettlement	Inclusion of issues related to land acquisition, resettlement, and compensation to avoid social conflict among multiple stakeholders
3	Environmental Systems and Trends	Inclusion of environmental systems and trends regarding air and water quality, hydrology, annual rainfall, groundwater recharge, and valley flooding.
4	Alignment with existing legislation	Ensure alignment with existing plans, policies, and programs, with their interrelationships considered within the broader scope
5	Gender Equality, Disability, and Social Inclusion (GEDSI)	Consideration of GEDSI aspects, including women-friendly, children-friendly, and disability-friendly facilities
6	Air Quality	Include NOx, SOx, and CO along with PM2.5, PM10, and TSP for

S.No.	Theme	Summary
	Information Enhancement	comprehensive air quality assessment.
7	Urban Flooding and River Corridor	Incorporation of urban flash flooding issues along riverbanks in the Kathmandu Valley, considering increasing monsoon impacts and proposed river corridor project
8	Transportation System Integration	Ensure integration of route- and operator-based issues with existing and new systems such as BRT or mass transit, addressing operator concerns.
9	Traffic Congestion	Integrate measures to address traffic congestion within the Transportation Master Plan
10	Kathmandu-Terai (Madhesh) Fast Track Traffic Considerations	Consideration of traffic demand, generation, and impacts on the southern Kathmandu Valley and surrounding areas
11	Legal Compliance	Ensure compliance with prevailing laws and acts of Nepal to avoid implementation disruption
12	Elevated Road Concerns	Assessment of social acceptance of elevated roads in congested areas and river corridors
13	Utility Network Impacts	Consideration of impacts on water supply and sewer network
14	Geological Assessment of Kathmandu Valley	Include comprehensive geological investigations covering groundwater conditions, seismic hazards, soil stability, liquefaction, subsidence, flooding, riverbank erosion, and active fault
15	Transport Governance and Route Rationalization	Recommend a unified transport authority and route digitization based on passenger demand and government guidelines
16	Transport Operators Integration and Transition	Ensure early stakeholder inclusion and phased, inclusive integration of existing operators into new mass transit systems
17	Inclusive Public Transport Planning	Incorporate Equity, Diversity, and Social Inclusion (EDSI) principles in public transport improvement
18	Safe and Inclusive Public Transport Infrastructure	Evaluate lighting and surveillance infrastructure to support safe 24/7 public transport for women and all users.
19	Biodiversity and Ecological Conservation	Consider ecological sensitivities and ensure protection of biodiversity and maintenance of greenery
20	Hydrological Assessment	Require detailed hydrological data and modelling to forecast future conditions under different scenarios
21	Electric Vehicle Battery Management	Address battery degradation, disposal, and related pollutants from electric vehicles and propose appropriate management mechanisms
22	Groundwater Impacts	Assess impacts on groundwater recharge and water table due to road network expansion.

Source: JICA Expert Team

12.4.4 3rd Stakeholder Meeting

The Third Stakeholder Meeting (3rd SHM) on Strategic Environmental Assessment for the Project on Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP) was held at Himalayan Hotel, Lalitpur dated 31 July 2026 to provide an overview of the Master Plan and to collect opinions and suggestions from various stakeholders on the environmental and social aspects of the draft SEA of the Master Plan, as well as the upcoming activities. A total of 103 participants, including 70 males and 33 females attended the meeting. The participants comprised representing ministries, commissions, departments, local governments, and academic institutions. The specific objectives of the Third Stakeholder Meeting for SEA are: (i) to present and discuss the result of Draft SEA; (ii) to incorporate stakeholders' opinions and suggestions into the Draft SEA Report, and (iii) to inform the public disclosure of the Draft SEA Report.

The key concerns and Feedback from participants of 3rd SHM are presented below. The minutes of the 3rd SHM are included in the Appendix 3 of this Report.

Table 12.4-6: Summary of Key concerns and Feedback from participants of 3rd SHM

S.No.	Theme	Summary of concerns
1	Protection of World Heritage Sites & Alternative Alignments	To safeguard the Outstanding Universal Value (OUV) of UNESCO World Heritage sites (Pashupati and Boudha), stakeholders strongly requested excluding or redirecting the proposed Chabahil–Gaushala Tunnel and Chabahil–Bagmati Elevated Highway. Exploring alternative alignments, such as the Dhobi Khola corridor road or a Kalopul–Chabahil–Boudha Tunnel, was highly recommended.
2	Preservation of Historical Settlements & Living Heritage	The historic urban settings and community-level heritage of Handigaun, Naxal, Bhaktapur, and the inner-city must be documented and preserved. Ensuring the uninterrupted operation of traditional chariot procession (Jatra/Rath Yatra) routes and active consultations with local Guthiyars (custodians) are essential.
3	River Corridor Infrastructure & Access to Rituals	Since riverbanks along the Bishnumati and Thapathali-Tripureshwor corridors are closely linked to daily religious rituals and traditional cremation sites (ghats), infrastructure design must guarantee uninterrupted public access to river sides and accommodate maintenance equipment for debris and waste removal.
4	HIA Implementation & Chance Find Procedures	Carrying out comprehensive Heritage Impact Assessments (HIA) for tunnels and river corridors under DoA's approval, establishing a roster of heritage experts, and establishing a "Chance Find Procedure" to immediately suspend construction and notify DoA upon subsurface archaeological discoveries are strictly required.
5	Inclusive Transport & Disaggregated Baseline Data	Planning and designing bus stops, reserved seats, and pedestrian infrastructure based on universal accessibility to enable women, children, older persons, and persons with disabilities to travel independently. Resettlement planning must incorporate disaggregated baseline data (by gender, age, and disability) to ensure social inclusion.
6	GPrevention of Gender-Based Violence & Public Safety	To prevent sexual harassment and GBV on public transport, installing CCTV and adequate street lighting is recommended. Strengthening coordination with the Nepal Police's "Safety Pin Campaign" (deploying plain-clothes police) and holding dedicated consultations with gender-focused organizations were requested.
7	Legal Status of Kathmandu Metropolitan City	Under the Constitution of Nepal and Local Government Operation Act, KMC must be legally recognized as a "co-decision maker" rather than a mere "supporting agency" or "stakeholder". Project implementation is deemed unfeasible without prior consent and active participation from KMC.
8	Compliance with Local Environmental Standards	In addition to federal laws, Chapter 2 (Legal Framework) must mandatorily include local regulations, specifically the KMC Environment and Natural Resources Conservation Act 2020 and the Solid Waste Management Collection and Transportation Procedures 2024.
9	Inter-governmental Coordination & Legal Amendments	Defining clear roles, responsibilities, and coordination mechanisms among federal, provincial, and local levels to minimize overlap. The Master Plan should also recommend legal amendments to the Council of Ministers to ensure the successful execution of the SEA and transport schemes.
10	Air Quality, Microclimate, & GHG Analysis	Expanding air quality studies to cover SOx, NOx, O3, and CO. Assessing impacts on the bowl-shaped Kathmandu Valley's microclimate and the Shivapuri-Nagarjun National Park using computer modeling, and clarifying whether the estimated 21% GHG reduction by 2050 stems from Master Plan projects or general EV market expansion are requested.
11	Groundwater Recharge & Riverine Ecosystems	Evaluating groundwater recharge capacity and hydrological impacts, particularly for underground infrastructure below Tundikhel, and incorporating underground water reuse during tunnel construction. Emphasizing the protection of riparian vegetation, wetland restoration of the Manohara, Bagmati, and Bishnumati rivers, and ensuring ecological flow (e-flow) mechanisms.
12	Construction & Demolition Waste Management	The ESMP must incorporate a concrete plan for the safe handling and disposal of millions of tons of construction and demolition (C&D) waste likely to be generated by major transport projects. The Master Plan must explicitly identify the ultimate responsible body (proponent/contractor) bearing the technical and financial duties for C&D waste.
13	Rights and Fair	To prevent social conflicts and project delays, Chapter 8 must explicitly

S.No.	Theme	Summary of concerns
	Treatment of Informal Settlers	guarantee fair compensation, livelihood restoration, and resettlement assistance for informal settlers without formal land ownership titles, strictly in accordance with the JICA Guidelines for Environmental and Social Considerations (2022) and international human rights principles.
14	Fair Property Compensation & Protection of Small Operators	Real estate and property acquisition must adhere to the principle of just compensation reflecting full replacement or fair market value. Furthermore, the plan should protect the investments of existing self-employed and small-scale transport entrepreneurs by offering opportunities to recover and participate in the future transport network.
15	Pedestrianization, Smart Parking, & Access	Transitioning areas like Thamel, Ason, and Durbar Marg to pedestrian-only zones requires detailed accessibility, emergency access, and socio-economic impact studies. To offset off-street parking shortages, stakeholders suggested introducing smart lift/mechanical parking structures and implementing suburb-based "Park and Ride" facilities.
16	Mass Transit Sustainability & Public Bus Promotion	Concerns were raised over the long-term sustainability of the proposed Metro/railway system due to heavy reliance on foreign technology, expertise, and spare parts (citing Janakpur-Jaynagar railway issues). Prioritizing road improvements, high-capacity bus services (BRT) using local materials, upgrading existing bus stops, issuing smart cards for students/farmers, and keeping long-distance buses at out-of-valley terminals are recommended as more sustainable alternatives.
17	Aviation Integration & Airport Safeguarding)	Tribhuvan International Airport (TIA) must be recognized as a key multimodal hub with seamless BRT/MRT connections. Development around TIA must strictly comply with airport safeguarding, such as Obstacle Limitation Surfaces (OLS) and aviation safety. The SEA should evaluate aviation-specific environmental impacts (noise, bird hazards, dust, electromagnetic interference) and actively include CAAN as a technical coordinator.
18	Technical Solutions & Multi-hazard Disaster Resilience	Technical measures must be incorporated into underground infrastructure to ensure uninterrupted reception of Radio Nepal broadcasts for emergency alerts. Designing infrastructure using multi-hazard risk assessment frameworks (earthquakes, floods, heatwaves), implementing utility corridors, and building trauma care/emergency rescue facilities near major junctions are recommended.

Source: JICA Expert Team

12.5 Technical Working Group Meeting

For this Master Plan study, three Technical Working Groups have been established to discuss specific technical matters related to urban transport and urban planning. In particular, Technical Working Group 3 focuses on environmental and social issues and thus serves as a focal point of the SEA study.

Table 12.5-1 Technical Working Group

TWG	Members	Topics
Urban Planning	KVDA, MOID, DOTM, DUDBC, KMC, LMC, BM	Future population, future urban development policy, etc.
Transportation Planning	MOID, DOR, DOTM, NRB, KVDA, FCCPTA, Bagmati Province, KMC, LMC, BM, Academic Expert	Traffic survey, traffic demand forecasts, sector planning, etc.
Environment	MOID, MOAFE, DOE, DOR, NRB, DOTM, KMC, LMC, BM, Academic Expert	Social and Environment Survey, SEA, Environmental Study, etc.

Source: JICA Expert Team

The minutes of the Technical Working Group 3 are summarized in Appendix 4,5 and 6 of this Report.

12.5.1 1st Technical Working Group 3 (Environment)

The 1st Technical Working Group 3 (Environment) meeting focused on discussing and reaching consensus on the Strategic Environmental Analysis (SEA) procedure for KVUTSMP among TWG members. The meeting also emphasized the need for support in providing baseline information on environmental aspects, GESI (Gender Equality and Social Inclusion), and climate change, as well as discussing stakeholders to be invited for upcoming SEA-related meetings.

The meeting was held on March 10, 2025, from 11:00 a.m. to 12:30 p.m. at the Meeting Hall, Ministry of Physical Infrastructure and Transport. It was attended by 21 participants from various ministries, departments, local levels, and organizations, including the JICA Expert Team.

The meeting concluded with a request to provide necessary data for the SEA and support stakeholder meetings. The legal process concerning consent and approval will be determined at a later stage through additional consultations to finalize the approach. A meeting with MoFE will be held prior to the stakeholder meeting to clarify the SEA approach. Further discussions will be carried out during subsequent meetings of stakeholders and the JCC.

12.5.2 2nd Technical Working Group 3 (Environment)

The 2nd Technical Working Group 3 (Environment**)** meeting on the preliminary Draft Scoping Report focused on GESI and climate change, including requests for baseline information on social aspects, GESI, climate change, and disaster management, as well as discussion of the upcoming activities schedule for the Strategic Environmental Assessment (SEA) of the Kathmandu Valley Urban Transport System Master Plan (KVUTSMP).

The meeting was held on December 16, 2025, from 11:00 a.m. to 12:30 p.m. at the Meeting Hall, Ministry of Physical Infrastructure and Transport. It was attended by 26 participants from various ministries, departments, local levels, and organizations, including the JICA Expert Team.

The key concerns raised in the meeting included quantifiable mitigation measures, effective monitoring, safe and reliable transport systems, narrow roads lacking footpaths, green belt provision, GEDSI approaches, vehicle-related air pollution, land acquisition, population projections, road safety measures, fleet renewal, cultural baseline considerations, Heritage Impact Assessment, and traffic management.

12.5.3 3rd Technical Working Group 3 (Environment)

The 3rd Technical Working Group (Environment) meeting was held on 21st July, 2026 for discussion on the Draft SEA Report of KVUTSMP from 11:00 a.m. to 12:30 p.m. at the Meeting Hall of Ministry of Infrastructure Development. The Meeting focused on the Draft Strategic Environmental Assessment (SEA) Report, covering the Outline of Necessary Projects/Interventions for the Master Plan, Progress of the SEA for the KVUTSMP, the Summary of the Draft SEA Report, and the Draft Program for the Third Stakeholder Meeting.

The meeting was attended by 23 participants from various ministries, departments, local governments, and organizations, including the JICA Expert Team.

The key concerns raised during the meeting can be grouped into three categories: strategic planning, including clarification of the SEA scope and consideration of transportation and project alternatives; social issues, including safeguards for employment impacts, vulnerable communities, and public acceptance; and environmental and climate considerations, including

cleaner transport technologies, climate resilience, air quality, and seismic vulnerability; as well as clearer documentation, emphasizing the use of definitive language to ensure certainty.

During the meeting, it was confirmed that the Draft SEA Report would be publicly disclosed on the website for one month following the 3rd SHM.

12.6 Focus Group Discussions and Key Informant Interviews

In addition to the above, additional engagement has been conducted for in-depth assessment of GEDSI-related matters in the transport sector in Kathmandu Valley. The list of informants/group and the key summary are presented below.

Table 12.6-1 Summary of Focus Group Discussion and Key Informant Interviews

S.No.	Organization / Section [Date]	Summary
1	Lalitpur Metropolitan City Community Development Section, Social Development Division [December 12, 2025]	• Public transport routes are inadequate, mostly on main roads, leaving residential areas poorly connected • Many roads are one-way to manage traffic, but congestion and frequent jams make timely travel difficult • Public transport punctuality is critical, but reliance on private vehicles remains high due to route and timing issues • Parking problems and limited vehicle-free zones create challenges for traffic management and road safety • Introduction of larger buses in coordination with Sajha Yatayat is planned to improve public transport capacity • No policy exists in LMC to phase out old vehicles that have exceeded age thresholds, affecting service quality • Vehicular emissions are monitored by city police in coordination with the Department of Environment; monitoring equipment has been installed in Pulchowk
2	Kathmandu Metropolitan City, Office of Municipal Executive Social Development Department [December 12, 2025]	• Public transport is difficult for people with disabilities due to the lack of ramps, insufficient space, and the extra time needed to board and alight • Ride-hailing services (e.g., Pathao, InDrive, Yango) are cheaper, reliable, and fast, but women sometimes face harassment from riders, who can identify them through their phone and harass them later • Abuse of women in public transport, knowingly or unknowingly by conductors or passengers, especially during peak office hours, due to overcrowded conditions • Footpaths should be accessible to persons with disabilities
3	Kathmandu Valley Traffic Police Office [December 17, 2025]	• Health-related issues for traffic police due to long hours of standing in polluted air and noisy roads • Improvement of road junctions is necessary to ensure smoother traffic flow, reduce congestion, and enhance road safety for both vehicles and pedestrians
4	National Human Rights Commission – Nepal Gender and Social Inclusion Division [December 12, 2025]	• Conductors and bus drivers harass senior citizens and students over fare discounts, despite their identities being clear." • Drivers and conductors are often unwilling to board senior citizens and persons with disabilities." • Land acquisition is a very sensitive issue in urban areas. • Women drivers do not feel safe operating public vehicles
5	National Women Commission Women Development Coordination Section	• Overcrowding and unsafe conditions in public transport • Gender-based violence and harassment in public vehicles • Lack of accessible infrastructure and facilities • Poor vehicle and road management

S.No.	Organization / Section [Date]	Summary
	[December 12, 2025]	• Low public awareness and enforcement of human rights and social responsibility • Severe air pollution and health risks due to emissions from old vehicles and traffic congestion • Need for training and inclusion of women in the transport sector
6	National Federation of the Disabled Nepal [December 14, 2025]	• Transport system should address the needs of all types of disabilities • Provision of wide, unobstructed, and accessible footpaths for people with disabilities • Lifts should be installed at sky bridges • Coordination with NFD-N for proper implementation of the transport master plan • Safe railings should be provided on the roadside
7	Feminist Dalit Organization [December 15, 2025]	• Harassment of passengers by drivers and conductors after knowing their identity must be prevented • Awareness programs should inform that such acts are offenses • Strict action and monitoring should be implemented to prevent harassment • Accessible feedback and complaint mechanisms should be provided for passengers • Mandatory training for drivers and conductors on professional conduct and ethics
8	Federation of Nepalese National Transport Entrepreneurs [December 18, 2025]	• Social and mental well-being of drivers and conductors should be considered as they work long hours in polluted and uncomfortable environments from 4 a.m. to 8 p.m • Moral and ethical education should be included in the curriculum from a young age to cultivate responsible behavior among future drivers and conductors • Drivers face health risks such as kidney problems because they often cannot use public toilets due to limited facilities at bus stops • Introduction of an efficient policy by the government to implement a mass transit bus system
9	LMC Network Child Club [December 18, 2025]	• Time-consuming public transport, unlike private vehicles that can cover many destinations quickly • Overcrowded public vehicles, causing discomfort and delays • Inappropriate behavior by conductors and drivers of public transport • Unsafe public transport, including over speeding due to competition for fares. • Mismanaged bus stops, leading to confusion and delays. • Air pollution from vehicles, with adverse impacts on public health • Sajha Yatayat can be considered one of the most reliable, safe, and accessible public transport options
10	LMC Ward Level Youth Club [December 18, 2025]	• Difficulty in land acquisition in LMC due to cultural and social constraints. • Lack of timely service, frequent delays, and long travel times are major issues in public transportation. • Traffic safety issues, with a special concern for pedestrian safety • Dedicated and safe cycle lanes should be provided along the road to protect cyclists and promote sustainable transportation • CCTV should be installed on roads and inside public vehicles to monitor traffic conditions and enhance passenger safety.
11.	Women's Cycling Group [December 18, 2025]	• Awareness is the foundation of all solutions. • Rules and regulations should be followed by every citizen. • Public participation and responsibility are key to effective implementation.

S.No.	Organization / Section [Date]	Summary
		• Continuous awareness programs help foster a culture of safety and accountability

Source: JICA Expert Team

Chapter 13: Overview of Comments from Stakeholders on SEA Report

13.1 Overview of comments on Draft Scoping Report

The Draft Scoping Report prepared in January 2026 was reviewed by key government agencies, technical experts, academic institutions, local governments, transport operators, and other stakeholders through formal consultations, technical working groups, stakeholder meetings, and written feedback. Detailed comments from stakeholders and responses from the MOPIT and/or JICA expert teams are summarized in Appendix 9 of this document.

A review of all comments indicates that stakeholder concerns were concentrated on several recurring themes rather than individual project-specific issues. The majority of comments focused on the adequacy of environmental and social baseline information, the need for stronger policy and legal consistency, cultural heritage protection, project implementation feasibility, and social acceptance of proposed transport interventions.

13.1.1 Distribution by Key Concern Category on Draft Scope Report

Figure 13.1-1 presents the distribution by key concern category on Draft Scope Report.

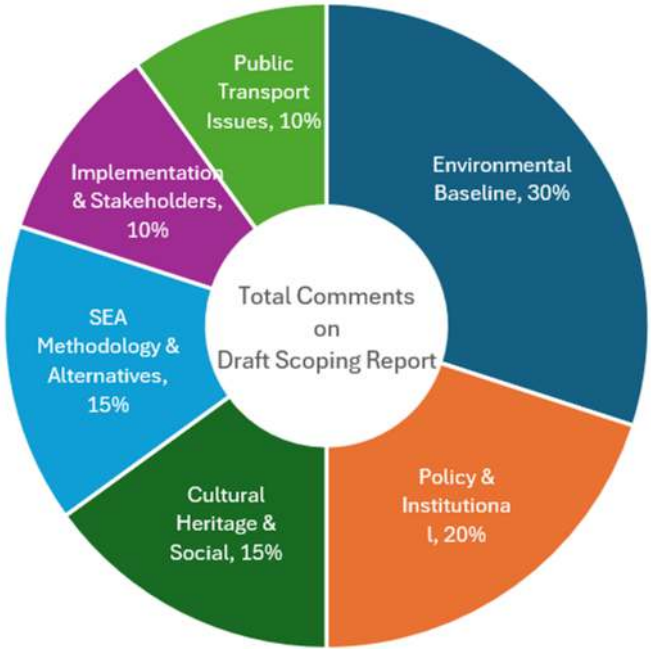
Overall, the comments received during the scoping stage indicate that stakeholders are primarily concerned with the adequacy of environmental baseline information, consistency with existing policies and regulations, protection of cultural heritage resources, and the practicality of implementing the proposed Master Plan. These comments provide valuable guidance for refining both the SEA and the Master Plan and have been reflected, where appropriate, in the subsequent stages of the study.

The largest share of comments concerned environmental baseline information, including air quality, water quality, hydrology, groundwater, flooding, geology, noise, and ecosystem conditions. Stakeholders frequently requested additional data collection and stronger trend analysis.

Another major concern related to policy consistency and institutional coordination, reflecting stakeholder expectations that the Master Plan and SEA should align with existing national policies, legislation, and sector plans.

Comments related to cultural heritage protection were also substantial, reflecting the unique heritage value of Kathmandu Valley and the need to consider heritage-sensitive planning approaches.

Many stakeholders also requested that transport alternatives remain open during the SEA process and that implementation risks, social acceptance, and governance challenges be explicitly considered.



Note: Percentage mentions in the graph shows the approximately share
Source: JICA Expert Team

Figure 13.1-1:Distribution by Key Concern Category on Draft Scoping Report

13.1.2 Category-wise Summary of Comments on Draft Scoping Report

Category-wise summary of comments is shown below. The detailed comments and responses or response directions tables are attached into the Annex 9 of SEA repot.

Table 13.1 1 Summary of Comments on Draft Scoping Report

S.No.	Main Comment	Response Strategy
Category1: Environmental Baseline and Natural Environment		
E1	Stakeholders emphasized that the environmental baseline should go beyond a simple description of existing conditions and include additional information on air quality, water quality, noise, hydrology, groundwater recharge, flooding, geological hazards, ecosystem connectivity, and long-term environmental trends.	The SEA will utilize all available secondary information to strengthen the environmental baseline and identify key environmental constraints and opportunities. Where detailed site-specific investigations are not feasible at the Master Plan stage, additional surveys and monitoring requirements will be recommended for subsequent FS, IEE, or EIA studies.
E2	Several agencies requested the inclusion of a wider range of environmental indicators, including gaseous air pollutants, river water quality, groundwater conditions, and disaster-related environmental risks.	Available data from relevant government agencies will be incorporated where possible. The SEA will also identify information gaps and recommend future monitoring programs required to support project-level environmental assessment.
E3	Concerns were raised regarding the potential impacts of future transport infrastructure on rivers, drainage systems, groundwater recharge areas, biodiversity, and environmentally sensitive locations within the Kathmandu Valley.	The SEA will identify environmentally sensitive areas and provide guidance on avoiding, minimizing, and mitigating potential impacts through appropriate planning, design, and f
Category2: Policy, Legal and Institutional Issues		
P1	Stakeholders requested a more	The SEA and the Master Plan will review

S.No.	Main Comment	Response Strategy
	comprehensive review of relevant policies, legislation, regulations, and strategic plans related to transport, urban development, environment, cultural heritage, and land use planning.	applicable national policies and legal frameworks and demonstrate consistency with higher-level plans and statutory requirements.
P2	Several comments highlighted the need to clarify institutional responsibilities, coordination mechanisms, and governance arrangements necessary for successful implementation of the Master Plan.	Institutional capacity, implementation responsibilities, and coordination requirements among relevant agencies will be analyzed and reflected in the recommendations of both the SEA and Master Plan.
P3	Concerns were expressed that policy inconsistencies or conflicts among different government agencies could create implementation challenges in the future.	Potential conflicts or overlaps among policies and institutions will be identified, and recommendations for strengthening inter-agency coordination will be proposed.
Category3: Cultural Heritage and Social Safeguards		
C1	Many stakeholders emphasized the importance of protecting UNESCO World Heritage Sites, monument zones, sacred rivers, archaeological resources, and other culturally significant locations within the Kathmandu Valley.	Cultural heritage has been included as a key assessment component in the SEA. Potential impacts will be identified, and recommendations for heritage-sensitive planning and project development will be presented.
C2	Several stakeholders recommended that Heritage Impact Assessment (HIA) requirements should be clearly recognized for future projects located near culturally sensitive areas.	The SEA will recommend that detailed HIA studies be undertaken during subsequent project preparation stages whenever cultural heritage resources may be affected.
C3	Comments also highlighted social issues such as land acquisition, involuntary resettlement, community acceptance, compensation mechanisms, and impacts on vulnerable groups.	Social risks will be addressed in accordance with national requirements and international good practice, while detailed mitigation measures will be recommended for consideration during project-level studies.
Category 4: SEA Methodology and Alternative Assessment		
S1	Stakeholders noted that potential transport infrastructure options should not be presented as predetermined decisions and that sufficient flexibility should be maintained during the SEA process.	The SEA will clearly state that the proposed transport interventions remain conceptual options at the Master Plan stage and are subject to further examination and refinement.
S2	Several comments requested a stronger strategic assessment framework, including the analysis of alternatives, cumulative impacts, environmental trends, and system-level interactions.	Alternative options will be evaluated using environmental, social, technical, and economic criteria, while broader strategic implications will be considered within the SEA framework.
S3	Concerns were raised regarding the need for preliminary guidance on future environmental assessment requirements for proposed subprojects.	The SEA will provide recommendations regarding the likely environmental and social assessment requirements that may apply during future project development stages.
Category 5: Public Transport and Traffic Management		
T1	Public transport operators requested that their operational experience, concerns, and future role within the transport system be adequately considered during the planning process.	The Master Plan and SEA will recognize transport operators as important stakeholders and will examine measures that facilitate their participation in future transport system reforms.
T2	Comments highlighted the importance of	Potential transition approaches, including

S.No.	Main Comment	Response Strategy
	integrating existing operators into future mass transit systems while minimizing disruption to livelihoods and business activities.	phased implementation and institutional reform measures, will be discussed as part of future implementation recommendations.
T3	Several stakeholders requested that future traffic growth, regional development trends, and emerging transport demands be more fully reflected in transport planning.	Traffic demand forecasts and transport planning assumptions will continue to be refined as additional information becomes available, and recommendations for future plan updates will be provided.

Source: JICA Expert Team

13.2 Overview of comments on Draft SEA Report

Following the completion of the Draft SEA Report in July 2026 for the KVUTSMP, comprehensive stakeholder consultations were conducted. Feedback was collected through the 3rd Technical Working Group 3 (Environment) meeting on July 21, 2026, the 3rd Stakeholder Meeting (SHM) on July 31, 2026, and written feedback. Detailed comments from stakeholders and responses from the MOPIT and/or JICA expert teams are summarized in Appendix10 of this report.

While comments during the scoping stage (Sections 13.1) focused primarily on baseline data requirements, legal review, and general methodological alignment, feedback at the Draft SEA Report stage shifted decisively toward concrete strategic implementation challenges. Stakeholders raised acute concerns regarding social safeguards for non-titleholders, physical protection of cultural heritage in sensitive corridors, legal recognition and co-decision roles for municipal authorities, contractor obligations for construction waste management, and the long-term technical and financial sustainability of mass transit options.

13.2.1 Distribution by Key Concern Category on Draft SEA Report

Figure 13.1-1 presents the distribution by key concern category on Draft Scope Report.

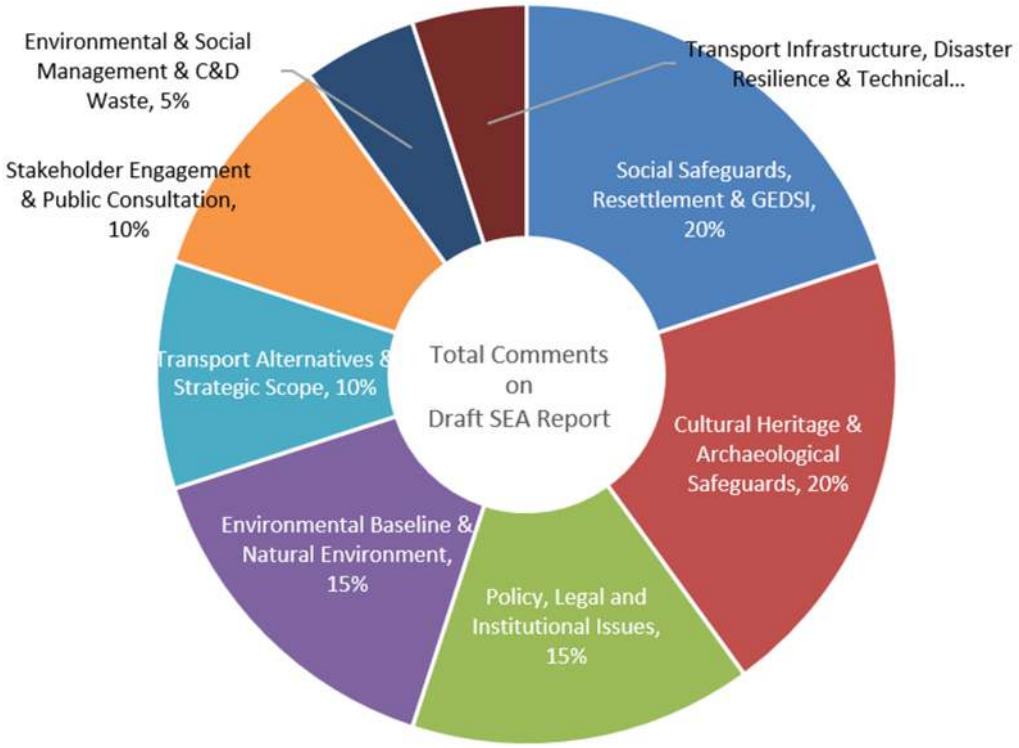
Overall, the comments received during the Draft SEA Report stage indicate that stakeholder attention shifted from broad institutional and baseline questions raised during scoping to specific, strategic implementation challenges. Stakeholders were primarily concerned with social safeguards for vulnerable populations, the physical protection of cultural heritage in sensitive corridors, legal alignment and co-decision roles for local authorities (particularly Kathmandu Metropolitan City), and the management of major construction-phase environmental risks such as demolition waste and urban flooding. These comments provide critical guidance for finalizing the SEA Report and formulating implementation frameworks for subsequent feasibility studies (F/S) and project-level ESIA/IEE assessments.

The main concerns focused on Social Safeguards, Resettlement & GEDSI and Cultural Heritage & Archaeological Safeguards, each accounting for about 20% of comments. Stakeholders emphasized fair compensation and livelihood restoration, protection of vulnerable groups and small transport operators, accessibility and GBV prevention, as well as protection of cultural heritage through Heritage Impact Assessments and alternative route evaluations.

Policy, Legal and Institutional Issues and Environmental Baseline & Natural Environment each represented about 15% of comments. Key requests included stronger municipal involvement, compliance with local environmental laws, improved baseline data and monitoring, and consideration of urban flooding, groundwater recharge, and heat island effects.

Transport Alternatives & Strategic Scope and Stakeholder Engagement & Public Consultation each accounted for about 10%, with stakeholders calling for transparent comparison of BRT and rail options, justification of the proposed corridor, and broader consultation.

The remaining comments addressed waste management, disaster resilience, airport safeguarding, utility infrastructure, and emergency response, emphasizing clear responsibilities and stronger technical coordination.



Note: Percentage mentions in the graph shows the approximately share
Source: JICA Expert Team

Figure 13.2-1: Distribution by Key Concern Category on Draft SEA Report

13.2.2 Category-wise Summary of Comments on Draft SEA Report

Category-wise summary of comments on Draft SEA Report is shown below. The detailed comments and responses or response directions tables are attached into the Annex 10 of SEA repot.

Table 13.1 1 Summary of Comments on Draft SEA Report

S.No.	Main Comment	Response Strategy
Category 1: Social Safeguards, Resettlement & GEDSI		
S1	River corridor road projects will cause involuntary displacement of informal settlers (Sukumbasi) who lack formal land ownership certificates.	To bridge gaps between Nepal's Land Acquisition Act 1977 and international standards. Non-titleholders displaced by project interventions are explicitly guaranteed full replacement-cost compensation for non-land assets, Resettlement Action Plans (RAP), Livelihood Restoration Plans (LRP), and assistance for vulnerable households.
S2	Universal Design (UD) & Accessibility	SEA Report enquires disability-disaggregated

S.No.	Main Comment	Response Strategy
	Standards for Vulnerable Groups	data in RAP surveys, Universal Design compliance for all transport facilities and footpaths, and reserved seats and fare subsidies for people with disabilities and senior citizens.
Category 2: Cultural Heritage & Archaeological Safeguards		
C1	Stakeholders requested the derail survey on the proposed Chabahil–Gaushala Underground Tunnel (No. 2) and Chabahil–Bagmati Elevated Highway (No. 3) due to geological soft clay risks and potential damage to UNESCO Outstanding Universal Value (OUV).	SEA Report proposes that prior to final design, a comprehensive Heritage Impact Assessment (HIA) approved by DoA, detailed borehole/hydrogeological surveys of lake-basin clay, and a comparative technical evaluation of alternative alignments (such as the Dhobi Khola Corridor) are mandatory F/S prerequisites.
C3	Stakeholders noted that Nepal lacks extensive practical experience and legal frameworks for Heritage Impact Assessments (HIA), requesting clear guidelines and multi-agency oversight.	SEA Report incorporated DoA's HIA Framework. An Advisory Body decided by DoA and a coordination mechanism (comprising DoA, PADT, KMC, LMC) will review the HIA Terms of Reference (TOR) and oversee the assessment process. Although there is little experience with HIAs in Nepal, it is proposed that HIAs be conducted in reference to international good practices.
Category 3: Policy, Legal and Institutional Issues		
P1	Addressing Overlapping Jurisdictions across Three Tiers of Government	To resolve overlapping mandates, the report proposes establishing multi-tiered Technical Working Groups (TWGs) and integrated transport management councils before project procurement.
P2	Recommendations for Legislative Amendments in Nepal	Noted.
Category 3: Environmental Baseline & Natural Environment		
E1	Reflection of Recent Urban Flood & Flash Flood Events (2024–2025)	Detailed damage statistics and water-level records were added in SEA Report as requested.
E2	Groundwater Recharge, Infiltration Capacity, and Water Reuse	SEA Report proposes conducting basic hydrogeological surveys during the FS phase and developing a detailed ESMP that addresses the recovery of discharged groundwater and measures to manage surface runoff.
Category 5: Transport Alternatives & Strategic Scope		
T1	Whether non-rail, road-oriented, or BRT alternatives were rigorously evaluated against capital-intensive metro systems.	SEA report presents a Multi-Criteria Analysis (MCA) comparing Scenario 0 (Without), Scenario 1 (Comprehensive Mass Transit), Scenario 2 (Road-Oriented), and Scenario 3 (Integrated Transport Strategy across technical, economic, financial, environmental, and social dimensions, justifying Scenario 3 as the optimal choice.
T2	Technical justification for selecting the Ratnapark–Bhaktapur East–West Corridor as the first priority over other potential corridors	Previous studies (2017 MP, 2018 KSUTP, 2019 JICA study) and updated traffic demand modeling confirmed that the Kathmandu–Bhaktapur East-West axis exhibits the highest passenger volume in the Valley, where road widening is physically constrained by dense urbanization.
T3	Implementing car-free zones in heritage/commercial hubs (Thamel, Ason, Basantapur) without alternative parking or access could harm local	Car-Free Zones, Off-Street Parking and TOD hubs are proposing in MP, F/S studies will conduct detailed accessibility, traffic diversion, and local business impact assessments prior to

S.No.	Main Comment	Response Strategy
	businesses and elderly mobility.	finalizing vehicle restrictions.
Category 6: Stakeholder Engagement & Public Consultation		
S1	Regarding public notice and online disclosure of the Draft SEA Report.	It was confirmed that National newspaper notice was published following the 3rd SHM, initiating a 30-day web disclosure period on MoID's website to gather final public feedback before submitting the report to the Cabinet.
S2	Multi-Faceted Inclusion of Academic Institutions	The valuable contribution of academic experts in TWG3 and SHMs, confirming that academic collaboration will be expanded during subsequent F/S and project-level EIA/IEE studies on a case-by-case basis.
Category 7: Environmental & Social Management during Construction phase		
M1	In strategic-level SEAs, contractor responsibilities must be translated into legally binding contractual obligations during procurement.	All ESMP/ESMoP mitigation, monitoring, and safety costs must be explicitly priced and included within the Bill of Quantities and tender specifications during future project-level procurement.
M2	Stakeholders requested proper traffic management and safety measures during construction to prevent extreme traffic jams in narrow urban corridors.	ESMP includes a mandatory requirement for contractors to formulate a detailed 'Construction Traffic Management Plan prior to site mobilization, obtaining formal approvals from the Traffic Police and local municipal authorities.
Category 7: Transport Infrastructure, Disaster Resilience & Technical Solutions		
D1	Radio Nepal requested incorporating technical solutions in underground to ensure uninterrupted reception of Radio Nepal broadcasts for emergency alerts.	Emergency Road Network projects incorporated underground radio rebroadcasting infrastructure as a mandatory technical safety design requirement to be detailed during the F/S stage.
D2	Stakeholders urged assessing seismic vulnerability using geological/geotechnical data, noting the thick, soft lacustrine clay deposits amplifying ground shaking and liquefaction risks.	For high-risk structural projects, it is required that the feasibility study (F/S) include in-depth geotechnical investigations and structural designs incorporating seismic and liquefaction countermeasures.

Source: JICA Expert Team

Chapter 14: Conclusion and Recommendation

14.1 Conclusion

14.1.1 Introduction of SEA to KVUTSMP

The Strategic Environmental Assessment (SEA) was integrated into the formulation of the Kathmandu Valley Urban Transport System Master Plan (KVUTSMP) to ensure that environmental and social considerations are embedded in decision-making at the highest planning level. Unlike traditional Environmental Impact Assessments (EIA), which are applied to specific implementation-stage projects, the SEA for this Master Plan (MP) examines strategic alternatives to avoid or minimize significant negative impacts from the outset.

The SEA process was structured into nine comprehensive tasks.

Task 1: Discussion on Approaches to SEA

The legal and procedural framework for this SEA was established through a high-level consensus between MOID and MOAFE. It was agreed that the study would follow the JICA Guidelines for Environmental and Social Considerations (2022) while adhering to the spirit of Nepal's Environment Protection Act (EPA) 2019. This dual approach ensures international best practices are combined with national regulatory requirements.

Task 2: Collecting Baseline Information

Comprehensive secondary data was collected, revealing critical environmental and social characteristics of the Kathmandu Valley. Key findings include i) severe air pollution (PM2.5 and PM10 levels frequently exceeding national standards), ii) major rivers are heavily polluted by sewage and waste, iii) The city is home to 131+ ethnic groups, with strong Newar heritage, iv) UNESCO sites, temples, festivals, and sacred rivers shape daily life, v) a high degree of social vulnerability, as approximately 71% of female-headed households, in the Valley do not own land or a house, and vi) Urbanization increases impervious surfaces, runoff, and flash flood risk.

Task 3: Outline of MP and Overview of Components

Based on a multi-criteria analysis of urban structures and transport strategies, Scenario 3 (prioritizing the East-West Mass Transit Line) was recommended as the most balanced option. This scenario best aligns with future urban development plans while considering environmental, social, and financial feasibility.

Task 4: Scoping (Identification of Potential Impacts)

The scoping process identified 30 potential environmental and social impact items. Strategic priorities were focused on Air Quality, Cultural Heritage, Land Acquisition and Resettlement, and GEDSI (Gender Equality, Disability, and Social Inclusion), which require detailed assessment.

Task 5: Preparation and Disclosure of Scoping Report

The Draft Scoping Report was disclosed during the 2nd Stakeholder Meeting (SHM). Stakeholder feedback highlighted the urgent need for Heritage Impact Assessments (HIA) for projects near UNESCO sites and the importance of protecting the livelihoods of existing small-scale transport operators.

Task 6: Assessment of Potential Impacts

The assessment concluded that implementing the Master Plan could reduce Greenhouse Gas (GHG) emissions by approximately 21% by 2050 compared to the "without project" scenario. However, infrastructure projects such as the Chabahil-Gaushala underground tunnel pose risks to archaeological resources, making detailed HIAs mandatory for implementation.

Task 7: Formulating Mitigation and Monitoring Plans

A framework for the Environmental and Social Management Plan (ESMP) and Grievance Redress Mechanism (GRM) was proposed. These plans emphasize systematic monitoring of air/water quality and ensuring a transparent process for addressing community concerns.

Task 8: Preparation of the Draft SEA Report

All evaluation results and stakeholder comments were integrated into the Draft SEA Report. This report serves as the basis for the final round of public consultations at the 3rd Stakeholder Meeting on July 31, 2026.

Task 9: Preparation of Final SEA Report

The final task involves incorporating all feedback received from the 3rd SHM and the Technical Working Group (TWG) to finalize the SEA Report. The Final SEA Report will then be submitted to the Council of Ministers for formal approval, marking the integration of environmental considerations into the Master Plan's adoption.

A cornerstone of this structure was the participatory process, involving three rounds of SHMs and three Technical Working Group (TWG) meetings focused on the environment, ensuring transparency and accountability in the decision-making process.

14.1.2 Key Environmental and Social Risks and Opportunities for KVUTSMP

The assessment identified several critical environmental and social items that require sustained attention during the implementation of the MP. These items were selected based on high stakeholder concern and the potential magnitude of their impact.

14.1.2.1 Improvement of Air Quality and Climate Change

In confirming the baseline environmental and social conditions, measures against air pollution—one of the major environmental challenges in the Kathmandu Valley—are deeply related to the introduction of the urban transportation system. Kathmandu Valley currently faces severe pollution, with PM2.5 and PM10 levels frequently exceeding national standards (NAAQS). Implementing the MP is projected to result in a 21% reduction in Greenhouse Gas (GHG) emissions by 2050 compared to the "Without Project" scenario. However, construction-related dust and emissions remain a temporary risk.

14.1.2.2 Cultural Heritage and Landscape

The Kathmandu Valley is recognized both domestically and internationally as a heritage-rich city, with numerous temples scattered throughout the city. Among these temples are World Heritage sites attracting tourists globally and historical and cultural facilities cherished by many local residents. When planning development activities in the Kathmandu Valley, it is necessary to consider not only historical and cultural heritage but also the use of related intangible cultural heritage, such as events. Specifically, paying attention to minimizing negative impacts on human flow and activity content during events, as well as routes involving processions like floats, represents environmental and social considerations that take regional characteristics into account. This is essential when considering the coexistence of the urban transportation

system with the region's historical and cultural heritage. Therefore, Heritage Impact Assessment (HIA) should be undertaken for future priority transport projects located within or near heritage-sensitive areas to ensure the protection of both tangible and intangible cultural heritage.

14.1.2.3 Land Acquisition and Involuntary Resettlement

One of the most challenging aspects of implementing development activities in the Kathmandu Valley is land acquisition and resettlement. Kathmandu city is already densely built up with roads and structures, and it is said that there is almost no space left for public facilities, particularly in the central urban area. Furthermore, land prices are high; even when land seems available, compensation costs can become prohibitively expensive, making economically viable public facility development impossible. Approximately 71% of female-headed households, in the Valley own neither land nor a house, making them highly vulnerable to economic displacement. Protecting the rights of non-titleholders, such as squatters (Sukumbasi), is essential to align with international standards.

14.1.2.4 Social Vulnerability and GEDSI

Enhancing accessibility for the 1.47% of the population who are persons with disabilities (PWDs) is a strategic priority. Furthermore, addressing safety from Gender-Based Violence (GBV) and sexual harassment on public transport is critical for ensuring equitable access for women, who currently make up only 42% of the workforce. In particular, the active adoption of universal design is expected for mass transit systems, which are being proposed as a new form of public transportation.

14.1.2.5 Urban Flooding and Hydrology:

Recent extreme rainfall events highlight the risk of flash floods along river corridors. New bridge and road projects along the Bagmati and Bishnumati rivers must incorporate climate-resilient designs to manage increasing monsoon runoff. For example, necessary measures include structures that do not require work within the riverbed or at the water’s edge, the application of appropriate construction methods, construction schedules that account for the rainy season, and the development of evacuation plans for heavy rainfall. Additionally, bridge girders must be designed with high water levels in mind, and underpasses must be equipped with adequate stormwater drainage systems.

14.1.2.6 Construction in the narrow street area

In Kathmandu Valley areas, there are many narrow roads and many sharp curves, then traffic congestion is already a problem. In addition to, there are many existing utilities (transmission lines, telecom lines, water lines, etc.) along the existing road. These infrastructures shall be protected and/or diverted before construction work. When implementing projects to improve these conditions, additional congestion and safety, sanitation, and health- issues in the surrounding areas may arise during construction. Therefore, when formulating the budget, it is necessary to develop existing infrastructure diversion and construction traffic management plans and appropriately incorporate into the construction costs the expenses associated with establishing temporary detours, relocating and restoring existing infrastructure, and ensuring the safety of residents using these narrow roads.

14.2 Challenges for Implementation and Recommendation of Proposed Countermeasures

The implementation of the KVUTSMP faces several institutional and organizational hurdles that could potentially stall progress. The key challenges regarding KVUTSMP and the proposed countermeasures are outlined below.

Table 14.2-1 Key Challenges and Proposed Countermeasures on KVUTSMP

Item	Key Challenges:	Proposed Countermeasures:
1.Impementation Structure	To formulate the Master Plan and implement it smoothly, coordination among a wide range of stakeholders (central and local governments, local communities, transport operators, etc.) will be required. There may be conflicts among stakeholders due to differences in their expected benefits and interests	Strengthening Coordination Platforms: Utilize the established Technical Working Groups (TWG) and High-Level Committees to clarify mandates and resolve jurisdictional disputes through continuous inter-agency dialogue.
2.Limited Institutional Capacity:	Government agencies face a shortage of technical personnel and financial resources to conduct effective environmental and social monitoring during the implementation phase.	Capacity Building Programs: Implement mandatory training for municipal officials, engineers, and contractors on Universal Design (UD) and GBV-responsive protocols.
3.Resistance from Operators:	Existing small-scale bus and tempo operators (syndicates) may resist modernization if they perceive it as a threat to their right to livelihood.	Inclusive Business Transition: Adopt a phased consolidation approach for transport operators, supporting them to transition into modern companies or cooperatives rather than excluding them from the market. Establishment of Robust GRM: Deploy a three-tiered Grievance Redress Mechanism (GRM) to resolve local disputes efficiently, ensuring that complainants are protected from retaliation.
4.Data Gaps:	The lack of continuous, public baseline data for air quality, water quality, and noise, hydrology, groundwater recharge, flooding, geological hazards, ecosystem makes it difficult to measure and analyse the actual long-term impacts of infrastructure projects.	Recommend that subsequent Feasibility Studies (F/S) include comprehensive on-site monitoring of environmental parameters to fill existing data gaps.
5.Heritage Impact Assessment (HIA):	Proposed transport infrastructure may affect UNESCO World Heritage Sites, monument zones, archaeological resources, traditional urban landscapes, and cultural activities including festivals and procession routes. On the other hand, the procedures for the Heritage Impact Assessment (HIA) recommended by the DOA are not currently stipulated by rules or regulations, and there is no sufficient HIA-related case history or practical experience in Nepal.	Conduct Heritage Impact Assessment (HIA) for priority projects located within or near heritage-sensitive areas in accordance with the progress of project design during the Pre-F/S or F/S stages. The HIA should evaluate both tangible and intangible cultural heritage and recommend avoidance, minimization, mitigation, and monitoring measures through consultation with Department of Archaeology.

Source: JICA Expert Team

Some comments from the SHM suggested that, in addition to organizational restructuring, legislative amendments in Nepal are necessary to ensure the smooth implementation of the MP.

14.3 Upcoming Activities (After the 3rd Stakeholder Meeting)

The SEA process will enter its final stages, comprising the following key activities:

- Public Notice and Public Disclosure: A public notice regarding the disclosure of the draft SEA report will be published in national newspapers. The Draft SEA Report will be publicly disclosed on the MOID website for one month to collect final feedback and comments on the report.
- Finalization of SEA Report: Feedback on the Draft SEA Report received from stakeholders through 3rd SHM and the public disclosure process will be collected, analysed and incorporated into the Final SEA Report.
- The Final SEA Report will be attached to the Master Plan and submitted to the Council of Ministers for formal approval.

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Appendix

Appendix 1: Summary of 1st Stakeholder Meeting

Summary of First Stakeholder Meeting of Strategic Environmental Assessment (SEA) of Project on Kathmandu Valley Urban Transport System Master Plan

Japan International Cooperation Agency (JICA) had an agreement with Government of Nepal (GON) for the Project on Kathmandu Valley Urban Transport System (KVUTS) Master Plan. JICA has awarded Nippon Koei Co., Ltd. in Joint Venture with other companies to undertake the Project on Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP). The objective of the Project is to promote the implementation of projects based on the master plan in the Kathmandu Valley and to contribute to sustainable economic growth and reduction of environmental burdens such as traffic congestion and air pollution by: 1) developing a new urban transportation master plan, 2) identifying priority mass transit modes and routes, and 3) establishing a coordination mechanism among stakeholders to realize the master plan. In addition, a Strategic Environmental Assessment (SEA) is to be carried out during the preparation of the master plan. SEA is an environmental assessment at the decision-making of the higher stage than the project-level environmental assessment, and Stakeholder Meeting is an integral part of the SEA.

The project has intended to conduct three rounds of Stakeholder Meeting; however, remaining meetings will be conducted only after the preparation of Scoping report and Draft Master Plan. The Stakeholder Meeting was held in presence of government officials from different line ministries, representatives from different local level organizations, Non-Governmental Organizations (NGOs) as stakeholders during the meeting

First Stakeholder Meeting on Strategic Environmental Assessment for the Project on Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP) was held at Himalayan Hotel, Lalitpur dated August 3, 2025 to collect opinions and suggestions from various stakeholders regarding environmental and social aspects to inform the preparation of the Master Plan. There were 39 stakeholders from ministries, commissions, offices, local groups, universities, and the press who attended the meeting

JICA has intended to carry out the Master Plan together with a Strategic Environmental Assessment (SEA) for the plan. As a part of SEA, JICA Expert Team is responsible in conducting three different Stakeholder Meetings (SHM) at different date in line with JICA Guidelines for Environmental and Social Considerations (JICA-GL), 2022. The specific objectives of this First Stakeholder Meeting for SEA are as follows;

- To inform commencement of SEA study to all the stakeholders;
- To present outline of the Project (purpose, back ground, contents, schedule of the Master Plan);
- To notify stakeholders about the objective and activities of SEA;
- To elaborate Environmental and Social Conditions of Kathmandu Valley; and
- To discuss on environmental and social priorities related to KVUTS MP

The formal program began with the opening remarks and an outline of the meeting's objectives from Mr. Bhimarjun Adhikari, Joint Secretary, MoPIT. Mr. Adhikari mentioned that the traffic condition and pollution are the major challenges of the Kathmandu valley. Therefore, long-term, mid-term, and short-term plans must be prepared to take necessary action to manage excessive motorization of the valley; he added. As a part of this plan, GoN has requested JICA to prepare a master plan to manage a transport system of the valley; while JICA has accepted the request for the preparation of Master Plan; he informed. He further explained that the objective or slogan of the Master Plan is safe, sustainable, and inclusive transportation system for vibrant and cultural Kathmandu city. Further informed that the JICA has started preparing Master Plan on 24 November 2023 JICA and will be completed within three years. Mr. Adhikar expected the output of the Master Plan will be comprehensive, sustainable, updated urban transport master plan of the Kathmandu valley, and will be prepared focusing on mass transit.

Mr. Adhikari, further highlighted the SEA is a part of the Master Plan; while crucial feedback for the

preparation of the Master Plan is inevitable. Mr. Adhikari defined the SEA as a systematic process used to assess the environmental impacts and implications of proposed policies, plan, programs and broad scale projects early in the decision-making process. Mr. Adhikari said; the objective of the SHM meeting is to conduct discussion with stakeholders on key environmental topics and issues including collection of essential data and information related to baseline environmental conditions, climate change, environmental pollution, gender, and social aspects. Further added that the stakeholder's involvement is a crucial for identifying environmental impacts related to Kathmandu valley Urban Transport System Master Plan. Mr. Adhikari further informed that; baseline data on environmental, climate change and gender issues should be collected to complete the SEA study. Environmental baseline means air quality of the valley, noise level, water quality, distribution of sensitive places like temples, cultural natural heritage, hospitals, schools etc. will be collected; he added. Similarly, protected areas, national parks, world heritage, forest, reserved areas will be collected; he specified.

Moreover, Mr. Adhikari added that; information on waste management practice of the Kathmandu valley and related data should be collected. In the climate-change field, status of greenhouse gas emission of Nepal and its emission with focus on Kathmandu valley and especial mitigation activities for reducing emission of greenhouse gas on transportation section shall be collected. Moreover, information on climate change, impact mitigation, technology development, technology transfer aspect should also be considered; he added. Furthermore, information on gender equality and social inclusions, harassment and crimes experienced by transport users should also be collected as baseline; he added.

Mr. Adhikari, informed that the stakeholders identified for the preparation of SEA are Ministries and government agencies, non-government organizations, academic and research institutions, relevant organizations, media representatives and other concern parties. Mr. Adhikari stressed that the stakeholders will be consulted and coordinated regularly throughout the SEA process. Information, concerns, and suggestions from stakeholders will be incorporated into the SEA report. Finally, Mr. Adhikari requested all the participants to provide valuable suggestion from their respective expertise.

Opening remarks and objective of the meeting was followed by a keynote speech from Mr. Keshab Kumar Sharma, Secretary, MOPIT. Mr. Sharma explained that the Kathmandu valley is a historic city, and not an urban pattern for the development of road and other utilities. Mr. Sharma further expressed that the Master Plan will recommend the appropriate mode of transport and necessary infrastructures, as this city needs sustainable types of non-motorized transport mode that will reduce the existing high fleet of small vehicles replaced by the bigger vehicles and bigger public transportation like Bus Rapid Transit (BRT). Mr. Sharma further added the Master Plan should envision the possibility of metro or monorail or cable cars in a multi-modal harmonic way. The Master Plan prepared by the JICA study team will be useful and implementable document; he added.

Table 1: List of Stakeholders attending the Meeting

Date	August 3rd, 2025
Organizer	Ministry of Physical Infrastructure and Transport (MoPIT) & JICA Study Team.
Venue	The Hotel Himalaya, Kupondole Height, Lalitpur, Kathmandu
	<Ministries, Commissions, Departments and Relevant Organizations> 1. Ministry of Physical Infrastructure and Transport, Singhadurbar, Kathmandu 2. Ministry of Forests and Environment, Singhadurbar, Kathmandu 3. Ministry of Urban Development, Singhadurbar, Kathmandu 4. Ministry of Health and Population 5. Ministry of Agriculture and Livestock Development, Singhadurbar, Kathmandu 6. National Women Commission (NWC) 7. National Human Rights Commission-Nepal Hariharbhawan, Laitpur 8. Department of Environment, Babarmahal, Kathmandu 9. Department of Roads, Babarmahal, Kathmandu 10. Department of Transport Management, Minbhawan, Kathmandu 11. Department of Railway, Bishalnagar, Kathmandu 12. Department of Forests and Soil Conservation, Babarmahal, Kathmandu

	13. Department of Plant Resources, Thapathali, Kathmandu 14. Department of Archaeology, Ramshahpath, Kathmandu 15. Department of Land Management and Archive, Babarmahal, Kathmandu 16. Department of Health Services, Teku, Kathmandu 17. Civil Aviation Authority of Nepal, Babarmahal, Kathmandu 18. Nepal Electricity Authority, Durbarmarg Kathmandu Nepal 19. Kathmandu Valley Traffic Police Office, Ramsahpath Kathmandu 20. Kirtipur Municipality, Office of Municipal Executive, Kirtipur, Kathmandu 21. Kageshwori Manohara Municipality, Office of Municipal Executive, Danchhi, Kathmandu 22. Chandragiri Municipality, Office of Municipal Executive, Balambu, Kathmandu 23. Tokha Municipality, Office of Municipal Executive, Maijuhiti, Kathmandu 24. Dakshinkali Municipality, Office of Municipal Executive, Pharping, Kathmandu 25. Budhanilkantha Municipality, Office of Municipal Executive, Hattigauda, Kathmandu 26. Shankharapur Municipality, Office of Municipal Executive, Sankhu Buspark, Kathmandu 27. Lalitpur Metropolitan City, Office of Municipal Executive, Pulchowk, Lalitpur 28. Mahalakshmi Municipality, Office of Municipal Executive, Kamalpokhari, Lalitpur 29. Mahankal Rural Municipality, Office of Rural Municipal Executive, Gotikhel, Lalitpur 30. Madhyapur Thimi Municipality, Office of Municipal Executive, Thimi, Bhaktapur 31. Suryabinayak Municipality, Office of Municipal Executive, Katunje, Bhaktapur 32. International Centre for Integrated Mountain Development (ICIMOD), Khumaltar, Kathmandu 33. Federation of Nepalese National Transport Entrepreneurs, Kathmandu 34. Feminist Dalit Organization (FEDO), Kupondol, Lalitpur 35. Nepal Environment Society, Kathmandu 36. Tribhuvan University, Central Department of Environmental Science, Kirtipur, Kathmandu 37. Kathmandu University, Department of Environmental Science and Engineering, Dhulikhel, Kathmandu 38. Solid Waste Management Association of Nepal (SWMAN) 39. Rastriya Samachar Samiti, Nepal (National News Agency, Nepal) 40. JICA Nepal

Following the ministerial addresses, Mr. Ramesh Basnet, Under Secretary and Chief of the Department of EIA at MoFE, delivered a presentation on environmental legislation in Nepal, with a particular focus on SEA requirements under the Environment Protection Act (EPA) 2019 and Environment Protection Rules (EPR) 2020. He emphasized the SEA's role in addressing issues related to displacement of local communities and safeguarding cultural heritage.

Subsequently, Mr. Hideo Tsuji, Team Leader of the JICA Expert Team, presented the JICA Project Outline, highlighting the significance of the Urban Transportation Master Plan in the Kathmandu Valley. This was followed by a presentation from Mr. Rajeev Pokharel, Director General of the Department of Transport Management, who outlined the current transportation challenges in the valley. He noted that average vehicle speeds have dropped to 13.6 km/h in the morning and 10.6 km/h in the evening due to congestion, with an alarming density of 868 vehicles per kilometer. He stressed that the expansion of a mass transit system is essential to improve mobility and reduce traffic-related incidents, which are on the rise alongside increasing vehicle numbers.

Similarly, Mr. Tomoaki Tanabe, Environmental and Social Expert from the JICA Expert Team, highlighted about the definition of SEA, the background and objectives of the SEA, proposal approach and tentative schedule of the SEA. Mr. Tanabe further highlighted the SEA definition presented by

Organization for Economic Cooperation and Development (OECD) as participatory approach that aim to integrate environmental consideration into policy, plan, and program interlinking with economic and social consideration. Mr. Tanabe further elaborated the SEA as a systematic examination on social and environmental impacts and issues associated with policy, plan, and program typically at the national level. Mr. Tanabe elaborated SEA process and comparison between EIA and SEA processes, further explaining that SEA will be carried out in decision-making stage while EIA is to be carried out during project implementation stage with direct impact upon the environment and proposing mitigation of measures. Mr. Tanabe further highlighted the requirement of SEA as per JICA Guidelines for Environmental and Social Considerations (2022) that shall be conducted at the planning stage before the project implementation. Mr. Tanabe further explained about the SEA system that has been legislated as per the EPA (2019) and EPR (2020) in the context of Nepal further explaining the steps require in conducting SEA in Nepal as the EPA and EPR. He emphasized that SEA will be carried out in accordance with JICA Guidelines for Environmental and Social Considerations, 2022 and in the spirit of the Environment Protection Act, 2019. Moreover, SEA will be conducted in consultation with the governmental bodies of Nepal. JICA Expert Team shares all the information with MoPIT, MoFE and other relevant authorities during the course of the study (Technical Working Group 3 has already been established).

For the KVUTS MP, Scoping Document and SEA report will be prepared. JICA Expert Team will collect the concerns and suggestion from various stakeholder through Stakeholder Meetings and reflect them into Master Plan. Finally, the KVUTS Master Plan including the SEA report will be approved by the Council of Ministers

Mr. Tanabe finally explained about the SEA schedule and informed about second SHM scheduled tentatively for the month of October or November 2025 with the result of Scoping; while the study team will be seeking the opinions from the participants during that meeting. Mr. Tanabe further informed that the third and final SHM meeting would be carried out during the month of January or February next year. The study team will be explaining the result of the final assessment report and proposal of framework and result of Environmental Management Plans. After that, SEA report will be finalized together with the master plan.

This technical session was complemented by a joint presentation from Ms. Laxmi K.C., Senior Divisional Engineer at MoPIT, and Mr. Abhishek B.C., Environmental and Social Expert with the JICA Expert Team, on the environmental and social challenges specific to Kathmandu Valley's transportation system.

Table 2: Details of the Participants of the First SHM of SEA

S.N.	Name	M/F	Ministry/Department/Organization	Designation
A.	**Ministries and Government Offices**			
1.	Honorable Mr. Debendra Dahal	M	Ministry of Physical Infrastructure and Transport	Honorable Minister
2.	Honorable Mr. Ain Bahadur Shahi Thakuri	M	Ministry of Forests and Environment	Honorable Minister
3.	Mr. Bhimarjun Adhikari	M	Ministry of Physical Infrastructure and Transport	Joint Secretary
4.	Mr. Sushil Babu Dhakal	M	Ministry of Physical Infrastructure and Transport	Joint Secretary
5.	Mr. Dr. Prakash Budhathoki	M	Ministry of Health and Population	Spokesperson/ Joint Secretary
6.	Mr. Ramesh Basnet	M	Ministry of Forests and Environment	Under Secretary
7.	Mr. Prakash Pantha	M	Ministry of Agriculture and Livestock Development	Under Secretary
8.	Mr. Keshav Prasad Sharma	M	Ministry of Physical Infrastructure and Transport	Secretary
9.	Mr. Gopal Guragai	M	Ministry of Physical Infrastructure and Transport Secretariat	Officer, Ministry Secretariat
10.	Mr. Rajendra Shahi	M	Ministry of Forests and Environment	Personal Secretary, Ministry Secretariat
11.	Mr. Lek Bikram Shah,	M	Ministry of Forests and Environment	Personal Secretary, Ministry Secretariat
12.	Ms. Laxmi K.C	F	Ministry of Physical Infrastructure and Transport	Senior Divisional Engineer
13.	Mr. Narayan Prasad Nihure	M	Ministry of Physical Infrastructure and Transport	Senior Divisional Engineer
14.	Ms. Shubha Shrestha	F	Ministry of Physical Infrastructure and Transport	Senior Sociologist
15.	Mr. Amar Bahadur Oli	M	Ministry of Forests and Environment	Sociologist
16.	Mr. Loknath Sharma	M	Ministry of Forests and Environment	Forest Officer
17.	Mr. Bipin Gyawali	M	Ministry of Urban Development	Senior Divisional Engineer
18.	Mr. Shakuntala Acharya	F	National Women Commission	Women Development Officer (WDO)
19.	Mr. Kiran Baram	M	National Human Right Commission	Officer
20.	Mr. Dr. Bijaya Jaishi	M	Department of Roads	Director General
21.	Mr. Shuva Raj Neupane	M	Department of Roads	Senior Engineer
22.	Mr. Manoj Aryal	M	Department of Roads	Environment Inspector
23.	Mr. Saujanya Nepal	M	Department of Roads, Nagdhunga Tunnel Construction Project,	Project Director
24.	Mr. Chudaraj Dhakal	M	Department of Roads, Project Directorate (ADB)	Project Director
25.	Mr. Kamal Kumar Sah	M	Department of Railways	Senior Divisional Engineer
26.	Mr. Surendra Prasad Adhikari	M	Department of Forests and Soil Conservation	Forest Officer
27.	Ms. Monika Dahal	F	Department of Plant Resources	Planning Officer

S.N.	Name	M/F	Ministry/Department/Organization	Designation
28.	Ms. Swasti Shrestha	F	Department of Environment	Environment Inspector
29.	Mr. Sandeep Khanal	M	Department of Archaeology	Chief Archaeological Officer
30.	Mr. Rajendra Manandhar	M	Department of Archaeology	Engineer
31.	Mr. Kaji Bahadur Bista	M	Department of Land Management and Archive	Director, Land Revenue and Land Reform Section
32.	Mr. Rajeev Pokharel	M	Department of Transport Management	Director General
33.	Mr. Dr. Prakash Gyawali	M	Department of Health Service, Management Division	Department Health Administrator
34.	Mr. Dipendra Shrestha	M	Civil Aviation Authority of Nepal	Project Director
35.	Mr. Raju Gyawali	M	Nepal Electricity Authority	Deputy Manager
36.	Mr. Milan Dahal	M	Nepal Electricity Authority	Director
37.	Mr. Dipak Giri	M	Kathmandu Valley Traffic Police Office	Superintendent of Police (SP)
38.	Mr. Gyan Bahadur Majhi	M	Kathmandu Valley Traffic Police Office	Inspector
39.	Mr. Gyan Bazra Maharjan	M	Kirtipur Municipality	Head of Environment Section
40.	Mr. Sandesh Kumar Dhakal	M	Kageshwori Manohara Municipality	Engineer
41.	Ms. Bhadra Aryal	F	Chandragiri Municipality	Senior Section Officer
42.	Mr. Paras Thapa	M	Chandragiri Municipality	Civil Engineer
43.	Ms. Anusha Sharma	F	Tokha Municipality	Engineer
44.	Mr. Ram Mani Kafle	M	Dakshinkali Municipality	Chief Administrator Officer
45.	Mr. Giri Raj Khanal	M	Dakshinkali Municipality	Section Officer
46.	Mr. Sunil Maharjan	M	Budhanilkantha Municipality	Engineer
47.	Mr. Prakash Singh Saud	M	Shankharapur Municipality	Engineer
48.	Mr. Pradeep Amatya	M	Lalitpur Metropolitan City	Engineer
49.	Mr. Manish Subedi	M	Mahalakshmi Municipality	Engineer
50.	Mr. Sandip Neupane	M	Mahankal Rural Municipality	Chief Administrative Officer
51.	Mr. Joni Kumar Nyasur	M	Mahankal Rural Municipality	Ward Chairperson
52.	Mr. Manoj Kumar Parajuli	M	Mahankal Rural Municipality	Ward Chairperson
53.	Mr. Krishna Gopal Shrestha	M	Madhyapur Thimi Municipality	Engineer
54.	Mr. Nabaraj Giri	M	Suryabinayak Municipality	Engineer
B.	**Non-Governmental Organizations, Academics, and Others**			
55.	Mr. Bhupesh Adhikary	M	International Centre for Integrated Mountain Development (ICIMOD)	Climate Action Lead
56.	Mr. Suresh Bishwakarma	M	Feminist Dalit Organization	Program Manager

S.N.	Name	M/F	Ministry/Department/Organization	Designation
57.	Mr. Anil K.C	M	Nepal Environment Society	President
58.	Mr. Ram Kumar Ghimire	M	Solid Waste Management Association of Nepal	Chairperson
59.	Mr. Udhab Raj Khadka	M	Central Department of Environmental Science, Tribhuvan University	Professor
60.	Mr. Subodh Luitel	M	Kathmandu University	Assistant Professor
C.	**Media**			
61.	Mr. Bhisma Raj Ojha	M	National News Agency	Sub-Editor
62.	Ms. Pragati Dhakal	F	National News Agency	Sub-Editor
63.	Mr. Menon Rajbhandari	M	National News Agency	Cameraman
64.	Mr. Gopal Dahal	M	National News Agency (RSS)	Photo Journalist
D.	**Japanese Side**			
65.	Ms. Aya Iwatsuji, Representative	F	Japan International Cooperation Agency (JICA), Nepal	Representative
66.	Mr. Hideo Tsuji	M	JICA Expert Team	Team Leader
67.	Mr. Tomoaki Tanabe	M	JICA Expert Team	Environmental and Social Expert
68.	Ms. Toko Hirora	F	JICA Expert Team	Public Transport
69.	Mr. Koji Yamada	M	JICA Expert Team	Urban Planner
70.	Mr. Chikara Uchida	M	JICA Expert Team	Land Use / GIS
71.	Mr. Minoru Yoshitoni	M	JICA Expert Team	Public transport
72.	Mr. Abhishek B.C	M	JICA Expert Team	Environmental and Social Expert
73.	Mr. Akhilesh Kumar Karna	M	Kathmandu Valley System Masterplan	JICA Expert
E.	**Sub-Consultant Team (TSE)**			
74.	Mr. Rikesh Chitrakar	M	Tech Studio of Engineering Pvt. Ltd.	Environmentalist
75.	Mr. Aditya Paudel	M	Tech Studio of Engineering Pvt. Ltd.	Master of Ceromony
76.	Mr. Sanjeev Regmi	M	Tech Studio of Engineering Pvt. Ltd.	Managing Director
77.	Mr. Sambad Mainali	M	Tech Studio of Engineering Pvt. Ltd.	Engineer
78.	Mr. Gopal Shrestha	M	Tech Studio of Engineering Pvt. Ltd.	Office Manager
79.	Ms. Monalisha Palikhay Shrestha	F	Tech Studio of Engineering Pvt. Ltd.	Proposal assistant
80.	Ms. Suvekchya Aryal	F	Tech Studio of Engineering Pvt. Ltd.	Administrator

Table 3: Summary of Participant Feedback

Name and Organization of Participant	Summary of comment
Honorable Minister Mr. Debendra Dahal, Ministry of Physical Infrastructure and Transport	➢ The MP aims to promote sustainable economic development and reduce environmental pollution by addressing key issues like traffic congestion and air pollution. ➢ Traffic congestion and air pollution have worsened due to increased vehicles, unmanaged urbanization, and inadequate infrastructure ➢ Daily traffic issues have impacted economic productivity and public health ➢ Necessity of adopting information technology, strengthening inter-agency collaboration, and ensuring broad participation for effective transport management and sustainable urban mobility goals
Honorable Minister Mr. Ain Bahadur Shahi Thakuri, Ministry of Forests and Environment	➢ Commitment of the ministry to facilitate the preparation of the SEA and to support the process through necessary policy and institutional cooperation ➢ Highlighted health impacts caused by unmanaged traffic conditions and related environmental and transportation issues in Kathmandu Valley, with expectations that the project will address these challenges. ➢ Emphasized the crucial role of the Ministry of Forest and Environment in cooperating and coordinating for the preparation of the Strategic Environmental Assessment report. ➢ Affirmed the Ministry's commitment to support the SEA preparation proces
Mr. Dipendra Shrestha, Project Director of the Tribhuvan International Airport (TIA) Expansion Project, Civil Aviation Authority of Nepal	➢ Emphasized the importance of adhering to safety standards within the TIA area during infrastructure development. ➢ Highlighted the need to enforce height restrictions near the airport. ➢ Stressed the prevention of interference with radar systems. ➢ Recommended considering the airport's drainage infrastructure in both MP and SEA planning processes
Mr. Suresh Bishwokarma, Program Manager, Feminist Dalit Organization (FEDO)	➢ An inclusive transportation system shall be established. ➢ SEA should address development of GESI and disability-friendly infrastructure. ➢ MP shall ensure safe and equitable transport for women, children, elderly, disabled, and all caste and ethnic groups. ➢ The study team shall involve marginalized groups and castes in MP preparation. ➢ SEA shall promote economic justice, equal access, and participation of target groups. ➢ Equal employment opportunities and social justice will be addressed, avoiding gender-based violence and disparities. ➢ The SEA study team is expected to coordinate with FEDO.
Mr. Kiran Baram, Officer, National Human Rights Commission	➢ Consult indigenous groups during MP and SEA preparation. ➢ Use recent, updated traffic data. ➢ Promote a human right–based development approach. ➢ Ensure community participation in MP preparation. ➢ Coordinate with Traffic Police to identify major accident sites. ➢ Define inter-governmental coordination steps in the MP. ➢ Align SEA with government plans like NAPA (National Adaptation Program of Action) and NDC3 (Third Nationally Determined Contribution)
Mr. Surendra Adhikari, Forest Officer, Department	➢ SEA/MP shall include underground water recharge in planning. ➢ How will SEA and KVUTS-MP address road development for dams at the valley's periphery?

Name and Organization of Participant	Summary of comment
of Forests and Soil Conservation	
Mr. Udhab Raj Khadka, PhD, Professor, Tribhuvan University-CDES	➢ SEA shall include a long-term plan for safe transport in the valley. ➢ Review limitations of the current transport system. ➢ Consider sensitive ecological, environmental, and archaeological areas in the MP. ➢ Include river corridors and flood plains in the MP. ➢ Explore alternative plans during MP preparation. ➢ Include geological assessment of the valley in SEA/MP. ➢ Address traffic management in the SEA
Mr. Pradeep Amatya, Environmental Engineer, Lalitpur Metropolitan City	➢ Heritage sites in the valley are sensitive and must be protected. ➢ Cycle lanes are important; currently, only parts of Lalitpur Metropolitan have them. ➢ Pedestrian-friendly roadside plantations should be included in the MP. ➢ Construction along the river corridor requires coordination with line agencies and detailed assessment during the design of roads and infrastructure ➢ SEA team should consider waste management, including the potential use of plastic waste in road construction
Mr. Rajendra Manandhar, Engineer, Department of Archaeology	➢ Include Heritage Impact Assessment (HIA) in the SEA for any infrastructure development near or within heritage sites in Kathmandu, Lalitpur, and Bhaktapur districts ➢ Tangible and intangible heritage of the valley needs to be considered to preserve local religious and cultural sentiments ➢ HIA should be an integral part of the SEA.
Mr. Raju Gyawali, Deputy Manager, Nepal Electricity Authority	➢ Approval of IEEs and EIAs in Nepal is a lengthy process, and mitigation measures are often poorly implemented. ➢ Considering these challenges, is it realistic to complete and approve the SEA report within the proposed timeframe?
Mr. Anil K.C., President, Nepal Environment Society	➢ Clarify if the Master Plan requires SEA or vice versa. ➢ Include the "Ministry of Law, Justice, and Parliamentary Affairs in the stakeholder list" ➢ Provide a project outline or conceptual framework
Mr. Milan Dahal, Director, Nepal Electricity Authority	➢ As the master plan is still under development, commenting on its strategic environmental aspects from a power utility perspective would be premature; best wishes for the team's efforts to improve the capital's transport system
Mr. Loknath Ghimire, Forest Officer, Ministry of Forests and Environment	➢ It is a legal requirement under EPA and EPR legislation. ➢ The scoping area should be broader. ➢ Issues such as roadside greenery, urban biodiversity, corridor connectivity (tree corridors/small fauna), and heat island effects caused by RCC/asphalt roads should be included
Mr. Amar Bahadur Oli, Sociologist, Ministry of Forests and Environment	➢ Consider the marginalization of minority groups in the SEA process. ➢ Collect and suggest relevant data and information. ➢ Assess Public-Private Partnerships in mass transportation mechanisms (such as Pubic Transportation or fully private sector operations) and provide recommendations to the Government of Nepal. ➢ Incorporate the theme of Net Zero Emission by 2045 in the masterplan. ➢ Ensure easy access for vulnerable and marginalized groups, with attention to affordable transportation costs. ➢ Consider the aesthetic value of Kathmandu and incorporate inclusion mechanisms in the MP/SEA
Ms. Swasti Shrestha,	➢ Including an overview of the master plan in this meeting will help focus our concerns and agendas more specifically.

Name and Organization of Participant	Summary of comment
Environment inspector, Department of Environment	➢ Since SEA is a new topic, vigorous discussion and critical analysis are needed; a zero draft is essential as a platform to proceed effectively. ➢ Kathmandu's urban transport system is currently ineffective due to unsafe, time-consuming mass transit, lack of footpaths, and missing routes in many areas; these issues should be addressed in the master plan.
Mr. Suresh Bishwakarma, Program Manager, Feminist Dalit Organization (FEDO)	➢ Incorporate GEDSI aspects in the Masterplan. ➢ Ensure the MP covers a safe and equitable transportation system for women, children, elderly, disabled persons, and all caste and ethnic groups. ➢ Guarantee participation of marginalized groups and castes during the preparation of the MP. ➢ Address economic justice, equal access, and participation of target groups in the SEA. ➢ Promote equal employment opportunities and social justice for caste and ethnic groups, while preventing gender-based violence and disparities in the SEA.
Mr. Dipak Giri, Superintendent of Police, Kathmandu Valley Traffic Police Office	➢ Formulate plans to prevent further pollution in the Kathmandu Valley and avoid impacts on cultural, archaeological, historical, and social activities. ➢ Construct underpasses/overpasses at two main locations. ➢ Pay attention to cycle lanes, service lanes, and sidewalks. ➢ Promote the concept of collective transportation. ➢ Electrify two-wheelers and private vehicles. ➢ Coordinate efforts on drinking water, sewage, and electricity. ➢ Prioritize CCTV, ANPR (Automatic Number Plate Recognition), road marking, and road furnishing
Mr. Gyan Bazra Maharjan, Head of Environment Section, Kirtipur Municipality	➢ It is necessary to plan for current road congestion in the Kathmandu Valley and determine the extent of additional road infrastructure needed in the future ➢ The policy for operating small and large vehicles should be clearly defined based on the transportation needs and population of the Kathmandu Valley. ➢ It is essential to plan while considering environmental pollution and various types of road accidents. ➢ It is necessary to create a space where the national master plan can be practically implemented.
Mr. Sandip Neupane, Chief Administrative officer, Mahankal Rural Municipality	➢ Consideration of presenting most of the cultural and religious heritage around the valley. ➢ Include previous works related to the urban master plan, reviewing their pros and cons. ➢ Enhance the framework to assess the river channels passing through the valley, covering every drainage system. ➢ Prioritize employment opportunities for Nepali residents.
Mr. Johni Kumar Nyasur and Manoj kumar Parajuli, Ward Chairperson of ward 2 and 3-Mahankal RM, Lalitpur	➢ The session was timely and well-covered. ➢ Discussion, interaction, and presentation will make the master plan impactful. ➢ Establish grassroots policy. ➢ Develop sustainable national road construction policies. ➢ Ensure the plan is a true master plan and the government acts proactively to prevent unscientific urbanization
Mr. Sunil Maharjan, Engineer, Budhanilkantha Municipality Office	➢ Special provisions for parking are needed. ➢ Unplanned settlements hinder effective transportation. ➢ High population in Kathmandu requires large-scale land acquisition and resettlement. ➢ Managing existing vehicles remains a major challenge. ➢ Many plans exist but remain unimplemented.

Name and Organization of Participant	Summary of comment
Mr. Paras Thapa, Civil Engineer, Chandragiri Municipality	➢ Road master plans should address congestion while prioritizing pedestrians and greenery. ➢ Focus meetings on content, not formalities. ➢ All 17 SDGs must be considered. ➢ Promote inclusive, bike-friendly lanes
Mr. Bhadra Aryal, Senior Section Officer, Chandragiri Municipality	➢ It is important for Gender Equality and Social Inclusion (GESI), Climate Change Mitigation (CCM), and Air Quality Improvement (AQI) to include a walkability strategy in the master plan
Mr. Prakash Singh Saud, Civil Engineer, Shankharapur Municipality, Kathmandu	➢ The program should be based solely on environmental contexts. ➢ What level of data and resources can be obtained from local governments and organizations? ➢ The mode of transportation is not clearly defined
Mr. Sandesh Kumar Dhakal, Engineer, Kageshwori Manohara Municipality, Kathmandu	➢ Consider implementing a mass transit transportation system ➢ Promote electric vehicles ➢ Preserve cultural and heritage areas ➢ Conserve the environment
Mr. Navaraj Giri, Engineer, Suryabinayak Municipality, Bhaktapur	➢ Implement mass transit as soon as possible. ➢ Prioritize electric vehicles. ➢ Phase out small and medium-sized vehicles. ➢ Enforce strict policies on vehicles over 20 years old. ➢ Inspect vehicle standards at entry points to Kathmandu Valley (Thankot, Banepa, Bhaktapur). ➢ Allow entry only after ensuring vehicle wheels are cleaned
Mr. Sandeep Khanal, Under-Secretary, Department of Archaeology	➢ Coordinate with the Department of Archaeology before any construction or intervention near or within heritage sites. ➢ Conduct a Heritage Impact Assessment (HIA) before implementing any development project; the Department has already introduced HIA procedures and guidelines. ➢ Promote new community initiatives that respect cultural identity and values. ➢ Ensure ongoing coordination with the Department of Archaeology (DoA)
Mr. Subodh Luitel, Assistant Professor, Kathmandu University	➢ Mass transit routes should connect designated and forecasted bus parks, as well as key public places like airports, hospitals, stadiums, parks, and markets. ➢ Routes should link Sanga Bhangyan, Kavre, Thankot, and Kathmandu to reduce long-route vehicles entering the valley. ➢ Ensure easy accessibility of stations, especially for the elderly and handicapped, to compete with online taxis that offer doorstep service. ➢ Keep costs affordable to ensure accessibility for all economic groups. ➢ Involve academia in TWG 3 for capacity building and knowledge transfer; universities can train future professionals in sustainable SEA practices. ➢ Universities can support long-term monitoring of SEA indicators, independent public reviews, baseline data collection, and research. ➢ Develop policies to encourage carpooling; allow private four-wheelers to pick up passengers. ➢ Focus on reducing emissions and traffic congestion with short-, mid-, and long-term implementation plans. ➢ Review and incrementally improve the existing system. ➢ Re-engineer routes and systems for better efficiency.

Name and Organization of Participant	Summary of comment
	➢ Redefine system boundaries with a holistic approach, incorporating MRT, smart city concepts, non-motorized transport, and minimizing vehicle use in communities. ➢ Address how to shift people from 2- and 4-wheelers to public transport. ➢ Promote lifestyles that favor non-motorized transport
Dr. Prakash Gyawali, Deputy Health Administrator, Management Division, Department of Health Services	➢ The transport system should connect major health institutions in the valley. ➢ Protective measures against communicable diseases must be mandatory in public transport. ➢ The Road Transport Authority (RTA) should implement a planned approach to minimize issues. ➢ Strategies to reduce noise, air pollution, and hazards should be incorporated. ➢ Hospital waste management procedures should be strictly enforced during transport
Ms. Monika Dahal, Planning Officer, Department of Plant Resources	➢ During transport system development, priority should be given to conserving rare, endangered, and indigenous plant species on-site. If not possible, translocation and replanting with local varieties should be prioritized. ➢ Wider pedestrian pathways should be provided near roadsides for tree planting to prevent vegetation obstructing pedestrians. ➢ Invasive species must be identified, controlled, and promptly removed during green space development and management. ➢ Regular pruning of roadside vegetation should be mandatory at set intervals. ➢ A list of suitable plant species for roadside plantations should be prepared.

Mr. Bhimarjun Adhikari, Joint Secretary, MOPIT clarified about the differences between Initial Environmental Examination (IEE) / Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) to the participants, highlighting that IEE/EIA focus on project-level assessments, whereas SEA addresses policies, plans, and programs at a broader, strategic level. Further, a detailed definition of SEA was provided, emphasizing its role as a systematic process for evaluating environmental and social implications of a plan or program before its adoption, with the aim of ensuring sustainable development. Similarly, clarification was made on the relationship between SEA and the Master Plan, noting that both are conducted in parallel, with SEA informing and guiding the MP's formulation and ensuring environmentally sound implementation.

Mr. Adhikari, further discussed about the environmental information requirements in SEA, including baseline environmental conditions, potential impacts, alternatives, and mitigation measures. It was stressed that SEA should be completed prior to the approval and implementation of the Master Plan to ensure that environmental considerations are fully integrated.

Mr. Adhikari highlighted, the specific requirements of the Master Plan, alongside the need for a comprehensive analysis of transport system requirements (such as RBT, underground rail etc.), taking into account current capacity, projected demand, and sustainability factors. Mr. Adhikari, further emphasized the presence of World Heritage sites and archaeological resources must be carefully

considered in the planning process to safeguard cultural heritage. Moreover, participants were informed that Nepal has relatively limited experience in implementing SEA, but the legal and procedural framework now allows for the approval of SEA reports. He requested all participants to actively participate, cooperate, and contribute to the SEA process, ensuring its timely finalization and smooth

The following clarifications were provided to address the concerns of the participants:

- Brief Environmental Study (BES), Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) focus on project-level assessments, while Strategic Environmental Assessment (SEA) addresses policies, plans, and programs at a broader strategic level.
- SEA is a systematic process for evaluating environmental and social impacts of plans or programs before adoption, aiming to ensure sustainable development.
- SEA and the Master Plan (MP) are developed in parallel, with SEA guiding the formulation of the MP to ensure environmentally sound implementation.
- SEA requires detailed environmental information, including baseline conditions, potential impacts, alternatives, and mitigation measures, and must be completed before the Master Plan is approved and implemented
- The Master Plan requires comprehensive analysis of transport system needs (e.g., Rapid Bus Transit, underground Railway), considering current capacity, projected demand, and sustainability factors.
- Protection of World Heritage sites and archaeological resources must be prioritized in the planning process.
- Although experience with SEA implementation is limited, the existing legal and procedural framework supports approval of SEA reports.
- Active cooperation and contribution from all participants are essential to ensure timely completion and smooth approval of the SEA process.

The closing Remarks was delivered by Mr. Sushil Babu Dhakal, Joint Secretary, MOPIT. Mr. Dhakal elaborated the requirements and objectives of the Master Plan (MP) and the Strategic Environmental Assessment (SEA). He further explained that the SEA is an integral part of the MP, ensuring that environmental considerations are embedded into the planning and implementation process from the outset. The Master Plan will present the environmental consequences of its proposals, selecting and implementing the best available alternatives to minimize negative impacts upon the ambient environment.

Mr. Dhakal further elaborated the importance and necessity of the Master Plan lie in its role as a guiding document for the future of urban transport in Kathmandu Valley. Adding the JICA expert team will conduct a thorough risk assessment and integrate identified opportunities and potentialities while drafting SEA. The SEA will provide specific restrictions, guidelines, and thematic areas to be addressed, ensuring environmental and social safeguards are upheld. Both the MP and the SEA will be developed in parallel to maintain consistency and coherence.

Mr. Dhakal further explained that the Constitution of Nepal emphasizes inclusive transport as a key pillar for sustainable development. In alignment with this, the long-term vision to 2043 envisions the establishment of a robust mass transport system. Mr. Dhakal further elaborated that the agreement between the Government of Nepal and JICA stipulates that JICA's guidelines will be applied in preparing the SEA; however, the SEA is also expected to meet all national requirements and legal obligations. Public consultations will be conducted at various stages of the SEA to ensure transparency, inclusivity, and participation from all concerned stakeholders.

Moreover, Mr. Dhakal clarified about the Kathmandu Valley facing critical challenges such as severe traffic congestion and concerns over public safety. To address these, a sustainable mass transit system is necessary, integrated within a comprehensive urban transport framework. The primary objective is to identify and prioritize the most suitable mass transit modes that can serve as the backbone of the valley's transport network. The vision is to establish a safe, reliable, and inclusive transport system that aligns with Nepal's international commitments, reduces road accidents by 50% by 2030, and ensures universal access to safe, affordable, and sustainable transport services.

Furthermore, the MP is envisioned as a transformative document, capable of meeting the growing transport demand by integrating intelligent systems and creating an equitable network that will serve as a lasting legacy for current and future generations. It will not only adhere to international standards but also address the contents of national legal provisions, striking a balance between economic progress and environmental conservation, Mr. Dhakal added.

Mr. Dhakal further added that both local knowledge and the expertise of international specialists are indispensable in shaping the MP. He is of the view that the JICA expert team is expected to deliver a comprehensive, implementable, and forward-looking plan. Stakeholder engagement will be critical, and it is expected that all parties will actively collaborate with the JICA team in the coming days. JICA's partnership is essential in ensuring that the MP is based on accurate data and reflective of the unique cultural, social, and environmental characteristics of Kathmandu Valley. Ultimately, Mr. Dhakal expressed that the development of an integrated mass transit system will aim to ease congestion, boost productivity, and significantly improve the valley's air quality.

Appendix 2: Summary of 2nd Stakeholder Meeting

Summary of Second Stakeholder Meeting of Strategic Environmental Assessment (SEA) of Project on Kathmandu Valley Urban Transport System Master Plan

1. Background and Objective

Japan International Cooperation Agency (JICA) had an agreement with Government of Nepal (GON) for the Project on Kathmandu Valley Urban Transport System (KVUTS) Master Plan. JICA has awarded JICA Expert Team (Nippon Koei Co., Ltd. in Joint Venture with other companies) to undertake the Project on Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP).

The objective of the master plan is to promote the implementation of projects based on the master plan in the Kathmandu Valley and to contribute to sustainable economic growth and reduction of environmental burdens such as traffic congestion and air pollution by: 1) developing a new urban transportation master plan, 2) identifying priority mass transit modes and routes, and 3) establishing a coordination mechanism among stakeholders to realize the master plan. In addition, a Strategic Environmental Assessment (SEA) is to be carried out during the preparation of the master plan. SEA is an environmental assessment at the decision-making of the higher stage than the project-level environmental assessment, and Stakeholder Meeting is an integral part of the SEA.

JICA has intended to carry out the Master Plan together with a Strategic Environmental Assessment (SEA) for the plan. As a part of SEA, JICA Expert Team is responsible in conducting three different Stakeholder Meetings (SHM) at different date in line with JICA Guidelines for Environmental and Social Considerations (JICA-GL), 2022.

The SEA planned to conduct three rounds of stakeholder meetings, with participants including government officials from various line ministries, representatives of local-level organizations, and Non-Governmental Organizations (NGOs). The first meeting focused on environmental and social aspects to inform the preparation of the Master Plan. The second meeting, which focused on the draft scoping report, has just been conducted, and the third meeting will be held after the preparation of the Draft SEA Report.

The Second Stakeholder Meeting on Strategic Environmental Assessment for the Project on Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP) was held at Himalayan Hotel, Lalitpur dated February 4, 2026 to provide an overview of the Master Plan and to collect opinions and suggestions from various stakeholders on the environmental and social aspects of the draft scoping report prepared for the SEA of the Master Plan, as well as the upcoming activities.

The specific objectives of the Second Stakeholder Meeting for SEA are as follows;

- To identify potential issues and impacts of the proposed Draft MP
- To present and discuss the Draft Scoping Report with stakeholders
- To incorporate the opinions and suggestions of stakeholders into the Draft Scoping Report.

2. Meeting Outline and Agenda

The outline of the Second Stakeholder Meeting is presented on Table 1.

Table 1: Outline of the Second Stakeholder Meeting

Date	February 4th, 2026
Organizer	Ministry of Physical Infrastructure and Transport (MoPIT) & JICA Study Team.
Venue	The Hotel Himalaya, Kupondole Height, Lalitpur, Kathmandu
Agenda	1. Speeches by Honorable Dignitaries 2. Objective of the meeting 3. Presentation

	❖ Outline of PKVUTSMP ❖ Future Urban Structure, Traffic Demand Forecast, Necessary Project Interventions of the Master Plan ❖ Strategic Environmental Assessment and Scoping Result ❖ SEA Baseline considered for Kathmandu Valley: Parameters and Sources 4. Discussion Session ❖ QA Session ❖ Concluding Remarks: Draft Scoping Report, SEA of PKVUTSMP 5. Closing Session

3. Participation and Stakeholder Representation

A total of 82 participants attended the Second Stakeholder Meeting, including 63 males and 19 females, comprising 42 stakeholders representing ministries, commissions, departments, local governments, academic institutions, and the media.

Table 2: Summary of Participant Attendance

No. of Attendances: Total 82 (Male 63 / Female 19)

Stakeholder Groups	Male	Female	Total
I. Central Government Agencies	18	7	25
II. Specialized departments directly under ministries and agencies	17	2	19
III. Local Level	7	5	12
IV. Education, Research, NGOs, Private Sector, and International Organizations	6	1	7
V. Media/News Agencies	1	2	3
VI. JICA Nepal, JICA Study Team and SEA Consultant	14	2	16
Total (No.)	63	19	82
Total (%)	76.83	23.17	100.00

Table 3: Details of the Participants of the Second SHM of SEA

S.N	Name	M/F	Ministry/Department/Organization	Designation
A. Central Government Agencies				
1.	Honorable Madhav Prasad Chaulagai	M	Ministry of Physical Infrastructure and Transport / Ministry of Forests and Environment	Honorable Minister
2.	Mr. Keshab Kumar Sharma	M	Ministry of Physical Infrastructure and Transport	Secretary
3.	Mr. Ram Hari Pokharel	M	Ministry of Physical Infrastructure and Transport	Joint Secretary
4.	Mr. Sushil Babu Dhakal	M	Ministry of Physical Infrastructure and Transport	Joint Secretary
5.	Mr. Bal Ram Rijal	M	Ministry of Physical Infrastructure and Transport	Joint Secretary
6.	Dr. Rajendra K.C	M	Ministry of Forests and Environment	Joint Secretary
7.	Mr. Surendra Raj Pant	M	Ministry of Forests and Environment	Scientific Officer
8.	Ms. Laxmi K.C	F	Ministry of Physical Infrastructure and Transport	Senior Divisional Engineer
9.	Ms. Shubha Shrestha	F	Ministry of Physical Infrastructure and Transport	Senior Sociologist
10.	Mr. Neeraj Thakur	M	Ministry of Physical Infrastructure and Transport	Senior Divisional Engineer
11.	Ms. Sushila Paudel	F	Ministry of Physical Infrastructure and Transport	Under Secretary
12.	Mr. Marshal Kumar Oli	M	Ministry of Physical Infrastructure and Transport	Section Officer
13.	Ms. Renuka Bhandari	F	Ministry of Urban Development	Architect
14.	Ms. Anju Dhungana	F	Ministry of Women, Children and Senior Citizens	Under Secretary
15.	Mr. Sujit Poudel	M	Ministry of Agriculture and Livestock Development	Plant Protection Officer
16.	Ms. Apeksha Marasini	F	Ministry of Water Supply	Senior Divisional Engineer
17.	Ms. Santosh Koirala	M	Ministry of Industry, Commerce and Supplies	Mechanical Engineer
18.	Mr. Hema Raj Neupane	M	Ministry of Health and Population	Senior Health Education Officer
19.	Mr. Harihar Neupane	M	Ministry of Physical Infrastructure and Transport	Advisor
20.	Mr. Rajendra Prasad Pant	M	Ministry of Physical Infrastructure and Transport	Non-Gazetted First Class Officer (Na.Su.)
21.	Mr. Gopal Raj Thapa	M	Ministry of Physical Infrastructure and Transport	Computer Operator
22.	Mr. Dharmendra Karki	M	Ministry of Physical Infrastructure and Transport	Personal Secretary, Private Secretariat of the Minister
23.	Mr. Laxmi Prasad Paudyal	M	Ministry of Physical Infrastructure and Transport	Personal Secretary, Private Secretariat of the Minister
24.	Mr. Kiran Baram	M	National Human Rights Commission-Nepal	Officer
25.	Ms. Sita Adhikary	F	National Women Commission	Under Secretary
B. Specialized Departments directly under Ministries and Agencies				

S.N	Name	M/F	Ministry/Department/Organization	Designation
26.	Mr. Jagadish Bista	M	National Disaster Risk Reduction and Management Authority	Engineer
27.	Ms. Swasti Shrestha	F	Department of Environment	Environmental Inspector
28.	Mr. Prabin Chaudhary	M	Department of Roads	Engineer
29.	Mr. Bodh Prasad Bhandari	M	Department of Railway	Engineer
30.	Mr. Bishworam Prajapati	M	Department of Urban Development and Building Construction	Senior Divisional Engineer
31.	Mr. Nabaraj Poudel	M	Department of Local Infrastructure Development	Senior Divisional Engineer
32.	Mr. Dipesh Guragain	M	Department of Forests and Soil Conservation	Agricultural Engineer
33.	Mr. Nabin B.K	M	Department of Mines and Geology	Geologist
34.	Mr. Krishna Ram Bhattarai	M	Department of Plant Resources	Scientific Officer
35.	Mr. Sandeep Khanal	M	Department of Archaeology	Under Secretary
36.	Mr. Ram Ashish Das	M	Department of Archaeology	Senior Divisional Engineer
37.	Mr. Govinda Adhikari	M	Department of Archaeology	Engineer
38.	Mr. Hari Prasad Panta	M	Department of Land Management and Archive	Director
39.	Mr. Ashutosh Shrestha	M	Department of Health Services	Public Health Administrator
40.	Lt. Col. Binod Shrestha	M	Kathmandu-Terai/Madhesh Fast Track (Expressway) Road Project, Nepal Army	Operation and Implementation Officer
41.	Mr. Purna Sundar Shrestha	M	Nepal Telecom	Senior Engineer
42.	Mr. Sanjeev Awasthi	M	Nepal Telecom	Senior Engineer
43.	Ms. Tripti Kharel	F	Kathmandu Valley Water Supply Management Board	Environment and Sanitation Head
44.	Mr. Suvash Chandra Joshi	M	Pashupati Area Development Trust	Executive Director
C. Local Level (Metropolitan City/Municipality/ /Rural Municipality)				
45.	Ms. Nisha Koirala	F	Kathmandu Metropolitan City, Office of Municipal Executive	Senior Environment Engineer
46.	Ms. Pramila Parajuli	F	Kathmandu Metropolitan City, Office of Municipal Executive	Architect
47.	Mr. Sandesh Kumar Dhakal	M	Kageshwori Manohara Municipality, Office of Municipal Executive	Engineer
48.	Mr. Rabin Khadka	M	Kageshwori Manohara Municipality, Office of Municipal Executive	Engineer
49.	Ms. Bhadra Aryal	F	Chandragiri Municipality, Office of Municipal Executive	Senior Section Officer
50.	Mr. Prabhat Baral	M	Chandragiri Municipality, Office of Municipal Executive	Engineer
51.	Ms. Anusha Sharma	F	Tokha Municipality, Office of Municipal Executive	Engineer
52.	Mr. Prakash Singh Saud	M	Shankharapur Municipality, Office of Municipal Executive	Senior Engineer

S.N	Name	M/F	Ministry/Department/Organization	Designation
53.	Mr. Pradeep Amatya	M	Lalitpur Metropolitan City, Office of Municipal Executive	Environment Engineer
54.	Mr. Saroj Khadka	M	Mahalakshmi Municipality, Office of Municipal Executive	Engineer
55.	Ms. Ganesh Devi Prajapati	F	Madhyapur Thimi Municipality, Office of Municipal Executive	Department Head of Environment
56.	Mr. Nabaraj Giri	M	Suryabinayak Municipality, Office of Municipal Executive	Engineer
D. Education, Research, NGOs, Private Sector, and International Organizations				
57.	Mr. Bhupesh Adhikary	M	International Centre for Integrated Mountain Development (ICIMOD),	Climate Action Lead
58.	Ms. Indira Parajuli	F	Tribhuvan University, Central Department of Environmental Science	Faculty, CDES
59.	Mr. Subodh Luitel	M	Kathmandu University, Department of Environmental Science and Engineering	Assistant Professor
60..	Mr. Ravi Rimal	M	Federation of Nepalese National Transport Entrepreneurs	Vice President
61.	Mr. Ram Saran Sapkota	M	Federation of Nepalese National Transport Entrepreneurs	Central Committee Member
62.	Mr. Rameshor Pokharel	M	Solid Waste Management Association of Nepal	Member
63	Mr. Arjun Aryal	M	Solid Waste Management Association of Nepal	Member (Managing Director -Nepal Fulbari Solid Waste Management)
E. Media/News Agencies				
64.	Ms. Pragati Dhakal	F	Rastriya Samachar Samiti, Nepal	Sub-Editor
65.	Ms. Chandani Hamal	F	Gorkhapatra Daily	Journalist
66.	Mr. Amrit Dhakal	M	Rastriya Samachar Samiti, Nepal	Reporter
F. JICA Nepal, JICA Study Team and SEA Consultant				
67.	Mr. Sourab Bikram Rana	M	Japan International Cooperation Agency (JICA)	Senior Program Manager
68.	Mr. Hideo Tsuji	M	JICA Expert Team	Team Leader
69.	Mr. Wataru Ohzono	M	JICA Expert Team	Deputy Team Leader
70.	Mr. Tomoaki Tanabe	M	JICA Expert Team	Environmental Expert
71.	Mr. Abhishek B.C	M	JICA Expert Team	Environmental and Social Expert
72.	Mr. Kota Nishimora	M	JICA Expert Team	Engineer
73.	Mr. Sumit Thapa	M	JICA Expert Team	Engineer
74.	Mr. Sanjeev Regmi	M	Tech Studio of Engineering (TSE)	Managing Director/Overall Program Coordinator
75.	Mr. Rikesh Chitrakar	M	Tech Studio of Engineering (TSE)	Environmentalist/Moderator
76.	Mr. Aditya Paudel	M	Tech Studio of Engineering (TSE)	Master of Ceremony/Transportation Engineer
77.	Mr. Nemi	M	Tech Studio of Engineering (TSE)	Transportation Engineer/

S.N	Name	M/F	Ministry/Department/Organization	Designation
	Bhattarai			Translation Facilitator
78.	Mr. Sambad Mainali	M	Tech Studio of Engineering (TSE)	Engineer/ Assistant Event Manager
79.	Mr. Shiva Adhikari	M	Tech Studio of Engineering (TSE)	Environmentalist/ Assistant Event Manager
80.	Ms. Shrinkhala Shrestha	F	Tech Studio of Engineering (TSE)	Event Manager
81.	Mr. Gopal Shrestha	M	Tech Studio of Engineering (TSE)	Assistant Event Coordinator
82.	Ms. Suvekchya Aryal	F	Tech Studio of Engineering (TSE)	Assistant Event Coordinator

4. Opening Session

Mr. Aditya Paudel, the Master of Ceremony, welcomed the Chair, Mr. Ram Hari Pokharel, Joint Secretary at the Ministry of Physical Infrastructure and Transport (MOPIT), and the Chief Guest, Honorable Mr. Madhav Prasad Chaulagain, Minister for Physical Infrastructure and Transport (MoPIT) and Ministry of Forests and Environment (MoFE). The session commenced with the National Anthem of Nepal, with all participants standing in due respect, followed by the Chief Guest formally inaugurating the program by watering a potted plant.

The formal program began with welcome remarks and the objectives of the meeting presented by **Mr. Ram Hari Pokharel**, Joint Secretary (MOPIT). He outlined the purpose and significance of the Strategic Environmental Assessment (SEA) for the Master Plan, noting that it has been conducted in line with JICA Guidelines and aligned with Nepal's Environment Protection Rules (EPR), 2020. He further highlighted that, although SEA for Master Plans is not explicitly required under current environmental legislation of the Government of Nepal (GoN), its implementation reflects a proactive approach to integrating environmental considerations at the strategic planning.

Mr. Pokharel emphasized that conducting a Strategic Environmental Assessment (SEA) at the Master Plan level would facilitate and streamline environmental approval processes for individual projects under the Master Plan by identifying potential environmental issues, risks, and sensitivities in advance. Such an approach would therefore reduce delays in subsequent Environmental Impact Assessments (EIA), Initial Environmental Examinations (IEE), or Brief Environmental Studies (BES), while ensuring that environmental safeguards are integrated into decision-making. He further highlighted that SEA is a policy-level tool that provides a broader environmental framework rather than site-specific analysis, offering appropriate mitigation measures, planning guidelines, and management strategies. This approach would support more sustainable infrastructure development and strengthen environmental governance. He emphasized that such an approach would contribute to more sustainable infrastructure development and strengthen environmental governance.

In conclusion, Mr. Pokharel expressed his hope that the SEA prepared for the Kathmandu Valley Urban Transport System Master Plan would serve as a model for sustainable and environmentally responsible

planning, fostering balanced development, minimizing environmental risks, and promoting a resilient and eco-friendly urban transport system for the future.

After the opening remarks and presentation of the meeting objectives, the dignitaries shared their insights on the Master Plan and the SEA, focusing on key issues and priorities

Dr. Rajendra K.C., Joint Secretary, MOFE, addressed the meeting, emphasizing the strategic importance of the Master Plan and the Strategic Environmental Assessment (SEA) process.

Dr. K.C. informed that the SEA would ultimately require approval from the Cabinet, emphasizing the need for a comprehensive, evidence-based assessment aligned with national environmental policies and legal provisions. He stressed that both the Master Plan and SEA should thoroughly assess and address any potential irreversible environmental damage or permanent loss from implementation of proposed projects, highlighting that early identification and mitigation of such impacts are essential for sustainable and environmentally responsible development. He stressed that both the Master Plan and SEA should thoroughly assess and address any potential irreversible environmental damage or permanent loss from the implementation of proposed projects, highlighting that early identification and effective mitigation of such impacts are essential for sustainable and environmentally responsible development.

Dr. K.C. further elaborated on several key environmental and planning considerations to be systematically addressed in the SEA and the Master Plan, including land use (changes in agricultural, forest, and open spaces due to project implementation and consideration of minimizing impacts on ecologically sensitive and productive land), water resources and drainage (surface and groundwater impacts, stormwater management, flooding risks, and watershed health), energy consumption (future demand and promotion of energy-efficient and sustainable solutions with long-term environmental implications), wind direction and valley meteorology (air circulation and wind patterns in relation to road infrastructure to avoid worsening air pollution and improve emission dispersion), road safety (integration of safety measures for pedestrians, cyclists, and vehicle users in road design, reducing accidents and enhancing public welfare), pollution control (air, water, and noise pollution to ensure subsequent mitigation and monitoring measures), urban beautification (enhancement of urban aesthetics, promotion of green spaces, and improved livability), and agriculture and agricultural land (assessment of impacts on agriculture, food production, and protection of fertile land and livelihoods, including food security).

Dr. K.C. also reiterated the legal mandate for conducting SEA, referencing the Environment Protection Act, 2019 and Rule 10 of the Environment Protection Rules (EPR), 2020, which require strategic-level environmental analysis for policies, programs, and projects of this nature, and emphasized strict compliance with these provisions.

Dr. K.C. concluded by expressing his anticipation that Nepal should take this opportunity to learn from the technical expertise and experience of JICA specialists, and encouraged knowledge sharing and the

adoption of international best practices. He also advised the JICA study team to review Cumulative Impact Assessment (CIA) documents prepared for hydropower projects in Nepal as useful reference materials, noting their value in understanding combined and long-term environmental impacts. He concluded by emphasizing that stakeholder collaboration is essential to ensure the Master Plan promotes sustainable, environmentally sound, and resilient development.

Subsequently, **Mr. Keshav Kumar Sharma**, Secretary, Ministry of Physical Infrastructure and Transport (MOPIT), delivered his remarks. Mr. Sharma emphasized the strategic importance of undertaking the Strategic Environmental Assessment (SEA), describing it as a significant and potentially pioneering initiative for Nepal in mainstreaming environmental considerations into higher-level planning and decision-making processes. He noted that the preparation of an SEA at the Master Plan stage represents a progressive step toward strengthening sustainable development practices in the nation.

Mr. Sharma underscored the functional role of the Master Plan, stating that it serves as a bridge between policy formulation and project-level implementation, thereby shaping the direction and quality of future infrastructure development. In this context, he stressed that environmental and social safeguards must be systematically integrated at the planning stage to minimize risks, avoid irreversible impacts, and ensure long-term sustainability.

Mr. Sharma highlighted the importance of identifying and presenting the most suitable alternatives within the Master Plan. He stated that the selection of the preferred alternative should be guided by a balanced evaluation of technical feasibility, social acceptability, economic practicality, and environmental soundness. He noted that such a comprehensive approach would enable informed decision-making and more resilient and inclusive development outcomes. He also encouraged all stakeholders and participants to actively engage in the review process and provide constructive comments and recommendations on the draft scoping report, emphasizing that collaborative input would enhance the quality and credibility of the SEA.

In his concluding remarks, Mr. Sharma noted that transportation systems serve as a key indicator of the overall development, functionality, and quality of life of the city Accordingly, he reiterated the need to prepare a high-quality, comprehensive, and forward-looking SEA report that would guide the development of a sustainable, efficient, and environmentally responsible transport system. He expressed confidence that the SEA would play a vital role in shaping a more sustainable and livable future for Kathmandu valley.

Following the remarks by Mr. Keshav Kumar Sharma, Secretary of the Ministry of Physical Infrastructure and Transport (MOPIT), the Chief Guest, the Honorable Minister **Mr. Madhav Prasad Chaulagain**, Minister of Physical Infrastructure and Transport and Minister of Forests and Environment, addressed the meeting.

The Honorable Minister emphasized that the Strategic Environmental Assessment (SEA) and Master Plan (MP) are vital to shaping the city's development, ensuring environmental safeguards and strengthening coordination among government agencies. He highlighted that these processes offer a timely opportunity to restore institutional coherence, enhance collaboration, and advance integrated urban planning and infrastructure development, while relying on reliable, evidence-based information from both primary and secondary sources.

He described Kathmandu Valley as a complex mix of social, cultural, and ecological systems, noting that the Master Plan should be a balanced, forward-looking document that supports modern infrastructure while conserving cultural heritage, traditional settlements, and sensitive ecosystems, and should not compromise the valley's historical and environmental integrity.

The Minister advised the JICA assessment team to adopt a people-centered philosophy in finalizing the SEA and Master Plan, emphasizing that planning must prioritize the needs, safety, and well-being of citizens and ensure development is inclusive and equitable, providing a key opportunity to shape the nation's urban future through sustainable and resilient planning.

Honorable Minister Mr. Chaulagain stated that MoPIT has been coordinating with the Embassy of Japan to facilitate knowledge sharing, technical cooperation, and technology transfer, recognizing the value of international experience and best practices in improving planning standards in Nepal. He noted that the SEA and Master Plan should identify procedural or regulatory hurdles and recommend policy revisions where needed for effective implementation. He emphasized that these documents should serve as practical, user-friendly tools for planners and decision-makers, enabling efficient and informed development processes.

In his closing remarks, the Honorable Minister emphasized the need to integrate sociological and anthropological perspectives into infrastructure planning. He stressed that development must respect local communities, social dynamics, and cultural practices to ensure projects are socially acceptable, culturally sensitive, and sustainable. He expressed confidence that a well-prepared SEA and Master Plan will help build a more sustainable, harmonious, and prosperous future for the Kathmandu Valley.

5. Presentation Session

Mr. Hideo Tsuji, Team Leader of the JICA Expert Team. He introduced the Master Plan's guiding slogan, "Sustainable, Safe and Inclusive Transportation for a Vibrant and Cultural Kathmandu Valley," and emphasized that the plan aims to address mobility challenges while preserving cultural heritage and promoting sustainable urban development.

Mr. Tsuji recalled the Japan International Cooperation Agency's longstanding support to Nepal's transport planning, including master plans prepared in 1993, 2012, and 2017. He noted that since 2017,

the Kathmandu Valley has undergone significant changes, with rapid urbanization, increased vehicle ownership, and unplanned growth worsening traffic congestion. In response to these challenges, the Government of Nepal requested JICA to update the 2017 Master Plan to address current and future needs. He also highlighted that many projects proposed in the 2017 Master Plan were not implemented, as it was not approved by the Cabinet, emphasizing that securing such endorsement for the revised plan is essential. He further informed that an implementation and monitoring committee will be established to ensure the effective execution, coordination, and oversight of the proposed projects. He mentioned that the updated Master Plan will focus on a comprehensive mass transit system to improve mobility, reduce congestion, and promote environmentally sustainable transport.

Following this, **Mr. Wataru Ohzono**, Deputy Team Leader of the JICA Expert Team, presented on the future urban structure, traffic demand forecast, and proposed projects and interventions under the Master Plan. Mr. Ohzono explained that, based on the latest National Statistics Office census data, the population of the Kathmandu Valley is projected to reach about 4.2 million by 2050. The projected population distribution has been aligned with the planned development of new town projects, taking into consideration the framework of the Kathmandu Valley Development Authority Master Plan. Three alternative future urban structure scenarios were analyzed, with population allocations directed toward high development potential areas and expected land-pooling zones under proposed new town initiatives. The Base Year traffic model revealed significant traffic congestion in key areas such as Koteshwor, Gaushala, and Siddhitol, with several northern roads already constrained due to narrow carriageway widths. Under the "Do Minimum" scenario, assuming no major infrastructure expansion beyond committed projects, the eastern Ring Road and major corridors including Araniko Highway and Boudhanath Road are projected to experience severe congestion by 2050.

Based on these findings, Mr. Ohzono discussed the Railway Network Performance Assessment, which suggests the need for mass transit along heavily traveled corridors, with maximum ridership estimated under a 40 km/h speed and no-fare assumption. He then outlined the necessary projects and interventions proposed under the Master Plan, covering road infrastructure, public transport enhancement, and traffic management measures. He highlighted that the transport strategy emphasizes strengthening connectivity between Kathmandu Metropolitan City, Lalitpur Metropolitan City, and Bhaktapur Municipality, particularly along the east–west corridor. He noted enhancing Ring Road capacity and improving northeastern corridors, while prioritizing a shift to public transport and better bus services, as road widening within the Ring Road is limited, along with effective traffic management in the core city area. Strengthening public transport, improving bus services, targeted road capacity enhancements along congested corridors, and better traffic management inside the Ring Road are all essential components to mitigate congestion and ensure sustainable mobility by 2050.

Under the Road and Traffic Management, Mr. Ohzono highlighted (a) requirement for road construction projects along congested routes, (b) improvement of roads, including selected river corridor routes in specific sections, and (c) implementation of short-term traffic management measures due to right-of-

way and urban constraints. He presented 18 priority projects, categorized into short, medium, and long-term phases, as follows:

- Maharajgunj Underpass
- Chabahil–Gaushala Underground Tunnel
- Tripureshwor–Maitighar Elevated Highway
- Dhobi Khola River Corridor Elevated Highway
- Bishnumati River Corridor Elevated Highway
- Widening of Ring Road (Gaushala–Tinkune section)
- New River Corridor (Thapathali–Tripureshwor)
- Improvement of unpaved sections along the Bagmati River corridor
- Buddha Marg Intersection Improvement
- Construction of new bridges over the Bishnumati, Dhobi Khola, Karma Nasa, and at Gwarko
- Car-free zones in Thamel, KMC Durbar Square, and LMC Durbar Square areas
- Development of cycling paths
- Road Safety Improvement Projects
- Intersection improvements and installation of traffic signals with a centralized control system
- Development of an Emergency Road Network

Moreover, he explained the current number of buses in operation and the requirements to meet future demand across various blocks in Kathmandu Valley, including the Central Block (including Ring Road), Northwest Block, Northeast Block, Eastern Block, Southwest Block, and Southeast Block, along with improvement of Lagankhel and Gongabu Busparks.

He outlined the traffic demand forecast identifying the proposed East to West Mass Transit Line from Ratna Park to Bhaktapur, approximately 14.6 kilometers long, as the highest-demand corridor, targeted for operation around 2040. The system is planned as a linear metro or Automated Guideway Transit (AGT) capable of handling steep gradients, with underground sections in the city center and Koteshwor intersection, and elevated sections along existing road rights-of-way. Future extensions, integration with Bus Rapid Transit (BRT), and Transit-Oriented Development (TOD) will also be considered.

Continuing with the meeting agenda, a comprehensive session on the Draft Scoping Report was delivered by **Mr. Tomoaki Tanabe**, Environmental and Social Expert of the JICA Expert Team. Mr. Tanabe elaborated on the concept of SEA and the approach to conducting the Strategic Environmental Assessment (SEA) for the Kathmandu Valley Urban Transport System Master Plan (KVUTSMP), highlighting the structure of the Draft Scoping Report and the key environmental and social issues identified during the scoping stage.

Mr. Tanabe began by presenting a conceptual figure illustrating the stages of SEA in comparison with project-level environmental assessments such as EIA and IEE. He emphasized that SEA is undertaken at a much earlier stage in the decision-making process than EIA or IEE and therefore serves as a vital tool for promoting sustainable development. By integrating environmental and social considerations at the policy and planning level, SEA ensures that potential impacts are addressed proactively rather than reactively.

Referring to Nepal's legal framework, he highlighted that the Strategic Environmental Assessment (SEA) system has been formally established under the Environment Protection Act, 2019, and the Environment Protection Rules, 2020. In particular, Section 9 of the Environment Protection Act, 2019 stipulates that a Strategic Environmental Assessment must be conducted prior to implementing any policy, program, or project specified by the Government of Nepal through notification in the Nepal Gazette. Furthermore, Rule 10, Sub-rule (4) of the Environment Protection Rules, 2020 requires the preparation of a Scoping Document, while Sub-rule (9) mandates the preparation of the SEA Report.

Mr. Tanabe also explained the SEA requirements under the Japan International Cooperation Agency Guidelines for Environmental and Social Considerations, 2022. According to the Guidelines, "Strategic Environmental Assessment (SEA)" refers to an environmental assessment conducted at a higher decision-making level than project-level assessments. SEA may be carried out at the planning stage before individual projects are defined, or even at the policy stage preceding planning. He noted that JICA applies SEA when conducting Master Plan studies and encourages project proponents to incorporate environmental and social considerations from the earliest stages through to monitoring, in line with its basic principles.

He clarified that the SEA for KVUTSMP will be conducted in accordance with JICA Guidelines and in the spirit of Nepal's Environment Protection Act, 2019, in close consultation with relevant governmental bodies. The JICA Expert Team is committed to sharing all relevant information with the Ministry of Physical Infrastructure and Transport (MoPIT), the Ministry of Forests and Environment (MoFE), and other concerned authorities throughout the study period. In this regard, Technical Working Group 3 has already been established to facilitate coordination and technical review.

Mr. Tanabe explained that both the Scoping Report and the full SEA Report will be prepared as integral components of the Master Plan formulation process. The JICA Expert Team will actively collect concerns, suggestions, and recommendations from various stakeholders and reflect them in the Master Plan. Ultimately, the KVUTS Master Plan, together with the SEA Report, will be submitted for approval by the Council of Ministers. He further highlighted that the Draft SEA Report and the 3rd Stakeholder Meeting are scheduled to be conducted in May 2026.

Explaining the scoping process, Mr. Tanabe stated that potential environmental and social impact items are identified based on the characteristics of the proposed plan and the project area. Through stakeholder

consultations, key issues are shared at an early stage, and feedback is systematically incorporated. This process enables the identification and prioritization of critical issues to be addressed during Master Plan formulation.

He noted that, in the scoping phase, typical project factors for the pre-construction and construction phases include land clearing, excavation and earthworks; operation of heavy machinery; transportation of construction materials; installation of temporary facilities such as construction yards, camps, and access roads; groundwater abstraction and dewatering; construction waste management; operation of worker camps; soil erosion and sediment runoff; emissions of dust, noise, and vibration; and vegetation removal and habitat modification. For the operation stage, potential factors include facility operation leading to emissions and effluents; increased traffic volume and user demand; energy consumption and greenhouse gas emissions; maintenance and repair activities; operational noise, vibration, and lighting impacts; induced development such as ancillary and commercial activities; and the long-term presence of infrastructure structures.

He emphasized key environmental concerns such as impacts on air quality, water quality, waste generation and management, soil contamination, noise and vibration, ground subsidence, offensive odors, and bottom sediment disturbance, along with potential adverse impacts on the natural environment, including ecosystems, hydrology, topography, and geology.

On the social dimension, Mr. Tanabe identified critical considerations including land acquisition and resettlement; poverty and vulnerability; ethnic minorities and Indigenous Peoples; local economy, employment, and livelihoods; land use and local resource utilization; water use; existing social infrastructure and services; community institutions and decision-making structures; inequitable distribution of benefits and burdens; local conflicts of interest; cultural heritage and landscape; gender and children's rights; public health concerns such as infectious diseases including HIV/AIDS; labor conditions and occupational safety; accident risks; transboundary impacts; and climate change.

Finally, Mr. Tanabe presented the proposed Table of Contents of the SEA Report, which includes: (1) Introduction; (2) Policy, Legal and Institutional Framework; (3) Description of the Proposed Plan/Program; (4) Baseline Environmental and Social Conditions; (5) Identification of Potential Impacts (Scoping); (6) Environmental and Social Impact Assessment; (7) Framework for Environmental Management and Monitoring Plan; (8) Stakeholder Engagement; and (9) Conclusions and Recommendations.

He concluded by reiterating that the SEA will serve as a strategic instrument to ensure that the KVUTS Master Plan is environmentally sound, socially inclusive, and aligned with the principles of sustainable urban development for the Kathmandu Valley

The presentation by Mr. Tanabe was followed by a comprehensive session on the SEA baseline considered for the Kathmandu Valley: Parameters and Sources, delivered **by Mr. Abhishek B.C.,**

Environmental and Social Expert of the JICA Expert Team. He elaborated on the scope, methodology, and stakeholder coordination involved in collecting and analyzing environmental and social baseline data to support the Strategic Environmental Assessment (SEA) of the Master Plan.

He emphasized that the collection of environmental and social baseline data from various institutions is essential for understanding the existing conditions of the Kathmandu Valley and for identifying potential environmental and social issues and impacts at the strategic planning level. He explained that the majority of baseline information used at the scoping stage consists of secondary data, which has been compiled and presented in the Scoping Report. To ensure the reliability and authenticity of the data, the JICA Expert Team conducted in-person visits to relevant stakeholder institutions to formally request and collect the necessary information. He acknowledged the valuable coordination support provided by Ms. Laxmi K.C. (SDE, MOPIT) and Ms. Shubha Shrestha (Sociologist, MOPIT), who facilitated communication with the concerned stakeholders. Official letters were issued by the Ministry of Physical Infrastructure and Transport (MoPIT) to stakeholder offices at the request of the JICA Expert Team, thereby ensuring smooth inter-stakeholder coordination and data sharing.

He provided a detailed explanation of the key environmental parameters and sources for the preparation of the Scoping Report. He mentioned that, in terms of the meteorological baseline, data on temperature, precipitation, and humidity were sourced from the Department of Hydrology and Meteorology (2024). These parameters are critical for understanding seasonal patterns, climate variability, and their implications for infrastructure planning and environmental management.

Air quality data for the Kathmandu Valley were obtained from the Department of Environment (2025), which include the compliance status of particulate matter, including $PM_{2.5}$, PM_{10}, and Total Suspended Particulates (TSP), with pollution levels at or below national standards; monthly and seasonal average concentrations of these pollutants ($\mu g/m^3$); and vehicular emission compliance inspections, which indicated that emissions were within permissible standards. The monitoring stations considered in the study included Bhaisipati, Bhaktapur, Khumaltar, Pulchowk, Ratnapark, Shankhapark, and TU–Kirtipur.

Noise level data were referenced from studies conducted by the Department of Environment (2017) and Chand et al. (2022), providing an understanding of ambient noise conditions in urban and traffic-influenced areas.

Regarding water quality, data for rivers and streams within Kathmandu Metropolitan City were obtained from Kathmandu Metropolitan City (2023). The assessment covered seven major water bodies: Bagmati River, Bishnumati River, Manohara River, Rudramati River (Dhobikhola), Samakhusi River, Bhachakhusi River, and Tukucha River. A total of 21 physico-chemical and microbial parameters were analyzed. Physico-chemical parameters included turbidity, dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), electrical conductivity (EC), total dissolved solids (TDS), ammonia, chloride, alkalinity, hardness, pH, temperature, nitrates,

phosphates, and heavy metals. Microbial parameters included total coliforms, fecal coliforms, and overall microbial load, providing insight into the level of contamination and public health risk.

On solid waste management, baseline information was compiled from Kathmandu Metropolitan City (2025), ADB (2013), Ranjit et al. (2019), and the World Bank (2021), highlighting waste generation rates, collection efficiency, and disposal practices within the Kathmandu Valley. Information on wastewater management was obtained from Karki et al. (2024), outlining the current status of sewerage systems and treatment infrastructure.

Regarding protected areas, Mr. B.C. noted Shivapuri Nagarjun National Park as a key ecological asset of the Kathmandu Valley. Information on biodiversity was obtained from Division Forest Offices (Kathmandu, Bhaktapur, and Lalitpur), the Department of National Parks and Wildlife Conservation, the official website of Shivapuri Nagarjun National Park (snnp.gov.np), IUCN, FishBase, and eBird databases, which cover flora, fauna, avifauna, and aquatic species.

Topography and geology data were referenced from JICA (2012), Sakai (2001), and Dhital (2015), including information on major rock types and soil composition. Seismic activity and earthquake risk assessments were drawn from Pandey et al. (1999) and JICA & MOUD (2012), recognizing the Valley's vulnerability to earthquakes. Additional information referenced includes hydrogeology and groundwater systems (Shrestha et al., 2004), landslides and geomorphological hazards (Dhital, 2015), urban geology and infrastructure planning (JICA & MoUD, 2012), and liquefaction risks (Piya et al., 2004).

Disaster-related data and information were obtained from the National Earthquake Monitoring and Research Center (2015–2025) and the National Disaster Risk Reduction and Management Authority (Preliminary Loss and Damage Assessment: Flood and Landslide, 2024). Climate change considerations include recent research on urban heat island effects, groundwater impacts, rainfall variability, and flood risks in the Kathmandu valley (Bajracharya et al., 2024; Thapa Chettri et al., 2022; Shrestha et al., 2020; Bagale et al., 2023; Subedi, 2025).

Administrative boundary data for the study area were obtained from the Ministry of Federal Affairs and General Administration (MOFAGA), the Central Bureau of Statistics (CBS), and the updated municipal GIS databases.

Socio-economic baseline data including population, education, health indicators, and social vulnerability were drawn primarily from the Central Bureau of Statistics (*National Population and Housing Census*, 2021), the Nepal Health Research Council (2015), Clean Energy Nepal (2022), and the Ministry of Health and Population (*Health Facility Registry*, 2025). Cultural and demographic characteristics were also drawn from the Central Bureau of Statistics (*National Population and Housing Census*, 2021). Road safety and traffic data were obtained from the Kathmandu Valley Traffic Police Office (2026).

Mr. B.C. stated that the information on the Valley's internationally recognized heritage assets is sourced

from the official UNESCO World Heritage Centre website. He also mentioned that the study considered both tangible and intangible heritage, including temples, stupas, palaces, monuments, courtyards, historic buildings, and traditional water features as tangible heritage, alongside festivals, rituals, traditional music and dance, artisan crafts, oral traditions, and cultural ceremonies as intangible heritage. Gender-related data were compiled from the Central Bureau of Statistics, Nepal Police annual reports, and the Election Commission Nepal (2022) to assess dimensions of gender equality, participation, and social inclusion.

In conclusion, Mr. B.C. requested stakeholders to support the SEA process by providing additional secondary data needed for the comprehensive SEA Report, including information on hydrology, climate change, air and water quality, soil, waste management, emissions, biodiversity, socio-economic conditions, gender equality, cultural practices, heritage, the Heritage Impact Assessment (HIA) Report, and other related information. He reiterated that the JICA Expert Team seeks continued cooperation and coordination from all relevant institutions to ensure that the environmental and social baseline is comprehensive, accurate, and reflective of the current conditions of the Kathmandu Valley.

6. Discussion, Feedback, and Concluding Session

The discussion and interaction session were held to collect feedback and suggestions from attendees following the presentation session. Representatives from MoPIT, the JICA expert team, and Mr. Rikesh Chitrakar, environmentalist, facilitated the session. The attendees provide opinions and suggestions verbally and in writing.

Table 4: Opinions and Suggestions provided verbally by the Participants of 2nd SNM

SN.	Name and Organization	Opinions and suggestions provided verbally
1.	Mr. Govinda Adhikari, Engineer Department of Archaeology	▪ Consideration of the Ancient Monuments Preservation Act (1956), UNESCO Conventions, and the Heritage Impact Assessment Procedure (2022), published by the Department of Archaeology (DoA) in coordination with UNESCO ▪ Conduct a separate consultation with the Department of Archaeology to obtain information on the heritage and culturally significant sites of the Kathmandu Valley ▪ Take into account the Monument Zones already designated for each heritage site in the Valley when finalizing the SEA and Master Plan (MP)
2.	Hari Prashad Panta, Director Department of Land Management	▪ Extensive consultation with local inhabitants for sustainable and safe implementation of the projects proposed in the Master Plan ▪ Inclusion of issues related to land acquisition, resettlement, and compensation in the SEA and MP to avoid social conflict among multiple stakeholders ▪ Proper coordination with the Department of Land Management and Archives and the Department of Survey should be ensured to obtain information on land, to avoid conflicts during implementation, and to ensure accurate cost estimation ▪ Review of Land Acquisition Act, 1977

SN.	Name and Organization	Opinions and suggestions provided verbally
		▪ Master Plan should be based on factual findings, with projects proposed accordingly
3.	Mr. Surendra Raj Panta, Scientific Officer Ministry of Forests and Environment (MOFE)	• The study team shall mention Environmental Systems and Trends of air and water qualities, hydrology, annual rainfall, groundwater recharge, runoff, flooding of the valley not only depict the present condition and baseline data • The study team shall maintain not only comprehensive information on forests but also detailed data on habitat continuity and the ecosystem to ensure a holistic understanding of environmental conditions • It is better not to finalize the infrastructure at this stage, and all options should be kept open • Even a physically sound project could not be implemented in Nepal due to court cases, social issues, and interventions from diplomatic commissions and embassies; thus, these issued and considerations should be taken into account • Even a technically sound project may not be implemented in Nepal due to court cases, social issues, and interventions from diplomatic missions; therefore, these issues and considerations should be taken into account • The Master Plan should be aligned with existing plans, policies, and programs, with its interrelations considered within the broader scope • MoFE is committed to providing full support to the JICA Study team in the preparation of the SEA Report
4.	Ms. Indira Parajuli, Faculty, CDES Central Department of Environment Science, Tribhuvan University.	• The presented baseline data for assessing air quality in the Kathmandu Valley, namely $PM_{2.5}$, PM_{10}, and TSP, is not sufficient to evaluate the overall air quality status, and additional pollutants such as NOx, SOx, and CO should be included, as these gases are emitted more significantly by vehicles • Groundwater table status should be considered in the SEA study, as recharge areas may be affected by urban transport infrastructure • Consideration of Gender Equality, Disability, and Social Inclusion (GEDSI) aspects, rather than focusing only on Gender Equality and Social Inclusion (GESI) • Consideration of battery waste management generated from electric vehicles, as EV use is increasing in the Kathmandu Valley. • Provision of women-friendly, children-friendly, and disability-friendly structures and facilities in the Master Plan. • Incorporation of information and key issues on urban flash flooding along riverbanks in the Kathmandu Valley, in view of the increasing impacts during the monsoon season and proposed river corridor projects • The three rural municipalities of Lalitpur District (Bagmati, Konjyoson, Mahankal) are not included in the scoping of the SEA study and should be considered in the context of the entire Kathmandu Valley
5.	Mr. Ravi Rimal, Vice President Federation of Nepalese National Transport Entrepreneurs	• Transport entrepreneurs should be considered formal stakeholders of the SEA from the scoping stage • Proper efforts must be made to ensure the Master Plan is practical and implementable • Gaps between the actual implementation of issues and the issues presented in the scoping document shall be avoided • Ensure incorporation of route-based and operator-based transportation issues

SN.	Name and Organization	Opinions and suggestions provided verbally
		• Ensure integration of the existing transportation system and transport entrepreneurs with new systems, such as Bus Rapid Transit (BRT) or Mass Transit, while addressing all issues of operators • Clarify whether the implementation of the Master Plan is a one-time replacement or a phased transition of vehicles • Ensure the survival of small and medium transport entrepreneurs • The occupation of transport entrepreneurs must not be displaced • KVUTSMP will be sustainable only if the SEA considers transport entrepreneurs as solution partners rather than a problem
6.	Mr. Rameshwor Pokharel, Member Solid Waste Management Association of Nepal	• Solid waste management is a major issue in the Kathmandu Valley; therefore, the study team should integrate it into the Transportation Master Plan, including measures to address traffic congestion • Although reports in Nepal are usually well-prepared, many recommendations are challenging to implement, so the focus should remain on practicality • Address sustainable traffic management by proposing varied schedules for offices, schools, and other activities • The Ministry should ensure that SEA and Master Plan reports are accessible to all stakeholders. • The SEA and MP assessment team should develop a sustainable traffic management system for the Kathmandu Valley • Consideration of the entire Kathmandu Valley should be ensured in the Master Plan
7.	Mr. Binod Shrestha, Lt. Col., Operation and Implementation Officer Kathmandu-Terai/Madhesh Fast Track (Express Highway) Road Project, Nepal Army	• In the southern Kathmandu Valley, the Kathmandu-Terai (Madhesh) Fast Track (KTFT), Expressway Road Project connecting Khokaha to Nijghad via Makawanpur, is expected to be operational in a few years, and the traffic generated by the highway should be considered in the MP • Consideration of traffic demand predictions at the starting point of the Kathmandu-Terai KTFT Expressway near Khokana, Lalitpur • Proper consideration of traffic management due to the ongoing and rapid traffic growth in southern Lalitpur District, namely the municipalities of Godawari, Lalitpur, Kirtipur, and Dakshinkali, resulting from the KTFT Expressway • Consideration of the traffic implications of the ongoing expansion of new link roads connecting the KTFT Expressway

Table 5: Opinions and Suggestions Provided in Writing by the Participants of 2nd SHM

S.N.	Name and Organization	Opinions and suggestions provided in written form
1.	Mr. Sanjeev Awasthi Nepal Telecom	• The draft scoping report covers all aspects of the problems and their potential solutions related to road transportation in the near future
2.	Mr. Purna Sundar Shrestha, Nepal Telecom	• Very good session with masterplan
3.	Mr. Rameshwor P. Pokharel, Solid Waste Management Association of Nepal	• In the overall context, it is fine. I will study it later and submit it
4.	Lt. Col. Binod Shrestha,	• In the southern part of the Kathmandu Valley, the Expressway Road Project, KTFT, is expected to be completed within a few years to

S.N.	Name and Organization	Opinions and suggestions provided in written form
	Kathmandu Tarai Madhesh Fasttrack Road Project, Nepal Army	connect Khokana to Nijgadh via Makawanpur. On this foundation, Godawari, Lalitpur, Kirtipur, and Dakshinkali municipalities are experiencing rapid growth. However, the prediction of traffic demand (generation) does not account for the effects and outcomes of KTFT • Proper consideration of traffic due to the ongoing and rapid growth in southern Lalitpur District, namely the local levels of Godawari, Lalitpur, Kirtipur, and Dakshinkali, resulting from the KTFT Road project. New link roads to connect KTFT are also expanding. These issues should be considered in the SE
5.	Ms. Swasti Shrestha, Department of Environment	• Issues to be considered in the Scoping Document (project-based), regarding the construction or expansion of roads, as well as bridge construction • Operation of concrete and bitumen batching plant to control air pollution and excessive noise • Muck/ spoil disposal not to be carried out in sensitive/ prone areas • Ground water use and extraction • Excavation to be carried in dry seasons
6.	Ms. Ganesh Devi Prajapati, Madhyapur Thimi Municipality	• It should not conflict with any prevailing laws or acts of Nepal, so that there will be no breaks during the implementation phase • There must be interaction between the concerned authorities and local people of the area where the plan will be implemented • When the plan is prepared and approved, it is very important to clearly define who will be responsible for each type of activity and when. If this is not done, the plan will remain only a master plan without any proper action. Therefore, the timeframe must be given priority
7.	Ms. Anusha Sharma, Tokha Municipality	• The study team shall assess short term and long-term impacts of the projects • The study team shall further consider demand side management interventions for traffic management as alternative analysis • The study team shall assess social acceptance assessment of elevated highway in congested road, rivers corridor. Structure option 2 in page 39 looks very unfeasible. The river water way is already narrow; construction of pier for elevated highway hinders natural flow
8.	Ms. Apeksha Marasini, Ministry of Water Supply	• The impacts due to the implementation of this Masterplan on the water supply pipe network and sewer lines area should be considered in the scoping document. You can contact KUKL, PID office for more information
9.	Er. Saroj Khadka, Mahalaxmi Municipality	• Decentralization of major crowded institution/ and other governmental/ business hubs outside of valley may halt flow of people towards Kathmandu. Can't we introduce Kathmandu valley just for tourist Centre and cannot we workout for shifting major business area/ hospital outside valley?
10.	Mr. Santosh Koirala, Mechanical Engineer, Ministry of Industry, Commerce and Supplies	• The study team may consider the report titled "Towards Clean Air in Nepal: Benefits, Pollution Sources, and Solutions," published by the World Bank, for the establishment of baseline information • Data on the number of vehicles in Kathmandu from the Department of Transport Management, as well as the Air Quality Management Guideline for the Kathmandu Valley, may be useful for the study team
11.	Mr. Prabin Chaudhary, Department of Road	• The Draft Scoping Report and the Master Plan for Sustainable, Safe, and Inclusive Transportation in the vibrant and culturally rich Kathmandu Valley need to be submitted to the Council of Ministers for final approval, as specified in the Environment Protection Act,

S.N.	Name and Organization	Opinions and suggestions provided in written form
		2019. According to this SEA, JICA has incorporated measures to protect social and archaeological sites. However, although Schedule 15 of the Environment Protection Rules, 2020 outlines 13 criteria, the social aspect is not clearly reflected. Therefore, this aspect also needs to be explicitly included
12.	Ms. Er. Prabhat Baral, Senior Engineer, Chandragiri Municipality	• What is your strategy and implementation plan, both during and after the completion of this Master Plan, to ensure that all public entities—such as metropolitan cities, municipalities, provincial governments, and central agencies (e.g., the Department of Roads, Kathmandu Valley Development Authority, etc.)—work toward the same objectives? How will you ensure that their ongoing and future projects do not conflict with or undermine the Master Plan? Additionally, what mechanisms will be established to enable effective inter-agency coordination and aligned budget allocation for infrastructure development in accordance with the Master Plan?
13.	Mr. Hari Prasad Panta, Department of Land Management	• Land Acquisition and Resettlement: Careful attention must be given to the processes of land acquisition and resettlement to ensure that they are conducted in a fair, transparent, and socially responsible manner. This includes assessing the potential impacts on affected communities, providing adequate compensation, minimizing displacement, and implementing measures that safeguard the livelihoods, rights, and well-being of those impacted by development projects under the Master Plan. • Reducing Social Conflict Among Multi-Stakeholders: A primary concern in implementing the Master Plan is how to prevent or mitigate social conflicts that may arise among diverse stakeholders, including local communities, government agencies, private developers, and civil society organizations. Effective strategies may include participatory planning, continuous stakeholder engagement, transparent decision-making processes, conflict resolution mechanisms, and ensuring that the interests and perspectives of all parties are adequately considered throughout the planning and implementation phases
14.	Mr. Govinda Adhikari, Department of Archaeology	• Regarding the aspect of cultural heritage, accepting Ancient Monument Protection Act, 1956, UNESCO Conventions about World Heritage sites and Department of Archaeology's procedure of Heritage Impact Assessment, 2021. I recommend to conduct a separate meeting with DoA.
15.	Mr. Sandeep Khanal, Department of Archaeology	• Given the exceptional cultural significance of the Kathmandu Valley, it is strongly recommended that a Heritage Impact Assessment (HIA) be conducted for all proposed transport intersections located within or adjacent to declared heritage sites and their buffer zones • The HIA should evaluate the potential impacts on both tangible and intangible heritage values, as well as on visual integrity and archaeological layers
16.	Mr. Nabin B.K, Department of Geology	• This project is very helpful for planning and policy level. For additional baseline information, details geology of Kathmandu valley should be included with the following investigation will be helpful for the proposed study of Master Plan, • Underground seepage and piping • Ground water condition of Kathmandu Valley, • Seismic hazard analysis, • Bearing capacity analysis, • Liquefaction analysis, • Subsidence analysis, • Flood hazard analysis, inundation, river bank cutting,

S.N.	Name and Organization	Opinions and suggestions provided in written form
		• Active fault inside Kathmandu valley
17.	Mr. Sourab Rana, Senior Program Manager, JICA	• The land related issues should be resolved before planning and implementing the infrastructure projects. One example is to look into the Tinkune land issues as it might impacted the future implementation of the East-West mass transit route specially during the Feasibility Study phase. • Therefore, if possible, highlighting the land related issues is important so that alternative arrangement can be identified
18.	Mr. Ram Saran Sapkota, Federation of Nepalese National Transport	• Recommend for unified transport management authority inside Kathmandu valley • Route digitization and as per passenger ratio route and vehicles type area recommended by government as per route
19.	Mr. Ravi Rimal, Federation of Nepalese National Transport	• (1) How can the transport entrepreneurs be formally recognized as stakeholders in the early stage during the scoping of the SEA? How the gap between paper-based scoping and real operational experience can be reduced? How does the scoping include the different impacts based on route and operators? • (2) Operation stage and system transition- When a new system (CBRT/Mass Transit) is introduced, what is the modality to integrate the existing transport operators into the system? Is it a one-time replacement or a phased transition? What were the methods to be applied to ensure the existence of small and medium transport operators? The KVUTSMP will only be sustainable if transport operators are considered as partners in the solution, but not as a problem while moving ahead with the SEA
20.	Mr. Subodh Luitel, Kathmandu University	• Master plan should incorporate Suryabinayak-Dhulikhel road expansion scenario, • In Draft Scoping Report, please mention EPR Regulation instead of Rules • For public transport improvement incorporate Equity, Diversity, Social Inclusion (EDSI) intersectionality • In report, Solid Waste Management (SWM) generation data is mentioned only 235 tons/day. However, the report does not mention about Banchare Danda landfill site • SEA must evaluate lighting and surveillance infrastructure required to make 24/7 public transport viable for women and all. • SEA must evaluate environmental cost of post disaster & debris management for elevated structure/ tunnel vs. surface level transit. • SEA should incorporate how sustainability can be achieved over time. • Focus on preventive measures before corrective measures. • Should be clear if the current Master Plan components are mathematically capable of realizing targets/ SDG or they are merely incremental improvements on a failing system?
21.	Mr. Bhupesh Adhikary, International Centre for Integrated Mountain Development	• It would have been good to share the written report prior or even after the meeting for receiving real constructive feedback unrealistic to expect critical comments based on power point slides heard for the first time. The presentation to me sounded more like a baseline for IEE/ EIA rather than SEA. The presentation did not seem strategic nor does it elaborate the catchy slogan "Sustainable, safe and Inclusive Transport for a vibrant cultural Kathmandu Valley." Example: How will it be sustainable, safe, or inclusive etc. etc. needs wider and more inclusive consultation?

S.N.	Name and Organization	Opinions and suggestions provided in written form
		• In addition, request to disclose previously completed Master Plan 1993, 2012, 2017 in public places for information dissemination and decision-making
22.	Mr. Krishna Ram Bhattarai, Department of Plant Resources	• During the past, when roads were expanding along the riverbanks, existing trees were fell down, which put birds, mongooses, and other animals at risk and reduced biodiversity. Therefore, this project shall consider these biological and ecological sensitivities and maintain greenery • While maintaining greenery, endemic species will be given priority • The project shall identify rare, endangered, and endemic species affected by the project and make necessary arrangements for their restoration • Public toilets and water-feeding ponds for stray animals and birds shall also be built
23.	Mr. Sandesh Kumar Dhakal, Kageshwori Manohara Municipality	• The draft Scoping report should consider about the cultural and heritage area • The draft Scoping report should consider preservation of environmental part at the time of construction • The draft Scoping report should consider mass transportation system
24.	Mr. Dipesh Guragain, Department of Forests and Soil Conservation	• Ishan new town concept- better it was presented and paused with some facts and figures • Isolating the Thamel zone as a car-free area could increase traffic on the roads linking the northern side of Kathmandu. Are there any alternatives? • Proposed structures at Bishnumati/ Dhobi khola requires the detailed hydrological data sets as well as an appropriate model that forecasts the hydrological conditions under different possible future scenarios • The current transportation sector is profit-oriented and largely privately owned. It would be better to suggest or recommend a nonprofit-oriented public transportation system, keeping in mind the possible negative consequences
25.	Ms. Tripti Kharel, Kathmandu Valley Water Supply Management Board	• The Kathmandu Valley Water Supply Management Board's Capital Investment Assessment Management Plan for 2020–2050 was shared with this team, but it seems that none of the information has been used. The Master Plan covers 18 municipalities and could be of great help for KVUTSMP
26.	Ms. Anju Dhungana, Ministry of Women, Children and Senior Citizen	• The second stakeholder Strategic Environmental Assessment meeting is useful in providing a clear understanding of SEA
27.	Mr. Surendra Raj Pant, Ministry of Forests and Environment	• The study team shall not only present the current environmental conditions and baseline data of the Kathmandu Valley. The team shall cover environmental systems and trends of air and water quality, hydrology, annual rainfall, groundwater recharge, runoff, and flooding further maintaining trends on habitat continuity and ecosystem conditions to ensure a holistic understanding of the valley's environmental status not just maintaining information on forests along with detailed data in the scoping report • Do not frame the infrastructures at this stage; just keep the options open. • Identify the social protest, court cases, and governance failure as a scope. • Align the Master Plan with existing plan, policies, and laws. How this Master Plan interacts with other plan, policies, and laws? Consider this as a scope

S.N.	Name and Organization	Opinions and suggestions provided in written form
28.	Dr. Indira Parajuli, CDES, TU	• The proposed elevated highways along the river corridors are not socially, aesthetically, and environmentally feasible. Rivers in the Kathmandu Valley are already heavily encroached upon, resulting in the narrowing of riverbeds and significant disturbance to their natural flow paths. Such encroachments have contributed to recurrent urban flash flooding in the Valley. Any further interventions of this nature would exacerbate river degradation and increase flood risks • Historical data on urban flash flood occurrences in the Kathmandu Valley should be incorporated into the report, and future projections should be developed based on this analysis, as urban flooding poses significant disaster risks to road infrastructure • Emissions of gaseous pollutants such as NO_x, SO_2, CO, and VOCs, along with particulate pollutants, should be included in the baseline emissions. • Electric vehicles (EVs) are increasingly operating on roads in the Kathmandu Valley alongside petrol- and diesel-powered vehicles. In the near future, issues related to battery degradation, disposal, and associated pollutants are likely to emerge. Therefore, the estimation of battery-related pollutants and the development of appropriate management mechanisms should be addressed in the report • The shrinkage of groundwater recharge areas due to the expansion of road networks should be incorporated into the assessment. • The potential impacts of the project on the underground water table should be explicitly evaluated and included in the report. • The Kathmandu Valley comprises 21 local levels, including 3 Rural Municipalities (RMs); however, the current plan covers only 18 LGs. In this context, it would be more appropriate to include the remaining 3 RMs to ensure sustainable and inclusive transportation planning. • The document currently refers to Gender Equality and Social Inclusion (GESI), which should be updated to reflect the prevailing policy framework, namely Gender Equality, Disability, and Social Inclusion (GEDSI) • Provisions for women-, children-, and persons-with-disabilities-friendly infrastructure should be ensured at stations, during vehicle boarding, and within the vehicles themselves

Following the discussion, interaction, and feedback, **Mr. Sundra Raj Panta**, Scientific Officer on behalf of the Ministry of Forests and Environment (MOFE), delivered concluding remarks, highlighting the strategic significance of integrating Strategic Environmental Assessment (SEA) into national planning and decision-making processes.

He underscored that SEA is not merely a procedural requirement but an essential planning tool that helps ensure environmental sustainability is embedded at the policy, plan, and program levels from the outset, thereby preventing adverse impacts rather than addressing them retrospectively. Mr. Panta drew attention to the current institutional gap in Nepal, noting the absence of a dedicated governing or coordinating body responsible for overseeing and guiding SEA implementation. In this context, he proposed that the National Planning Commission (NPC) could serve as an appropriate authority to lead and institutionalize the SEA framework, given its central role in national development planning and cross-sectoral

coordination.

Concluding his remarks, Mr. Panta reaffirmed the commitment of MOFE to providing technical guidance and institutional support to facilitate the effective completion of the SEA report, reflecting the continued dedication of the Ministry to strengthening environmental governance in the country.

7. Closing Session

The session concluded with clarification notes and closing remarks delivered by **Mr. Sushil Babu Dhakal**, Joint Secretary, Ministry of Physical Infrastructure and Transport (MOPIT) In his address, Mr. Dhakal elaborated on the requirements, objectives, and strategic significance of both the Master Plan (MP) and the Strategic Environmental Assessment (SEA). He emphasized that the SEA is not merely a complementary exercise but an indispensable and integral component of the Master Plan.

Likewise, public consultation was highlighted as another essential and integral element, serving as a critical mechanism to ensure that environmental and social considerations are systematically integrated into the planning and decision-making process from the outset. He further stressed that the baseline information presented in the Scoping Report should be project-specific, accurate, and up-to-date. He urged the expert team to refine and strengthen the baseline data to enable more effective analysis, facilitate informed decision-making, and accurately identify and address potential social and economic impacts associated with the implementation of the Master Plan.

Mr. Dhakal noted that, according to recent statistics, Kathmandu, Lalitpur, and Bhaktapur contribute approximately 31% of Nepal's GDP. A significant proportion of the population in these districts is engaged in the transportation sector, which, however, has been widely regarded as inefficient. He acknowledged concerns raised by participants regarding previous Transportation Master Plans that were prepared but not effectively implemented. In coordination with JICA, Nepal prepared transport master plans in 1993, 2012, and 2017, and a new Master Plan has been initiated in 2024.

He cautioned that, in the present context of rapid urbanization and population growth in the Kathmandu Valley, the future traffic situation could significantly deteriorate if timely interventions are not undertaken. With the valley's population projected to reach approximately 4.2 million by 2050, major challenges such as traffic congestion and air pollution are likely to intensify, thereby directly affecting economic growth. In response to these emerging challenges, the Government of Nepal (GoN) and the Government of Japan (GoJ) have agreed to update the Transport Master Plan for the Kathmandu Valley.

Mr. Dhakal highlighted that the SEA must comprehensively assess potential impacts on historically, culturally, and archaeologically significant sites, particularly given the rich heritage and identity of Kathmandu Valley, further emphasizing the consideration of the scope of the Heritage Impact Assessment (HIA) for the World Heritage Sites of the valley, as applicable. He stressed that infrastructure development should be undertaken with due respect for these sensitive areas, ensuring

their protection and preservation for future generations.

He further noted that issues related to land acquisition, resettlement, and compensation are likely to be among the most prominent challenges associated with the implementation of projects under the Master Plan. These aspects, he explained, should therefore be carefully considered during the scoping stage of the SEA as well as in the formulation of the Master Plan. Recognizing the complexities of land acquisition and compensation processes in Nepal and the difficulties associated with amending existing legal provisions, he encouraged the JICA expert team to explore practical and innovative alternatives for land procurement and management that minimize social disruption and ensure fairness and transparency, as land compensation issues in Nepal are very critical.

He also reaffirmed the mutual understanding between JICA and MOPIT to conduct the SEA in accordance with JICA guidelines, while simultaneously adhering to the spirit and provisions of Nepal's prevailing environmental laws and regulations. Mr. Dhakal highlighted that there is a clear mutual understanding between the Government of Nepal (GoN) and the Government of Japan (GoJ) to prepare the Master Plan in accordance with the agreement reached between the two parties.

He noted that the plan would be formulated in compliance with the provisions of the JICA Guidelines for Social and Environmental Considerations 2022, while also in accordance with the spirit and legal framework of the Government of Nepal. Furthermore, Mr. Dhakal emphasized that the Ministry of Physical Infrastructure and Transport (MOPIT) has been receiving continuous support from the Ministry of Forests and Environment (MOFE) in this regard. He stated that the Ministry envisions the Master Plan as a comprehensive strategic framework designed to enhance the internal road network and strengthen east-west linkages across the Kathmandu Valley.

Furthermore, Mr. Dhakal advised and requested the JICA study team to consider the comments and suggestions provided by the participants during the consultation process. He specifically mentioned the importance of incorporating issues related to Gender Equality, Disability, and Social Inclusion (GEDSI); assessing the groundwater table, air pollution, and associated hydrological considerations, as highlighted by Ms. Indira Parajuli, Faculty, CDES, Tribhuvan University; and examining the appropriate modality for integrating the existing transportation system as well as small transport entrepreneurs with the proposed new Master Plan, as suggested by Mr. Ravi Rimal, Vice President of the Federation of Nepalese National Transport Entrepreneurs. He emphasized that addressing these sector-specific concerns would enhance the comprehensiveness and practicality of the SEA and the Master Plan.

In his closing remarks, Mr. Dhakal expressed confidence that through collaborative efforts, careful assessment, and meaningful stakeholder engagement, the SEA and Master Plan would serve as effective instruments for guiding sustainable infrastructure development.

Appendix 3: Summary of 3rd Stakeholder Meeting

Summary of Third Stakeholder Meeting of Strategic Environmental Assessment (SEA) of Project on Kathmandu Valley Urban Transport System Master Plan

1. Background and Objective

Japan International Cooperation Agency (JICA) had an agreement with Government of Nepal (GON) for the Project on Kathmandu Valley Urban Transport System (KVUTS) Master Plan. JICA has awarded JICA Expert Team (Nippon Koei Co., Ltd. in Joint Venture with other companies) to undertake the Project on Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP).

The objective of the master plan is to promote the implementation of projects based on the master plan in the Kathmandu Valley and to contribute to sustainable economic growth and reduction of environmental burdens such as traffic congestion and air pollution by: 1) developing a new urban transportation master plan, 2) identifying priority mass transit modes and routes, and 3) establishing a coordination mechanism among stakeholders to realize the master plan. In addition, a Strategic Environmental Assessment (SEA) is to be carried out during the preparation of the master plan. SEA is an environmental assessment at the decision-making of the higher stage than the project-level environmental assessment, and Stakeholder Meeting is an integral part of the SEA.

JICA has intended to carry out the Master Plan together with a Strategic Environmental Assessment (SEA) for the plan. As a part of SEA, JICA Expert Team is responsible in conducting three different Stakeholder Meetings (SHM) at different date in line with JICA Guidelines for Environmental and Social Considerations (JICA-GL), 2022.

The SEA planned to conduct three rounds of stakeholder meetings, with participants including government officials from various line ministries, representatives of local-level organizations, and Non-Governmental Organizations (NGOs). The first meeting focused on environmental and social aspects to inform the preparation of the Master Plan. The second meeting, which focused on the draft scoping report, has just been conducted, and the third meeting was held after the preparation of the Draft SEA Report.

The Third Stakeholder Meeting on Strategic Environmental Assessment for the Project on Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP) was held at Himalayan Hotel, Lalitpur dated July 31, 2026 to provide an overview of the Master Plan and provide the preliminary environmental and social impact assessment, the proposed environmental and social management plan and the proposed environmental and social monitoring plan mentioned in the draft SEA report, as well as the upcoming activities.

The specific objectives of the Third Stakeholder Meeting for SEA are as follows;

- To present outline of the PKVUTSMP Report with issues raised;
- To present the sub-projects identified and proposed in the Draft Master Plan;
- To share Background/Need for SEA of KVUTSMP, Progress of SEA

- To provide Table of Contents of Draft SEA Report, Preliminary Impact assessment and Proposed ESMP on SEA and public disclosure; and
- To discuss the issues identified by the study team in the Draft SEA Report and collect opinions and suggestions from the participating stakeholders.
- To inform the disclosure Draft SHM Report prepared by the SEA study team to all the stakeholders;

2. Meeting Outline and Agenda

The outline of theThird Stakeholder Meeting is presented on Table 1.

Table 1: Outline of the Third Stakeholder Meeting

Date	July 31st, 2026
Organizer	Ministry of Infrastructure Development (MoID) & JICA Study Team.
Venue	The Hotel Himalaya, Kupondole Height, Lalitpur, Kathmandu
Agenda	1. Speeches by Honorable Dignitaries 2. Objective of the meeting 3. Presentation ❖ Outline of PKVUTSMP ❖ Future Urban Structure, Traffic Demand Forecast, Necessary Projects/interventions for Master Plan ❖ Background/Need for SEA of KVUTSMP, Progress of SEA – Approaches to SEA / Preparation of Draft SEA Report, next Step for the SEA ❖ Table of Contents of Draft SEA Report, Preliminary Impact assessment and Proposed ESMP on SEA and public disclosure 4. Discussion/Interaction and collection of suggestion, feedback and information 5. Closing Session

3. Participation and Stakeholder Representation

A total of 103 participants attended the Third Stakeholder Meeting, including 70 males and 33 females, comprising representing ministries, commissions, departments, local governments, academic institutions, and the media.

Table 2: Summary of Participant Attendance

Stakeholder Groups	Male	Female	Total
I. Ministries and Government Offices	24	18	42
II. Local Levels of Kathmandu Valley	21	9	30
III. Non-Governmental Organizations, Academics and Others	8	3	11
VI. Media	4	1	5
V. JICA Expert Team	7	0	7
VI. Sub-Consultant (Tech Studio of Engineering)	6	2	8
Total number of participants	70	33	103
In Percentage (%)	67.96	32.04	100

Table 3: List of stakeholders attended the meeting

S.N.	Name	M/F	Ministry/Department/Organization	Designation
A.	**Ministries and Government Offices**			
1.	Mr. Ram Hari Pokharel	M	Ministry of Infrastructure Development	Joint Secretary

2.	Mr. Sushil Babu Dhakal	M	Ministry of Infrastructure Development	Joint Secretary
3.	Mr. Balaram Rijal	M	Ministry of Infrastructure Development	Joint Secretary
4.	Ms. Madhu Ghimire	F	Ministry of Agriculture, Forests and Environment	Under Secretary
5.	Ms. Sushila Paudel	F	Ministry of Infrastructure Development	Under Secretary
6.	Sunita Ghimire	F	Ministry of Infrastructure Development	Under Secretary
7.	Ms. Laxmi K.C	F	Ministry of Infrastructure Development	Senior Divisional Engineer
8.	Ms. Shubha Shrestha	F	Ministry of Infrastructure Development	Senior Sociologist
9.	Mr. Neeraj Thakur	M	Ministry of Infrastructure Development	Senior Divisional Engineer
10.	Bharat Kumar Yadav	M	Ministry of Infrastructure Development	Senior Divisional Engineer
11.	Babita Sharma	F	Ministry of Infrastructure Development	Engineer
12.	Ruby Koju	F	Ministry of Infrastructure Development	Engineer
13.	Devi Acharya	F	Ministry of Infrastructure Development	Non-Gazetted First-Class Officer (Na. Su.)
14.	Namita Kumari Shah	F	Ministry of Infrastructure Development	Non-Gazetted First-Class Officer (Na. Su.)
15.	Ms. Ranjana Pokharel	F	Ministry of Women, Children, Gender and Sexual Minorities and Social Security	Women Development Officer
16.	Mr. Sunil Raj Pandey	M	Bagmati Province Government, Ministry of Physical Infrastructure Development	Engineer
17.	Mr. Ram Sundar Kusi	M	Bagmati Province Government, Ministry of Labor, Employment and Transport	Senior Divisional Engineer
18.	Mr. Khagendra Paudel	M	Bagmati Province Government, Ministry of Labor, Employment and Transport	Officer
19.	Ms. Pramila Gautam	F	National Planning Commission	Planning Officer
20.	Ms. Rajani Thakur	F	National Planning Commission	Planning Officer
21.	Mr. Kiran Baram	M	National Human Rights Commission-Nepal	Officer
22.	Ms. Shakuntala Acharya	F	National Women Commission	Women Development Officer
23.	Mr. Udhab Nepal	M	High Powered Committee for Integrated Development of Bagmati Civilization (HPCIDBC)	Deputy Project Director
24.	Mr. Lokendra Adhikari	M	National Disaster Risk Reduction and Management Authority	Conservation Officer
25.	Mr. Rabin Shakya	M	Department of Environment	Environment inspector
26.	Mr. Mukunda Raj Adhikari	M	Department of Roads	Senior Divisional Engineer
27.	Ms. Ramita Tachamo	F	Department of Urban Development and Building Construction	Engineer
28.	Mr. Sabindra B.	M	Department of Mines and Geology	Senior Divisional

	Shrestha			Geologist
29.	Ms. Amrita Maharjan	F	Department of Archaeology	Archaeological Officer
30.	Mr. Rajal Shrestha	M	Department of Archaeology	Engineer
31.	Mr. Dhruba Bhandari	M	Department of Land Management and Archive	Officer-Law
32.	Mr. Chandra Kumar Pan Shrestha	M	Department of Water Supply and Sewerage Management	Senior Divisional Engineer
33.	Mr. Gopal Bhattarai	M	Department of Health Services	Engineer
34.	Ms. Uma Kumari Rijal	F	Department of Health Services	Nursing Officer
35.	Mr. Suman Kumar Mishra	M	Kathmandu Valley Development Authority	Engineer
36.	Mr. Dipendra Shrestha	M	Civil Aviation Authority of Nepal	Project Director
37.	Mr. Kailash Pantha	M	Nepal Electricity Authority	Engineer
38.	Mr. Youb Raj Poudel	M	Investment Board of Nepal	Senior Divisional Engineer
39.	Ms. Gyanmanjari Sharma	F	Nepal Police, Women, Children and Senior Citizen Service Directorate	Police Inspector
40.	Lt. Col. Mr. Binod Shrestha	M	Kathmandu-Terai/Madhesh Fast Track (Expressway) Road Project, Nepal Army	Implementation and Operation Officer
41.	Ms. Rikka Joshi Shrestha	F	Pashupati Area Development Trust	Architect
42.	Mr. Madan Raj Pandey	M	Pashupati Area Development Trust	Engineer
B.	**Local Levels of Kathmandu Valley**			
43.	Mr. Ramesh Ghimire	M	Kathmandu Metropolitan City, Office of Municipal Executive	Senior Planning Officer
44.	Ms. Pramila Parajuli	F	Kathmandu Metropolitan City, Office of Municipal Executive	Architect
45.	Ms. Shriju Pradhan	F	Kathmandu Metropolitan City, Office of Municipal Executive	Division Chief
46.	Mr. Jeeban Regmi	M	Kathmandu Metropolitan City, Office of Municipal Executive	Senior Engineer
47.	Ms. Achal Acharya	F	Kathmandu Metropolitan City, Office of Municipal Executive	Engineer
48.	Ms. Nisha Koirala	F	Kathmandu Metropolitan City, Office of Municipal Executive	Senior Environment Engineer
49.	Ms. Binita Sharma	F	Kathmandu Metropolitan City, Office of Municipal Executive	Section Officer
50.	Ms. Urmila Bhattarai	F	Kathmandu Metropolitan City, Office of Municipal Executive	Section Officer
51.	Ms. Iru Shrestha	F	Kathmandu Metropolitan City, Office of Municipal Executive	Senior Engineer
52.	Mr. Prem Kumar Sonam	M	Kirtipur Municipality, Office of Municipal Executive	Senior Divisional Engineer
53.	Mr. Sandesh Kumar Dhakal	M	Kageshwori Manohara Municipality, Office of Municipal Executive	Engineer
54.	Mr. Bikram Shrestha	M	Gokarneshwor Municipality, Office of Municipal Executive	Engineer
55.	Mr. Bibhusan K.C	M	Gokarneshwor Municipality, Office of Municipal Executive	Engineer

56.	Mr. Sandesh Lamichhane	M	Chandragiri Municipality, Office of Municipal Executive	Engineer
57.	Mr. Prabhat Baral	M	Chandragiri Municipality, Office of Municipal Executive	Engineer
58.	Ms. Puja Singh	F	Tokha Municipality, Office of Municipal Executive	Engineer
59.	Mr. Ujwal Neupane	M	Tarkeshwor Municipality, Office of Municipal Executive	Engineer
60.	Mr. Giri Raj Khanal	M	Dakshinkali Municipality, Office of Municipal Executive	Section Officer
61.	Mr. Bimochan Bhandari	M	Nagarjun Municipality, Office of Municipal Executive	Engineer
62.	Mr. Sakar Adhikari	M	Budhanilkantha Municipality, Office of Municipal Executive	Engineer
63.	Mr. Prakash Singh Saud	M	Shankharapur Municipality, Office of Municipal Executive	Senior Engineer
64.	Mr. Pradeep Amatya	M	Lalitpur Metropolitan City, Office of Municipal Executive	Environment Engineer
65.	Mr. Arjun Upadhyaya	M	Godawari Municipality, Office of Municipal Executive	Senior Engineer
66.	Mr. Kamal Pokhrel	M	Godawari Municipality, Office of Municipal Executive	Engineer
67.	Ms. Suwan Maharjan	M	Mahalakshmi Municipality, Office of Municipal Executive	Engineer
68.	Mr. Rajan Suwal	M	Bhaktapur Municipality, Office of Municipal Executive	Engineer
69.	Ms. Ganesh Devi Prajapati	F	Madhyapur Thimi Municipality, Office of Municipal Executive	Engineer
70.	Mr. Krishna Bharosa Basnet	M	Changunarayan Municipality, Office of Municipal Executive	Engineer
71.	Mr. Anmol Chhetri	M	Changunarayan Municipality, Office of Municipal Executive	Engineer
72.	Mr. Janak Neupane	M	Suryabinayak Municipality, Office of Municipal Executive	Senior Engineer
C.	**Non-Governmental Organizations, Academics, and Others**			
73.	Mr. Rajendra Acharya	M	Federation of Nepalese National Transport Entrepreneurs	Treasurer
74.	Mr. Suman Giri	M	Federation of Nepalese National Transport Entrepreneurs	Coordinator of Bagmati Province
75.	Mr. Kushal Neupane	M	National Federation of the Disabled Nepal (NFD-N)	Senior Project Coordinator
76.	Ms. Laxmi Kafle	F	National Federation of the Disabled Nepal (NFD-N)	Member
77.	Ms. Kala Swarnakar	F	Feminist Dalit Organization (FEDO	President
78.	Mr. Yogesh Rana Magar	M	Nepal Environment Society	Vice-Chairman
79.	Mr. Samir Thapa	M	Nepal Environment Society	General Secretary
80.	Mr. Nabin Bikas Maharjan	M	Solid Waste Management Association of Nepal	Technical Advisor
81.	Mr. Rameshor Pokhrael	M	Solid Waste Management Association of Nepal	Member
82.	Ms. Smriti Gurung	F	Kathmandu University, Department of Environmental Science	Head of Department, KU
83.	Mr. Subodh Luitel	M	Kathmandu University, Department of Environmental Science	Assistant Professor

D.	**Media**			
84.	Mr. Sachchidanand Yadav	M	Radio Nepal	Engineer
85.	Mr. Krishna Kumar Shrestha	M	Radio Nepal	Technical Officer
86.	Ms. Situ Manandhar	F	Radio Nepal	Reporter
87.	Mr. Bhauch Prasad Yadav	M	Gorkhapatra National Daily	Reporter
88.	Mr. Batu Uprety	M	Nepal Forum of Environmental Journalists-NEFEJ	Executive Member
E.	**JICA Expert Team**			
89.	Mr. Hideo Tsuji	M	JICA Expert Team	Team Leader
90.	Mr. Wataru Ohzono	M	JICA Expert Team	Deputy Team Leader
91.	Mr. Tomoaki Tanabe	M	JICA Expert Team	Environmental Expert
92.	Mr. Hayato Kobayashi	M	JICA Expert Team	GEDSI Expert
93.	Mr. Daijiro Suto	M	JICA Expert Team	Engineer
94.	Mr. Abhishek B.C.	M	JICA Expert Team	Environmental and Social Expert / Engineer
95.	Mr. Sumit Thapa	M	JICA Expert Team	Engineer
F.	**Sub-Consultant (Tech Studio of Engineering)**			
96.	Mr. Nemi Bhattarai	M	Tech Studio of Engineering (TSE)	Engineer
97.	Mr. Sanjeev Regmi	M	Tech Studio of Engineering (TSE)	Managing Director
98.	Mr. Rikesh Chitrakar	M	Tech Studio of Engineering (TSE)	Environmental Expert/ Moderator
99.	Mr. Sambad Mainali	M	Tech Studio of Engineering (TSE)	Master of Ceremony
100.	Mr. Gopal Shrestha	M	Tech Studio of Engineering (TSE)	Manager
101	Ms. Shrinkhala Shrestha	F	Tech Studio of Engineering (TSE)	Event Manager
102.	Ms. Suvekchya Aryal	F	Tech Studio of Engineering (TSE)	Assistant/ Event Coordinator
103.	Mr. Shiva Adhikari	M	Tech Studio of Engineering (TSE)	Environmentalist/ Assistant Event Manager

4. Opening Session

4.1 Official Welcome and Introduction of Attendees and Organizers

Mr. Sambad Mainali, the Master of Ceremony, extended a warm welcome to the Chair of the program, Mr. Ram Hari Pokharel, Joint Secretary at the Ministry of Infrastructure Development (MoID), and Guests of the program, Mr. Balram Rijal, Joint Secretary, Ministry of Infrastructure Development (MoID) and Ms. Madhu Ghimire, Under Secretary, Ministry of Agriculture, Forests and Environment

(MoAFE).

Mr. Mainali, respectfully greeted the Chair of the program and Guests and warmly welcomed chairperson and guests to take a seat at the podium in front of the meeting hall. The opening session commenced formally with all participants respectfully stood for the National Anthem of Nepal. Following this, the Chair of the program Mr. Ram Hari Pokharel, Joint Secretary at the Ministry of Infrastructure Development (MoID) initiated the formal launch of the event delivering the opening remarks and objective of the meeting.

4.2 Opening Remarks and Objective of the Meeting

By Mr. Ram Hari Pokharel, Joint Secretary, MoID

The formal program commenced with an official welcome, opening remarks, and a statement of the objectives of the program by Mr. Ram Hari Pokharel, Joint Secretary, Ministry of Infrastructure Development (MoID).

Mr. Pokharel highlighted the significant contributions of the Government of Japan to Nepal across various sectors since the establishment of JICA's cooperation with Nepal in 1970. Among the notable projects supported by the Government of Japan is the construction of the BP Highway under grant assistance. Similarly, the recently completed and operational Nagdhunga Tunnel was constructed with financial assistance from JICA through a soft loan. JICA has also been providing continued support to Nepal in the urban transport sector, particularly in the Kathmandu Valley. Such support dates back to the preparation of the Urban Transport Master Plan in 2004 and its subsequent update in 2009, based on which JICA has also supported improvements to various major intersections in the Valley. However, with the rapid growth in population, urbanization, and vehicle ownership, traffic volumes in the Kathmandu Valley have increased substantially, resulting in severe traffic congestion, particularly during peak office hours. Recognizing the need to improve the efficiency and sustainability of the Valley's urban transport system through alternative and integrated solutions, JICA has agreed to provide technical assistance to the Government of Nepal. The technical assistance for the Kathmandu Valley urban transport system is now in its final stage. Two stakeholder consultation meetings have already been conducted, and the present meeting represents the third and final stakeholder consultation under this technical assistance. The JICA Expert Team will finalize the SEA Report by incorporating the comments, suggestions, and recommendations received during this meeting. The finalized SEA Report will form an integral part of the Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP).

In his remarks, Mr. Pokharel further noted that JICA has prepared the Kathmandu Valley Urban Transport System Master Plan, together with a Traffic Alternatives Study and a Strategic Environmental Assessment (SEA). He explained the distinction between SEA and project-level environmental assessment instruments, such as Environmental Impact Assessment (EIA), Initial Environmental Examination (IEE), and Brief Environmental Study (BES), as provided under the Environment Protection Act (EPA), 2019 and the Environment Protection Rules (EPR), 2020. While EIA, IEE, and BES primarily assess the potential environmental impacts of individual projects, SEA evaluates the

broader environmental and social implications of policies, plans, and programs at the strategic level.

Mr. Pokhare further emphasized that the SEA would serve as an important foundation for integrating environmental and social considerations into the planning of major infrastructure and transportation initiatives. It would also provide a strategic framework for incorporating environmental safeguards into future transportation planning and decision-making in Nepal. In this regard, he noted that the SEA, together with the Master Plan, could serve as an important reference document for guiding sustainable urban transport development in the country.

Mr. Pokharel expressed his sincere appreciation to the JICA Expert Team, relevant government agencies, stakeholders, and all participants for their valuable presence, contributions, and continued support. In closing, he encouraged all participants to actively engage in the discussion session by sharing their comments, suggestions, and recommendations. He warmly welcomed their constructive contributions toward further strengthening the SEA Report and ensuring the successful completion of the stakeholder consultation process.

4.3 Speech by Under Secretary, MoAFE

By Ms. Madhu Ghimire, Under Secretary, MoAFE

Following the opening remarks and the meeting objectives, Ms. Madhu Ghimire, Under Secretary, MoAFE, delivered her address emphasizing the strategic importance of the Master Plan and the Strategic Environmental Assessment (SEA) process. Ms. Madhu Ghimire, expressed her pleasure at participating in the program. Ms. Ghimire, emphasized the protection of Forest, Environment and Climate Change issues are common responsibility of all three level governments (Local level, Province Level and Federal Level) and also not only limited to the single country. These issues are also a global issue.

In her remarks, she emphasized the significance of Strategic Environmental Analysis as mentioned under the Environment Protection Act (EPA), 2019 and the Environment Protection Rules (EPR), 2020, formulated under the new constitution of Nepal, highlighting its important role in guiding sustainable transportation planning and development. She noted that the preparation of the SEA for the Kathmandu Valley Urban Transport System Master Plan is a pioneering initiative and is expected to serve as a significant milestone in advancing the application of SEA as per the legal provisions of Nepal.

Ms. Ghimire also expressed her sincere appreciation and thanks to MOID for initiating the Strategic Assessment and to the Japan International Cooperation Agency (JICA) for providing both technical and financial support for the preparation of the Master Plan and the SEA report. She expressed confidence that the implementation of the Master Plan would contribute to the development of a more efficient, sustainable, and environmentally responsible transportation system for the Kathmandu Valley. She concluded her remarks by extending her best wishes to the Study Team for the successful completion of the assignment.

Following the opening remarks and presentation of the meeting objectives, Ms. Madhu Ghimire, Under Secretary, Ministry of Forests and Environment (MoAFE), delivered her remarks, emphasizing the

strategic importance of the Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP) and the Strategic Environmental Assessment (SEA) process. She expressed her pleasure at participating in the stakeholder consultation meeting and appreciated the efforts of the concerned government agencies, the Japan International Cooperation Agency (JICA), and the Study Team in advancing the preparation of the Master Plan and SEA.

Ms. Ghimire highlighted that the protection of forests and the environment, as well as addressing climate change, are shared responsibilities of all three tiers of government—federal, provincial, and local governments. She emphasized that environmental protection and climate change are not issues that can be addressed by a single institution or government level alone. Rather, they require effective coordination, collaboration, and shared responsibility among government agencies, development partners, the private sector, local communities, and other stakeholders. She further noted that issues related to protection of forest, environmental degradation, climate change issues transcend administrative and national boundaries and have therefore become global concerns requiring collective action and coordinated responses.

In her remarks, Ms. Ghimire emphasized the importance of Strategic Environmental Assessment (SEA) as provided for under the Environment Protection Act (EPA), 2019 and the Environment Protection Rules (EPR), 2020, which were formulated within the framework of Nepal's federal constitutional system. She explained that SEA provides an important mechanism for integrating environmental and social considerations into policies, plans, and programs at an early stage of decision-making. Unlike project-level environmental assessment, which primarily focuses on the impacts of individual projects, SEA enables environmental considerations to be incorporated into broader planning processes and helps identify potential cumulative, long-term, and strategic impacts.

She further noted that the application of SEA to the Kathmandu Valley Urban Transport System Master Plan represents an important and pioneering initiative in Nepal. Considering the scale, complexity, and long-term implications of the proposed urban transport interventions, she expressed the expectation that the SEA would provide a sound strategic basis for integrating environmental and social considerations into the Master Plan and would contribute to more sustainable and resilient urban transport development in the Kathmandu Valley.

Ms. Ghimire also highlighted the importance of considering climate change and environmental resilience in future transportation planning. She further emphasized the need to promote environmentally sustainable modes of transportation, improve public transport systems, encourage non-motorized transport, enhance urban green spaces, and reduce emissions from the transport sector. She stressed that such measures would contribute not only to improved mobility but also to a healthier, safer, and more livable Kathmandu Valley.

Ms. Ghimire expressed her sincere appreciation to the Ministry of Infrastructure Development (MoID) for initiating and facilitating the strategic assessment process and to the Japan International Cooperation Agency (JICA) for providing technical and financial support for the preparation of the Master Plan and

SEA. She acknowledged the valuable contribution of the JICA Expert Team and other stakeholders involved in the preparation of these important planning documents.

She expressed confidence that the implementation of the Master Plan, supported by the findings and recommendations of the SEA, would contribute to the development of a more efficient, sustainable, climate-resilient, inclusive, and environmentally responsible urban transportation system in the Kathmandu Valley. She also emphasized that the successful implementation of the Master Plan would require strong institutional coordination, effective implementation mechanisms, adequate resources, and continued engagement with relevant stakeholders at all levels of government.

In concluding her remarks, Ms. Ghimire reiterated the importance of incorporating the comments, suggestions, and recommendations of stakeholders into the final SEA Report and Master Plan. She extended her sincere appreciation to all participants for their active engagement and valuable contributions and conveyed her best wishes to the JICA Study Team and all concerned agencies for the successful completion and effective implementation of the assignment.

5. Technical Presentations

Mr. Hideo Tsuji, Team Leader, JICA Expert Team

Following the addresses from Joint Secretary, MoID and Under Secretary MoAFE, the technical session commenced with a presentation on the outline of the PKVUTMSP by Mr. Hideo Tsuji, Team Leader of the JICA Expert Team. Mr. Tsuji introduced the Master Plan's future urban structures together with the population projection of the Kathmandu Valley further focusing on the year 2050. Mr. Tsuji further recalled Japan International Cooperation Agency's longstanding support to Nepal's transport planning efforts, noting its assistance in preparing previous master plans in 1993, 2012, and 2017. He highlighted the vision and objectives of the MP in his presentation and further mentioned that the MP will be updated focusing on Mass Transit transportation system together with candidate projects with interventions (road, public transport, traffic management, etc.). Mr. Tsuji highlighted the overarching vision and strategic objectives of the Master Plan (MP) in his presentation, with a stronger focus on the development and integration of a comprehensive mass transit transportation system, aimed at improving mobility, reducing congestion, and promoting environmentally sustainable transport solutions. Mr. Tsuji highlighted the requirement and importance of east–west corridor (tentatively named: Ratna Park – Bhaktapur, approx. 14.6 km) with high demand for mass transit, as identified from demand forecasting results to be developed. He emphasized the mode is assumed to be Metro. The central urban area and the vicinity of the Koteshwor intersection to be developed as underground structures, while elevated structures within existing road right-of-way will be adopted for other sections. The target opening year is around 2040. Future extensions, integration with other public transport systems (e.g., BRT), and transit-oriented development (TOD) are also to be considered.

Mr. Hayato Kobayashi, GEDSI Expert, JICA Expert Team

The presentation delivered by Mr. Tsuji was followed by presentation on Strategic Environmental Assessment with key highlights, background and need for SEA of KVUTSMP, approach of SEA and

next step for the SEA by Mr. Hayato Kobayashi, GEDSI Expert, JICA Expert Team, Mr. Abhishek B.C, Environmental and Social Expert.

Mr. Kobayashi explained to the participants about the SEA and its needs. He stressed that the SEA primarily answers "Why?" by evaluating the need for a policy, plan, or program, comparing strategic alternatives, and identifying the most sustainable option before major decisions are made. In contrast, the EIA, IEE, or BES answer "How?" by assessing the site-specific environmental and social impacts of the selected project and identifying appropriate mitigation, management, and monitoring measures for its implementation. Moreover, he stressed the SEA does not conduct detailed, site-specific assessments for individual projects. Detailed environmental assessments are carried out at the project level through the EIA, IEE, or BES once the project design, location, and baseline information are available. The SEA also considers reasonable strategic alternatives to support informed decision-making.

Mr. Abhishek B.C, Environmental and Social Expert

Mr. Abhishek B.C. Environmental and Social Expert, JICA Expert Team, emphasized that as per the Record of Discussions agreed between the then Ministry of Physical Infrastructure and Transport and the Japan International Cooperation Agency (JICA) on November 24, 2023, the Strategic Environmental Assessment (SEA) for the Kathmandu Valley Urban Transport System Master Plan is to be carried out in accordance with the JICA Guidelines for Environmental and Social Considerations.

Mr. B.C. insisted that several discussions were held with the then Ministry of Forests and Environment (MoFE), and MOFE has officially requested that the Strategic Environmental Assessment (SEA) for the Kathmandu Valley Urban Transport System Master Plan (KVUTSMP) be prepared by incorporating international best practices in SEA and in accordance with the spirit of Nepal's Environment Protection Act, 2019. Accordingly, the SEA is being prepared in accordance with the JICA Guidelines and in line with the spirit and principles of Nepal's environmental legislation. SEA is positioned as a preliminary environmental assessment of strategic actions, plans, and programs, aiming to ensure that environmental impacts are effectively considered at the early stages of decision-making. The SEA addresses the likely environmental and social impacts of the Master Plan in a strategic and holistic manner. It assesses the environmental impacts of all major proposed projects under the Master Plan from a broader perspective.

Mr. B.C. further stressed regarding the environmental study, Technical Working Group 3 (Environment) (TWG3) was formed under the leadership of the Ministry of Infrastructure Development (MoID). The members of the TWG include the Ministry of Agriculture, Forests and Environment (MoAFE); Department of Environment (DoEnv); Department of Roads (DoR); Nepal Railway Board (formerly the Department of Railways); Department of Transport Management (DoTM); Kathmandu Metropolitan City (KMC); Lalitpur Metropolitan City (LMC); Bhaktapur Municipality; and an academic expert, the Head of the Department of Environmental Science at Kathmandu University. The SEA study comprises three Stakeholder Meetings and three Technical Working Group 3 (Environment)) meetings as part of the stakeholder consultation process to obtain feedback on the SEA. Following the discussions in the) (TWG3-Environment) meetings, a total of 70 stakeholders from various organizations have been

identified and invited to provide feedback on the SEA.

Mr. B.C. further explained that, in the first Stakeholder Meeting, the SEA approach for KVUTSMP was discussed. In the second Stakeholder Meeting, the draft Scoping Report was presented. In this third Stakeholder Meeting, the draft SEA Report will be presented for stakeholders' review and feedback. The Scoping Report has already been completed and shared with the Ministry of Agriculture, Forests and Environment (MoAFE).

Mr. B.C, illustrated that for developing a transport corridor, the SEA may evaluate alternatives such as developing a railway corridor, implementing a Bus Rapid Transit (BRT) system, widening the existing road to improve traffic capacity, or adopting the no-project option. These alternatives are assessed to identify the most environmentally, socially, technically, and economically sustainable option.

Mr. B.C. kindly requested all the participants to listen to Mr. Tanabe's presentation and provide valuable comments and suggestions on the Draft Strategic Environmental Assessment (SEA) Report and insisted that the feedback will be invaluable in further improving the report. Finally, Mr. B.C. informed that it was decided during the third TWG3 (Environment) meeting to disclose the draft SEA Report on the MoID website and publish a public notice in national daily newspapers after the Third Stakeholder Meeting. This will enable the concerned stakeholders to respond to any queries or comments received from the public and other stakeholders during the disclosure period.

Mr. Tomoaki Tanabe, Environmental and Social Expert, JICA Expert Team

The presentation by Mr. Hayato Kobayashi, GEDSI Expert, JICA Expert Team and Mr. Abhishek B.C, Environmental and Social Expert was followed by a comprehensive session on the Draft SEA Report delivered by Mr. Tomoaki Tanabe, Environmental and Social Expert of the JICA Expert Team. In his presentation, Mr. Tanabe elaborated on the concept of Strategic Environmental Assessment (SEA) and approach of conducting the SEA for the Kathmandu Valley Urban Transport System Master Plan (KVUTSMP), outlining including Tale of Contents of the Draft SEA Report and the key environmental and social issues identified at the scoping stage.

Mr. Tanabe began by presenting a conceptual diagram illustrating the stages of SEA in comparison to project-level environmental assessments such as EIA and IEE. He emphasized that SEA is undertaken at a much earlier stage in the decision-making process than EIA/IEE and therefore serves as a vital tool for promoting sustainable development. By integrating environmental and social considerations at the policy and planning level, SEA ensures that potential impacts are addressed proactively rather than reactively.

Referring to Nepal’s legal framework, he highlighted that the Strategic Environmental Analysis system has been formally established under the Environment Protection Act, 2019 and the Environment Protection Rules, 2020. In particular, Section 9 of the Environment Protection Act, 2019 stipulates that prior to the implementation of any policy, program, or project specified by the Government of Nepal through notification in the Nepal Gazette, a Strategic Environmental Analysis must be carried out.

Furthermore, Rule 10, Sub-rule (4) of the Environment Protection Rules, 2020 requires the preparation of a Scoping Report, while Sub-rule (9) mandates the preparation of the SEA Report.

Mr. Tanabe also explained the SEA requirements under the Japan International Cooperation Agency Guidelines for Environmental and Social Considerations, 2022. According to the Guidelines, "Strategic Environmental Assessment (SEA)" refers to an environmental assessment conducted at a higher decision-making level than project-level assessments. He clarified that the SEA for KVUTSMP will be conducted in accordance with JICA Guidelines and in the spirit of Nepal's Environment Protection Act, 2019, in close consultation with relevant governmental bodies. Mr. Tanabe informed participants that Stakeholder feedback will be collected through 3rd stakeholder meetings and public disclosure and incorporated into the Final SEA Report.

Mr. Tanabe stated that potential environmental and social impact items are identified based on the characteristics of the proposed plan and the project area. Through stakeholder consultations, key issues are shared at an early stage, and feedback is systematically incorporated. This process enables the identification and prioritization of critical issues to be addressed during Master Plan formulation. He further emphasized that the alternative analysis on Urban Transport System was carried out based on the multi-criteria evaluation, compared with the other alternatives, to achieve the best overall balance across technical, economic, financial, environmental, and social aspects, while also being feasible to implement and sustainable in the long term. Moreover, evaluation on impact of SEA was based upon Significant beneficial effect (build on and preserve), significant adverse effect (requiring mitigation), Beneficial effect (build on and preserve), Adverse effect (requiring mitigation), Combined effect (focusing management need), Unclear outcome (requiring additional review). If any MP Project is expected to have adverse impacts, an Environmental and Social Management Plan (ESMP) that includes Mitigation measures and Monitoring plans will be proposed.

Finally, Mr. Tanabe concluded his remarks by reiterating that the Strategic Environmental Assessment (SEA) would serve as a key strategic tool for integrating environmental and social considerations into the KVUTS-MP. He emphasized that the SEA would help ensure that the Master Plan is environmentally sustainable, socially inclusive, and aligned with the principles of sustainable urban development, thereby supporting the long-term resilience and livability of the Kathmandu Valley.

6. Discussion, Interaction, and collection of suggestion or information

The discussion and interaction session was organized to collect feedback and suggestions from attendees following the presentation session. Representatives from MoID, the JICA expert team, and Mr. Rikesh Chitrakar, environmentalist, facilitated the session. The attendees provide opinions and suggestions through both verbally and in written submissions. The JICA Expert Team addressed the questions, comments, and suggestions raised by the stakeholders and provided necessary clarifications on the proposed Master Plan and the Draft SEA.

JICA Expert Team responded upon the verbal feedbacks provided during the discussion session.

Table 4: Opinions and Suggestions provided verbally by the Participants of 3rd SNM

SN.	Name and Organization	Opinions and suggestions provided verbally
1.	Civil Aviation Authority of Nepal	・ Tribhuvan International Airport (TIA) serves as Nepal's primary international gateway and should be recognized as a major multimodal transport hub in the Master Plan. He stressed that the MP and the Strategic Environmental Assessment (SEA) should adequately address airport connectivity, environmental and social safeguards, restrictions on high-rise developments, utility infrastructure, aviation safety requirements, and other operational safety considerations to ensure the safe and sustainable development of the airport and its surrounding areas.
2.	Nepal Forum of Environmental Journalists-NEFEJ	・ Any infrastructure development proposed in or around the Pashupati Area should fully consider the obligations under the World Heritage Convention to safeguard the Outstanding Universal Value of the Pashupati World Heritage Site. He recommended reviewing and complying with relevant national legislation, including the Treaty Act 1990, the Pashupati Area Development Trust Act 1987 (2044 BS), the Ancient Monument Preservation Act 1956 (2013 BS), and other applicable legal provisions governing cultural heritage conservation. While acknowledging that a Heritage Impact Assessment (HIA) has been proposed as an important safeguard tool, he noted that Nepal currently has limited practical experience in conducting HIAs and lacks a comprehensive legal framework for their implementation. He further stated that the proposed Chabahil–Gaushala Tunnel should be ruled out due to the absence of tunnel construction experience in Kathmandu Valley and the valley's geological characteristics as a former lake basin. Similarly, he recommended excluding the proposed Chabahil–Bagmati River Elevated Highway because of its potential impacts on the heritage setting and surrounding environment. As an alternative, he suggested exploring innovative options such as the Dhobi Khola Corridor Road and/or elevated highway alignments that would avoid both the Chabahil–Gaushala Tunnel and the Chabahil–Bagmati River Elevated Highway. Finally, he stressed the importance of establishing an effective coordination mechanism among relevant government agencies, heritage authorities, and local governments to ensure integrated planning, informed decision-making, and the protection of cultural heritage throughout the implementation of the Master Plan and the Strategic Environmental Assessment (SEA).
3.	Pashupati Area Development Trust	・ The Pashupati Area covers an area of 264 hectares. It was inscribed on the UNESCO World Heritage List in 1979 due to its Outstanding Universal Value. Under the Ancient Monument Preservation Act, 2013 B.S. (1956 A.D.), the Government of Nepal declared the Pashupati Protected Monument Area in 2056 B.S. (1999/2000 A.D.). The protected area includes Wards 7, 8, and 9 of KMC. ・ Likewise, to preserve religious values, protect both tangible and intangible cultural heritage, and develop the Pashupati Area as an international pilgrimage destination, the Pashupati Area Development Trust (PADT) has established a Master Plan. Further, the Ring Road, Gaushala, and Chabahil corridors contain numerous historically and archaeologically significant heritage structures, including temples, dabalis (traditional open platforms), rest houses, and chaityas (Buddhist shrines) on both sides of the road. Due to heavy traffic congestion, these archaeological and cultural heritage assets have experienced adverse physical impacts and are also affected by air pollution, dust, noise, and other forms of environmental pollution. She further suggested that the views and recommendations of heritage experts should also be sought. Further discussions and consultations are considered necessary.

SN.	Name and Organization	Opinions and suggestions provided verbally
		Moreover, The Pashupati Area Master Plan envisions the Ring Road–Tilganga–Gaushala–Chabahil corridor as a heritage- and pilgrim-friendly corridor, and this consideration should be taken into account during future transport planning.
4.	Kathmandu Metropolitan City	・ The Master Plan should assess the pedestrianization of roads connecting the Ason area, as it proposes pedestrianization in the Ason and Basantapur areas. A detailed assessment should therefore be undertaken to identify the appropriate areas for pedestrianization within the Kathmandu Valley, including consideration of accessibility, traffic diversion, emergency access, public transport connectivity, and impacts on local businesses and residents. The study should also establish the prerequisites and planning requirements for parking facilities, particularly in areas where on-street parking may be restricted following pedestrianization. Handigaun and Naxal are historically and culturally significant areas, with substantial archaeological evidence and artifacts dating back to the Lichhavi period (5th century). These heritage values should be properly documented and considered in the Master Plan and SEA. Consultation with Sajha Yatayat and relevant NGOs and community-based organizations should also be undertaken to incorporate their perspectives on public transport, mobility, and social considerations. Furthermore, the SEA assessment team should include Social, Heritage, and Legal Experts to ensure comprehensive assessment of social, cultural heritage, and regulatory issues. The study should also incorporate urban flood resilience and climate-resilient infrastructure considerations, particularly when planning roads and transport infrastructure along the Bishnumati River corridor, including potential impacts on river hydrology, drainage, flood conveyance, and riverine ecosystems.
5.	KMC	・ The Tripureshwor section, where the MP proposes a flyover adjoining the Bagmati River corridor, comprises a significant number of historical, archaeological, cultural, and religious heritage sites. She further emphasized that the proposed Thapathali–Tripureshwor River Corridor and the Bishnumati River Corridor Elevated Highway also require a comprehensive HIA because these riverbanks are closely associated with daily cultural and religious practices, including temples, traditional ghats (cremation sites), and ritual activities. She recommended that the design of the elevated highways should ensure uninterrupted public access to the river side ghats for the performance of daily religious rituals and should also incorporate suitable access for equipment required for debris and solid waste removal to facilitate effective river maintenance. In addition, she noted that the assessment report does not provide adequate information on the Ishan City and recommended that a detailed assessment of its heritage significance and potential project impacts be included.
6.	Kathmandu Metropolitan City, Office of Municipal Executive	・ Following the review of executive summary of the SEA report provided; the Kathmandu Metropolitan City should not be limited to the role of merely a "supporting agency" or "stakeholder." Instead, it should be legally recognized as a co-decision maker in the decision-making process to avoid overlapping during project implementation. ・ The study team has mostly followed central/federal laws like EPA 2019 and EPR 2020 while preparing the Master Plan. Whereas, local level guideline such as the provisions made under the Kathmandu Metropolitan City Environment and Natural Resources Conservation Act, 2020 (2077 B.S.), Solid Waste Management Collection and Transportation Procedures, 2024 (2081 B.S.) as the overarching local legal framework has not been found to be addressed in the report.

SN.	Name and Organization	Opinions and suggestions provided verbally
		・ In para 8 of the executive summary mentioned about the involuntary resettlement and squatters. However, the provision of compensation to a person without land ownership certificate has not been mentioned explicitly. She further suggested to the study team to clarify upon the provision of compensation in the report as there is no any provision of compensation in the local acts and further to clarify upon provision of compensation as per JICA guideline. ・ The report has emphasized the cultural heritage sites such as Thamel and Durbar Marg will be pedestalized with vehicle free-zone and HIA will be carried out. The main concern of the Kathmandu Municipality is to area comprises traditional festivals, guthi (local cultural groups) and chariot pulling festivals etc. therefore the study team is suggested to conduct consultation not only with the Department of Archaeology but also with Heritage Department under the Kathmandu Metropolitan City and the local Guthiyars (traditional guthi custodians/trustees) before proceeding with the project. ・ The pollution due to solid waste and demolition waste mentioned in para 4 and 5 of the executive summary mentioned that the valley produces 335 tons of solid waste daily and is problematic in operation of Sisdol Dumping site. However, a concrete plan for the safe disposal and management of the huge amount of demolition waste likely to be generated due to the implementation of flyover, tunnel and road widening projects proposed under the Master Plan has not been presented in the report. Likewise, she further suggested presenting the ultimate responsible body for the safe disposal of demolition waste and spoil in the Master Plan.Likewise, Ms. Bhattarai further highlighted in terms of public hearing and access to local stakeholders presented in the Paragraph 10 of the executive summary mentioned about the grievance redress committee and its establishment; she recommended to establish the mechanism of committee comprising the representatives from local wards and representatives from Kathmandu Metropolitan City.
7.	Department of Mines and Geology	・ I suggested to incorporate recommendation for the amendment of prevailing laws to notify the Council of Ministers and other government entity so that they should do to amend the prevailing laws to point out legal problems at the early stage of the project implementation resulting successful implementation of this SEA as well as Master Plan. ・ I further suggested for lift parking especially adjoining the Thamel and three Durbar Square World Heritage Sites minimizing car free zone in these areas to ease social gathering of the local Newar community as these areas is culturally reach for the traditional festivals with significant numbers of traditional social gathering. Implementation of car free zone in these area likely to have significant impact upon the accessibility of locals also affecting elderly ones. ・ I further suggested to refer Department of Mines and Geology for the maps and other geological reports used in this report. Mr. Shrestha also sought clarification on GEDSI (Gender Equality, Disability, and Social Inclusion), particularly the inclusion of the "D" (Disability), and questioned the relevancy of the D in GEDSI, further seeking its practical in Nepal instead of GESI (Gender Equality and Social Inclusion) in the Master Plan and the SEA Report.
8.	Radio Nepal	・ The design of tunnels and other road infrastructure ensure uninterrupted reception of Radio Nepal broadcasts for all road users, particularly to facilitate the dissemination of emergency information and public service announcements.
9.	National Federation of the Disabled	・ A more diverse range of stakeholders be engaged during the consultation process, including organizations representing persons with disabilities,

SN.	Name and Organization	Opinions and suggestions provided verbally
	Nepal (NFD-N)	senior citizens, and other marginalized and vulnerable groups. He further suggested that, during the land acquisition and resettlement process the persons with disability might be affected severely; therefore he recommended that the baseline information include disaggregated data (e.g., by gender, age, disability, and other relevant social categories) to support inclusive planning and decision-making ensuring the alternative and best solution for the quality and dignified life including easy accessibility. Furthermore, he emphasized the need to integrate Gender Equality, Disability, and Social Inclusion (GEDSI) considerations throughout the Master Plan and to ensure that proposed technologies, transport systems, and infrastructure are accessible and inclusive for all users so that a person with differently able could use the road and associated infrastructures independently without any difficulty facing any barriers which will make their life more independent and could live dignified life in the society. Mr. Neupane further suggested to maintain subsidy provisions allocating the mandatory reservation seats to senior citizens, disabled persons and children in the means of transportations as that sort of provision is not fully complied in current contexts by the service providers. Finally, he requested to ensure the participants of disabled persons in the coming days and in further assessment stages like EIA stages so that the issues related to disabled persons could be identified at early stages of the project implementation identifying the appropriate solutions.
10.	Nepal Environment Society	・ The School of Environmental Management and Sustainable Development (SchEMS), Pokhara University be included as an academic stakeholder in the upcoming stages of the study, noting that Tribhuvan University (TU) and Kathmandu University (KU) have already been involved in the stakeholder consultation process. Since this Master Plan will serve as the guiding document for the preparation of the Detailed Project Report (DPR), Environmental Assessment (EA), and subsequent project implementation, it is essential to comprehensively address key issues, including the potential impacts of large-scale groundwater extraction and the corresponding mitigation measures. He further recommended that the Master Plan should incorporate reuse of underground water egressed during the tunnel construction. He further suggested a study team to carry out a comprehensive assessment of land use and land cover (LULC) changes, including the existing, projected, and proposed distribution of open spaces and green spaces. ・ The SEA should assess the potential impacts on the microclimate of Kathmandu Valley arising from air pollution and dust generated by the proposed project interventions. He emphasized that changes to the urban environment, including increased dust and air pollution, could indirectly influence the valley's microclimatic conditions. Given the bowl-shaped topography of Kathmandu Valley, which can contribute to the accumulation and retention of pollutants and function as a carbon sink, these potential impacts should be carefully assessed and appropriate mitigation measures incorporated into the Master Plan. Mr. Thapa further suggested the study team use a computer model to get results for a better future scenario of microclimatic condition of the Kathmandu Valley. ・ Finally, he stressed the significant reduction of GHG by 2050 mentioned in the report. He suggested the study team clarify the calculation of GHG reduction whether this is only with the implementation of proposed projects incorporated in the Master Plan or due to the significant use and operation of Electric Vehicles in the near future.
11.	National Disaster Risk Reduction and	・ I emphasized the need to assess the water percolation and groundwater recharge capacity of project sites, particularly where underground

SN.	Name and Organization	Opinions and suggestions provided verbally
	Management Authority	infrastructure is proposed beneath public open spaces, such as Tundikhel. Such assessments should evaluate the potential impacts of large-scale groundwater extraction on the local hydrological regime and identify appropriate mitigation and groundwater management measures. He further stressed that the Study Team should adopt an integrated urban planning approach that incorporates urban biodiversity conservation into the design and development of transport infrastructure. In addition, he recommended placing greater emphasis on the protection and restoration of the riverine ecosystems and associated microclimates of the Manohara, Bagmati, and Bishnumati Rivers, recognizing their critical ecological functions and their importance to the environmental sustainability and climate resilience of the Kathmandu Valley.
12.	Nepal Environment Society	・ I ecommended conducting consultations with the indigenous communities of the Kathmandu Valley to integrate their traditional knowledge and cultural practices into the planning and development of urban infrastructure.
13.	Nepal Police, Women, Children and Senior Citizen Service Directorate	・ The Master Plan should incorporate effective measures to enhance safety in public transportation and prevent sexual harassment, particularly by addressing the safety and security concerns of women and other vulnerable passengers. 2,153 persons were taken under control and proceeded with required punishment legally due to using foul language harassing women in the public vehicles during the fiscal year 2082/83 B.S. in Kathmandu valley. She further informed that the Nepal Police has been conducting safety campaigns to promote safe, secure, and efficient public transportation. As part of these initiatives, the Nepal Police has been deploying plain-clothes police personnel on public transportation to monitor and prevent incidents of gender-based violence (GBV), sexual exploitation and abuse (SEA), and sexual harassment (SH). Such personnel are responsible for identifying and controlling perpetrators and, where necessary, initiating appropriate legal proceedings in accordance with prevailing laws. Finally she suggested a study team to organize separate consultations with relevant organizations and stakeholders, including those working on gender and public safety, to obtain adequate feedback and recommendations and ensure that these concerns are appropriately reflected in the Master Plan.
14.	Kathmandu Metropolitan City, Office of Municipal Executive	・ The future transport infrastructure, including bus bays and bus stops, should be planned and designed in safe, accessible, and strategically located areas that adequately address the needs of children, women, older persons, and persons with disabilities, in line with universal accessibility principles. As the development of additional transport infrastructure will require substantial land, it is important to minimize urban sprawl and avoid excessive pressure on the city's limited land resources. Sufficient natural open spaces and green areas should be preserved to maintain urban biodiversity, ecosystem services, and environmental quality. ・ The population growth projections should not be based solely on increase of residential population. The Master Plan should also consider the anticipated growth in commercial activities, business districts, tourism, and the resulting increase in commuters, visitors, consumers, and travelers, all of which will influence future transport demand. ・ In addition to complying with the requirements of UNESCO and the Department of Archaeology (DoA), the planning and implementation process should take into account local cultural heritage, including community-level heritage sites, traditional practices, and culturally significant places that may give rise to concerns during project implementation.

SN.	Name and Organization	Opinions and suggestions provided verbally
		・ Further, he suggested that the Master Plan should clearly define the roles, responsibilities, and coordination mechanisms among the three tiers of government (federal, provincial, and local) for the planning, implementation, operation, and management of the overall urban mobility system, thereby minimizing institutional overlap and strengthening governance.
15.	Nursing Officer, Department of Health Services	・ One section of the SEA Report indicates that GHG emissions could be reduced by approximately 21% by 2050. This would be very encouraging news if the proposed projects are successfully implemented. Such a reduction in greenhouse gas emissions could contribute to improved air quality and, consequently, help reduce health problems, particularly those related to respiratory and cardiovascular diseases. ・ On Page 33 of the report, the Bishnumati River Corridor is discussed, including several options for the proposed elevated highway. Among the alternatives, as a road user, I would prefer Option 1, which proposes constructing a road above the existing road. In my opinion, this would be a more appropriate and safer option than constructing a road structure directly over the river. A major structure over the river could create serious risks and operational challenges during natural disasters, such as earthquakes and river flooding. Therefore, Option 1 appears to be the preferable alternative, particularly if it is designed to accommodate high-capacity public buses. This approach could provide efficient public transportation while minimizing potential risks to human lives and property. ・ Likewise, she further highlighted Page 37 mentioning the installation of off-street parking in the Ratnapark area, together with a proposal for a metro rail system. She informed that there has been considerable discussion regarding the feasibility and sustainability of railway projects in the Kathmandu Valley, particularly because such systems may increase Nepal's dependence on external technology, expertise, spare parts, and other resources. Instead of prioritizing the proposed metro rail system, she suggested that a consideration could be given to road improvement and widening, supported by underground parking facilities, where technically and environmentally feasible. This approach could make greater use of locally available human resources and construction materials, including sand, stone, and other aggregates, thereby potentially contributing to greater local economic benefits and sustainability. From a transport management perspective, she expressed the view that improving the existing road network and promoting high-capacity public bus services may be more practical, and sustainable for Kathmandu Valley than immediately investing in a large-scale metro rail system. The experience of the existing Janakpur–Jaynagar railway also demonstrates some of the challenges associated with railway infrastructure, including relatively high operation and maintenance requirements, dependence on specialized human resources and technology, and difficulties associated with maintaining continuity of service, repairing equipment, and obtaining spare parts.
16.	Department of Health Services	・ The commitments and recommendations identified in the Master Plan should be clearly stated; however, strong political commitment will be essential for the effective implementation of the projects and interventions proposed in the Master Plan. The Plan should also clearly define institutional responsibilities, coordination mechanisms, and implementation arrangements. Urban planning issues should be comprehensively assessed, and population projections and future urban growth forecasts should be based on reliable and realistic data.

SN.	Name and Organization	Opinions and suggestions provided verbally
		・ He further suggested that the Master Plan should also consider the social and behavioral aspects of urban mobility, including encouraging people to choose appropriate modes of transport according to trip distance and purpose. To promote sustainable and non-motorized transport, dedicated and safe footpaths and cycle lanes should be incorporated into the proposed transport network. To enhance road safety and public health, the Plan should consider establishing trauma care or emergency response facilities near major junctions and accident-prone locations, preferably within an appropriate distance to enable rapid emergency response and rescue. In addition, the Master Plan should explore the provision of integrated utility corridors along proposed road alignments to accommodate essential services such as water supply, drainage, electricity, telecommunications, and other underground utilities, thereby reducing repeated road excavation and improving the efficiency and sustainability of urban infrastructure.
17.	Department of Archaeology	・ The SEA and Master Plan comprise various projects located along or near historically and archaeologically significant sites, including Pashupati and the Chabahil–Gaushala Corridor, therefore the MP shall address archaeological artifacts and cultural heritage resources not only within designated archaeological sites but also those that may be located along roadsides and within or adjacent to the areas affected by the proposed projects. The Bishnumati River Corridor and other areas proposed as traffic-free zones are also considered important cultural heritage areas, although they are not listed as UNESCO World Heritage Sites. Nevertheless, the Department of Archaeology (DoA) accords archaeological and cultural importance to historical and cultural sites irrespective of their UNESCO designation. The Study Team is therefore advised to coordinate with the Kathmandu Metropolitan City Office, the Pashupati Area Development Trust (PADT), and the Department of Archaeology (DoA) if any further interventions are proposed along the Bishnumati River Corridor or other culturally and archaeologically sensitive areas. The SEA shall establish a Chance Find Procedure to be followed in the event that archaeological artifacts or other cultural heritage resources are discovered during the time of construction of the proposed projects. In such cases, all construction and excavation activities in the affected area shall be immediately suspended, and the Department of Archaeology shall be promptly notified and consulted for further guidance and appropriate action.
18.	Department of Environment	・ The MP and SEA should address the timely rehabilitation of potholes and road surface inconsistencies to ensure the smooth and safe operation of vehicles. In addition to $PM_{2.5}$ and PM_{10}, the MP and SEA should also consider other key air pollutants, including SOx, NOx, ozone (O_3), and carbon monoxide (CO), in the preparation of the final SEA report. The available vehicle emissions test reports should also be reviewed and incorporated into the assessment, as appropriate. Furthermore, the MP should consider urban greenery and the urban heat island effect, give greater emphasis to local customs and traditions, and assess the potential for land price escalation following the implementation of the Master Plan.
19.	Bhaktapur Municipality	・ As Bhaktapur City is attracting an increasing number of visitors, it is important to recognize that the city has strong community-driven practices and a distinctive living cultural heritage managed in a sustainable and inclusive manner. The local government is committed to preserving Bhaktapur as a living cultural museum. Accordingly, the Master Plan (MP) and Strategic Environmental Assessment (SEA) should adequately address key environmental and social issues, including cultural heritage safeguards, air pollution, wastewater management, and

SN.	Name and Organization	Opinions and suggestions provided verbally
		the protection and sustainable management of Bhaktapur's historic urban environment, as well as the Hanumante and Manohara River corridors. Particular attention should also be given to land acquisition and resettlement impacts associated with proposed interventions along these river corridors. In addition, smart and accessible ticketing systems should be considered in MP to facilitate convenient and affordable transportation for students and local farmers who transport and sell agricultural products in Kathmandu and the surrounding areas.

Table 5: Opinions and Suggestions Provided in Writing by the Participants of 3rd SHM

S.N.	Organization	Opinions and suggestion provided in written form
1.	Kathmandu Terai Fast Track Project, Nepal Army	・ KTFT road project linking to Kathmandu valley from Terai and Mid region is completing within 5 years which will change all the traffic dynamic of Kathmandu valley. The main time KTFT and other road links (dispersion road) will also increase by traffic volume. It should be considered in this Master plan. The Kanti Highway from Satdobato (of LMC) to Makawanpur and Dakshinkali Makawanpur road traffic should be considered.
2.	Madhyapur Thimi Municipality Engineer (Environment Department)	・ Long-distance public transport vehicles should be required to terminate and operate from well-planned bus terminals located outside the Kathmandu Valley, thereby reducing traffic congestion within the Valley. ・ The river corridors of the Kathmandu Valley (Kathmandu, Lalitpur, and Bhaktapur districts) should be developed as a Fast Track Valley Ring Road and constructed at the earliest possible opportunity. ・ Existing bus stops should be upgraded, and public bus services should be promoted and expanded through the effective implementation of regulations governing public transport operations. Such regulations should include strict enforcement of measures such as allowing buses to stop only for designated time periods at authorized bus stops and prohibiting passenger pick-up and drop-off outside designated bus stops. ・ A formal incentive and enforcement mechanism should be established whereby drivers who consistently comply with traffic regulations are recognized and rewarded on a monthly and annual basis, while repeat traffic offenders are subject to stricter penalties, fines, and public disclosure through social media, with these provisions incorporated into the relevant traffic regulations.
3.	Department of Mines and Geology Senior Division Geologist	・ Please add a sub-topic (Recommendation for the amendment of prevailing law of Nepal) in the recommendation chapter in order to notify the Council of Ministers and other government entity so that they should do to amend the prevailing laws resulting successful implementation of this SEA as well as Master Plan. ・ Please advocate for lift parking for the existing commercial building and new commercial building with small spaces so that car free zone can be changed into taxi free zone because without RAP similar to Pashupati area, the local people of Thamel and two Durbar square area might be severely affected especially elderly ones. ・ Please refer DMG for the maps and other geological reports used in this report.
4.	Godawari Municipality Engineer	・ Special consideration should be given for ground water percolation during the construction of ground water structures as it has been greater issue in Kathmandu. ・ At the site of world heritage zone, considerations of world heritage should not be avoided.

S.N.	Organization	Opinions and suggestion provided in written form
5.	Chandragiri Municipality Engineer	・ How can local communities, schools and young people be more actively involved in improving air quality? ・ How will the Strategic Environmental Assessment ensure measurable reductions in PM2.5 emissions, greenhouse gas emissions and noise pollution over the next 10-20 years? Will there be publicly available monitoring indicators to evaluate the success of the master plan? ・ How will the project ensure that future road and transport development protect urban forests, rivers and ecological corridors while addressing climate resilience?
6.	National Planning Commission Planning officer	・ Is there any alignment or plan for alignment with the Kathmandu Vision 2040 program as stated in point 22 of budget for the fiscal year 2083/84? ・ Considering the major earthquakes in past and the recent 2015 earthquake and its impact, the plan for the open spaces should be considered in Strategic Environmental Assessment as well. ・ There is also need to consider climate resilient infrastructure and risk zone mapping to act accordingly for the disaster-prone zones.
7.	Lalitpur Metropolitan City Environmental Engineer	・ Please consider vehicle free zone at heritage place or World UNESCO Heritage. ・ Allocate side road or dedicate cycle lane and consider existing cycle lane. ・ Consider road separate road for Sanitary landfill site.
8.	National Federation of Nepal Transport Entrepreneurs Treasurer	・ It is recommended that this Master Plan be prepared based on a thorough understanding of the current socio-economic conditions of the Kathmandu Valley and Nepal as a whole, including consultations and assessments at the grassroots level. The Plan should also ensure that the investments made by existing self-employed and small-scale transport operators are protected by providing reasonable opportunities for them to recover their investments and participate in the future transport system. At the same time, the Plan should avoid imposing an unnecessary financial burden on the country. ・ Furthermore, the Master Plan should be inclusive of existing transport entrepreneurs while effectively addressing the Valley's growing traffic congestion and deteriorating environmental conditions. It is hoped that this workshop will provide a clear direction for developing a transport system that contributes to a cleaner, greener, more efficient, and more beautiful Kathmandu Valley.
9.	National Women Commission Women Development Officer	・ Footpaths should be expanded to improve pedestrian safety, accessibility, and mobility. ・ A safe and secure public transport environment should be ensured by preventing all forms of violence, harassment, and abuse within public transport vehicles. ・ Adequate street lighting should be provided throughout the road network during nighttime, and CCTV cameras should be installed to enhance public safety and security. ・ Reserved seating and appropriate transport facilities should be provided for women, children, senior citizens, and persons with disabilities to ensure equitable, safe, and inclusive access to public transportation.
10.	Ministry of Women, Children, Gender and Sexual Minorities and Social Security Women Development Officer	・ The program should be implemented in a manner that protects the environment while ensuring that women, children, and persons with disabilities are among its primary beneficiaries. Appropriate measures should be incorporated to maximize their access to, participation in, and benefits from the program.
11.	Suryabinayak Municipality	・ Presented proposed Kathmandu Valley Urban Transport System Master Plan will be effective for safe, easy and timely access to public. I liked the proposal and wish to be applicable.

S.N.	Organization	Opinions and suggestion provided in written form
	Senior Engineer	
12.	Chandragiri Municipality Engineer	Travel demand modelling- How much trips people make and where they travel when they travel, why they travel and which mode they choose. Traditional four step should be taken into consideration: ・ Trip generation: How many trips are produced and attracted by each zone ・ Trip distribution: O-D study and patterns ; common method: Gravity model ・ Mode choice: predicts which transport mode travelers use e.g.: walking, cycling, bus, air, multinomial method • Traffic assignment: assign trips to specific roads or transit route estimates traffic volumes, speeds and congestion Congestion pricing, Metered parking, Multi storeyed parking, Ground water recharge, Socio economic analysis, Amsterdam- More bicycles than residents excellent public transport Chicago, New York, LA, park and ride (metro) Tokyo ・ Conventional multi storey parking garages ・ Mechanical parking system ・ Parking to work Focus on park and ride: ・ Park your vehicle in suburbs. There should be provision of huge parking in suburbs and just public transportation. ・ Land allocation would be great challenge to tackle with. ・ Compensation of land is something difficult to deal with. ・ Temples in the highway. ・ Intersection should be removed from highway while clover lead intersection seems to be impossible. ・ Might be expensive, nothing other the underground subways would be option for already congested city like KTM.
13.	Kathmandu Metropolitan City Senior Engineer (Architect)	Consider antiquity of Kathmandu Valley ・ The major development such as underground tunnel in Gaushala-Chabahil stretch should be diverted as the measure of why in SEA is undermined by why nots ・ The site has a history that is more than 2000 years old (Jayabageshwori/ Pashupati), Charumati Bihar area (Buddha era). Points need to be considered underground water table of water conduits lines can be damaged. Road expansion can damage road side heritage overhead walkway should consider ・ Heritage height restrictions ・ Hence recommend for diversion in milsu with urban planning. ・ Heritage friendly planning: so that is locally accepted and endorsed by local level government
14.	Civil Aviation Authority of Nepal Project Director, SASEC Airport Capacity Enhancement Project	From the perspective of CAA Nepal, Tribhuvan International Airport, Nepal's primary aviation gateway has not been adequately addressed in Master Plan and SEA. While the report comprehensively discusses road transport, public transport and mass transit, aviation has received very limited attention. Our recommendations are: ・ TIA should be recognized as a major multimodal transport hub. Further BRT, MRT or other mass transit system should provide direct and efficient connectivity to the airport. ・ Airport safeguarding requirements should be incorporated into the Master Plan. Future roads, flyover, bridges, high rise buildings, utility, corridors and other infrastructure around the airport must consider obstacles limitation surface (OLS), flight procedures, Navigational Aids, and aviation safety requirements.

S.N.	Organization	Opinions and suggestion provided in written form
		・ SEA should include an assessment of aviation specific environmental and operational impacts, including aircraft noise, bird hazards, construction dusts, lighting, cranes, electromagnetic interference and emergency access to the airport. ・ CAAN should be included as a key stakeholder and technical coordination agency for all transport projects that may affect airport operation and / or future airport expansion. ・ With these additions, the KVUTS MP will truly become an integrated transport strategy that supports not only road transport but also Nepal's international aviation gateway, while ensuring safety, sustainability and long term infrastructure development.
15.	Nepal Forum of Environmental Journalists-NEFEJ Executive member	IA-predictive tool, normally does not block project SEA as per JICA guidelines, spirit Nepalese EPA/ EPR ・ Sensitivity of Pashupatinath Area- Cultural Heritage Site, party to World Heritage Convention, Treaty Act, (1990), section 9- recall case of ERIP in 1989, NIPPON koi was consultant. ・ Also check for Nagmati High Dam ・ See Laws- Pashupati Area Development Trust Act / Ancient Monument Act- legal provisions+ other relevant laws ・ HIA proposed however, no experience no legal provision ・ Ruled out-Chabahil- Gaushala tunnel, as no experience in tunnel in KTM + former lake ・ Ruled out- Chabahil -Bagmati river elevated Highway. ・ Wild proposal- Dhobi khola corridor road and/ or elevated highways to avoid Chabahil-Gaushala tunnel+ chabahil- Bagmati River elevated highways. ・ Issue based preliminary (terminology?) impact assessment ・ In report cultural heritage-avoid works near (define) designated heritage zone. ・ Iv. 30 transboundary (need definition/ hybrid approach) and cultural heritage This SEA look 'cocktail' as JICA guideline followed +EPA (2019)/ EPR (2020) provisions- Nepal's EIA provisions for SEA analyzer Executive summary ・ Existing coordination mechanism? ・ EIA to consider 'heritage' through ToR. ・ Data gaps- required env. Monitoring during feasibility studies – unclear ・ Alternative analysis looks interesting
16.	Department of Health Services Nursing Officer	Page -21 Road network, outer ring road should be restored to manage transportation. Page 33, Bishnumati river corridor elevated road – structure option 1 is best in my (as a public user) opinion. This type of structure is preferable to combat and rescue the victims in emergency/ disaster situation as (floods, earthquakes) Page 37- 3.2 Installation of off-street parking underground shopping mall, parking is suitable Metro is out of our expertise, so it will not be sustainable in our country. ・ Transport Management ・ For sustainability- Widen road, Large capacity bus should be operated ・ Train is not preferable because human resources as well as maintenance and other resource are not in our country.
17.	Department of Land Management and Archive Officer- Law	Regarding the Chabahil–Gaushala Tunnel: ・ What will be the total length of the proposed tunnel? ・ What is the estimated construction cost of the tunnel? ・ Has a cost–benefit analysis been carried out to compare the expected public benefits of the tunnel with its construction cost?

S.N.	Organization	Opinions and suggestion provided in written form
		・ When mobilizing international loans or grant assistance, is it not necessary to undertake a comprehensive cost–benefit analysis before implementation? ・ Or will the project simply place an additional debt burden on future generations? ・ Is the construction of such a tunnel appropriate within or adjacent to a UNESCO World Heritage area? ・ Instead, consideration should be given to constructing a Kalopul–Chabahil–Boudha Tunnel, which may be a more suitable alternative.
18.	Department of Health Services Civil Engineer	・ For short distance, the use of vehicle should be discouraged by policy (human behavioral change) ・ Separate and dedicated utility corridor should be provisioned. ・ This reform program for 'foot path' should be incorporated. ・ Cycle barter systems like Japan and China should be promoted. ・ Trauma center should be managed (established) in certain distance interval on road.
19.	Kathmandu Metropolitan City Culture and Creative program coordinator Division chief	・ Local government should be given more leading role for natural, cultural and social intervention. ・ Rivers cannot be trained (!) so be mindful while recommending raised/ elevated road in parts of Bishnumati corridor road. ・ Heritage settlements like core area, Pashupati, Handigaun, Naxal are and have always been recommend for vehicle free or regulated areas for many years (since 1st master plan 1969B.S) the study team can also work on prerequisite for the same like alternative routes, parking are, service and goods transportations
20.	Kirtupur Municipality Senior Divisional Engineer	・ The Master Plan should be prepared in a manner that ensures the development of urban transportation does not diminish or adversely affect the historical and religious significance of the Kathmandu Valley. ・ Since this is a Master Plan for the entire Kathmandu Valley, it would be beneficial to conduct separate consultation meetings with each local government, as far as practicable, to obtain their views and recommendations. Each local government may have roads of particular local importance, and due consideration should be given to how these roads can be effectively integrated with the broader transport network at the metropolitan and regional levels. ・ Rather than focusing solely on road widening, greater emphasis should be placed on the development and promotion of mass public transportation systems as a sustainable solution for urban mobility.
21.	Godawari Municipality Senior Engineer	・ Quarry sites, haul routes, and construction waste management: The Master Plan should identify and assess potential quarry sites, transportation routes for quarry materials, and suitable locations and mechanisms for the collection, transportation, disposal, and management of construction and solid waste. ・ Institutional mandates and jurisdiction: The Plan should take into account the provisions of the Local Government Operation Act, 2017 (2074 B.S.), and clearly recognize the roles, responsibilities, and jurisdictions of the federal, provincial, and local governments to ensure effective coordination and implementation. ・ Review of the legal framework: The Study Team should comprehensively review the prevailing laws, regulations, and policies, identify any legal constraints or implementation challenges, and ensure that the Master Plan is consistent with the applicable legal and institutional framework. ・ Protection of heritage core areas and traditional routes: The Master Plan should give due consideration to heritage core areas, including the protection and uninterrupted functioning of traditional chariot

S.N.	Organization	Opinions and suggestion provided in written form
		procession (Rath Yatra) routes, Jatra routes, and other culturally significant processional pathways. Appropriate design measures should be incorporated to preserve and facilitate these traditional cultural practices. ・ Compensation for land acquisition: The land acquisition and compensation framework should adopt the principle of just and fair compensation, ensuring that affected property owners receive compensation reflecting the full replacement or fair market value of their assets. Any inconsistencies between this principle and the prevailing legal provisions should be identified and appropriately addressed. ・ Compliance with the Land Use Act, 2019 (2076 B.S.): The Master Plan should be prepared in accordance with the Land Use Act, 2019 (2076 B.S.), while taking into consideration the land use plans, zoning regulations, and development priorities of all municipalities within the Kathmandu Valley.
22.	Nepal Environment Society General Secretary	・ Involve SchEMS, Pokhara University as academic stakeholders for upcoming stages. ・ Incorporate LULC (land use land change) along with current expected and proposed open space and green space. ・ Since this is the guiding document for DPR, EA and implementation of the project, it is necessary to incorporate as much as topics such as huge water extraction and its possible mitigation measures. ・ Consider micro-climate too. This will in-turn impact Shivapuri-Nagarjun National Park (only protected area of Kathmandu Valley). ・ Incorporation of indigenous knowledge from indigenous communities of Kathmandu valley.
23.	Kathmandu Metropolitan City Senior Planning Officer	・ In future, considering right market; safe location and design are to be indicated for child, women, and elder; bus bay, bus stop. ・ More infrastructure occupies more land, pressurize spun city, we have to leave natural open space for natural biodiversity. ・ Population growth speculation, not increase but as business district and tourist flow will increase consumers, travelers ・ Beyond the UNESCO and DoA, small local cultural issue likely to raise during implementation phase, we have to take in consideration. ・ Powers, reallocation / distribution among 3 tier governments agencies regarding whole mobility system, government issues.
24.	Tokha Municipality Kathmandu Engineer	・ The draft strategic Environmental Assessment should prioritize environmental protection, public participation, biodiversity conservation, pollution control and regular monitoring to support sustainable development.
25.	Department of Archeology, Ramshahpath, Kathmandu Engineer	・ The Kathmandu Valley Urban Transport System Master Plan should ensure the active involvement of the Department of Archaeology (DoA) in the planning and implementation process to safeguard the Valley's cultural heritage. To strengthen the implementation of Heritage Impact Assessments (HIAs), a roster of qualified heritage experts should be established and mobilized for projects that may affect heritage resources. The planning and implementation process should aim to minimize adverse impacts on cultural heritage through effective coordination with local governments, local communities, and custodians of living heritage, ensuring that both tangible and intangible cultural values are adequately protected. ・ The Master Plan should give due recognition to the Protected Monument Zones (PMZs) designated by the Department of Archaeology, while also ensuring full compliance with UNESCO World Heritage conservation requirements and international best practices for the protection and management of cultural heritage.

S.N.	Organization	Opinions and suggestion provided in written form
		・ As subsurface investigations and tunnel construction have the potential to adversely affect archaeological remains and heritage assets, the proposed Gaushala–Chabahil Tunnel should be carefully reassessed. Alternative alignments located outside the Protected Monument Zone (PMZ) of the Pashupati World Heritage Site should be evaluated to avoid or minimize potential impacts on the site's Outstanding Universal Value (OUV) and associated cultural heritage.
26.	Pashupati Area Development Trust Architect	・ The Pashupati Area covers an area of 264 hectares. It was inscribed on the UNESCO World Heritage List in 1979 due to its Outstanding Universal Value (OUV). Under the Ancient Monument Preservation Act, 2013 B.S. (1956 A.D.), the Government of Nepal declared the Pashupati Protected Monument Area in 2056 B.S. (1999/2000 A.D.). The protected area includes Wards 7, 8, and 9. ・ To preserve religious values, protect both tangible and intangible cultural heritage, and develop the Pashupati Area as an international pilgrimage destination, the Pashupati Area Development Trust (PADT) has prepared a Master Plan. ・ The Ring Road, Gaushala, and Chabahil corridors contain numerous historically and archaeologically significant heritage structures, including temples, dabalis (traditional open platforms), rest houses, and chaityas (Buddhist shrines) on both sides of the road. Due to heavy traffic congestion, these archaeological and cultural heritage assets have experienced adverse physical impacts and are also affected by air pollution, dust, noise, and other forms of environmental pollution. ・ It was suggested that the views and recommendations of heritage experts should also be sought. Further discussions and consultations are considered necessary. ・ The Pashupati Area Master Plan envisions the Ring Road–Tilganga–Gaushala–Chabahil corridor as a heritage- and pilgrim-friendly corridor, and this objective should be taken into consideration during future transport planning. ・ The Tilganga–Tamraganga Road was constructed without obtaining the necessary approvals/consent, resulting in environmental damage. Consequently, there is now a need to close or discontinue its operation until the outstanding issues are appropriately addressed.
27.	Department of Archeology, Ramshahpath, Kathmandu Archeological Officer (World Heritage Conservation Section)	・ In addition to the Protected Monument Zones, the project should also give due consideration to other cultural heritage resources located within the project influence area. Along the proposed Chabahil–Gaushala corridor, particular attention should be paid to the Pashupati Protected Monument Zone, the Dhando Chaitya (a significant Licchavi-period monument), and the Ratna Park area, which includes archaeological remains associated with the historic Bhotahiti stone spout (Hiti) and Rani Pokhari. Appropriate measures should be taken to identify, protect, and conserve both above-ground and subsurface archaeological remains, as well as other heritage assets that may be affected by the project. ・ The project should undertake phased consultations with the Department of Archaeology (DoA), the Pashupati Area Development Trust (PADT), and the Kathmandu Metropolitan City (KMC) throughout the planning, design, and implementation stages. ・ If archaeological remains or cultural artifacts are discovered during project implementation, construction activities should be immediately suspended in the affected area. The Department of Archaeology should be promptly notified, and works should resume only after the Department has completed the necessary investigations and provided formal clearance in accordance with the applicable legal procedures.

S.N.	Organization	Opinions and suggestion provided in written form
		・ A comprehensive Heritage Impact Assessment (HIA) should be carried out for the proposed tunnel alignment and the Ratna Park area. The HIA report should be submitted to the Department of Archaeology for review and approval, and project implementation should proceed only after the Department has granted the necessary clearance.
28.	Bhaktapur Municipality Engineer	・ Bhaktapur operate with highly decentralized community drives governance focused on preserving 'The living cultural Museum. Some specific environmental and social argument to be done ・ Cultural heritage safeguards ・ Urban infrastructure concerns with air pollution ・ Hanumante river corridors restriction ・ Protection of traditional local livelihood ・ Roads with walkability framework (Solar street lamps etc.) ・ Mass population of students and farmers, so for themselves smart card ticketing system ・ HIA must be highly focused for protecting structural integrity along with local community level, trust (Guthis), also include DoA and other local historians rather than just urban transport planners ・ Syndicate and institutional resistance happening on current bus industries ・ Land acquisition and involuntary resettlement ・ Gender based violence
29.	Kathmandu Metropolitan City Engineer	・ Strategic Environmental Assessment is crucial for transport planning, construction and management. Climate change, air quality, land acquisition and resettlement risks, urban flooding and hydrology. ・ New projects for transport (Projects) should acquire all these key environment impacts. Such studies can be extremely helpful if studied earlier before the design phase for the future master-plans
30.	Kathmandu Metropolitan City Senior Environment Engineer	・ New river corridor Thapathali-Tripureshwor and Bishnumati river corridor elevated highway also requires Heritage Impact Assessment as these river sides are related closely related to daily cultural rituals, temples, traditional ghats. ・ River corridor elevated highway should have access to the river ghats for performing daily rituals. These should also have access in equipment for debris and solid waste removal. ・ Ishan city; there is no any detail of assessment about the Ishan city.
31.	Kageshwori Manohara Municipality Engineer	・ Please consider all cultural heritage areas in master plan. ・ Should consider Pashupatinath areas in Master Plan.
32.	Nagarjun Municipality Engineer	・ Informal settlers area (in maps) ・ Small decentralized core area in KV ・ Open space connectivity during disaster and road connectivity
33.	Kathmandu Metropolitan City Senior Civil Engineer	・ To cope with urban flooding; side drain can be used as rainwater recharge zone (rain garden concept) ・ (rainwater recharge concept during planning)
34.	Nepal Police, Women, Children and Senior Citizen Service Directorate Police Inspector	・ To reduce and prevent Gender-Based Violence (GBV) in public transportation and to enhance the safety and security of passengers, the Nepal Police has been implementing the "Safety Pin Campaign" targeting public transport services. In addition, the Nepal Police has been conducting various public awareness and outreach programs to promote safe public transportation and prevent GBV-related incidents.

S.N.	Organization	Opinions and suggestion provided in written form
		・ Therefore, it is recommended that the Study Team strengthen coordination and consultation with relevant stakeholders, including the Nepal Police, transport operators, local governments, civil society organizations, and women's organizations, to develop more effective strategies for the prevention, control, and response to GBV in public transportation. Such collaborative efforts would contribute to creating a safer, more secure, and inclusive public transport system for all users.
35.	Kathmandu Metropolitan City Senior Architect	・ Elevated highway proposed along Chabahil Bagmati River have Boudha stupa which is a world heritage site. Hence, required HIA in this project as well. ・ Elevated highway along Bishnumati river corridor have high social and cultural impact. In context of Nepali culture, Bishnumati River have higher religious and cultural value. No. of religious and cultural activities (cremation, festivities etc.) are associated with river bank. Hence the Strategic projects shall not limit the easy access to these river bank on daily basis. ・ Relocation via alignment adjustment seems as one difficult approach in mitigation as per Kathmandu previous experience being on highly populated Kathmandu valley. ・ The assessment studies pollution about air quality, waste and soil, water quality etc. but the visual pollution aspect is missing. The elevated highway ia a narrow corridor along low rise buildings around these alignment can have visual pollution. The project shall assess (study) built environment created by these development projects.
36.	Department of Water Supply and Sewerage Management Senior Divisional Engineer	・ 1000 mm to 1400 mm size bulk distribution line for distribution of Melamchi water is at Chabahil-Gaushala section. Is relocation of this pipes needed while constructing Tunnel road at this section? Utility corridor at this section may be possible to relocate all utilities such as water pipes, sewerage, electricity line, telecom line etc. ・ Efficient drainage structures should be made in the junctions to drain out rain water accumulated during heavy rainfall. ・ There are numbers of waste water treatment plants under implementation and in plans within Kathmandu Valley, for the river water quality this is to be highlighted in the report. ・ For water and waste water related issued Kathmandu Valley Water Supply Management Board (KVWSMB) (the utility owner within Kathmandu valley) should be coordinated.
37.	National Disaster Risk Reduction and Management Authority Conservation Officer	• **Ecosystem**; identifying key ecosystem species and propose trans/ ・ You have proposed action based on terrestrial ecosystem, however you have missed the water ecosystem. ・ Rehabilitation of urban forestry integrated with riparian vegetation restoration should be incorporated considering the future climate scenario considering the recently seen heatwave events and depraving of road networks in Europe. • **Disaster**: I would suggest to go through multi-hazard risk assessment framework and consider the fluvial flood ・ Green urban space management ・ Promotion of nature based solutions ・ Urban biodiversity- landscape ecology principles deviates from normal diversity • **Policy** ・ Insured e-flow mechanism ・ Integrated urban forestry through rehabilitation and restoration of degraded wetland ecosystem and riverine ecosystem. ・ Integrated urban space managed following nature based solutions. ・ Integrated approach on rodent, insects and reptiles management. ・ Consideration of risk informed land use planning

S.N.	Organization	Opinions and suggestion provided in written form
		・ Depaving of European; less on land ・ Based on audience, presentation have to be improvised so that participant would more focus on policy level rather than plan level. ・ Multi hazard risk (e.g. Flood, heat wave.)
38.	Departmental of Environmental Science Kathmandu University	・ Considering the population growth and trend, rapid urbanization and Kathmandu being a transit and cultural hub, the KTM urban transport is very timely and crucial. ・ The SEA has 23 projects/ alternatives including provision of emergency exits and additional alteration which can complement the 23 alternatives. ・ The objectives and rationale behind MRT is well explained and logical: GH emission, reduction, pollution emission reduction. ・ the project could be a benchmark in the urbanizing areas/ region if it is successful 'environment friendly' ・ changing people's mind set is crucial ・ stakeholders perspective; logical with report ・ Airport connectivity with the proper MRT ・ Impacts project may have an important heritage sites ・ Flash flood ・ Radio transmission to be made accessible at underground infrastructure ・ Physically challenged friendly infrastructure ・ Inclusion of other Universities as stakeholders ・ Urban landscape ecology ・ Observation1: stakeholders still seem to be confirmed with SEA and EIA ・ Observation 2: The project team has a big challenges
39.	Radio Nepal Technical Officer	・ The underground transportation system should include a technical solution that allows passengers to listen to Radio Nepal throughout the underground. This will ensure continuous access to news, emergency information, public service announcements and other important broadcasts during travel. ・ As a Radio Nepal has received significant support from Japan over the years. It is requested that JICA also consider integrating Radio Nepal's broadcasting service into the Master Plan.
40.	Kathmandu Metropolitan City Section Officer, Law and Human Right Department	Subject: Comments and Recommendations on the Draft Strategic Environmental Assessment (SEA) Report for the Kathmandu Valley Urban Transport System Master Plan Following a review of the Strategic Environmental Assessment (SEA) Report prepared for the Kathmandu Valley Urban Transport System Master Plan, the following legal and technical comments are submitted on behalf of the Kathmandu Metropolitan City (KMC) to ensure compliance with constitutional provisions, environmental sustainability, and social justice. 1. Jurisdictional Alignment and Co-decision Role Rationale: The Constitution of Nepal and Section 11(2), Clauses (Ñ), (Ta), and (Jha) of the Local Government Operation Act, 2017 (2074 B.S.) grant local governments exclusive authority over local roads, pedestrianization, local traffic management, and environmental regulation. Recommendation: In Chapter 11 (Implementation Structure) of the report, Kathmandu Metropolitan City should not be limited to the role of merely a "supporting agency" or "stakeholder." Instead, it should be legally recognized as a co-decision maker in the planning and decision-making

S.N.	Organization	Opinions and suggestion provided in written form
		process. The implementation of the Master Plan is unlikely to be feasible without the prior consent and active participation of the Kathmandu Metropolitan City. 2. Compliance with Local Environmental Laws Rationale: Any large-scale infrastructure project implemented within the jurisdiction of Kathmandu Metropolitan City must fully comply with the applicable local environmental standards and regulations. Recommendation: In addition to the relevant federal legislation and the JICA Guidelines, Chapter 2 (Legal Framework) should mandatorily include the Kathmandu Metropolitan City Environment and Natural Resources Conservation Act, 2020 (2077 B.S.) and the Solid Waste Management Collection and Transportation Procedures, 2024 (2081 B.S.) as part of the overarching legal framework governing project implementation. 3. Legal Responsibility for Construction and Demolition (C&D) Waste Management Rationale: The construction of major roads, flyovers, and mass transit infrastructure will generate millions of tons of construction and demolition (C&D) waste, placing a substantial burden on the existing municipal solid waste management system. Recommendation: A clear provision should be incorporated into the Environmental and Social Management Plan (ESMP) (Chapter 7) specifying that the project proponent and/or contractor shall bear full technical and financial responsibility for the collection, transportation, treatment, and final disposal of all construction and demolition waste generated by the project. 4. Rights of Informal Settlers and Social Justice Rationale: Displacement of informal settlers who do not possess formal land ownership certificates, without appropriate mitigation measures, is likely to create significant social conflict and could delay or obstruct project implementation. Recommendation: In accordance with the JICA Guidelines for Environmental and Social Considerations (2022) and internationally recognized human rights principles, Chapter 8 of the report should explicitly ensure that displaced persons without formal land ownership or legal title are also entitled to fair compensation, livelihood restoration, and appropriate resettlement assistance. 5. Prior Informed Consent for Heritage Sites and Heritage Impact Assessment (HIA) Rationale: Kathmandu's historic inner-city areas, traditional Guthi routes, and UNESCO-listed heritage sites are highly sensitive from environmental, archaeological, and cultural perspectives. Recommendation: The report should include a mandatory provision requiring that Heritage Impact Assessments (HIAs) for infrastructure developments in and around heritage areas obtain prior informed consent not only

S.N.	Organization	Opinions and suggestion provided in written form
		from the Department of Archaeology but also from the Kathmandu Metropolitan City and the local Guthi custodians (Guthiyars) before project implementation proceeds. Conclusion: ・ The above five recommendations should be incorporated into both the Draft Strategic Environmental Assessment (SEA) Report and the final Kathmandu Valley Urban Transport System Master Plan. Their inclusion will help ensure that the Master Plan is environmentally sustainable, legally compliant, socially equitable, and locally acceptable, while strengthening institutional coordination and facilitating effective implementation.

7. Closing Remarks

By Mr. Sushil Babu Dhakal, Joint Secretary, MoID

The session concluded with closing remarks delivered by Mr. Sushil Babu Dhakal, Joint Secretary, Ministry of Infrastructure Development (MoID). In his address, Mr. Dhakal elaborated on the guiding vision of the Kathmandu Valley Urban Transport System Master Plan (KVUTS-MP): "Sustainable, Safe and Inclusive Transportation for a Vibrant and Cultural Kathmandu Valley." He emphasized that the MP and SEA has been developed within the framework of this vision, ensuring that all proposed interventions contribute to a transport system that is environmentally sustainable, socially inclusive, economically viable, and respectful of the Valley's unique cultural identity. He further highlighted that the Master Plan aims not only to address existing and future mobility challenges but also to protect Kathmandu Valley's outstanding cultural heritage while supporting sustainable urban development.

Mr. Dhakal acknowledged that the current traffic situation in the Kathmandu Valley has reached a critical stage, with increasing congestion, declining mobility, and growing environmental concerns. He stressed that the Master Plan has therefore been prepared with a long-term vision extending to the year 2050, considering projected population growth, urban expansion, future transport demand, and changing land-use patterns. He appreciated the extensive efforts made by the JICA Study Team in collecting baseline data, conducting technical analyses, and consulting with relevant stakeholders throughout the planning process.

He noted that successful implementation of the Master Plan requires not only sound technical planning but also improvements in knowledge, attitudes, and practices (KAP) among government agencies, transport operators, and the general public. In this regard, he expressed his appreciation for the active participation and constructive engagement of all stakeholders during the consultation meeting. He stated that the valuable comments, recommendations, and technical suggestions received would contribute significantly to strengthening both the Master Plan and the Strategic Environmental Assessment (SEA).

Mr. Dhakal clarified the relationship between Nepal's environmental assessment system and the JICA SEA process. He explained that under Nepal's Environment Protection Act (EPA), 2019 and Environment Protection Rules (EPR), 2020, environmental assessments are generally undertaken for policies, programs, and projects as required by national legislation. Under the JICA Guidelines, however,

the Strategic Environmental Assessment (SEA) is specifically undertaken for plans, policies, and programs. Since the present study concerns the Kathmandu Valley Urban Transport System Master Plan, the SEA has been prepared as an integral component of the Master Plan rather than as a separate exercise.

He further explained that, unlike project-level Initial Environmental Examinations (IEEs) and Environmental Impact Assessments (EIAs), which identify site-specific impacts and mitigation measures during project implementation, the SEA adopts a strategic approach by identifying broad environmental and social opportunities, constraints, cumulative impacts, and risks at an early planning stage. This proactive approach enables environmental and social considerations to be integrated into decision-making before individual projects are designed. As an example, the SEA has identified potential risks to cultural heritage and archaeological resources and recommends that Heritage Impact Assessments (HIAs) be undertaken for transport projects located within or adjacent to heritage sites and their buffer zones. He noted that the study team had already assessed alternative transport alignments along the Chabahil–Gaushala–Tilganga–Airport corridor, taking into account environmental, social, and cultural considerations. Nevertheless, each individual project proposed under the Master Plan will subsequently be subject to separate IEE or EIA studies, as required under Nepal's environmental legislation.

Mr. Dhakal also highlighted the importance of adopting the Compact Street approach in future urban transport planning. He explained that this concept aims to create more livable urban environments by increasing space allocated for pedestrians, cyclists, and public transport while reducing the dominance of private vehicles. Such an approach would improve road safety, accessibility, environmental quality, improve traditional cultural practices as well as the overall urban experience.

Referring to the discussions held during the consultation, Mr. Dhakal acknowledged the recommendations provided by stakeholders regarding the Bishnumati Corridor, emphasizing the need for careful environmental assessment, integrated corridor planning, and consideration of ecological restoration opportunities. He also noted that stakeholders had raised important issues concerning the Valley's environmentally sensitive ecosystems, biodiversity, microclimatic conditions, drainage systems, and disaster resilience, all of which should continue to be considered during future project preparation.

He further observed that the draft Master Plan has identified 23 priority projects to be implemented over the short-, medium-, and long-term planning horizons. These projects have been selected after evaluating various alternatives and implementation modalities based on technical feasibility, environmental sustainability, social considerations, and financial viability. He emphasized that many of the detailed comments and site-specific concerns raised during the consultation would be further examined and addressed during the preparation of individual IEEs and EIAs for the respective projects.

Mr. Dhakal also highlighted stakeholder recommendations concerning urban transport management, including the need for improved bus parks, well-designed bus bays, integrated public transport facilities, and strengthened transport connectivity along the north-south and east-west road corridors, where traffic demand continues to increase significantly. He requested the JICA Study Team to comprehensively

document all comments and recommendations received during the consultation, including suggestions related to amendments of relevant laws, institutional coordination, policy improvements, environmental management, and implementation arrangements.

In his concluding remarks, Mr. Dhakal expressed his sincere appreciation to all stakeholder participants for their valuable feedback, technical inputs, and constructive observations. He reiterated that the Master Plan has successfully identified key transport challenges and proposed feasible interventions under different implementation modalities while integrating strategic environmental and social considerations. Finally, he informed the participants that the draft SEA Report would be disclosed for public review and comments, and stakeholders would be invited to submit their feedback during the 30-day public disclosure period, after which the comments would be reviewed and incorporated, as appropriate, into the final SEA Report and the Master Plan.

Appendix 4: Summary of 1st Technical Working Group 3 (Environment)

Summary of the 1st TWG 3 (Environment) Meeting - Kathmandu Valley Urban Transport System Master Plan (KVUTS MP)

Subject: 1st Technical Working Group 3 (Environment) Meeting on the Approach for Strategic Environmental Assessment (SEA) of the Kathmandu Valley Urban Transport System Master Plan (KVUTS MP)

Venue: Meeting Hall, Ministry of Physical Infrastructure and Transport

Date/Time: March 10, 2025/ 11:00 a.m. to 12:30 p.m

Attendees:

- **Nepalese Side:**
  - **Ministry of Physical Infrastructure and Transport (MoPIT):**
    - Mr. Bhimarjun Adhikari (Joint Secretary, Planning, Monitoring, and Evaluation Division)
    - Mr. Narayan Niure (Senior Divisional Engineer, Planning, Monitoring, and Evaluation Division)
    - Mr. Arjun Suwal (Senior Division Engineer, Development Cooperation and Quality Standard Division)
    - Ms. Laxmi K.C (Senior Divisional Engineer, Environment and Social Branch, Planning, Monitoring, and Evaluation Division)
    - Ms. Shuva Shrestha (Sociologist, Environment and Social Branch, Planning, Monitoring, and Evaluation Division)
    - Ms. Babita Sharma (Engineer, Planning, Monitoring, and Evaluation Division)
    - Ms. Ruby Koju (Engineer, Planning, Monitoring, and Evaluation Division)
  - **Ministry of Forests and Environment:**
    - Mr. Ramesh Basnet (Under Secretary, Environment and Biodiversity Division)
    - Mr. Surendra Pant (Scientific Officer, Environment and Biodiversity Division)
  - **Ministry of Urban Development:**
    - Mr. Kamal Adhikari (Senior Sociologist)
  - **Department of Environment:**
    - Mr. Gyan Raj Subedi (Director General)
  - **Department of Roads:**
    - Mr. Amit Kumar Sharma (Engineer)
  - **Department of Transport Management:**
    - Mr. Shreekant Yadav (Director, Technical)
  - **Department of Railways:**
    - Mr. Bodh Prasad Bhandari (Engineer)
  - **Kathmandu Metropolitan City:**
    - Ms. Nisha Koirala (Senior Engineer, Environment)
  - **Lalitpur Metropolitan City:**
    - Mr. Pradeep Amatya (Environmental Engineer)

- **Japanese Side:**
  - **JICA Expert Team:**
    - Mr. Hideo Tsuji (Team Leader)
    - Mr. Hayato Kobayashi (GEDSI Expert)
    - Mr. Tomoaki Tanabe (Environmental and Social Expert, attended online)
    - Mr. Abhishek B.C. (Engineer, Environmental and Social Expert)
    - Mr. Yuki Sasaki (Engineer)

Key Issues Raised by the Participants:

1. **JICA's Approach to SEA:**

Mr. Hayato Kobayashi presented the proposed approach for the SEA of the KVUTS MP, emphasizing the need to follow JICA Guidelines to ensure a timely completion, considering the limited duration of the Master Plan study. The SEA process according to Nepal's legal provisions could be more time-consuming, which might delay the Master Plan's approval.

2. **Government of Nepal's SEA Legislation:**

Mr. Ramesh Basnet emphasized that SEA is a new concept for Nepal and that this Master Plan could set a benchmark as the first SEA officially approved by the Government of Nepal. He appreciated the JICA Expert Team's presentation and encouraged collaboration with MoPIT and the JICA team to ensure success. He supported the planned stakeholder meetings, recognizing their potential for gathering valuable feedback and baseline information. While he couldn't guarantee government approval within one year, Mr. Basnet stressed the importance of starting the SEA process with optimism, aiming to make it the first approved SEA in Nepal.

Mr. Surendra emphasized the importance of defining the scope and SOP of the SEA to ensure the process stays on track. While SEA is legislated, he pointed out the absence of a formal Standard Operating Procedure (SOP) for its implementation and suggested that developing one should be a priorit

3. **Inclusion of Environmental Concerns:**

Ms. Nisha Koirala suggested incorporating Disaster Risk Reduction along with GESI and climate change issues in the SEA.

Mr. Gyan Raj Subedi emphasized the importance of air quality management in the Kathmandu Valley, particularly addressing vehicular emissions, which are a major concern. He highlighted the 'Air Quality Management Action Plan for Kathmandu Valley, 2020,' which outlines key actions such as promoting electric vehicles, ensuring quality fuel availability, and establishing effective monitoring systems. As part of the SEA for the KVUTS MP, he proposed including provisions to promote mass transit vehicles and further control air pollution in the valley.

4. **Stakeholder Involvement:**

Mr. Kamal Adhikari recommended including local organizations such as the National Federation of the Disabled Nepal (NFD-N) and Tribhuvan University's Department of Sociology and Anthropology in the stakeholder list.

- **Mr. Ramesh Basnet** and **Mr. Surendra Pant** suggested including all local levels in the Kathmandu Valley and departments like the Department of Geology from Tribhuvan University in the stakeholder list for comprehensive input.

5. SEA Process and Legal Procedures:

- There was a concern about whether the SEA should follow **JICA Guidelines** or adhere to **Nepal's legislation**. **Mr. Bhimarjun Adhikari** emphasized the importance of following the JICA guidelines to ensure timely completion of the Master Plan, as delays in the SEA could affect the entire timeline.
- **Mr. Ramesh Basnet** suggested consulting with senior officials in MoFE to clarify the approach to SEA.

6. Data Collection and Coordination:

- **Mr. Surendra Pant** requested the JICA Expert Team to be specific about the baseline data they require and suggested that official letters from MoPIT be used to collect the necessary data.

Conclusion:

- **Mr. Hideo Tsuji** emphasized that following Nepal's SEA process would affect the project's timeline. He stated that if the decision is made to proceed with Nepal's SEA laws, it should be discussed with JICA Headquarters. Tsuji also sought clarification on why the KVUTS MP is following these procedures when similar Master Plans have no. His main concern was ensuring the timely completion of the Master Plan to address the transport challenges in Kathmandu Valley without unnecessary delay, social, and disaster risk reduction considerations are integrated into the Master Plan.
- **Mr. Hayato Kobayashi** explained that SEA must be integrated during the planning phase to provide input on environmental, gender, and disaster risk reduction aspects. The engineering team will analyze various options, with SEA providing input on the advantages and disadvantages of these options. He stressed that SEA and the Master Plan should be developed simultaneously to ensure meaningful recommendations are made during the preparation phase.
- **Mr. Bhimarjun Adhikari** requested that stakeholders provide the necessary data for the SEA and informed them that a stakeholder meeting would be organized in April 2025. He concluded the meeting by deciding to proceed with the SEA based on JICA Guidelines for now, while ensuring that the SEA incorporates all necessary components outlined in Nepal's environmental legislation. The legal process concerning consent and approval will be determined later, with further consultations to finalize the approach. He also proposed conducting a meeting with MoFE before the stakeholder meeting to establish a clear and common understanding of the SEA approach He emphasized the importance of the suggestions in shaping the direction of the SEA process. He thanked the participants for their active involvement and valuable feedback.

Appendix 5: Summary of 2nd Technical Working Group 3 (Environment)

Summary of the 2nd TWG 3 (Environment) Meeting - Kathmandu Valley Urban Transport System Master Plan (KVUTS MP)

Subject: 2nd Technical Working Group 3 (Environment) Meeting on the Preliminary Draft Scoping Report, focusing on GESI and climate change aspects; request for baseline information on social aspects, GESI (Gender Equality and Social Inclusion), climate change, and disaster management, and discussion on the schedule of upcoming activities of the Strategic Environmental Assessment (SEA) for the Kathmandu Valley Urban Transport System Master Plan (KVUTS MP

Venue: Meeting Hall, Ministry of Physical Infrastructure and Transport

Date/Time: December h 16, 2025/ 11:00 a.m to 12:30 p.m

The 2nd TWG3 meeting was attended by 24 participants from various ministries, departments, local levels, and organizations. The meeting was conducted by **Mr. Hayato Kobayashi**, GESI Expert, and facilitated by **Mr. Abhishek B.C**., Environmental and Social Expert of the JICA Expert Team.

Attendees:

- **Nepalese Side:**
  - **Ministry of Physical Infrastructure and Transport**
    - Mr. Ram Hari Pokharel (Joint Secretary, Planning Monitoring and Evaluation Division)
    - Mr. Sushil Babu Dhakal (Joint Secretary, Development Cooperation and Quality Standard Division)
    - Ms. Laxmi K.C (Senior Divisional Engineer, Environment and Social Branch, Planning Monitoring and Evaluation Division)
    - Mr. Neeraj Thakur (Senior Divisional Engineer, Planning Section, Planning Monitoring and Evaluation Division)
    - Ms. Shubha Shrestha (Senior Sociologist, Environment and Social Branch, Planning Monitoring and Evaluation Division)
  - **Ministry of Forests and Environment**
    - Mr. Ramesh Basnet (Under Secretary, Environment and Biodiversity Division)
  - **Ministry of Urban Development**
    - Mr. Hari Shankar Jha (Environment Inspector)
    - Ms. Astha Panta (Architect)
  - **Department of Environment**
    - Ms. Swasti Shrestha (Environment Inspector)
  - **Department of Hydrology and Meteorology**
    - Ms. Zinky Bhusal (Hydrologist Engineer)
  - **Kathmandu Metropolitan City**
    - Ms. Shristi Shrestha (Environment Inspector)

- Ms. Samikshya Niraula (Department Chief, Social Development Department)
- Mr. Madhav Kafle (Senior Engineer)

❖ **Lalitpur Metropolitan City**

- Ms. Puja Karki (Senior Engineer)
- Ms. Sarita Maharjan (Section Chief, Community Development Section, Social Development Division)

❖ **Kathmandu Valley Traffic Police Office**

- Mr. Naresh Raj Subedi (Superintendent of Police)
- Mr. Abhaya Lama (Police Inspector)

❖ **National Women Commission**

- Ms. Shristi Poudel Timilsina (Law Officer)

❖ **National Dalit Commission**

- Ms. Samikshya Sharma (Section Officer)

❖ **Feminist Dalit Organization (FEDO)**

- Ms. Srijana Biswakarma (National Program Coordinator)

❖ **National Federation of the Disabled-Nepal (NFD-N)**

- Mr. Kushal Neupane (Senior Project Coordinator)
- Mr. Ramesh Prasad Mainali (Assistant)

❖ **Federation of Nepalese National Transport Entrepreneurs (FNNTES)**

- Mr. Purushottam Simkahada (Joint General Secretary)
- Mr. Gyanendra Shrestha (Treasurer)

- **Japanese Side:**

❖ JICA Expert Team:

- Mr. Hayato Kobayashi (GESI Expert)
- Mr. Abhishek B.C. (Engineer, Environmental and Social Expert)

The meeting commenced with opening remarks on its purpose, delivered by **Mr. Ram Hari Pokharel,** Joint Secretary of MoPIT, followed by the introduction of the participants. Afterwards, Mr. Hayato Kobayashi explained the meeting agenda through a PowerPoint presentation.

After the presentation, the participants provided their feedback and suggestions as follows:

1. Ms. Swasti Shrestha, Department of Environment

- Mitigation measures should be quantifiable
- Monitoring measures should be effective, include clear indicators, and involve all relevant agencies

2. Mr. Kushal Neupane, National Federation of the Disabled-Nepal (NFD-N)

- Accessible audits and monitoring for persons with disabilities shall be ensured.
- Provision of zebra crossings and traffic lights equipped with video and audio systems to meet the needs of all persons with disabilities

3. Ms. Sarita Maharjan, Lalitpur Metropolitan City

- LMC is coordinating with all relevant stakeholders, including transport entrepreneurs, to construct physical infrastructure friendly to persons with disabilities, senior citizens, women, and children
- Existing roads within the LMC are narrow, often lacking footpaths or having very narrow footpaths, and green belts further reduce their width.
- LMC has consistently implemented road safety initiatives and educational programs to promote safer driving and reduce traffic accident
- An effective monitoring mechanism should be established to ensure proper implementation of impact control measures, along with a strong grievance redress mechanism
- LMC has established a pollution monitoring system and is in the process of expanding it to assess air quality and vehicle emission

4. Ms. Srijana Biswakarma, Feminist Dalit Organization (FEDO)

- Marginalized communities often have limited land; therefore, the impacts of land acquisition on such communities should be properly addressed by avoiding involuntary resettlement
- Dalit communities face harassment while traveling on public vehicles when the driver, conductor, or passengers recognize their identity, and such behavior is not recognized as a crime. Although Nepal's laws are strong, there is a lack of public awareness
- Bicycle, scooter, and motorcycle riders, especially women, are not safe, as drivers of four-wheeled vehicles, such as buses and trucks, often misbehave toward them
- Air pollution from vehicle emissions is often associated with health impacts; therefore, provision should be made for maintaining old vehicles or removing them

5. Ms. Shristi Shrestha, Kathmandu Metropolitan City

- Provision to control and manage vehicular emissions should be included in the master plan.
- Population projection should be considered while formulating the master plan

6. Ms. Astha Panta, Ministry of Urban Development

- Issues related to land acquisition should be considered if the master plan proposes widening the existing road.

- The existing traffic, including the number of two-wheelers using the road, should be taken into account when preparing the master plan.
- Road safety measures should be considered, as travel by two-wheelers is unsafe in the Kathmandu Valley

7. Mr. Purushottam Simkahada, Federation of Nepalese National Transport Entrepreneurs (FNNTES)

- Provision of a proper plan to manage old vehicles and introduce new ones
- Formulation of effective plans to reduce road accidents
- Provision for excluding ride-hailing motorbikes if mass transit is considered

8. Mr. Hari Shankar Jha, Ministry of Urban Development

- Future traffic projections in the Kathmandu Valley should account for vehicles used by residents of newly developed residential communities, as failure to consider this factor in many road projects has contributed to significant traffic congestion

9. Mr. Ramesh Basnet, Ministry of Forests and Environment

- MoFE seeks continuous coordination from the JICA Expert Team during the preparation of the SEA for the KVUTSMP.
- Relevant baseline data is crucial for the preparation of both the scoping document and the SEA report.
- Cultural bassline and issues in the Kathmandu Valley should be considered by coordinating with relevant institutions and authorities, and Heritage Impact Assessment should also be taken into account.
- The technical report on the master plan shall be provided to MoFE along with the scoping document and SEA report.
- MoFE expects a high-quality SEA report from the JICA Expert Team, with the report being acceptable and serving as a reference for upcoming SEAs of development projects in Nepal

10. Ms. Samikshya Niraula, Kathmandu Metropolitan City

- GEDSI approaches should be incorporated into the master plan, prioritizing people with disabilities
- Issues concerning harassment of women in public transport should be duly considered, and measures to address them should be properly implemented

11. Mr. Naresh Subedi, Kathmandu Valley Traffic Police Office

- Proper monitoring plan for the management of traffic and measures implemented for traffic safety
- Provision of proper pedestrian-friendly footpaths

- Implementation of a safe and reliable transport system

12. Ms. Shristi Poudel Timilsina, National Women Commission

- Public vehicles operating in the Kathmandu Valley are mostly unsafe, especially for women
- Social and safety awareness among both transport operators and users is insufficien

At the end, **Mr. Shushil Babu Dhakal**, Joint Secretary, MoPIT delivered the closing remarks, thanking the participants and the JICA Expert Team. He noted that the feedback and suggestions from the participants are valuable and assured that the issues raised are to be incorporated into the SEA Report of the Master Plan.

Appendix 6: Summary of 3rd Technical Working Group 3 (Environment)

Summary of the 3rd TWG 3 (Environment) Meeting - Kathmandu Valley Urban Transport System Master Plan (KVUTS MP)

Subject: 3rd TWG3 (Environment) Meeting to discuss the Draft SEA Report for the Kathmandu Valley Urban Transport System Master Plan (KVUTSMP)

Venue: Meeting Hall, Ministry of Infrastructure Development

Date: 2026-07-21 **/Time:** 11:00～12.30.00 (Nepal time)

The 3rd Technical Working Group meeting was attended by 23 participants from various ministries, departments, local governments, and organizations, including the JICA Expert Team, and was conducted by Mr. Hideo Tsuji, Team Leader, and Mr. Tomoaki Tanabe, Environmental and Social Expert, with facilitation by Mr. Abhishek B.C., Environmental and Social Expert of the JICA Expert Team.

Attendees:

A. Nepalese Side:

❖ **Ministry of Infrastructure Development (MoID)**
- o Mr. Krishna Raj Panta, Division Chief, Joint Secretary, Infrastructure Work and Transport Division
- o Er.. Laxmi K.C, Senior Divisional Engineer, Environment and Social Section, Planning Monitoring and Evaluation Division
- o Er. Amit Kumar Shrestha, Senior Divisional Engineer, Development Cooperation and Quality Standard Division
- o Er. Neeraj Thakur, Senior Divisional Engineer, Planning Section, Planning Monitoring and Evaluation Division
- o Ms. Shubha Shrestha, Senior Sociologist, Environment and Social Section, Planning Monitoring and Evaluation Division
- o Er. Ruby Koju, Engineer, Monitoring and Evaluation Section, Planning Monitoring and Evaluation Division
- o Er. Babita Sharma, Engineer, Planning Section, Planning Monitoring and Evaluation Division
- o Mr. Hari Shankar Jha, Environment Inspector

❖ **Ministry of Agriculture, Forests and Environment**
- o Mr. Surendra Raj Pant, Scientific Officer, Environmental Impact Study Section, Environment and Biodiversity Division

❖ **Department of Environment**
- o Mr. Kanchan Kumar Nayak, Senior Divisional Chemist

❖ **Department of Roads**
- o Mr. Abhiman Das Mulmi, Unit Chief, Geo-Environment and Social Unit

- Mr. Manoj Aryal, Environment Inspector

❖ **Kathmandu Metropolitan City**

- Ms. Nisha Koirala, Senior Environment Engineer

❖ **Bhaktapur Municipality**

- Mr. Rajan Suwal, Engineer

❖ **Kathmandu University**

- Associate Professor Dr. Smriti Gurung, Academic Expert, Technical Working Group 3 (Environment)
- Mr. Subodh Luitel, Assistant Professor

B. Japanese Side:

❖ **<u>JICA Expert Team</u>**

- Mr. Hideo Tsuji, Team Leader
- Mr. Tomoaki Tanabe, Environmental Expert
- Mr. Abhishek B.C, Engineer, Environmental and Social Expert
- Mr. Dajiro Suto, Engineer
- Mr. Sumit Thapa, Engineer
- Mr. Rikesh Chitrakar, Environment Expert (TSE, Sub-Consultant of JET)
- Mr. Sanjeev Regmi, Managing Director (TSE, Sub-Consultant of JET)

The meeting commenced with opening remarks on its purpose, delivered by Mr. Krishna Raj Panta, Joint Secretary of MoID, followed by the introduction of the participants. Thereafter, Ms. Laxmi K. briefly explained the agenda of the meeting. Subsequently, Mr. Hideo Tsuji, Team Leader, and Mr. Tomoaki Tanabe presented the relevant topics through a PowerPoint presentation.

1. Mr. Krishna Raj Panta, Division Chief, Joint Secretary, Infrastructure Work and Transport Division

❖ The introduction of a mass transit system is expected to result in a modal shift, with smaller public transport vehicles being replaced by larger-capacity vehicles. In this regard, social safeguards should be considered, as the reduction in small public transport modes, such as microbuses and tempos, etc., may reduce employment opportunities in the public transport sector and potentially leave many people unemployed. Therefore, as this is an important socioeconomic issue, the SEA should adequately consider, assess, and address its potential impacts and propose appropriate mitigation measures

2. Mr. Manoj Aryal, Environment Inspector, Department of Roads

❖ The Master Plan appears to focus primarily on road development projects such as road

bridge, tunnel, car parking, river corridor etc. Therefore, a range of strategic transportation alternatives, including options beyond road-based transport, should also be identified, assessed, and considered.

- The basic sequence of the SEA process is to identify the sub-projects, identify the key issues and scope of the sub-projects, identify the activities, assess the potential impacts, and propose mitigation measures. Moreover, a major component of the SEA process is the assessment of strategic alternatives. Therefore, it should be clarified whether strategic alternatives for other transport options have been adequately assessed before proposing road projects
- The rationale for selecting only the Ratnapark–Bhaktapur East–West Corridor (approximately 14.6 km) for the development of a mass transit system should be clearly explained. Other potential mass transit corridors and routes should also be identified, proposed, and comparatively assessed to determine their suitability for mass transit development. The Plan should prioritize this route while also considering other routes, such as Budhanilkantha-Godawari and Nagdhunga-Bhaktapur
- Nepal is a party to the Paris Agreement, adopted in 2015 under the United Nations Framework Convention on Climate Change (UNFCCC), and has committed to reducing greenhouse gas emissions and enhancing climate resilience through its Nationally Determined Contributions (NDCs). While Nepal has set 2045 as a national target year for carbon emission reduction, the presentation refers to 2050. Therefore, CO_2 emission reductions should also be calculated up to 2045, considering the implementation of sub-projects under this SEA, in accordance with Nepal's National climate commitments.
- The scoping matrix should clearly present all 30 environmental and social items evaluated under the section "Scoping of Key Environmental and Social Issues. The contents of the scoping matrix, including the potential consequences and corresponding mitigation measures, should also be clearly presented.
- The impact assessment focuses on CO_2 emission reduction and the Heritage Impact Assessment (HIA). However, as the master plan proposes projects along the river corridor, these projects are likely to be particularly favorable for vulnerable communities. Therefore, a Vulnerable Community Development Plan should be considered for the affected vulnerable communities, while an Indigenous Peoples Development Plan (IPDP) covering the Kathmandu Valley should also be considered, as applicable.
- Intangible Cultural Heritage, including traditional feasts, festivals, rituals, and other living cultural traditions and practices, should also be identified, assessed, and appropriately considered in the SEA
- The SEA should identify and flag potential cumulative impacts arising from th implementation of multiple projects and interventions under the Master Plan. This is particularly relevant where multiple transport projects may collectively affect air quality,

GHG emissions, traffic, water resources, land use, biodiversity, cultural heritage, and communities.

- ❖ The publication of the SEA Notice in the national daily newspaper and the disclosure of the SEA Report should be carried out on the website after the Third Stakeholder Meeting to ensure that stakeholders have a clear understanding of the report.

3. Mr. Kanchan Kumar Nayak, Senior Divisional Chemist, Department of Environmen

- ❖ Air quality can be improved through the adoption of alternative transportation technologies and cleaner energy sources. Greenhouse gas (GHG) emissions can be reduced by adopting higher Euro emission standards for vehicles, improving fuel efficiency, promoting the use of electric vehicles (EVs), and reducing dependence on fossil fuels.

4. Mr. Hari Shankar Jha, Environment Inspector, Ministry of Infrastructure Development

- ❖ The projects and interventions proposed in the Master Plan should be clearly defined and supported by adequate analysis and assessment. There should not be any uncertainty regarding the projects proposed in the Master Plan Accordingly, tentative terms such as "may" and "might" should be avoided wherever the project scope and interventions have already been determined; instead, clear and definitive language should be used, such as "will be," as appropriate.
- ❖ Furthermore, the SEA should not rely solely on assumptions when assessing potential impacts. Detailed assessment should be undertaken regarding landscape impacts, terrain and gradient conditions, urban flooding, and changes in surface runoff resulting from increased built-up areas within Kathmandu Valley. These issues should be assessed at an appropriate strategic level, considering the cumulative and long-term impacts of the proposed interventions.
- ❖ In addition, the proposed car-free hubs and zones should be supported by proper studies and assessments of their potential impacts on tourist movement and visitor flows in major tourist and cultural areas. There have been concerns regarding reduced tourist flows following the implementation of car-free zones in some key tourist areas of Kathmandu, such as Basantapur. Therefore, merely proposing car-free hubs or zones in the Master Plan is not sufficient. Their potential impacts on tourism, local businesses, accessibility, cultural heritage, pedestrian movement, and surrounding communities should be properly studied, assessed, and analyzed before finalizing the proposed interventions.
- ❖ The publication of the SEA Notice and disclosure of the SEA Report on the website shall be carried out after the Third SHM to avoid confusion among stakeholders when submitting comments.

5. Mr. Surendra Raj Pant, Scientific Officer, Ministry of Agriculture, Forests and Environment

- ❖ No potential social acceptance or social resistance-related challenges have been identified in the SEA of the Master Plan. However, such challenges should be adequately considered, particularly in view of the past obstruction of several road projects by local communities and landowners.
- ❖ There are historical cases in which road projects have faced significant obstruction due to social resistance and the unwillingness of landowners to provide land, such as the Pepsi Cola–Sallaghari Road. This has been a major challenge in road construction and infrastructure development. In addition, conflicts may arise between different policies and legal provisions, while local-level laws and regulations may also vary. Therefore, the SEA should clearly assess how the Master Plan will interact with and be coordinated with existing national policies, sectoral policies, and local-level laws and regulations.
- ❖ It would be preferable to provide the Draft SEA Report to relevant stakeholders and concerned authorities for their review and comments. Based on the experience of MoAFE, stakeholders may be less likely to provide detailed comments on a report merely published through a newspaper notice. Therefore, the Draft SEA Report should be formally circulated to concerned authorities and key stakeholders, with a clear mechanism for soliciting and incorporating their comments and suggestions.
- ❖ The current SEA report appears to be a fusion of SEA and project-level EIA. Therefore, the SEA should clearly define its strategic scope and focus on policies, plans, programmes, alternatives, cumulative impacts, and key strategic environmental and social issues relevant to the Master Plan.
- ❖ Regarding Heritage Impact Assessment (HIA), the heritage-related impacts and assessment requirements of the Department of Archaeology (DoA) can also be addressed within project-level EIA or IEE studies. The SEA should clarify the strategic-level scope of heritage impact assessment and distinguish it from detailed assessments required under subsequent project-level EIA/IEE studies.

6. **Associate Professor Dr. Smriti Gurung, Academic Expert, JICA Expert Team, Kathmandu University**

- ❖ The issues regarding effect on employment dur to mass transit should be properly addressed.
- ❖ Appropriate measures should be identified and incorporated for flash flood mitigation
- ❖ The SEA should review and address the applicable laws and legal provisions related to wildlife conservation in relation to linear transport infrastructure.

7. Ms. Nisha Koirala, Senior Environment Engineer, Kathmandu Metropolitan City

- ❖ Proper traffic management and safety measures should be ensured during the construction phase through an appropriate Traffic Management Plan.
- ❖ Appropriate alternatives should be identified and assessed for each proposed project at the Master Plan stage so that no further alternative analysis is required during the subsequent detailed environmental assessments (EIA/IEE/BES). If additional alternatives need to be considered during the detailed assessment stage, this may indicate that the Master Plan requires further review or revision

8. Mr. Abhiman Das Mulmi, Unit Chief, Geo-Environment and Social Unit

- ❖ Climate change data for the Kathmandu Valley should be incorporated, including measures based on flood-warning information.
- ❖ Seismic vulnerability should be assessed using relevant geological and geotechnical information.

9. Mr. Subodh Luitel, Assistant Professor, Kathmandu University

- ❖ The report currently presents information primarily on particulate matter. However, gaseous pollutants such as NO_x and SO_x should also be included, as the SEA is being conducted for a transport master plan.
- ❖ Flood inundation and its potential impacts should be properly presented and assessed.
- ❖ It remains a matter of debate whether the SEA should be presented in detail or in a concise manner. Regardless of the report structure, the team should focus on clearly presenting the core essence and key findings of the SEA.
- ❖ The report could be further strengthened through collaboration with academic experts and scholars.

Appendix 7: Summary of Meetings with Stakeholders

Meeting with Technical Working Group 3 Members and Stakeholders for the Scoping of the SEA of KVUTSM

Conducted by: Mr. Hayato Kobayashi – GESI Expert, JICA Expert Team

Facilitated by: Mr. Abhishek B.C – Environmental and Social Expert, JICA Expert Team

Purpose of Meeting: To discuss key environmental and social issues and challenges, for consideration in the SEA of KVUTSMP

S.No.	Name of Organization [Date]	Division/ Section	Attendee/ Distinguished Attendee	Position	Key Issues, concerns and suggestions
1.	Lalitpur Metropolitan City, Office of Municipal Executive, Pulchowk, Lalitpur [December 12, 2025]	Community Development Section, Social Development Division	Ms. Sarita Maharjan	Section Chief	• Public transport routes are inadequate, mostly on main roads, leaving residential areas poorly connected • Many roads are one-way to manage traffic, but congestion and frequent jams make timely travel difficult • Public transport punctuality is critical, but reliance on private vehicles remains high due to route and timing issues • Parking problems and limited vehicle-free zones create challenges for traffic management and road safety • Introduction of larger buses in coordination with Sajha Yatayat is planned to improve public transport capacity • No policy exists in LMC to phase out old vehicles that have exceeded age thresholds, affecting service quality • Vehicular emissions are monitored by city police in coordination with the Department of Environment; monitoring equipment has been installed in Pulchowk
2.	National Human Rights Commission-Nepal Hariharbhawan, Laitpur [December 12, 2025]	-	Dr. Lily Thapa	Honorable Member	• Conductors and bus drivers harass senior citizens and students over fare discounts, despite their identities being clear." • Drivers and conductors are often unwilling to board senior citizens and persons with disabilities." • Land acquisition is a very sensitive issue in urban areas. • Women drivers do not feel safe operating public vehicles
		Gender and Social Inclusion Division	Ms. Madhu Sunam	Human Right Officer	
3.	National Women Commission, Bhadrakali Plaza, Kathmandu	-	Honorable Krishna Kuamri Poudyal Khatiwada	Senior Member/ Spokesperson	• Overcrowding and unsafe conditions in public transport • Gender-based violence and harassment in public vehicles • Lack of accessible infrastructure and facilities • Poor vehicle and road management

S.No.	Name of Organization [Date]	Division/ Section	Attendee/ Distinguished Attendee	Position	Key Issues, concerns and suggestions
	[December 12, 2025]	Women Development Coordination Section	Ms. Sita Adhikari	Chief Woman Development Officer	• Low public awareness and enforcement of human rights and social responsibility • Severe air pollution and health risks due to emissions from old vehicles and traffic congestion • Need for training and inclusion of women in the transport sector
4.	Kathmandu Metropolitan City, Office of Municipal Executive, Kathmandu Plaza, Kathmandu [December 12, 2025]	Social Development Department	Ms. Samikshya Niraula	Department Chief	• Public transport is difficult for people with disabilities due to the lack of ramps, insufficient space, and the extra time needed to board and alight • Ride-hailing services (e.g., Pathao, InDrive, Yango) are cheaper, reliable, and fast, but women sometimes face harassment from riders, who can identify them through their phone and harass them later • Abuse of women in public transport, knowingly or unknowingly by conductors or passengers, especially during peak office hours, due to overcrowded conditions • Footpaths should be accessible to persons with disabilities
5.	National Federation of the Disabled Nepal (NFD-N), Bhrikutimandap, Kathmandu [December 14, 2025]	Federal Board	Mr. Sugam Bhattarai	General Secretary	• Transport system should address the needs of all types of disabilities • Provision of wide, unobstructed, and accessible footpaths for people with disabilities • Lifts should be installed at sky bridges • Coordination with NFD-N for proper implementation of the transport master plan • Safe railings should be provided on the roadside
		Federal Office	Mr. Laya Prasad Upreti	Admin Manager	
		Federal Office	Ms. Jalasa Sapkota	Senior Project Coordinator	
		Federal Office	Mr. Kushal Neupane	Senior Project Coordinator	
		Federal Office	Mr. Suvas Gnywali	Monitoring and Evaluation Coordinator	
6.	Feminist Dalit Organization (FEDO), Kupondol, Lalitpur [December 15, 2025]	-	Dr. Rabina G. Rasaily	Executive Director	• Harassment of passengers by drivers and conductors after knowing their identity must be prevented • Awareness programs should inform that such acts are offenses • Strict action and monitoring should be implemented to prevent harassment • Accessible feedback and complaint mechanisms should be provided for passengers

S.No.	Name of Organization [Date]	Division/ Section	Attendee/ Distinguished Attendee	Position	Key Issues, concerns and suggestions
					• Mandatory training for drivers and conductors on professional conduct and ethics
7.	Kathmandu Valley Traffic Police Office, Ramsahpath Kathmandu [December 17, 2025]	-	Mr. Nabaraj Adhikari	Office Chief/ Senior Superintendent of Police	• Health-related issues for traffic police due to long hours of standing in polluted air and noisy roads • Improvement of road junctions is necessary to ensure smoother traffic flow, reduce congestion, and enhance road safety for both vehicles and pedestrians
		-	Mr. Naresh Raj Subedi	Information Officer/ Superintendent of Police	
8.	Federation of Nepalese National Transport Entrepreneurs (FNNTES) [December 18, 2025]	Central Official	Mr. Punya Prasad Sitaula (Saroj)	Senior Vice President	• Social and mental well-being of drivers and conductors should be considered as they work long hours in polluted and uncomfortable environments from 4 a.m. to 8 p.m • Moral and ethical education should be included in the curriculum from a young age to cultivate responsible behavior among future drivers and conductors • Drivers face health risks such as kidney problems because they often cannot use public toilets due to limited facilities at bus stops • Introduction of an efficient policy by the government to implement a mass transit bus system
		Central Official	Mr. Kiran Kumar Khadka	Secretary	
		Central Official	Mr. Purushottam Simkahada	Joint General Secretary	
		Central Official	Mr. Dek Nath Gautam	General Secretary	
9.	LMC Network Child Club [December 18, 2025]	-	Mr. Aswin Khatri	Vice President	• Time-consuming public transport, unlike private vehicles that can cover many destinations quickly • Overcrowded public vehicles, causing discomfort and delays • Inappropriate behavior by conductors and drivers of public transport • Unsafe public transport, including over speeding due to competition for fares. • Mismanaged bus stops, leading to confusion and delays. • Air pollution from vehicles, with adverse impacts on public health • Sajha Yatayat can be considered one of the most reliable, safe, and accessible public transport options
			Ms. Yusha Shakya	Past President	
			Mr. Emon Maharjan	Secretary	
			Mr. Rakish Dangol	Treasurer	
			Ms. Sumnika Maharjan	Member	
			Mr. Samyak Maharjan	Member	
			Ms. Sarita Maharjan	Section Chief, Community Development Section, Social Development	

S.No.	Name of Organization [Date]	Division/ Section	Attendee/ Distinguished Attendee	Position	Key Issues, concerns and suggestions
				Division	
			Ms. Bijani Byanjankar	Computer Operator, Community Development Section	
10.	LMC Ward Level Youth Club [December 18, 2025]	-	Mr. Dipesh Maharjan		• Difficulty in land acquisition in LMC due to cultural and social constraints. • Lack of timely service, frequent delays, and long travel times are major issues in public transportation. • Traffic safety issues, with a special concern for pedestrian safety • Dedicated and safe cycle lanes should be provided along the road to protect cyclists and promote sustainable transportation • CCTV should be installed on roads and inside public vehicles to monitor traffic conditions and enhance passenger safety.
			Ms. Sabera Maharjan		
			Mr. Sangam Pandey		
			Ms. Aarsee Dhakal		
			Ms. Sarita Maharjan	Section Chief, Community Development Section, Social Development Division	
			Ms. Bijani Byanjankar	Computer Operator, Community Development Section	
11.	Women's Cycling Group [December 18, 2025]	-	Ms. Manju Shakya		• Awareness is the foundation of all solutions. • Rules and regulations should be followed by every citizen. • Public participation and responsibility are key to effective implementation. • Continuous awareness programs help foster a culture of safety and accountability
			Ms. Reshma Maharjan		
			Ms. Asta Maya Dangol		
			Ms. Nani ChhoriMharjan		
			Ms. Nani Shibha Maharjan		

S.No.	Name of Organization [Date]	Division/ Section	Attendee/ Distinguished Attendee	Position	Key Issues, concerns and suggestions
			Ms. Sarita Maharjan	Section Chief, Community Development Section, Social Development Division	
			Ms. Bimala Maharjan	Computer Operator, Community Development Section	

Source: JICA Expert Team

Appendix 8: Photographs

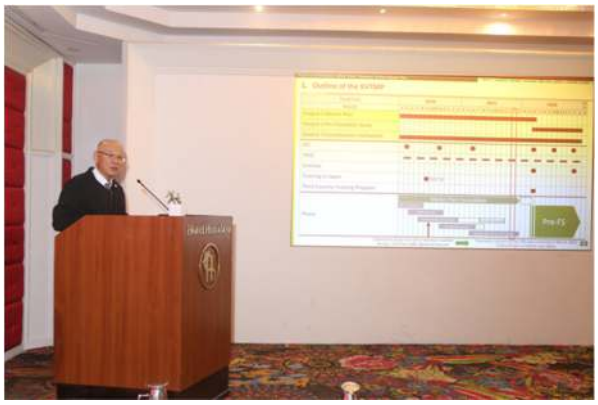
	
First TWG3 (Environment) held at MOPIT, March 10, 2025	**First TWG3 (Environment) held at MOPIT, March 10, 2025**
	
First TWG3 (Environment) held at MOPIT, March 10, 2025	**First TWG3 (Environment) held at MOPIT, March 10, 2025**
	
First TWG3 (Environment) held at MOPIT, March 10, 2025	**First TWG3 (Environment) held at MOPIT, March 10, 2025**

	
Honorable Minister of MOPIT welcomed by the Secretary of MoPIT at the 1st Stakeholder Meeting (August 3, 2025)	**Honorable Ministers of MOPIT and MOFE attending the 1st Stakeholder Meeting (August 3, 2025)**
	
Glimpses of the 1st Stakeholder Meeting (August 3, 2025)	**Glimpses of the 1st Stakeholder Meeting (August 3, 2025)**
	
Glimpses of the 1st Stakeholder Meeting (August 3, 2025)	**Glimpses of the 1st Stakeholder Meeting (August 3, 2025)**

	
Glimpses of the 1st Stakeholder Meeting (August 3, 2025)	**Attendees of the 1st Stakeholder Meeting (August 3, 2025)**
	
Second TWG3 (Environment) held at MOPIT, December 16, 2025	**Second TWG3 (Environment) held at MOPIT, December 16, 2025**
	
Second TWG3 (Environment) held at MOPIT, December 16, 2025	**Second TWG3 (Environment) held at MOPIT, December 16, 2025**

	
Consultation held at National Women Commission (December 12, 2025)	**Consultation held at the Social Development Department, Kathmandu Metropolitan City (December 12, 2025)**
	
Consultation held at the Community Development Section, Lalitpur Metropolitan City (December 12, 2025)	**Post-Consultation with Officers, Kathmandu Valley Traffic Police Office (December 17, 2025)**
	
Consultation held at National Federation of the Disabled Nepal (Dec 14, 2025)	**Consultation held at Feminist Dalit Organization (December 15, 2025)**

	
Consultation held at Federation of Nepalese National Transport Entrepreneurs (December 18, 2025)	**Participants of the LMC Child Club, Ward Youth Club, and Women's Cycling Group Consultations (December 18, 2025)**
	
Inauguration of the 2nd Stakeholder Meeting by the Honorable Minister of MoPIT and MoFE (February 4, 2026)	**Honorable Minister and dignitaries of Ministries during National Anthem, 2nd Stakeholder Meeting (Feb 4, 2026)**
	
Speech by the Honorable Minister of MoPIT and MoFE at the 2nd Stakeholder Meeting (February 4, 2026)	**Speech by the Secretary of MoPIT at the 2nd Stakeholder Meeting (February 4, 2026)**

	
Team Leader, JICA Expert Team presenting at 2nd Stakeholder Meeting (Feb 4, 2026)	**JICA Expert Team at the 2nd Stakeholder Meeting (February 4, 2026)**
	
Glimpses of the 2nd Stakeholder Meeting (February 4, 2026)	**Glimpses of the 2nd Stakeholder Meeting (February 4, 2026)**
	
Glimpses of the 2nd Stakeholder Meeting (February 4, 2026)	**Participants of the 2nd Stakeholder Meeting (February 4, 2026).**

	
Third TWG3 (Environment) held at MOPIT, July 21, 2026	**Third TWG3 (Environment) held at MOID, July 21, 2026**
	
Glimpses of the 3rd Stakeholder Meeting (July 31, 2026)	**Participants of the 3rd Stakeholder Meeting (July 31, 2026)**

Appendix 9: Response to comment on the Draft Scoping Report

1. MOPIT

Table1: Response to Comment from MOPIT on the Draft Scoping Report

S.No.	Comment from MOPIT (1 February 2026)	Response from JICA Expert Team
1	The issues raised in the first Technical Working Group (Environment), first stakeholder meeting and the second technical working Group (Environment) should be adequately addressed in the Scoping Report. It is missing in the scoping report.	The outline of issues raised in 1st SHM and 1st and 2nd TWG3 and correspondences are mentioned in the Draft Scoping Report. **(Refer Section 6.4 On going Stakeholder Engagement and 6.5 Technical Working Group)**
2	The SEA shall incorporate primary baseline information in addition to relevant secondary data. This shall include comprehensive water quality information of major rivers such as Bagmati and Bishnumati, as well as other rivers including Manohara, Hanumante, Dhobi Khola, Tukucha Khola, Balkhu Khola, and Nakkhu Khola. Furthermore, primary baseline noise level data from selected locations within the Kathmandu Valley must be included.	During SEA, the study is conducted at the early stage (Policy, Program, and Plan) prior to the implementation stage (Feasibility Study stage). The primary data shall be taken at just point during EIA/IEE stage based on the basic design. As the master plan stage, the proposed project location and design have not been examined in detail and are not yet fixed. Therefore, to grasp the trend of regional baseline, the latest secondary data at representative monitoring stations are collected as much as possible. **(Refer Chapter 4: Environmental and Social Baseline of Kathmandu Valley)**
3	The write-up on the cultural environment can be presented concisely in the scoping document and elaborated in the SEA Report	The write-up on cultural heritage has been revised and concisely presented (**Refer Section 4.4.6)** The Cultural heritage is selected in the Scoping Matrix. Impacts are assessed, and mitigation measures are proposed in the SEA report. **(Refer section 5.1.2 Scoping and 5.1.3 TOR of Impact Assessment)**
4	The baseline should include meteorological data, including climatological trends, from relevant stations in the Kathmandu Valley.	The metrological information at Kathmandu International Airport Station (2019-2023) is explained in the draft scoping report. Currently, the SEA team is requesting the relevant authority to provide the latest information. **(Refer Section 4.1 Meteorology)**
5	A detailed methodology for collecting baseline information for the SEA Report should be presented in the section on the structure of the SEA Report. Moreover, the methodology should focus on collecting primary information where gaps are observed or where no information is obtained from secondary sources for certain baseline parameters.	Regarding the policy on collection of baselines, same as comment 2. In case of no secondary data, that parameter will be taken in the F/S. **(Refer Chapter 4: Environmental and Social Baseline of Kathmandu Valley)** The Table of contents of the SEA report is mentioned in section 8.2 and explains its outline in the 2nd SHM. **(Refer Section 8.2 Structure of SEA Report)**

S.No.	Comment from MOPIT (1 February 2026)	Response from JICA Expert Team
6	The MP shall incorporate proposed initiatives for the development of urban green spaces alongside the development of new infrastructure. Accordingly, the SEA Scoping Report should comprehensively address the scope and opportunities for enhancing green space development	The National Environment Policy 2019 and the Land Use Policy 2015 will be reviewed in detail during the preparation of the SEA report, which stipulates provisions for green belts and open spaces, including the development of parks and the expansion of urban greenery.
7	The issues identified in the scoping document are largely generic. Therefore, the scoping document should incorporate more specific and project-relevant issues, based on the nature and characteristics of the proposed projects.	In MP stage, the sub-components are not studying details at this moment. Therefore, regional level key environmental and social issues due to the implementation of traffic management master plan are found through several consultations with stakeholders. **(Refer Section 5.2. Key Environmental and Social Risks and Opportunities for KVUTS)**
8	In addition to identifying typical project factors that may cause negative impacts on environmental and social conditions during the pre-construction, construction, and operation stages of the specific projects proposed in the MP, the MP should also recommend relevant international policies, national policies, acts, and rules that are likely to be triggered and should be considered during the implementation of these sub-projects.	At this moment, SEA study and MP are proceeding in parallel. The listed proposed components are tentative at this scoping stage and will be further discussed with relevant stakeholders for updating. **(Refer Section 3.3 Identification of Strategic Alternative Components (Under Examination)** The list of the national constitution, policies, acts, rules, and standards on environmental assessment for the transport sector in Nepal has been included. Moreover, a detailed assessment of the relevant legislation based on the projects proposed in the master plan will be carried out in the SEA report **(Refer Section 2.1, Table 2.1.1: Constitution, Plans, Policies, Acts, Rules, and Standards).**
9	As most of the rivers in the Kathmandu Valley are considered holy rivers, and cremation practices along their banks represent a major cultural aspect of the Nepalese people, these practices should not be adversely affected. In addition, the numerous cultural sites in the valley must also be considered in development planning to prevent negative impacts. Moreover, relevant national policies and legal instruments related to cultural heritage, such as the Ancient Monument Preservation Act and the Ancient Monuments Preservation Regulations, should be reviewed and applied during project implementation.	There are numerous cultural and heritage sites in the Kathmandu Valley located near the major road network. In the baseline chapter, the majority of such sites have been presented. The Ancient Monument Preservation Act, 1956, and the Ancient Monuments Preservation Rules, 1990, have been included (**Refer Section 2.1, Table 2.1.1)**. Information regarding UNESCO World Heritage Sites (including map), Intangible Cultural Heritage such as feasts and festivals, and Cultural and Natural Heritage including sacred rivers is included in the Scoping Report (**Refer Section 4.4.6 Cultural Heritage**) The information on Heritage Impact Assessment in Nepal has been included (**Refer Section 2.2.6: Related Acts, Rules and Heritage Impact Assessment (HIA) Framework of Archaeological Significance**)

S.No.	Comment from MOPIT (1 February 2026)	Response from JICA Expert Team
10	The scoping report should identify the likely environmental impacts of each sub-project and provide preliminary guidance on the appropriate level of assessment, whether BES, IEE, or EIA, in line with EPA 2019 and EPR 2020. It should reference the Master Plan recommendations and provide sufficient information to support the regulatory authority in determining the final assessment level.	At this moment, SEA study and MP study including sub-components are proceeding in parallel. The listed proposed components are tentative at this scoping stage and will be further discussed with relevant stakeholders for updating. Once the scale of proposed components is cleared, result of preliminary screening is mentioned in the SEA report.
11	The Master Plan should be consistent with national policies and plans. Therefore, all policies and plans related to transportation and urban development should be reviewed and considered during the scoping stage of the SEA	Consistency with all policies and plans related to transportation and urban development is detailed and confirmed within the MP study. Key aspects pertaining to urban transportation and urban development are documented in the scoping report. **(Refer Section 2.2.3, 2.2.4 and 2.2.5)**
12	The Master Plan shall identify vehicle emissions and congestion critical locations within the valley, whereas the Strategic Environmental Assessment shall evaluate and address these issues through the implementation of projects proposed in the Master Plan. These considerations should be explicitly reflected in the scoping report.	SEA study and MP study including sub-components are proceeding in parallel. The listed proposed components are tentative at this scoping stage and will be further discussed with relevant stakeholders for updating. Whether the proposed components are an effective and rational approach for alleviating traffic congestion and reducing pollutants, including economic and environmental aspects are under examination. The results will be updated within the SEA report.
13	The Strategic Environmental Assessment shall assess institutional capacity, roles, and coordination among transport, environment, urban planning, and local authorities. These aspects should also be reflected in the scoping report.	The difficulties and challenges for implementation of MP institutional capacity, roles, and coordination among relevant authorities will arise in the MP report and SEA report as recommendation.
14	Other comments are as follows: ・ The Table of Contents of the SEA Report should be clearly disclosed.	Table of contents of the SEA report is mentioned in section 7.2 and explains its outline in the 2nd SHM. **(Refer Section 8.2 Structure of SEA Report)**
	・ The Abbreviations/Acronyms and References sections are currently missing and should be included.	The Abbreviations/Acronyms and References sections are added in the draft scoping report.
	・ Flooding, rainwater retention, water logging and stormwater drainage management issues in the Kathmandu Valley should be thoroughly addressed in the report.	This MP focus on the traffic management in Kathmandu Valley. Flooding issues are not so relevant to this master plan. **(Refer Section 1.2 Objectives and Output of the Project)**
	・ A review of relevant Acts, Regulations, and Plans should	List of Relevant Act, and Regulation on Environmental Assessment are

S.No.	Comment from MOPIT (1 February 2026)	Response from JICA Expert Team
	be incorporated.	added. **(Refer Table 2.1.1 Constitution, Policy, Act, and Regulation on Environmental Management)**
	・ A review of the 16th National Five-Year Plan should also be included.	Add the outline of 16th National Five-Year Plan **(Refer Section 2.2.3 (2) The Sixteenth Plan (Fiscal Year 2024/25 – 2028/29)**
	・ The name of the consultant preparing the SEA must be mentioned in the report but should not appear on the cover page	Remove "JICA Expert Team" from coverage. JICA will dispatch a JICA expert team to provide technical assistance for MOPIT to develop the KVUTS MP, including conducting the Strategic Environmental Assessment (SEA) and surveys for completing deliverables. The list of experts requested during consultations between JICA and the Government of Nepal are mentioned in the draft scoping report. **(Refer Section 1.8 Organization of Project Team)**

Note: The section numbers listed in the response refer to chapters or sections of the Scoping Report for KVUTS MP.
Source: JICA Expert Team

2. MOFE

2.1 Comment on draft scoping report from MOFE dated 23 January 2026

Table 2: Response to Comment (1) from MOFE on the Draft Scoping Report

S.No.	Comment from MOFE (23 January 2026)	Response from MOPIT/JET (2 February 2026)
1.	The report should clearly disclose the budget allocated for the SEA study to ensure transparency, public accountability, and good governance	The SEA study is part of the Project on Kathmandu Valley Urban Transport System Master Plan under contract with JICA. JCIA publishes the Request for Proposals (RfP) on this study. Consultants wishing to undertake this study submitted technical proposals, including work experience, and quotations in line with the guideline based on JICA's RfP. JICA conducted a comprehensive and fair evaluation based on the proposals submitted by competing participants, taking into account their

S.No.	Comment from MOFE (23 January 2026)	Response from MOPIT/JET (2 February 2026)
		plans, technical proposals, and overall capabilities. The budget requirements specified in the RFP for this survey are outlined in draft scoping report. **(Refer Section 1.8 Organization of Project Team)**
2.	The Scoping Document and SEA Draft Report should be disclosed on the website of the concerned ministry, and a notice regarding these reports should be published in the Gorkhapatra National Daily newspaper to seek feedback and suggestions	Environment Protection Rule (EPR), 2020 mentioned that Draft Strategic Environmental Analysis Report should be disclosed on the website of the concerned ministry, and a notice regarding the report will be published in the Gorkhapatra National Daily newspaper to seek feedback and suggestions. MOPIT will follow the requirement of EPR 2020 for formulating Final SEA report on KVUTS-MP. Regarding the Draft Scoping Report stage, MoPIT distributed the hard copy of its executive summary in English and Nepal language to stakeholders for their understanding and to obtain feedback
3.	The suggestions given in the previous meeting should be implemented. For example, an Academic Expert should be included	Please **Refer the following table** which explains the comments from MOFE and JICA Expert team replies.
4.	Both primary and secondary data need to be collected and included in the study.	During SEA, the study is conducted in the early stage (Policy, Program, and Plan) prior to the implementation stage (Feasibility Study stage). The primary data shall be taken at just point during EIA/IEE stage based on the basic design. As the master plan stage, the proposed project location and design are not examined the detail and not fixed. Therefore, to grasp the trend of regional baseline, the latest secondary data at representative monitoring stations are collected as much as possible. **(Refer Chapter 4: Environmental and Social Baseline of Kathmandu Valley)**
5.	The names of the experts of the study team, along with their self-declaration and commitment, should also be mentioned.	JICA will dispatch a JICA expert team to provide technical assistance for MOPIT to develop the KVUTS MP, including conducting the Strategic Environmental Assessment (SEA) and surveys for completing deliverables. The list of experts requested during consultations between JICA and the Government of Nepal are mentioned in the draft scoping report. **(Refer Section 1.8 Organization of Project Team)**
6.	The following stakeholders should be included in the list: Nepal Forum of Environmental Journalists; Empowered Bagmati Civilization Integrated Development Committee; Pashupati Area	The stakeholder list is updated to include the suggested offices. No.14: High Powered Committee for Integrated Development of Bagmati Civilization (HPCIDBC),

S.No.	Comment from MOFE (23 January 2026)	Response from MOPIT/JET (2 February 2026)
	Development Trust, and the Ministry of Defense (Kathmandu-Terai/Madhesh Fast Track Road Project)	No.39: Pashupati Area Development Trust No.36: Kathmandu-Terai/Madhesh Fast Track (Expressway) Road Project, Nepal Army, Jangi Adda No.70: Nepal Forum of Environmental Journalists **(Refer Table 6.4.1 Invitation List of Stakeholders**
7.	A certified laboratory should be ensured for measuring water quality, and there should also be an indication to study floods.	Same response with **Comment 4.**
8.	The report should be prepared in a reader-friendly manner, with clear text and formatting	The draft scoping report is updated in a reader friendly manner (installing abbreviation, reference, replace the fine figures).

Note: The section numbers listed in the response refer to chapters or sections of the Scoping Report for KVUTS MP.

Regarding Comment 3

S.No.	Comment from MOFE (22 January 2026 during Pre-Discussion)	Response from MOPIT/JET (22 January 2026 and 2 February 2026)
a	An academic expert should be included in Technical Working Group 3 (Environment) to ensure the scientific accuracy of the reports.	MOPIT and JET accept to invite an academic expert to Technical Working Group 3 (Environment) with the same manner with another academic expert who joins other TWGs. Our invitation list for SHM has already included the two universities, Tribhuvan University and Kathmandu University. During 1st SHM, two professors provided comments on our SEA. As recommended by MOFE, Head of the Department of Environmental Science at Kathmandu University, has been appointed as an academic expert to participate in TWG3.
b	Project information, a detailed methodology of the SEA, and the total budget for the SEA should be provided in the SEA report	The detailed methodology for the SEA will be provided in the Scoping Report. **(Refer Section 1.7 SEA process)** The budget requirements specified in the RFP for this survey are outlined in the draft scoping report. **(Refer Section 1.8 Organization of Project Team)**
c	Primary baseline information shall also be collected apart from secondary information.	Same response with **Comment 4** above.
e	The draft Scoping Report, including the draft SEA report, should	Same response with **Comment 2** above.

S.No.	Comment from MOFE (22 January 2026 during Pre-Discussion)	Response from MOPIT/JET (22 January 2026 and 2 February 2026)
	be disclosed on the website of MoPIT.	
f	A public notice seeking comments and suggestions on the draft SEA report should be published in a national daily newspaper	Same response with **Comment 2** above.
g	The SEA report should recommend authorized, dependable, and reliable water testing laboratories so that water quality can be tested at these labs.	Same response with **Comment 4** above.
h	The SEA team should use the air pollution data available from the Department of Environment.	SEA team has already asked Department of Environment to provide the latest air pollution data. **(Refer Section 4.2.1 Air Quality)**
i	The list of stakeholders should include the Nepal Forum of Environmental Journalists (NEFEJ), the High-Powered Committee for Integrated Development of Bagmati Civilization (HPCIDBC), the Pashupati Area Development Trust, and the Kathmandu-Terai/Madhesh Fast Track (Expressway) Road Project	Same response with **Comment 6** above.
j	The format of the submitted Draft Scoping Report should be improved to make it more readable.	Same response with **Comment 8** above.

Note: The section numbers listed in the response refer to chapters or sections of the Scoping Report for KVUTS MP.
Source: JICA Expert Team

2.2 Comment on draft scoping report from MOFE dated 26 February 2026

Table 3: Response to Comment (2) from MOFE on the Draft Scoping Report

S.No.	Comment from MOFE (22 February 2026)	Response from MOPIT/JET
1.	**Regarding the advanced presentation of Structural Proposals** In some sections of the Scoping Report, structural concepts such as flyovers, grade separations, terminals, and bridges are clearly mentioned or illustrated. If such structures are presented as concrete proposals during the scoping stage: • The scope of alternatives that the SEA is supposed to examine may become limited, • There is a risk that the SEA could be confined to a process that validates predetermined decisions, rather than serving as an independent assessment tool	At the MP stage, the project plan is limited to the concept and its alternatives. Based on the MP, detailed aspects such as structure, location, and alignment are then examined in the pre-FS or FS stages. We will use appropriate wording when referring to the candidate projects proposed in the MP report and the SEA.

S.No.	Comment from MOFE (22 February 2026)	Response from MOPIT/JET
	Therefore, it would be appropriate to present these structural proposals as indicative options rather than definite decisions, and to clearly indicate that all maps and illustrations are "Conceptual presentation based on the SEA findings"	
2.	**System-Based Approach to Baseline** The baseline analysis presented in the Scoping Report appears to be primarily focused on a statistical snapshot of the current environmental conditions. However, according to the nature of SEA, the baseline should not only reflect the current state but also include the existing environmental system, its functioning, trends, carrying capacity, and interlinkages. Since the Kathmandu Valley is a region with complex geographic, ecological, and urban systems, the key systemic aspects through which transport infrastructure development may have long-term and cumulative impacts are as follows: • Air quality trends and carrying capacity • Groundwater recharge areas and surface water drainage systems, • Seismic hazards and geo-structural sensitivity • Trends in land-use change, • Integrity of cultural heritage and landscape If the baseline is limited only to the present indicator-based conditions, it may be challenging for SEA to conduct a strategic analysis of cumulative and induced impacts. Therefore, at the scoping stage it would be appropriate to: • Adopt the concept of "Strategic Environmental System Baseline", • Include trend analysis and carrying capacity assessment, • Incorporate analysis of the Transport-Land Use-Environment nexus, • Include spatial sensitivity mapping as a key analytical area.	Since primary/secondary baseline surveys are not conducted continuously at many locations in Nepal, the regional data enviably reflects conditions at specific locations at a given point in time. At the MP stage, the project plan is limited to the concept and its alternatives. Based on the MP, detailed aspects such as structure, location, and alignment are then examined in the pre-FS or FS stages. Therefor during the SEA, the detail analysis is not included. The MP report and the SEA report will identify, as recommendations and implementation considerations, the surveys and analyses that need to be undertaken to overcome challenges toward realizing the MP.
3.	**Inclusion of social barriers and implementation risks.** In the Kathmandu Valley, previous infrastructure projects have often been obstructed or modified due to local public resistance, legal challenges, and social unacceptability. However, these	The comment is acknowledged and the importance of social acceptance and institutional capacity is recognized. At the Master Plan level, social risk is addressed preventively through screening out project/route selection affecting important cultural heritage sites at the alternative

S.No.	Comment from MOFE (22 February 2026)	Response from MOPIT/JET
	social and governance risks do not seem to be clearly included in: • Baseline conditions, and • Criteria for assessing strategic alternatives If the SEA does not consider social acceptance, institutional capacity, and implementation feasibility, there is a risk that the plan will be difficult to implement in practice. Hence, it is necessary to consider this aspect as a key scoping issue.	assessment stage. Regarding broader structural challenges, including multi-agency coordination, political interference, and institutional capacity constraints: it is recognized that these are systemic issues that cannot be resolved at the level of a Transport Master Plan alone, nor at the level of individual project implementation. These are external risks that lie outside the scope of what the MP and its SEA can be expected to address directly. Nevertheless, these risks will be explicitly acknowledged in the MP Report and SEA as contextual constraints on implementation. Within the bounds of what is feasible at the Master Plan level, the MP proposes measures to strengthen implementation conditions, including Cabinet approval of the Master Plan to secure cross-governmental commitment, and the establishment of an inter-agency implementation mechanism to facilitate coordination among relevant ministries and agencies. These measures represent the actions available to MOPIT at this planning level to improve the enabling environment for implementation. Detailed project-level safeguards, including grievance redress mechanisms and replacement cost-based compensation, will be addressed at the Feasibility Study stage under JICA's Guidelines for Environmental and Social Considerations.
4.	**Policy alignment with existing laws, policies, and other plans** The policy and planning coherence between the KVUTS Master Plan and sectoral policies or plans related to land use, local government authority, environment, heritage, roads, and other areas does not appear to have been adequately analyzed. At the scoping stage, it is necessary to explicitly include: • Policy and legal compatibility analysis, • Identification of regulatory conflicts, and • Institutional coordination constraints, to minimize policy inconsistencies during the implementation phase	We have added relevant higher-level policies and guidelines. **(Refer Section 2.2 Other Laws and Guidelines relevant to the Master Plan and SEA)** And also, we pointed out the potential conflicts of interest**.** **(Refer Section 6.3 Potential Conflicts of Interests)** We will address challenges to be overcome in realizing the MP and as aspects of the capacity of relevant organizations in the MP Report and SEA report.

Note: The section numbers listed in the response refer to chapters or sections of the Scoping Report for KVUTS MP.
Source: JICA Expert Team

3. Open forum and Feedback Sheet of 2nd SHM

Table3: Opinions and Suggestions provided verbally by the Participants of 2nd SHM

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOPIT/JET
1.	Department of Archaeology	・ Consideration of the Ancient Monuments Preservation Act (1956), UNESCO Conventions, and the Heritage Impact Assessment Procedure (2022), published by the Department of Archaeology (DoA) in coordination with UNESCO ・ Conduct a separate consultation with the Department of Archaeology to obtain information on the heritage and culturally significant sites of the Kathmandu Valley ・ Take into account the Monument Zones already designated for each heritage site in the Valley when finalizing the SEA and Master Plan (MP)	・ Information regarding UNESCO World Heritage sites is included in the Scoping Report. （**Refer Section 4.4.6 Cultural Heritage**） ・ Consultations were held with the Department of Archaeology, and concerns and related issues were shared. At the stage of project concretization for implementing the MP (e.g., pre-FS or FS), necessary measures and considerations will be examined and discussed in light of the relevant legislation; accordingly, in this MP's SEA, they will be organized as recommendations and advisory items.
2.	Department of Land Management	・ Extensive consultation with local inhabitants for sustainable and safe implementation of the projects proposed in the Master Plan ・ Inclusion of issues related to land acquisition, resettlement, and compensation in the SEA and MP to avoid social conflict among multiple stakeholders ・ Proper coordination with the Department of Land Management and Archives and the Department of Survey should be ensured to obtain information on land, to avoid conflicts during implementation, and to ensure accurate cost estimation ・ Review of Land Acquisition Act, 1977 ・ Master Plan should be based on factual findings, with projects proposed accordingly	In the SEA report, the challenges and recommendations for project implementation will be organized, including the importance of continuous stakeholder engagement, gaps between domestic laws and international standards regarding land acquisition and compensation, and the potential for conflicts among stakeholders.
3.	Ministry of Forests and Environment (MoFE)	・ The study team shall mention Environmental Systems and Trends of air and water qualities, hydrology, annual rainfall, groundwater recharge, runoff, flooding of the valley not only depict the present condition and baseline data ・ The study team shall maintain not only comprehensive information on forests but also detailed data on habitat continuity and the ecosystem to ensure a holistic understanding of environmental conditions	・ The SEA report will assess impacts qualitatively based on the collected secondary regional environmental and social baseline and expected project-related factors and will propose the framework/outline of typical mitigation measures. ・ This Master Plan primarily focuses on the urbanized areas of the Kathmandu Valley,

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOPIT/JET
		・ It is better not to finalize the infrastructure at this stage, and all options should be kept open ・ Even a physically sound project could not be implemented in Nepal due to court cases, social issues, and interventions from diplomatic commissions and embassies; thus, these issued and considerations should be taken into account ・ Even a technically sound project may not be implemented in Nepal due to court cases, social issues, and interventions from diplomatic missions; therefore, these issues and considerations should be taken into account ・ The Master Plan should be aligned with existing plans, policies, and programs, with its interrelations considered within the broader scope ・ MoFE is committed to providing full support to the JICA Study team in the preparation of the SEA Report	where pollution caused by transportation activities is particularly pronounced. The SE A Report recommends that, during the FS phase, detailed surveys be conducted in areas designated as requiring special consideration for ecosystems if project activities are proposed within those areas. ・ Furthermore, since this Master Plan stage does not finalize locations or structures, the Master Plan and SEA should state that these elements are subject to review based on future detailed surveys. ・ It is difficult to include specific court cases, social issues, and interventions by diplomatic missions in the Urban Transportation Master Plan, since these matters evolve over time ・ It will be formulated as a recommendation that consultations and coordination should continue at the pre-FS, FS, and subsequent stages.
4.	Central Department of Environment Science, Tribhuvan University.	・ The presented baseline data for assessing air quality in the Kathmandu Valley, namely PM2.5, PM10, and TSP, is not sufficient to evaluate the overall air quality status, and additional pollutants such as NOx, SOx, and CO should be included, as these gases are emitted more significantly by vehicles ・ Groundwater table status should be considered in the SEA study, as recharge areas may be affected by urban transport infrastructure ・ Consideration of Gender Equality, Disability, and Social Inclusion (GEDSI) aspects, rather than focusing only on Gender Equality and Social Inclusion (GESI) ・ Consideration of battery waste management generated from electric vehicles, as EV use is increasing in the Kathmandu Valley. ・ Provision of women-friendly, children-friendly, and disability-friendly structures and facilities in the Master Plan.	・ There are no information on pollutants such as NOx, SOx, and CO monitoring data. SEA report would recommend that it is required to monitor pollutant gas parameters during the Feasibility Study. ・ Regarding other parameters apart from particulate matter, there is no continuous monitoring data for pollutants such as NOx, SOx, and CO available from relevant secondary data sources. The SEA report recommends that monitoring of these gaseous pollutant parameters be carried out during the feasibility study ・ If a project proposal is anticipated to involve excavation work, the SEA report should also address the impact on the groundwater level.

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOPIT/JET
		・ Incorporation of information and key issues on urban flash flooding along riverbanks in the Kathmandu Valley, in view of the increasing impacts during the monsoon season and proposed river corridor projects ・ The three rural municipalities of Lalitpur District (Bagmati, Konjyoson, Mahankal) are not included in the scoping of the SEA study and should be considered in the context of the entire Kathmandu Valley (Same with Comment 28)	Where it is clear that a project will result in a reduction of exposed ground surface due to the expansion of the road network, the issue of a reduction in groundwater recharge areas should also be addressed as a potential concern. ・ In line with the current policy framework, the SEA report updates the term “Gender Equality and Social Inclusion (GESI)” to “Gender Equality, Disability, and Social Inclusion (GEDSI).” ・ Potential concerns regarding the disposal of electric vehicle (EV) batteries will be addressed as future challenges in the SEA report. ・ Regarding the development of structures and facilities for mass transit system that accommodate women, children, and persons with disabilities, organize these as recommendations during the feasibility study (FS) phase. ・ For assessment on river corridor projects, we will consider the monsoon season in the SEA report, such as by referring to historical data on flash floods in urban areas of the Kathmandu Valley, if any. ・ The development of the Urban Transportation System Master Plan is based on the future urban structure examined in KVDA MP. We believe that establishing a transportation system in accordance with this foundational plan will enable more effective traffic management. The survey area is identified at the beginning. (**Refer Section 1.3 Project Target Area)**

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOPIT/JET
5.	Federation of Nepalese National Transport Entrepreneurs	・ Transport entrepreneurs should be considered formal stakeholders of the SEA from the scoping stage ・ Proper efforts must be made to ensure the Master Plan is practical and implementable ・ Gaps between the actual implementation of issues and the issues presented in the scoping document shall be avoided ・ Ensure incorporation of route-based and operator-based transportation issues ・ Ensure integration of the existing transportation system and transport entrepreneurs with new systems, such as Bus Rapid Transit (BRT) or Mass Transit, while addressing all issues of operators ・ Clarify whether the implementation of the Master Plan is a one-time replacement or a phased transition of vehicles ・ Ensure the survival of small and medium transport entrepreneurs ・ The occupation of transport entrepreneurs must not be displaced ・ KVUTSMP will be sustainable only if the SEA considers transport entrepreneurs as solution partners rather than a problem	・ Federation of Nepalese National Transport Entrepreneurs, Kathmandu was invited to the SHM during draft scoping report stage. ・ We will identify challenges and recommendations for project implementation within the SEA report. ・ Mass transit route and system will be study alternatives ・ The implementation schedule for the master plan is outlined in the scoping report. The SEA report will include supplementary explanations to ensure clarity, if necessary. (**Refer Section 4.3.2 Implementation Schedule)** ・ In the Master Plan, “Public Transport Industry Reform” is identified as a key project, and the consolidation of the public transport sector is proposed. ・ The current fragmented market structure is a critical challenge in the public transport sector in the Kathmandu Valley. The objective is not to preserve the survival of small- and medium-sized transport operators in their existing form. Instead, a major consolidation into a limited number of operators, with block-based operational management, should be promoted. ・ At the same time, through this consolidation process, small- and medium-sized operators will be integrated into larger entities, ensuring their participation and securing their livelihoods. ・ One-time replacement will cause One-time scrapping and require huge investment. As the part of the modernization program, vehicle procurement plan is also proposed to establish

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOPIT/JET
			the reasonable renewal program. ・ At the MP stage, preliminary examinations and discussions on the business model associated with implementing public transport policies—such as the need for integration of bus operators and the impacts on the livelihoods of existing operators and service providers—are conducted through stakeholder meetings. Based on the outcomes of these discussions, they will be compiled as recommendations and considerations for future stages of project concretization.
6.	Solid Waste Management Association of Nepal	・ Solid waste management is a major issue in the Kathmandu Valley; therefore, the study team should integrate it into the Transportation Master Plan, including measures to address traffic congestion ・ Although reports in Nepal are usually well-prepared, many recommendations are challenging to implement, so the focus should remain on practicality ・ Address sustainable traffic management by proposing varied schedules for offices, schools, and other activities ・ The Ministry should ensure that SEA and Master Plan reports are accessible to all stakeholders. ・ The SEA and MP assessment team should develop a sustainable traffic management system for the Kathmandu Valley ・ Consideration of the entire Kathmandu Valley should be ensured in the Master Plan	・ Solid waste management issues are not so strong relationship to transportation out of the MP from transportation aspect. The KVUTMP does not address the waste management issue. ・ We will identify challenges and recommendations for project implementation within the SEA report and MP report ・ A dashboard will be developed as a website that consolidates information related to the MP, from which citizens and stakeholders will be able to access and obtain relevant information.
7.	Kathmandu-Terai/Madhesh Fast Track (Express Highway) Road Project, Nepal Army	・ In the southern Kathmandu Valley, the Kathmandu-Terai (Madhesh) Fast Track (KTFT), Expressway Road Project connecting Khokaha to Nijghad via Makawanpur, is expected to be operational in a few years, and the traffic generated by the highway should be considered in the MP ・ Consideration of traffic demand predictions at the starting point of the Kathmandu-Terai KTFT Expressway near Khokana, Lalitpur	・ Consultations regarding KTFT have been requested through MOPIT to the relevant KTFT agencies; however, approval for meetings has not yet been granted. The incorporation of these factors into the traffic demand forecast will be organized as a recommendation to be reflected in future updates. ・

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOPIT/JET
		・ Proper consideration of traffic management due to the ongoing and rapid traffic growth in southern Lalitpur District, namely the municipalities of Godawari, Lalitpur, Kirtipur, and Dakshinkali, resulting from the KTFT Expressway ・ Consideration of the traffic implications of the ongoing expansion of new link roads connecting the KTFT Expressway ・	

Note: The section numbers listed in the response refer to chapters or sections of the Scoping Report for KVUTS MP.
Source: JICA Expert Team

Table 4:Opinions and Suggestions Provided in Writing by the Participants of 3rd SHM

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
1.	Nepal Telecom	・ The draft scoping report covers all aspects of the problems and their potential solutions related to road transportation in the near future.	・ Thank you for sharing your thoughts with us. We will take them into consideration for future reference.
2.	Nepal Telecom	・ Very good session with masterplan	・ Thank you for sharing your thoughts with us. We will take them into consideration for future reference.
3.	Solid Waste Management Association of Nepal	・ In the overall context, it is fine. I will study it later and submit it	・ Thank you for sharing your thoughts with us. We will take them into consideration for future reference.
4.	Kathmandu Tarai Madhesh Fasttrack Road Project, Nepal Army	・ In the southern part of the Kathmandu Valley, the Expressway Road Project, KTFT, is expected to be completed within a few years to connect Khokana to Nijgadh via Makawanpur. On this foundation, Godawari, Lalitpur, Kirtipur, and Dakshinkali municipalities are experiencing rapid growth. However, the prediction of traffic demand (generation) does not account for the effects and outcomes of KTFT ・ Proper consideration of traffic due to the ongoing and rapid growth in southern Lalitpur District, namely the local levels of Godawari, Lalitpur, Kirtipur, and Dakshinkali, resulting from the KTFT Road project. New link roads to connect KTFT are also expanding. These issues should be considered in the SEA	・ Consultations regarding KTFT have been requested—through MOPIT—to the relevant KTFT agencies; however, approval for meetings has not yet been granted. The incorporation of these factors into the traffic demand forecast will be organized as a recommendation to be reflected in future updates.

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
5.	Department of Environment	Issues to be considered in the Scoping Document (project-based), regarding the construction or expansion of roads, as well as bridge construction ・ Operation of concrete and bitumen batching plant to control air pollution and excessive noise ・ Muck/ spoil disposal not to be carried out in sensitive/ prone areas ・ Ground water use and extraction ・ Excavation to be carried in dry seasons	・ In the SEA report, regarding potential environmental impacts, we will refer to Nepal's good practices and the ES framework developed by MOPIT's DOR to propose an environmental management plan that includes conservation measures to avoid, reduce, and minimize anticipated impacts.
6.	Madhyapur Thimi Municipality	・ It should not conflict with any prevailing laws or acts of Nepal, so that there will be no breaks during the implementation phase ・ There must be interaction between the concerned authorities and local people of the area where the plan will be implemented ・ When the plan is prepared and approved, it is very important to clearly define who will be responsible for each type of activity and when. If this is not done, the plan will remain only a master plan without any proper action. Therefore, the timeframe must be given priority	・ In reference to the suggestion and information from stakeholders, we will identify challenges and recommendations for project implementation in the SEA Report and MP Report, taking into account compliance with relevant laws and regulations and higher-level plans, the importance of dialogue and cooperation with relevant authorities and local residents, and the implementation framework.
7.	Tokha Municipality	・ The study team shall assess short term and long-term impacts of the projects ・ The study team shall further consider demand side management interventions for traffic management as alternative analysis ・ The study team shall assess social acceptance assessment of elevated highway in congested road, rivers corridor. Structure option 2 in page 39 looks very unfeasible. The river water way is already narrow; construction of pier for elevated highway hinders natural flow	・ The multiple components proposed at scoping stage are still under study. Their contents, including locations, are tentative and have not been finalized at this scoping stage. Further study will be conducted through careful discussions with relevant stakeholders, and the proposals will be updated in the draft SEA report and the draft Master Plan. ・ In the SEA report and the MP report, we will identify as specific concerns the fact that detailed surveys and analyses are necessary for the implementation of the project.
8.	Ministry of Water Supply	・ The impacts due to the implementation of this Masterplan on the water supply pipe network and sewer lines area should be considered in the scoping document. You can contact KUKL, PID office for more information	・ Potential impacts on existing infrastructure facilities have been identified in the scoping table. We will request any necessary information during the SEA preparation process. **(Refer Section 5.1.2 Scoping)**

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
			・
9.	Mahalaxmi Municipality	・ Decentralization of major crowded institution/ and other governmental/ business hubs outside of valley may halt flow of people towards Kathmandu. Can't we introduce Kathmandu valley just for tourist Centre and cannot we workout for shifting major business area/ hospital outside valley?	・ As this is a master plan for the urban transportation system, it is based on projected future land use and other factors. While information currently specified in the urban plan can be incorporated as given conditions, change of land use including traffic flows are not projected in cases where no specific autolyzed plan exists.
10.	Mechanical Engineer, Ministry of Industry, Commerce and Supplies	・ The study team may consider the report titled "Towards Clean Air in Nepal: Benefits, Pollution Sources, and Solutions," published by the World Bank, for the establishment of baseline information ・ Data on the number of vehicles in Kathmandu from the Department of Transport Management, as well as the Air Quality Management Guideline for the Kathmandu Valley, may be useful for the study team	・ Air quality data explained in the Towards Clean Air in Nepal: Benefits, Pollution Sources, and Solutions, 2025 World Bak, is referred to DoE's annual reports on Status of Air Quality in Nepal, 2021 and 2023. While, the air quality data explained in the draft scoping report is referred to DoE's annual reports on Status of Air Quality in Nepal, 2024, which is the latest version. ・ The air quality information and analysis in the suggested report, Towards Clean Air in Nepal: Benefits, Pollution Sources, and Solutions (World Bank), are based on the annual reports of the Department of Environment for the years 2021 and 2023. However, for the scoping report, JET has used the most recent air quality data from the Department of Environment's 2024 annual report **(Refer Section 4.2.1 Air Quality)** ・ According to the Annual Progress Report of the Department of Transport Management for the fiscal year 16 July 2024 to 16 July 2025, the total number of registered vehicles is available; however, the number of vehicles registered in the Kathmandu Valley is not available Air Quality Management Action Plan for Kathmandu Valley, 2020 has been included. (**Refer Section 2.1, Table 2.1.1: Constitution, Plan, Policies, Acts, Rules, and Standards**).

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
11.	Department of Road	・ The Draft Scoping Report and the Master Plan for Sustainable, Safe, and Inclusive Transportation in the vibrant and culturally rich Kathmandu Valley need to be submitted to the Council of Ministers for final approval, as specified in the Environment Protection Act, 2019. According to this SEA, JICA has incorporated measures to protect social and archaeological sites. However, although Schedule 15 of the Environment Protection Rules, 2020 outlines 13 criteria, the social aspect is not clearly reflected. Therefore, this aspect also needs to be explicitly included	・ The SEA implementation approach was discussed in advance within the TWG. To date, no Master Plans (MPs) formulated after the enactment of the legislation have undergone SEA in accordance with EPA 2019. In addition, procedures such as those for the Cabinet meeting have not been clearly defined in the EPA and EPR. For this project, the process is designed to meet the requirements by preparing both a Scoping Report and a SEA Report as stipulated in EPA 2019, conducting the SHM at the scoping stage (although EPA 2019 only requires it at the Draft SEA stage), and convening the TWG in place of a Cabinet meeting. ・ The 13 criteria set out in Schedule 15 of EPR 2020 are requirements for SEA. As the current document is a Scoping Report, it does not yet include all of these elements. In the SEA Report, additional explanations will be provided to clearly demonstrate how the contents satisfy the requirements of the Schedule.
12.	Chandragiri Municipality	・ What is your strategy and implementation plan, both during and after the completion of this Master Plan, to ensure that all public entities—such as metropolitan cities, municipalities, provincial governments, and central agencies (e.g., the Department of Roads, Kathmandu Valley Development Authority, etc.)—work toward the same objectives? How will you ensure that their ongoing and future projects do not conflict with or undermine the Master Plan? Additionally, what mechanisms will be established to enable effective inter-agency coordination and aligned budget allocation for infrastructure development in accordance with the Master Plan?	・ After the formulation of the MP, various challenges are anticipated for its implementation, including legal and institutional issues, financing and financial aspects, organizational and implementation arrangements, schedule management, stakeholder coordination and land acquisition. These challenges will be identified and organized in the MP report to support its realization.
13.	Department of Land Management	・ Land Acquisition and Resettlement: Careful attention must be given to the processes of land acquisition and resettlement to ensure that they are conducted in a fair,	・ Land acquisition and resettlement: The gaps between national laws and international standards (the JICA Environmental and Social Considerations Guidelines)

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
		transparent, and socially responsible manner. This includes assessing the potential impacts on affected communities, providing adequate compensation, minimizing displacement, and implementing measures that safeguard the livelihoods, rights, and well-being of those impacted by development projects under the Master Plan. ・ Reducing Social Conflict Among Multi-Stakeholders: A primary concern in implementing the Master Plan is how to prevent or mitigate social conflicts that may arise among diverse stakeholders, including local communities, government agencies, private developers, and civil society organizations. Effective strategies may include participatory planning, continuous stakeholder engagement, transparent decision-making processes, conflict resolution mechanisms, and ensuring that the interests and perspectives of all parties are adequately considered throughout the planning and implementation phases	will be identified, and measures to address any such gaps will be proposed in the SEA report. ・ Mitigation of social conflicts among diverse stakeholders: The SEA report will recommend continuous stakeholder engagement, including during subsequent studies following the MP, to support project implementation.
14.	Department of Archaeology	・ Regarding the aspect of cultural heritage, accepting Ancient Monument Protection Act, 1956, UNESCO Conventions about World Heritage sites and Department of Archaeology's procedure of Heritage Impact Assessment, 2021. I recommend to conduct a separate meeting with DoA.	・ Information regarding UNESCO World Heritage sites is included in the Scoping Report. （**Refer Section 4.4.6 Cultural Heritage**） Consultations were held with the Department of Archaeology, and concerns and related issues were shared. At the stage of project concretization for implementing the MP (e.g., pre-FS or FS), necessary measures and considerations will be examined and discussed in light of the relevant legislation; accordingly, in this MP's SEA, they will be organized as recommendations and advisory items.
15.	Department of Archaeology	・ Given the exceptional cultural significance of the Kathmandu Valley, it is strongly recommended that a Heritage Impact Assessment (HIA) be conducted for all proposed transport intersections located within or adjacent to declared heritage sites and their buffer zones	・ Same response with **Comment 14** above.

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
		・ The HIA should evaluate the potential impacts on both tangible and intangible heritage values, as well as on visual integrity and archaeological layers	
16.	Department of Mines and Geology	・ This project is very helpful for planning and policy level. For additional baseline information, details geology of Kathmandu valley should be included with the following investigation will be helpful for the proposed study of Master Plan, ・ Underground seepage and piping ・ Ground water condition of Kathmandu Valley, ・ Seismic hazard analysis, ・ Bearing capacity analysis, ・ Liquefaction analysis, ・ Subsidence analysis, ・ Flood hazard analysis, inundation, river bank cutting, ・ Active fault inside Kathmandu valley	・ The following Information on topography and geology has been compiled as a baseline based on publicly available data. - Engineering Geological and Environmental Map -liquefaction susceptibility map of the Kathmandu Valle **(Refer Section 4.3.4 Topography/Geology)** ・ Regarding Geography and Topography, secondary baseline data, which is Scoping report We will contact DMG regarding the existing geological data you mentioned, and we will incorporate it into the SEA report as soon as we receive it.
17.	Senior Program Manager, JICA	・ The land related issues should be resolved before planning and implementing the infrastructure projects. One example is to look into the Tinkune land issues as it might impacted the future implementation of the East-West mass transit route specially during the Feasibility Study phase. ・ Therefore, if possible, highlighting the land related issues is important so that alternative arrangement can be identified	・ The details of the transportation system presented during the scoping phase have not yet been fully discussed and/or evaluated, and the projects outlined in the master plan do not constitute a final determination of their locations or structures. The SEA report will organize the various alternatives under consideration, including project locations. Furthermore, after addressing issues related to project implementation, such as land acquisition, the report will present the plan deemed most appropriate at this stage.
18.	Federation of Nepalese National Transport	・ Recommend for unified transport management authority inside Kathmandu valley ・ Route digitization and as per passenger ratio route and vehicles type area recommended by government as per route	・ The transport management framework will also be examined within the Master Plan (MP). and make recommendations based on those discussions. ・ The introduction of digitalization is considered as one of MP's initiatives, and we are also compiling recommendations regarding related challenges and other issues.
19.	Federation of Nepalese	・ (1) How can the transport entrepreneurs be formally recognized as stakeholders in the early stage during	・ (1) Transport operators can be both project proponents that generate impacts through the introduction of new

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
	National Transport	the scoping of the SEA? How the gap between paper-based scoping and real operational experience can be reduced? How does the scoping include the different impacts based on route and operators? ・ (2) Operation stage and system transition- When a new system (CBRT/Mass Transit) is introduced, what is the modality to integrate the existing transport operators into the system? Is it a one-time replacement or a phased transition? What were the methods to be applied to ensure the existence of small and medium transport operators? The KVUTSMP will only be sustainable if transport operators are considered as partners in the solution, but not as a problem while moving ahead with the SEA	transport systems, while existing bus operators and similar entities become stakeholders that are affected by the implementation of such new systems. In the scoping process, the presence or absence of potential impacts is examined for each phase—pre-construction, construction, and operation. Even if perspectives differ, an impact is considered to be present if it is anticipated. ・ (2) At the Master Plan stage, a list of potential measures has been presented; however, issues of concern such as those mentioned are expected to be addressed in the feasibility study (FS) of the detailed projects. In the MP and SEA, these will be organized as challenges to be addressed for implementation.
20.	Kathmandu University	・ Master plan should incorporate Suryabinayak-Dhulikhel road expansion scenario, ・ In Draft Scoping Report, please mention EPR Regulation instead of Rules. ・ For public transport improvement incorporate Equity, Diversity, Social Inclusion (EDSI) intersectionality ・ In report, Solid Waste Management (SWM) generation data is mentioned only 235 tons/day. However, the report does not mention about Banchare Danda landfill site. ・ SEA must evaluate lighting and surveillance infrastructure required to make 24/7 public transport viable for women and all. ・ SEA must evaluate environmental cost of post disaster & debris management for elevated structure/ tunnel vs. surface level transit. ・ SEA should incorporate how sustainability can be achieved over time. ・ Focus on preventive measures before corrective measures. ・ Should be clear if the current Master Plan components are mathematically capable of realizing targets/ SDG or	・ In MP, JET utilized the population projection data prepared by National Statistical Office (NSO) in order to project the future urban population. For the daytime population, Household Interview Survey (2023) data prepared by this MP was utilized. Also, JET has considered Ishan Project, which is one of the large-scale new town projects proposed by KVDA. KVDA has shared names of five small- and large-scale new town projects which they are planning, but only Ishan Project has its expected population. JET has projected the population for Ishan Project in this MP by considering the migration within KV and from outside KV. ・ Similarly, the Node concept proposed in Comprehensive Physical Development Master Plan of Kathmandu Valley (KVDA MP), is considered. The sub city centers will be developed in Primary Node area which will be connected by node connecting roads. So, for the future urban structure, Node Concept of KVDA MP along with Ishan new town project is considered.

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
		they are merely incremental improvements on a failing system?	・ EPR : Environmental Protection "Rule" 2020 is correct instead "Regulation" ・ In line with the current policy framework, the SEA report updates the term "Gender Equality and Social Inclusion (GESI)" to "Gender Equality, Disability, and Social Inclusion (GEDSI)." Banchare danda landfill site (BDLS) is a sanitary landfill facility that commenced its operations on May 24, 2022 and serves as the disposal site for waste generated by 16 municipalities **(Refer Section 4.2.6, a. Kathamndu District)** Consideration has been given to improving convenience for women in public transportation. However, measures such as 24/7 availability depend on the operational conditions of the transit system; therefore, recommendations will be made in line with the MP proposals. ・ If long-term sustainability refers to the durability of structures, it will be incorporated into the economic evaluation (i.e., construction cost). If it is considered from the perspective of environmental impact, factors such as the clearing of forests associated with project implementation will be treated as comparative elements. ・ While scenarios incorporating multiple measures are envisaged, the SEA report will identify the optimal option based on multiple criteria, including not only economic efficiency but also environmental and technical aspects. In particular, since the definition of "environmental cost" is not clearly established, the economic assessment will generally be based on construction costs. ・ The objectives of the Project are to promote various project implementations based on the Master Plan in the Kathmandu Valley, and to support sustainable

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
			economic growth and reduced environmental burdens such as traffic congestion and air pollution. These objectives are to be achieved by: 1) developing a new urban transportation master plan; 2) identifying priority mass transit modes and routes; and 3) establishing a coordination mechanism among stakeholders to realize the master plan. (**Refer Section 1.2.1 Objectives of the project**)
21.	International Centre for Integrated Mountain Development	・ It would have been good to share the written report prior or even after the meeting for receiving real constructive feedback unrealistic to expect critical comments based on power point slides heard for the first time. The presentation to me sounded more like a baseline for IEE/ EIA rather than SEA. The presentation did not seem strategic nor does it elaborate the catchy slogan "Sustainable, safe and Inclusive Transport for a vibrant cultural Kathmandu Valley." Example: How will it be sustainable, safe, or inclusive etc. etc. needs wider and more inclusive consultation? ・ In addition, request to disclose previously completed Master Plan 1993, 2012, 2017 in public places for information dissemination and decision-making.	・ Since there were no clear guidelines regarding how to publicize the SEA scoping phase, we distributed a summary version in English and Nepali this time. ・ Based on feedback from Stakeholder, for the Draft SEA phase, we are considering not only providing advance notice through the SHM but also publishing the document on the MOPIT website. ・ Regarding the addition of the connection between the slogan and the MP, we will refine the wording and organize it within the MP report. ・ The Master Plan report prepared by JICA is available for viewing in the "Published Materials" section of the JICA website.
22.	Department of Plant Resources	・ During the past, when roads were expanding along the riverbanks, existing trees were fell down, which put birds, mongooses, and other animals at risk and reduced biodiversity. Therefore, this project shall consider these biological and ecological sensitivities and maintain greenery. ・ While maintaining greenery, endemic species will be given priority. ・ The project shall identify rare, endangered, and endemic species affected by the project and make necessary arrangements for their restoration. ・ Public toilets and water-feeding ponds for stray animals and birds shall also be built.	・ Depending on the location of the project, there is a possibility of impacts on water bodies; therefore, when specifically examining such projects, the project proponent will refer to Good practice in Nepal and the ES framework developed by MOPIT's DOR to propose an environmental management plan that avoids, reduces, and minimizes anticipated impacts.

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
23.	Kageshwori Manohara Municipality	・ The draft Scoping report should consider about the cultural and heritage area. ・ The draft Scoping report should consider preservation of environmental part at the time of construction, ・ The draft Scoping report should consider mass transportation system.	・ The Cultural heritage is selected in the Scoping Matrix. Impact are assessed and mitigation measures are proposed in the SEA report. (**Refer 5.1.2 Scoping and 5.1.3 TOR of Impact Assessment)** ・ In the SEA report, regarding potential environmental impacts, we will refer to Nepal's good practices and the ES framework developed by MOPIT's DOR to propose an environmental management plan that includes conservation measures to avoid, reduce, and minimize anticipated impacts. ・ Since the details of the public transportation system were not sufficiently examined during the scoping phase, we will discuss the impact assessment in the SEA report.
24.	Department of Forests and Soil Conservation	・ Ishan new town concept- better it was presented and paused with some facts and figures. ・ Isolating the Thamel zone as a car-free area could increase traffic on the roads linking the northern side of Kathmandu. Are there any alternatives? ・ Proposed structures at Bishnumati/ Dhobi khola requires the detailed hydrological data sets as well as an appropriate model that forecasts the hydrological conditions under different possible future scenarios. ・ The current transportation sector is profit-oriented and largely privately owned. It would be better to suggest or recommend a nonprofit-oriented public transportation system, keeping in mind the possible negative consequences.	・ The concept of Ishaan New Town has been examined under KVDAMP, and this study is based on those results. ・ Traffic in the Thamel area is assumed to be primarily local within the district; therefore, a dramatic increase in roads connecting the northern part of Kathmandu is not anticipated. However, by implementing traffic management measures (such as the introduction of signal systems) in conjunction with improvements to surrounding traffic flows, we aim to prevent the worsening of congestion. ・ When proposing projects involving river areas and/or river-crossing structures in the master plan list, the SEA report will recommend the need for detailed studies at the feasibility study (FS) stage, as well as the implementation of appropriate mitigation measures. ・ This master plan aims to ensure smooth traffic flow to alleviate chronic congestion and associated air pollution within the Kathmandu Valley, based on future

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
			land use plans, traffic volume and congestion surveys, and OD survey results, and is not intended for profit generation.
25.	Kathmandu Valley Water Supply Management Board	・ The Kathmandu Valley Water Supply Management Board's Capital Investment Assessment Management Plan for 2020–2050 was shared with this team, but it seems that none of the information has been used. The Master Plan covers 18 municipalities and could be of great help for KVUTSMP.	・ The Kathmandu Valley Water Supply Management Board's Capital Investment Assessment Management Plan for 2020–2050 has not yet been received from KVWSMB. JET will request the document during the preparation of the SEA report for the review of necessary information.
26.	Ministry of Women, Children and Senior Citizen	・ The second stakeholder Strategic Environment Assessment meeting is useful in providing a clear understanding of SEA.	・ Thank you for sharing your thoughts with us. We will take them into consideration for future reference.
27.	Ministry of Forests and Environment	・ The study team shall not only present the current environmental conditions and baseline data of the Kathmandu Valley. The team shall cover environmental systems and trends of air and water quality, hydrology, annual rainfall, groundwater recharge, runoff, and flooding further maintaining trends on habitat continuity and ecosystem conditions to ensure a holistic understanding of the valley's environmental status not just maintaining information on forests along with detailed data in the scoping report. ・ Do not frame the infrastructures at this stage; just keep the options open. ・ Identify the social protest, court cases, and governance failure as a scope. ・ Align the Master Plan with existing plan, policies, and laws. How this Master Plan interacts with other plan, policies, and laws? Consider this as a scope.	・ This study focuses on collecting information related to urban transportation systems within the study area. It does not aim to provide a comprehensive overview of other human activities or environmental trends. Furthermore, analyzing and understanding such trends would require a vast amount of continuous survey data collected across multiple locations over a wide area; however, sufficient survey data has not been accumulated in Nepal. ・ Discussions regarding the various components proposed in the MP are currently ongoing. Their details (including locations) are provisional and have not been finalized at this preliminary scoping stage. ・ When implementing the content formulated in the MP, if it is clearly attributable to social protests, litigation, or a lack of governance, these will be identified as challenges to implementation. ・ The Master Plan is designed to be consistent with existing plans, policies, and laws. Relevant plans and policies are identified within the report. This MP is being developed based on the land use trends future urban structutre examined in the KVDA MP.

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
28.	CDES, TU	・ The proposed elevated highways along the river corridors are not socially, aesthetically, and environmentally feasible. Rivers in the Kathmandu Valley are already heavily encroached upon, resulting in the narrowing of riverbeds and significant disturbance to their natural flow paths. Such encroachments have contributed to recurrent urban flash flooding in the Valley. Any further interventions of this nature would exacerbate river degradation and increase flood risks. ・ Historical data on urban flash flood occurrences in the Kathmandu Valley should be incorporated into the report, and future projections should be developed based on this analysis, as urban flooding poses significant disaster risks to road infrastructure. ・ Emissions of gaseous pollutants such as NO_x, SO_2, CO, and VOCs, along with particulate pollutants, should be included in the baseline emissions data. ・ Electric vehicles (EVs) are increasingly operating on roads in the Kathmandu Valley alongside petrol- and diesel-powered vehicles. In the near future, issues related to battery degradation, disposal, and associated pollutants are likely to emerge. Therefore, the estimation of battery-related pollutants and the development of appropriate management mechanisms should be addressed in the report. ・ The shrinkage of groundwater recharge areas due to the expansion of road networks should be incorporated into the assessment. ・ The potential impacts of the project on the underground water table should be explicitly evaluated and included in the report. ・ The Kathmandu Valley comprises 21 local levels, including 3 Rural Municipalities (RMs); however, the current plan covers only 18 local levels. In this context, it would be more appropriate to include the remaining 3	・ Same response with **Comment 4** above.

S.No.	Organization	Opinions and suggestion provided in written form	Response from MOPIT/JET
		RMs to ensure sustainable and inclusive transportation planning. ・ The document currently refers to Gender Equality and Social Inclusion (GESI), which should be updated to reflect the prevailing policy framework, namely Gender Equality, Disability, and Social Inclusion (GEDSI). ・ Provisions for women-, children-, and persons-with-disabilities-friendly infrastructure should be ensured at stations, during vehicle boarding, and within the vehicles themselves.	

Note: The section numbers listed in the response refer to chapters or sections of the Scoping Report for KVUTS MP.
Source: JICA Expert Team

Appendix 10: Response to comment on the Draft SEA Report

1. MOID

Table -1 Response to Comment from MOID on the Draft SEA Report

S.No.	Comment from MOID (21 August 2026)	Response from JICA Expert Team
1	It would be better to include an executive summary in both English and Nepali in the SEA Report. The summary should clearly present the key findings and overall essence of the SEA Report.	We distributed summaries of the Draft SEA Report in English and Nepali with the invitations to the third stakeholder meeting. We have successfully included a comprehensive executive summary in both English and Nepali as the introductory section of the main SEA Report (**Executive Summary E-1 to E-17**).
2	Chapter 2: it presents a list of plans, policies, Acts, regulations, rules, guidelines, and standards formulated and implemented by the Government of Nepal. However, the chapter primarily provides descriptions of the major legal and policy instruments, similar to the approach commonly adopted in project-level EIA reports in Nepal. For an SEA of a Master Plan, the chapter should go beyond merely listing the relevant legal and policy instruments. It should explain their relevance and significance to the Master Plan and identify the specific provisions, requirements, and potential legal or regulatory triggers that may apply to the implementation of the projects and interventions proposed under the Master Plan.	The legal and policy review in Chapter 2 has been undertaken with consideration of the nature, scope, and significance of the KVUTSMP. The relevant legal and policy instruments have been reviewed and presented based on their applicability and relevance to the Master Plan, including key provisions and requirements that may have implications for the implementation of the proposed projects and interventions. Moreover, relevant laws and regulatory provisions enacted at the local level within the Kathmandu Valley have also been reviewed and incorporated. Thus, the chapter has been structured to provide a contextual understanding of the applicable legal and policy framework, rather than serving solely as a list of instruments.
3	Chapter 2: The recent National Transport Policy, 2026, and Nepal Road Standard, 2070 should be reviewed and included in the Legal section of the report.	The National Transport Policy, 2026 and Nepal Road Standard, 2070 have been reviewed and incorporated into Chapter 2: Legal, Policy, and Institutional Framework, as suggested.
4	Chapter 2: The latest provisions specified in the amended Acts, Rules, and Regulations need to be reviewed and incorporated into the SEA Report, wherever necessary.	The latest provisions of the amended Acts, Rules, and Regulations have been reviewed and incorporated into Chapter 2: Legal, Policy, and Institutional Framework, as necessary. In particular, recently updated instruments, including the National Transport Policy 2026, and relevant local-level laws, have been considered and incorporated.
5	Chapter 2: The chapter should strategies level suggestions highlighting the applicable institutional responsibilities, approval requirements, environmental and social safeguards, and potential areas of legal or policy conflict that may arise during implementation.	The key point is that a proper implementation system for the EMOP and EMP is necessary to implement the projects in the Master Plan while addressing environmental and social issues. A proposed implementation framework is presented in Chapter 11 of SEA report. Section 12.3 also

S.No.	Comment from MOID (21 August 2026)	Response from JICA Expert Team
		analyzes potential policy and legal conflicts, such as the overlapping jurisdictions of federal, provincial, and local authorities under the Federal Capital City Public Transport Authority (FCCPTA) Act, and the overlapping mandates and institutional coordination challenges between KVDA and municipalities. To resolve these conflicts during implementation, we propose establishing a multi-tier Inter-Agency Coordination Committee and Technical Working Groups (TWG), building on the successful model used in this SEA study.
6	In Chapter 7, the impacts and mitigation measures presented in Table 7.1-1 for the pre-construction and construction stages appear to be predominantly project-level measures. The identification of the contractor as the agency responsible at this stage is therefore not appropriate for an SEA, as the specific contractors, contractual arrangements, and implementation responsibilities will only be determined during subsequent project preparation and procurement. Similarly, the use of "TBD" in the Cost column is not particularly meaningful at the strategic level. This approach is more consistent with the conventional methodology adopted in project-level EIA reports in Nepal than with the strategic nature of an SEA.	The objective of the Strategic Environmental Assessment (SEA) is to incorporate environmental and social considerations into the decision-making process at the policy, plan, and program levels at an early stage, to avoid and minimize significant environmental and social impacts through the examination of alternatives, to promote sustainable development, and to enhance the quality of subsequent Environmental Impact Assessments (EIAs). Table 7.1-1 (ESMP) and Table 7.2-1 (ESMoP) serve as general strategic guidelines rather than project-specific directives, since most projects proposed in the MP are conventional road and transport infrastructure projects intended to reduce congestion. In accordance with the objectives of the SEA mentioned above, in Section 7.1, we have added a note stating that these tables serve as a kind of "framework" to ensure that key issues are not overlooked when conducting future detailed ESIA/IEE studies in the Kathmandu Valley. The 'TBD' cost entries and 'Contractor' responsibility entries indicate matters to be specified and enforced by the project proponent at the project-preparation and procurement stages. Because the format of Table 7.1-1 is used for JICA projects in accordance with the JICA Guidelines for Environmental and Social Considerations, the columns for responsible organization and cost have been retained, although specific agencies and values cannot yet be identified..
7	For an SEA of a Master Plan, Chapter 7 should instead focus on strategic environmental considerations and requirements that need to be	Table 7.2-1 proposes the general/typical Environmental and Social Monitoring Plan (ESMoP) for mitigating the negative impact. ESMoP

S.No.	Comment from MOID (21 August 2026)	Response from JICA Expert Team
	incorporated into the planning, design, preparation, procurement, and implementation of each project proposed under the Master Plan. The SEA should identify the key environmental and social risks associated with different types of proposed projects and provide strategic-level avoidance, minimization, and mitigation, enhancement, and management measures. It should also establish the environmental conditions, standards, safeguards, and project-level assessment requirements that should be followed during subsequent project preparation. In this regard, Tables 7.2-1 to 7.2-4 also appear to present scenarios and assessments more appropriate to project-level EIA. These tables should be reviewed and, where necessary, reframed to demonstrate the strategic implications, cumulative effects, alternatives, and long-term environmental and social consequences of the different Master Plan scenarios.	shall be studied further during the Feasibility Study and EIA studies in the following phases. Since the expected projects, such as road widening, bridge construction, underground tunnels, and river corridor development, are considered general road projects, the monitoring items listed in Table 7.2-1 are intended to cover all these types of projects. We had inserted one column which is the road structure type to identify the typical impact depending on the project structure type. Tables 7.2-2, 7.2-3, and 7.2-4 introduce the specific description, and technical details, of monitoring measures, including the parameters to be measured, location of monitoring and methods for the baseline, compliance and impact monitoring, which are based on the Environmental and Social Management Framework (ESMF 2023) of the Department of Roads, MOID. These tables provide typical monitoring matrices for reference during feasibility studies in Nepal.
8	The SEA should also establish a strategic environmental monitoring and compliance framework covering the project preparation and procurement stages. Monitoring and review requirements should commence prior to contract award and during the preparation of tender and bidding documents, so that relevant environmental and social safeguard requirements, mitigation measures, environmental specifications, and monitoring obligations are appropriately incorporated into the bidding documents and subsequent contracts for each project. The framework should also establish a mechanism for verifying compliance during the bidding/e-bidding, contract award, construction, and operation stages. This would help ensure that environmental and social safeguard requirements are clearly defined before procurement, consistently applied during project implementation, and appropriately reflected in contractual obligations. Such an approach would also promote transparent and competitive procurement while strengthening environmental performance and the overall sustainability of project implementation.	Compliance with procurement regulations is considered less an environmental or social issue and more a matter of ensuring the proper implementation of the master plan and the road project proposed under it. Therefore, it is not addressed in the SEA report in accordance with the objectives of the SEA. On the other hand, we place great importance on complying with environmental standards and other regulations by properly implementing the environmental and social management plan and carrying out monitoring activities.
9	The SEA should provide clear, practical, and enforceable strategic	We have compiled the key environmental and social challenges,

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	recommendations to ensure that implementation of the Master Plan contributes to the protection of cultural integrity, preservation of cultural and natural heritage, social harmony and inclusion, environmental sustainability, climate resilience, and long-term livability of the Kathmandu Valley.	together with proposed countermeasures, as well as other challenges currently faced in the implementation of implementation of the Master Plan and subsequent projects. Chapter 14, "Conclusions and Recommendations," highlights the key environmental and social risks and opportunities identified in the SEA Report: Climate Change & Air Quality, Cultural Heritage Safeguards, Land Acquisition and Resettlement Risks, Social Vulnerability and GEDSI, Urban Flooding & Hydrology, and Construction in Narrow Streets. These items were selected based on the level of stakeholder concern and the potential magnitude of their impact. Chapter 14 also presents the major issues and proposed countermeasures and recommends that subsequent Environmental Impact Assessments (EIAs) conduct more detailed studies of these issues.
10	Chapter 4.3.3: The available hydrological data have been presented only as recorded gauge height data, without any assessment. Hence, a brief hydrological assessment based on the available data should be included in the SEA Report. Recent flood events within the Kathmandu Valley, particularly along the proposed road corridors, have not been adequately reflected in the baseline assessment. Furthermore, a flood risk assessment of the river corridors has not been carried out based on the available hydrological data. Given that various projects are proposed along these river corridors, a comprehensive flood analysis should be incorporated into the baseline assessment, as previously requested in the Scoping Report. JICA Expert Team should give due consideration to this request and incorporate the relevant flood-related information and analysis into the SEA Report.	The recent flood event of October 2025 has been presented in Section 4.6.4. Moreover, the following information regarding flood events has already been presented. "The preliminary loss and damage assessment of the September 2024 floods and landslides" has already been presented in Section 4.5.2. Additionally, the Draft SEA report classifies and organizes localized flood and natural disaster risks in the Kathmandu Valley in detail, combining hydrological monitoring data (4.3.3), past liquefaction and landslide hazard maps (4.3.4), and specific inundation-damaged areas from recent major flash floods (4.6.4) Hydrological Characteristics (Section 4.3.3): The hydrological characteristics of major rivers in the Kathmandu Basin are summarized. River levels rise significantly during the monsoon season and increasing impervious surfaces due to urbanization have increased stormwater runoff, resulting in a high risk of flash floods. Natural Hazard Risks (Section 4.3.4): Key risks include earthquake-induced liquefaction, landslides, and riverbank erosion. Thimi and Gongabu are identified as areas with high liquefaction risk, while Sankhu, Thankot, and Lele are prone to landslides. Riverbank erosion and sedimentation along the Bagmati and Manohara Rivers may also

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		increase downstream flood risks. Flood Risk under Climate Change (Section 4.6.4): Flood risks are assessed considering increasingly intense rainfall associated with climate change. Low-lying and riverside areas in Kathmandu, Lalitpur, and Bhaktapur are particularly vulnerable, with urbanization and inadequate drainage contributing to increased flood impacts. Since several proposed projects are located along rivers, potential flood-related risks need to be considered. Chapter 14 therefore highlights the need to address flood-related issues in the subsequent stages of project planning. At the Master Plan stage, the exact locations and detailed structures of individual projects have not yet been determined. These details will be examined and designed at the FS stage based on the geological and hydrological conditions of each project area, using both primary and secondary data. As a basic requirement at this stage, potential impacts related to water, including flooding, need to be considered. Therefore, this SEA identifies the potential risks and summarizes the necessary mitigation measures and additional studies that should be considered at the FS stage. At present, sufficient regional data on hydrology, surface conditions, topography, and geology are not available to conduct a detailed assessment of potential hazards across the entire study area. Therefore, detailed hazard assessment and site-specific countermeasures should be further examined during the FS stage.
11	During the 3rd SHM, a representative from the Nepal Police, Women, Children and Senior Citizen Service Directorate stated that data on the nature and number of harassment cases in the transport sector are available. It would therefore be appropriate to contact the representative concerned and incorporate the relevant data and details into the SEA Report.	The information has been incorporated in Chapter 4.4.4, mentioning that during the last fiscal year, 2,153 persons were detained and subjected to legal proceedings for using abusive language and harassing women on public transport.
12	Extensive consultations, including FGDs and KIIs, were conducted with various stakeholders during the Scoping Phase; however, apart from the TWG3 and SHM meetings, no further consultations were conducted	In the process of this SEA, focus group discussions (FGDs) and key informant interviews (KIIs) were used to collect information and feedback from individuals and small, identified stakeholder groups. They were

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	during the SEA study phase. The reasons for not conducting additional stakeholder consultations should be clarified, particularly considering the need for continued stakeholder engagement throughout the SEA process.	conducted as needed throughout the SEA process and were not required at predetermined stages, such as the scoping stage or the draft SEA stage. In the case of this SEA, as additional engagement for in-depth assessment, we focused on the GEDSI-related matters in the transport sector in Kathmandu Valley. In this case, since we had sufficient time to discuss the SEA procedures, we had already conducted the necessary FGDs and KIIs prior to the scoping meeting.
13	It would be better to include the details and documentation of the Third SHM in the Appendix of the SEA Report for reference and completeness.	The details and documentation of the third SHM were included in **Appendix 3** of the SEA Report.
14	It would be better to address the comments and suggestions received from the participants of 3rd Technical Working Group-3 (Environment) and the 3rd Stakeholder Meeting (Third SHM) into the report.	The detailed comments on the Draft SEA report from the participants of 3rd Technical Working Group-3 (Environment) and the third SHM and the corresponding responses were included in Appendix 10 of the SEA Report.
15	During the 3rd SHM, a representative from the Nepal Police, Women, Children and Senior Citizen Service Directorate stated that data on the nature and number of harassment cases in the transport sector are available. It would therefore be appropriate to consult the representative concerned and obtain this data, along with relevant details and analysis, for incorporation into the SEA Report.	This comment duplicates S.No. 11 and is addressed in response to S.No. 11.
16	It would be better to present the recent air quality status (2025) at the established monitoring stations in the Kathmandu Valley, along with a comparative analysis with the previous year (2024), in the report.	The baseline data and comparative assessment of ambient air quality for 2024 and 2025, based on the annual reports published by the Department of Environment, have been presented in Section 4.2.1.
17	Please correct the grammatical errors throughout the SEA Report through a thorough page-by-page review and revision. SEA	The grammatical errors throughout the SEA Report have been addressed through a thorough page-by-page review and revision.

Source: JICA Expert Team

2. Technical Working Group 3(Environment) (21 July 2026)

Table-2 Response to Comment from Technical Working Group 3 (environment) on the Draft SEA Report

S.No.	Name and Organization	Comment from Technical Working Group 3 (environment) (21 July 2026)	Response from MoID/ JICA Expert Team
1.	Secretary, Infrastructure Work and Transport Division	・ The introduction of a mass transit system is expected to result in a modal shift, with smaller public transport vehicles being replaced by larger-capacity vehicles. In this regard, social safeguards should be considered, as the reduction in small public transport modes, such as microbuses and tempos, etc., may reduce employment opportunities in the public transport sector and potentially leave many people unemployed. Therefore, as this is an important socioeconomic issue, the SEA should adequately consider, assess, and address its potential impacts and propose appropriate mitigation measures.	・ We have already noticed that the relationship between the modal shift and employment opportunities is a key challenge identified in Chapter 14. (Table 14.2-1 Key challenges and proposed countermeasures, 'Operator Resistance'). To protect the livelihoods of existing transport workers, the Master Plan proposes a 'Step-wise Control Scenario' (Table 3.5.4, Scenario 3) and a phased transition model (Figure 3.5.23 exclusive operations by urban blocks). This model supports the gradual integration of self-employed drivers and small operators into newly established larger bus cooperatives/companies, preventing sudden unemployment and creating formalized, safer employment opportunities in modern bus transit operation and fleet maintenance. We highlighted these concerns and countermeasures during the 3rd SHM.

S.No.	Name and Organization	Comment from Technical Working Group 3 (environment) (21 July 2026)	Response from MoID/ JICA Expert Team
2.	Environment Inspector, Department of Roads	・ The Master Plan appears to focus primarily on road development projects such as road bridge, tunnel, car parking, river corridor etc. Therefore, a range of strategic transportation alternatives, including options beyond road-based transport, should also be identified, assessed, and considered. ・ The basic sequence of the SEA process is to identify the sub-projects, identify the key issues and scope of the sub-projects, identify the activities, assess the potential impacts, and propose mitigation measures. Moreover, a major component of the SEA process is the assessment of strategic alternatives. Therefore, it should be clarified whether strategic alternatives for other transport options have been adequately assessed before proposing road projects.	・ Strategic Alternatives: Section 3.6 of the SEA Report presents the strategic alternatives analysis, by comparing three development scenarios, including the “Without Option” (doing nothing) scenario. Scenario 1: Comprehensive Mass Transit Network Scenario Scenario 2: Road-Oriented Improvement Scenario Scenario 3: Integrated Transport Strategy Scenario The scenarios were assessed from environmental, social, technical, economic, and financial perspectives As a result, Scenario 3 was selected, and several road improvement projects, including a mass transit system connecting the east and west areas, were identified as priority projects. ・ As shown in Sections 3.5 of SEA Report, the Master Plan proposes several road improvement projects, as well as public transport improvement projects and the introduction of East-West mass transit system.
		・ The rationale for selecting only the Ratnapark–Bhaktapur East–West Corridor (approximately 14.6 km) for the development of a mass transit system should be clearly explained. Other potential mass transit corridors and routes should also be identified, proposed, and comparatively assessed to determine their suitability for mass transit development. The Plan should prioritize this route while also considering other routes, such as Budhanilkantha-Godawari and Nagdhunga-Bhaktapur	・ Route Selection of Mass transit: Section 3.5.1.3 describes the details of key points to select the route at master plan stage, as follows. The introduction of mass transit in the Kathmandu Valley has been continuously considered since previous studies. The 2017 MP proposed two AGT and two BRT lines, followed by a review of five MRT routes, with Option 4 recommended as the highest priority. The 2019 JICA study reaffirmed the need for urban railways. Traffic demand forecasts identified the east–west corridor between Kathmandu and Bhaktapur as having the highest passenger demand, due to its concentration of residential, commercial, educational, and government facilities and its role as a major urban development axis. As further road widening is constrained by dense urbanization and congestion is expected to worsen, a high-capacity mass transit system along this corridor was prioritized.

S.No.	Name and Organization	Comment from Technical Working Group 3 (environment) (21 July 2026)	Response from MoID/ JICA Expert Team
		・ Nepal is a party to the Paris Agreement, adopted in 2015 under the United Nations Framework Convention on Climate Change (UNFCCC), and has committed to reducing greenhouse gas emissions and enhancing climate resilience through its Nationally Determined Contributions (NDCs). While Nepal has set 2045 as a national target year for carbon emission reduction, the presentation refers to 2050. Therefore, CO_2 emission reductions should also be calculated up to 2045, considering the implementation of sub-projects under this SEA, in accordance with Nepal's National climate commitments.	・ The SEA was conducted to support the preparation of the Master Plan (MP). Therefore, the assessment in this SEA and discussion are based on the target year (long-term target year: 2050) of the KVUTS MP. The target year of the Master Plan was determined by the TWG and JCC established for this project.
		・ The scoping matrix should clearly present all 30 environmental and social items evaluated under the section "Scoping of Key Environmental and Social Issues. The contents of the scoping matrix, including the potential consequences and corresponding mitigation measures, should also be clearly presented.	・ All 30 environmental and social impact items to be evaluated are shown in Table 5.1-1 Preliminary Scoping Matrix and Table 6.1-2 Result of Environmental and Social Impact assessment. The potential consequences and proposed corresponding mitigation measures are shown in Table 7.1-1.
		・ The impact assessment focuses on CO_2 emission reduction and the Heritage Impact Assessment (HIA). However, as the master plan proposes projects along the river corridor, these projects are likely to be particularly favorable for vulnerable communities. Therefore, a Vulnerable Community Development Plan should be considered for the affected vulnerable communities, while an Indigenous Peoples Development Plan (IPDP) covering the Kathmandu Valley should also be considered, as applicable.	・ Regarding indigenous peoples, secondary socio-economic baseline data (Section 4.4.1) indicates that since the Kathmandu Valley has been the capital city of Nepal, many people from different parts of the country have migrated there, and more than 131 ethnic and caste groups now reside across different parts of the valley ・ In the preliminary environmental impact assessment in SEA, the impact on "ethnic minorities and indigenous peoples" has been rated as "B-: Some negative impacts are expected" or "C: The extent of the impact is unknown (further consideration is needed, and the impact may become clear as the investigation progresses)." Since sufficient data is not available, it is necessary to conduct appropriate surveys of the affected residents to accurately assess the situation. (Table 6.1-2 and Table7.1-1)

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			・ Vulnerable groups : Based on the secondary data, In the environmental impact assessment in the Report, the impact on "Vulnerable group" has been rated as "B+/- "The project may bring positive impact on local economy through construction activities and rural development. Some poor groups may be negatively affected by the project if their properties are acquired and/or their livelihood is lost by the project. ・ The proposed mitigation measures include the preparation of an appropriate RAP, including a Livelihood Restoration Program (LRP), consistent with national and development partners' policies ・ (Table 6.1-2 and Table7.1-1)
		・ Intangible Cultural Heritage, including traditional feasts, festivals, rituals, and other living cultural traditions and practices, should also be identified, assessed, and appropriately considered in the SEA	・ Intangible Heritage: Section 4.4.5 documents living heritage (Jatras, rituals), and Table 7.1-1 includes measures to protect traditional procession routes. Since SEA serves to provide advance consideration regarding matters that should be considered during the project implementation phase, this SEA highlights the importance of considering not only the numerous cultural properties designated by UNESCO in the Kathmandu Valley but also the local people's way of life.
		・ The SEA should identify and flag potential cumulative impacts arising from the implementation of multiple projects and interventions under the Master Plan. This is particularly relevant where multiple transport projects may collectively affect air quality, GHG emissions, traffic, water resources, land use, biodiversity, cultural heritage, and communities.	・ One of the key characteristics of the Master Plan (MP) is that its proposed interventions will be implemented progressively across the Kathmandu Valley in short-, medium-, and long-term phases. Therefore, the environmental and social impacts are also expected to emerge gradually as individual projects are implemented over time. As noted in Chapter 14, however, there is currently a lack of continuous and comprehensive baseline data covering the entire study area. This limitation makes it difficult to quantitatively predict and assess the combined or cumulative impacts of all sub-projects in a fully integrated

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			manner. Under these circumstances, the assessment therefore focuses on impacts that can be reasonably examined based on the information currently available. In particular, trends in traffic volumes and the road sections where congestion is expected to improve are relatively well identified. Accordingly, the potential impact on CO_2 emissions reduction has been presented as a representative indicator of the broader regional environmental effects of the Master Plan. The above was added to Chapter 6 of the SEA report.
		・ The publication of the SEA Notice in the national daily newspaper and the disclosure of the SEA Report should be carried out on the website after the Third Stakeholder Meeting to ensure that stakeholders have a clear understanding of the report.	・ Public Notice and Public Disclosure: The suggestion is duly noted and agreed**.** During the 3rd SHM, we explained that a public notice regarding the disclosure of the draft SEA report would be published in national newspapers after 3rd SHM and the draft SEA report would be publicly disclosed for one month on MOID website to collect final feedback on the Draft SEA Report. This public disclosure process was agreed in the - 3rd TWG3 meeting before 3rd SHM.
3.	Senior Divisional Chemist, Department of Environment	・ Air quality can be improved through the adoption of alternative transportation technologies and cleaner energy sources. Greenhouse gas (GHG) emissions can be reduced by adopting higher Euro emission standards for vehicles, improving fuel efficiency, promoting the use of electric vehicles (EVs), and reducing dependence on fossil fuels.	・ This Master Plan focuses primarily on improvements to the urban transportation system. The SEA explains that CO_2 emissions are expected to be reduced through the implementation of the Master Plan, as discussed in Section 6.1.1, and this effect has been considered in the evaluation of the Master Plan ・ It is generally recognized that air quality benefits would be further enhanced through complementary measures, such as the introduction of electric vehicles and the use of higher-quality fuels. As these measures are not proposed under this Master Plan, they have not been considered in the SEA assessment.

S.No.	Name and Organization	Comment from Technical Working Group 3 (environment) (21 July 2026)	Response from MoID/ JICA Expert Team
4.	Environment Inspector, Ministry of Infrastructure Development	・ The projects and interventions proposed in the Master Plan should be clearly defined and supported by adequate analysis and assessment. There should not be any uncertainty regarding the projects proposed in the Master Plan Accordingly, tentative terms such as “may” and “might” should be avoided wherever the project scope and interventions have already been determined; instead, clear and definitive language should be used, such as “will be,” as appropriate.	・ The Master Plan (MP), as described in Chapter 3, has been developed based on projected future population and development, the development direction of the KVMDP-MP, identified residential development areas, current traffic conditions, and future traffic demand. Based on these factors, major traffic bottlenecks have been identified, and improvement projects have been proposed. The MP represents the most appropriate planning scenario based on the information and trends available at the time of planning. However, it should be noted that the MP also contains inherent uncertainties, as it considers short-, medium-, and long-term development over several decades and does not yet establish the exact locations or detailed designs of individual projects based on detailed site investigations. Therefore, the future conditions and potential impacts presented in the SEA should be understood as projections based on the current planning assumptions, rather than definitive outcomes. The wording has therefore been kept appropriately cautious where the level of certainty does not allow a definitive statement.
		・ Furthermore, the SEA should not rely solely on assumptions when assessing potential impacts. Detailed assessment should be undertaken regarding landscape impacts, terrain and gradient conditions, urban flooding, and changes in surface runoff resulting from increased built-up areas within Kathmandu Valley. These issues should be assessed at an appropriate strategic level, considering the cumulative and long-term impacts of the proposed interventions. ・	・ As noted in Chapter 14, one of the key challenges is the limited availability of continuous and comprehensive baseline data covering the entire study area. Therefore, there are certain limitations in quantitatively predicting and assessing the combined and cumulative impacts of all sub-projects. Therefore, based on the data reasonably available at the Master Plan stage and general project information, the major potential adverse impacts were assessed qualitatively. Based on this assessment, key issues requiring further consideration at the FS stage were identified from a strategic perspective. The minimum surveys and investigations

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			considered necessary for the next stage were also organized accordingly.
		・ In addition, the proposed car-free hubs and zones should be supported by proper studies and assessments of their potential impacts on tourist movement and visitor flows in major tourist and cultural areas. There have been concerns regarding reduced tourist flows following the implementation of car-free zones in some key tourist areas of Kathmandu, such as Basantapur. Therefore, merely proposing car-free hubs or zones in the Master Plan is not sufficient. Their potential impacts on tourism, local businesses, accessibility, cultural heritage, pedestrian movement, and surrounding communities should be properly studied, assessed, and analyzed before finalizing the proposed interventions.	・ The Kathmandu Valley Urban transport Master Plan (MP) was developed based on analyses of future population and urban growth, current traffic conditions, and future travel demand to identify major congestion bottlenecks and prioritize improvement projects. Concerns about vehicle-free zones in areas such as Basantapur may reflect insufficient supporting measures, such as alternative access, public transport connections and additional parking area near vehicle-free zone, indicating that a single intervention alone may not be effective. Therefore, MP implementation should be guided by continuous assessment of impacts on tourism, local businesses, cultural heritage, and accessibility from short-, medium-, and long-term perspectives.
		・ The publication of the SEA Notice and disclosure of the SEA Report on the website shall be carried out after the Third SHM to avoid confusion among stakeholders when submitting comments.	・ Public Notice and Public Disclosure: During 3rdSHM, we had explained that a public notice regarding the disclosure of the draft SEA report would be published in national newspapers after 3rd SHM and the draft SEA report would be public disclosed for one month on MOID website to collect feedback on the Draft SEA Report.
5.	Scientific Officer, Ministry of Agriculture, Forests and Environment	・ No potential social acceptance or social resistance-related challenges have been identified in the SEA of the Master Plan. However, such challenges should be adequately considered, particularly in view of the past obstruction of several road projects by local communities and landowners. ・ There are historical cases in which road projects have faced significant obstruction due to social resistance and the unwillingness of landowners to provide land, such as the Pepsi Cola–Sallaghari Road. This has been a major	・ Chapter 8 of the report focuses on the challenges and implementation guidelines for land acquisition and resettlement associated with the Kathmandu Valley Urban Transport Master Plan. These critical challenges are also highlighted in Section 14.1.2.3. To conduct the consultation with affected households, It is important to prepare the Resettlement Action Plan (RAP), which harmonizes Nepal's domestic laws with international safeguard standards, including Livelihood Rehabilitation Plan (LRP) based on thorough surveys, establishing a Grievance Redress

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		challenge in road construction and infrastructure development.	Committee (GRC) to ensure transparency, alongside continuous monitoring by external third-party agencies are important.
		・ In addition, conflicts may arise between different policies and legal provisions, while local-level laws and regulations may also vary. Therefore, the SEA should clearly assess how the Master Plan will interact with and be coordinated with existing national policies, sectoral policies, and local-level laws and regulations.	・ In section 12.3 of SEA report, we mentioned the potential conflict and interests. We addressed potential policy and legal conflicts, such as the overlapping jurisdictions of federal, provincial, and local authorities under the Urban Area Public Transport (Management) Authority Act, 2022 and the overlapping mandates and institutional coordination challenges between KVDA and municipalities. To resolve these conflicts during implementation, we propose establishing a multi-tier Inter-Agency Coordination Committee and Technical Working Groups (TWG), building on the successful model used in this SEA study.
		・ It would be preferable to provide the Draft SEA Report to relevant stakeholders and concerned authorities for their review and comments. Based on the experience of MoAFE, stakeholders may be less likely to provide detailed comments on a report merely published through a newspaper notice. Therefore, the Draft SEA Report should be formally circulated to concerned authorities and key stakeholders, with a clear mechanism for soliciting and incorporating their comments and suggestions.	・ Discussions regarding the procedures for the Environmental and Social Impact Assessment (SEA) of the KVUTS-MP were held during the 1st SHM and the 1st TWG3 meeting. It was concluded that the SEA for the KVUTS-MP would be conducted in accordance with the “JICA Environmental and Social Considerations Guidelines (2022)” and would also be consistent with the spirit of Environmental Protection Act in Nepal. Therefore, in accordance with the public notice and information disclosure procedures outlined in EPR2020, we will conduct a 30-day public consultation via the web. The team did not identify additional procedural requirements in the cited provisions of the EPA/EPR. ・ In addition to gathering comments during the public disclosure period as required by the EPA and EPR, we held three stakeholder meetings to gather stakeholder input throughout the entire SEA process. We have invited a diverse range of stakeholders representing various ministries, commissions, departments, local governments, and relevant academic institutions to these meetings, and

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			we are making every effort to gather feedback through PowerPoint presentations, Q&A sessions, and post-meeting feedback forms.
		・ The current SEA report appears to be a fusion of SEA and project-level EIA. Therefore, the SEA should clearly define its strategic scope and focus on policies, plans, programmes, alternatives, cumulative impacts, and key strategic environmental and social issues relevant to the Master Plan.	・ Strategic Scope: The SEA report is explained in Chapter 1. The objectives, process, and scope of the SEA are outlined in Sections 1.5, 1.6, and 1.7, respectively. The Urban Transport Master Plan includes relatively familiar types of transport projects, such as the introduction of a mass transit system, road projects to reduce congestion, and improvements to public transport. Therefore, based on the general descriptions of the proposed projects, this SEA examines the potential environmental and social impacts that can reasonably be anticipated at the Master Plan stage. In addition, during the TWG meetings and SHM, there were requests to address all 30 environmental and social assessment items. Therefore, all 30 items have been covered within the SEA report. As a result, some parts of the SEA report may appear similar in structure to an EIA report. Since the SEA report is required to provide key environmental and social remarkable point and findings as a result of strategic assessment at an early stage of decision-making, accordingly, Chapter 14 highlights the main conclusions and issues identified through the SEA. Section 14.1 summarizes the key strategic environmental and social issues and findings, while Section 14.2 summarizes the issues that should be considered for the future implementation of the Master Plan. In addition, an overall summary has been added at the beginning of the report. This should make the overall structure and key messages of the SEA easier to understand.
		・ Regarding Heritage Impact Assessment (HIA), the heritage-related impacts and assessment requirements of the	・ This draft SEA report identifies UNESCO World Heritage Sites and recognizes the high cultural sensitivity of the

S.No.	Name and Organization	Comment from Technical Working Group 3 (environment) (21 July 2026)	Response from MoID/ JICA Expert Team
		Department of Archaeology (DoA) can also be addressed within project-level EIA or IEE studies. The SEA should clarify the strategic-level scope of heritage impact assessment and distinguish it from detailed assessments required under subsequent project-level EIA/IEE studies.	Pashupati area. It recommends that a comprehensive Heritage Impact Assessment (HIA) be conducted for priority transport projects in or near heritage-sensitive areas during the Pre-F/S or F/S stage, in coordination with the Department of Archaeology (DoA) and in accordance with relevant UNESCO guidelines. Such projects may affect tangible and intangible cultural heritage, including archaeological resources, traditional urban landscapes, and cultural activities. As the HIA procedure is not yet clearly established in Nepal and experience is limited, HIA should be carried out in coordination with the DoA.
6.	Academic Expert, Kathmandu University	1) The issues regarding effect on employment dur to mass transit should be properly addressed. 2) Appropriate measures should be identified and incorporated for flash flood mitigation 3) The SEA should review and address the applicable laws and legal provisions related to wildlife conservation in relation to linear transport infrastructure.	1) Employment: We have already recognized that the relationship between the modal shift and employment opportunities is a key challenge in Chapter 14 (Table 14.2-1 Key challenges and proposed countermeasures, 'Operator Resistance') and Section of the SEA report. To protect the livelihoods of existing transport workers, the Master Plan proposes a 'Step-wise Control Scenario' (Table 3.5.4, Scenario 3) and a phased transition model (Figure 3.5.24 Tokyo-style block exclusive operations). 2) Flash Flood: The response measures include drainage measures designed to address heavy rainfall associated with global warming, as well as the establishment of an emergency communication network in the event of a disaster. 3) Wildlife: National Trust for Nature Conservation Act, 1982 , International Trade Control Regulations on Endangered Wildlife and Flora Rule, 2019, and National Parks and Wildlife Conservation Rules, 1974 are explained in Section 2.1.4.11, Section 2.1.5.11, and Section 2.1.5.12, respectively

S.No.	Name and Organization	Comment from Technical Working Group 3 (environment) (21 July 2026)	Response from MoID/ JICA Expert Team
7.	Senior Environment Engineer, Kathmandu Metropolitan City	1) Proper traffic management and safety measures should be ensured during the construction phase through an appropriate Traffic Management Plan. 2) Appropriate alternatives should be identified and assessed for each proposed project at the Master Plan stage so that no further alternative analysis is required during the subsequent detailed environmental assessments (EIA/IEE/BES). If additional alternatives need to be considered during the detailed assessment stage, this may indicate that the Master Plan requires further review or revision	1) Traffic Management Plan (TMP) As a mitigation measure in Chapter 7 (Table 7.1-1, ESMP), the contractor will be required to prepare a detailed Construction Traffic Management Plan (TMP) before starting construction and obtaining approval from the Traffic Police and the municipal authorities. The TMP will include construction vehicle routes, deployment of traffic control personnel, temporary or alternative signs, traffic safety measures, and measures to avoid or reduce traffic congestion. 2) Approach to Alternative Analysis In Chapter 3 (Section 3.6, Table 3.6-1), transport system scenarios (0–3) were compared and evaluated at the macro level to establish the overall direction of the transport system. This helps reduce the need to repeat the comparison of major structural alternatives at the subsequent individual EIA/IEE stages. Instead, the FS stage can focus on more detailed issues, such as the specific location and alignment of each project. However, the MP does not determine the exact locations or detailed structures of individual projects. Future technological developments, changes in traffic and social conditions, and changes in technical requirements may also need to be considered. Therefore, the MP is not intended to rigidly fix or constrain future project designs. At this stage, the MP identifies locations where transport measures are expected to be effective in reducing traffic congestion and presents the general direction of the proposed measures. The specific locations, alignments, and designs will be further examined and optimized during the FS stage based on the latest conditions, technologies, and project requirements.

S.No.	Name and Organization	Comment from Technical Working Group 3 (environment) (21 July 2026)	Response from MoID/ JICA Expert Team
8	Unit Chief, Geo-Environment and Social Unit	・ Climate change data for the Kathmandu Valley should be incorporated, including measures based on flood-warning information. ・ Seismic vulnerability should be assessed using relevant geological and geotechnical information.	・ The Draft SEA report has already addressed flood and natural disaster risks in the Kathmandu Valley in detail, using hydrological monitoring data (4.3.3), past liquefaction and landslide hazard maps (4.3.4), and recent flash-flood damage areas (4.6.4). Hydrological mitigation measures, such as climate-resilient drains, and scheduling riverside works outside the monsoon season, are incorporated into the ESMP (Table 7.1-1). ・ Key natural hazard risks (Section 4.3.4) include earthquake-induced liquefaction, landslides, riverbank erosion, and flash floods. ・ The Kathmandu Valley is covered by thick, soft lacustrine sediments, including clay, sand, and gravel. These geological conditions may amplify ground shaking during earthquakes and increase the risk of liquefaction. In addition, rapid urbanization has increased impervious surfaces such as roads and buildings, resulting in increased stormwater runoff and a very high risk of flash floods during intense monsoon rainfall. ・ Considering these natural hazard risks, the following two groups of projects require particular attention due to their structural and geographical conditions. Group1: Maharajgunj Underpass (No. 1), Chabahil-Gaushala Underground Tunnel (No. 2) and the underground section of the East-West Mass Transit Line Group 2. Bishnumati River Corridor Elevated Highway (No. 4) and other bridge and road projects along rivers （No. 3, 6, 7, 8～13, 15）
9	Assistant Professor, Kathmandu University	1) The report currently presents information primarily on particulate matter. However, gaseous pollutants such as NO_x and SO_x should also be included, as the SEA is being conducted for a transport master plan. 2) Flood inundation and its potential impacts should be properly presented and assessed.	1) Gaseous pollutants: It is recognized that NOx, and SOx, which are covering the National Air Quality Standards 2026 (Table 2.1-1), are important air pollutant parameters related to the transportation sector as well as particulate matter. But gas pollutant parameters are not monitored at regular air quality monitoring stations, we could not show the

S.No.	Name and Organization	Comment from Technical Working Group 3 (environment) (21 July 2026)	Response from MoID/ JICA Expert Team
		3) It remains a matter of debate whether the SEA should be presented in detail or in a concise manner. Regardless of the report structure, the team should focus on clearly presenting the core essence and key findings of the SEA. 4) The report could be further strengthened through collaboration with academic experts and scholars.	requested parameter's data in the baseline results. Section 14 of SEA report highlights the current lack of measurement data within the Kathmandu Valley as a "data gap" and mandates the "implementation of continuous on-site monitoring of gaseous pollutants" during the feasibility study (F/S) phase of subsequent projects. 2) Flood Inundation: The extreme flash floods of September 2024 and March 2025 are detailed in Section 4.5.2; Potential impact was explained in No.8 of this table. 3) Executive Summary: Updated in English and Nepali (E-1 to E-17). It will help to understand the SEA report. 4) Academic Collaboration: In preparing the SEA report, the JICA expert team is making efforts to incorporate advice from university experts through SHM and TWG.

3. Open forum and Feedback Sheet of 3rd SHM (31 July 2026)

Table-3 Opinions and Suggestions provided verbally by the Participants of 3rd SHM

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOID/JET
1.	Civil Aviation Authority of Nepal	・ Tribhuvan International Airport (TIA) serves as Nepal's primary international gateway and should be recognized as a major multimodal transport hub in the Master Plan. The MP and the Strategic Environmental Assessment (SEA) should adequately address airport connectivity, environmental and social safeguards, restrictions on high-rise developments, utility infrastructure, aviation safety requirements, and other operational safety considerations to ensure the safe and sustainable development of the airport and its surrounding areas.	・ The Master Plan considered the Tribhuvan International Airport (TIA) as one of the major transport hubs in the Kathmandu Valley. It also recognizes that, in advancing the Master Plan, it is important to identify and appropriately address specific operational and environmental issues related to aviation facilities. Specific airport safeguarding requirements and technical requirements for seamless multimodal coordination will be integrated through continued consultation with relevant stakeholders during pre-F/S stage and/or F/S stage.
2.	Nepal Forum of Environmental Journalists-NEFEJ	・ Any infrastructure development proposed in or around the Pashupati Area should fully consider the obligations under the World Heritage Convention to safeguard the Outstanding Universal Value of the Pashupati World Heritage Site. Reviewing and complying with relevant national legislation, including the Treaty Act 1990, the Pashupati Area Development Trust Act 1987 (2044 BS), the Ancient Monument Preservation Act 1956 (2013 BS), and other applicable legal provisions governing cultural heritage conservation. While acknowledging that a Heritage Impact Assessment (HIA) has been proposed as an important safeguard tool, Nepal currently has limited practical experience in conducting HIAs and lacks a comprehensive legal framework for their implementation. The proposed Chabahil–Gaushala Tunnel should be ruled out due to the absence of tunnel construction experience in Kathmandu Valley and the valley's geological characteristics as a former lake basin. Similarly, he recommended excluding the proposed Chabahil–Bagmati River Elevated Highway because of its potential impacts on the heritage setting and	・ The Nepal Treaty Act, 1990 provides legal provisions for the signing, ratification, accession, acceptance, approval, implementation, registration, and publication of treaties and agreements to which Nepal or the Government of Nepal is a party. However, the Act does not establish specific requirements for cultural heritage assessment, heritage impact assessment, or the protection and management of cultural heritage in relation to infrastructure development. Therefore, it is not considered a directly applicable legal instrument for assessing the environmental or cultural heritage impacts of the proposed infrastructure development. ・ The Pashupati Area Development Trust Act, 1987, has been reviewed and summarized in Chapter 2 (Legal, Policy, and Institutional Framework), which outlines the provisions for the protection of cultural and natural heritage, construction standards, and prior consent requirements for infrastructure development within the Pashupati Area ・ The draft SEA report identifies UNESCO World Heritage Sites in the baseline and recognizes the high cultural

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOID/JET
		surrounding environment. As an alternative, he suggested exploring innovative options such as the Dhobi Khola Corridor Road and/or elevated highway alignments that would avoid both the Chabahil–Gaushala Tunnel and the Chabahil–Bagmati River Elevated Highway. The importance of establishing an effective coordination mechanism among relevant government agencies, heritage authorities, and local governments to ensure integrated planning, informed decision-making, and the protection of cultural heritage throughout the implementation of the Master Plan and the Strategic Environmental Assessment (SEA).	sensitivity of the Pashupati area. Accordingly, the report recommends that a comprehensive Heritage Impact Assessment (HIA), in coordination with the Department of Archaeology (DoA) and in accordance with the World Heritage Convention and national legislation including the Pashupati Area Development Trust Act, 1987, be undertaken and approved during the F/S stage prior to final design. The procedures of HIA based on DoA material are summarized in Section 6.2.2. ・ For the Chabahil–Gaushala–Tilganga corridor, multiple alignment options have been considered with due regard to cultural heritage and geological risks. The sensitivity of the Pashupati site and the associated challenges and data gaps are addressed in Section 14.1.2.2 (Cultural Heritage and Landscape) and Table 14.2-1 (Key Challenges and Proposed Countermeasures of KVUTSMP: Heritage Impact and Data Gaps). ・ The proposed Chabahil–Gaushala underground tunnel (No.2, Table 3.5-1) is considered a strategic option for maintaining the existing four lane ring road and designing tunnels under its existing road. However, detailed geological, geotechnical, and hydrogeological assessments, including analysis of lake-basin clay conditions, groundwater recharge, and underground structures, will be required as part of the F/S. Alternative alignments, including the Dhobi Khola Corridor, will also be comparatively assessed during the F/S to identify the most appropriate option while minimizing potential impacts on cultural heritage. ・ Regarding the implementation framework for the MP, the SEA report also identifies this as Key challenges to be addressed in the future in Section 14.2 and proposes the establishment of a Technical Working Group (TWG) comprising representatives from relevant agencies as a potential solution.

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3.	Pashupati Area Development Trust	・ The Pashupati Area covers an area of 264 hectares. It was inscribed on the UNESCO World Heritage List in 1979 due to its Outstanding Universal Value. Under the Ancient Monument Preservation Act, 2013 B.S. (1956 A.D.), the Government of Nepal declared the Pashupati Protected Monument Area in 2056 B.S. (1999/2000 A.D.). The protected area includes Wards 7, 8, and 9 of KMC. ・ Likewise, to preserve religious values, protect both tangible and intangible cultural heritage, and develop the Pashupati Area as an international pilgrimage destination, the Pashupati Area Development Trust (PADT) has established a Master Plan. Further, the Ring Road, Gaushala, and Chabahil corridors contain numerous historically and archaeologically significant heritage structures, including temples, dabalis (traditional open platforms), rest houses, and chaityas (Buddhist shrines) on both sides of the road. Due to heavy traffic congestion, these archaeological and cultural heritage assets have experienced adverse physical impacts and are also affected by air pollution, dust, noise, and other forms of environmental pollution. She further suggested that the views and recommendations of heritage experts should also be sought. Further discussions and consultations are considered necessary. Moreover, The Pashupati Area Master Plan envisions the Ring Road–Tilganga–Gaushala–Chabahil corridor as a heritage- and pilgrim-friendly corridor, and this consideration should be taken into account during future transport planning.	・ However, as the Master Plan has not yet been publicly disclosed by the Pashupati Area Development Trust (PADT), its specific provisions and contents remain inaccessible. Despite this limitation, we have made every effort to identify and incorporate all relevant environmental, social, cultural, and heritage-related concerns associated with the proposed project. ・ The heritage impact assessment has been addressed in Chapter 14, Table 14.2-1, “Heritage Impact.” During the F/S, a comprehensive HIA, to be undertaken in coordination with PADT, KMC, and DoA, is identified as a mandatory requirement. ・ We understand that the Pashupati Area Master Plan, which is based on the premise of development that preserves cultural heritage, religious sites, and the natural environment, also includes infrastructure development such as transportation systems and roads. The engineering design of the Ring Road-Tilganga-Gaushala-Chabahil corridor must incorporate heritage-friendly principles, including pedestrian safety, dust suppression, noise barriers near monuments, and consultations with local Guthiyars (traditional custodians) to ensure the continuity of local religious practices. ・ The Master Plan embraces the 'Car-Free Area' concept and the 'Compact Street Approach' to maximize human space and walking rights while restricting vehicle dominance in historical zones. This will not affect traditional festivals (Jatras) but will enhance heritage protection. With appropriate design and consultation, the concept is intended to avoid adverse effects on traditional festivals; this must be verified during the F/S and HIA.
4.	Kathmandu Metropolitan City	・ The Master Plan should assess the pedestrianization of roads connecting the Ason area, as it proposes pedestrianization in the Ason and Basantapur areas. A detailed assessment should therefore be undertaken to	・ Pedestrianization (No. 17: Car-Free Zone) and parking (No. 22: Off-Street Parking) have been proposed in MP and explained in Chapter 3, Table 3.5-1 of SEA, while relevant heritage impact and flooding considerations are addressed

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		identify the appropriate areas for pedestrianization within the Kathmandu Valley, including consideration of accessibility, traffic diversion, emergency access, public transport connectivity, and impacts on local businesses and residents. The study should also establish the prerequisites and planning requirements for parking facilities, particularly in areas where on-street parking may be restricted following pedestrianization. Handigaun and Naxal are historically and culturally significant areas, with substantial archaeological evidence and artifacts dating back to the Lichhavi period (5th century). These heritage values should be properly documented and considered in the Master Plan and SEA. Consultation with Sajha Yatayat and relevant NGOs and community-based organizations should also be undertaken to incorporate their perspectives on public transport, mobility, and social considerations. Furthermore, the SEA assessment team should include Social, Heritage, and Legal Experts to ensure comprehensive assessment of social, cultural heritage, and regulatory issues. The study should also incorporate urban flood resilience and climate-resilient infrastructure considerations, particularly when planning roads and transport infrastructure along the Bishnumati River corridor, including potential impacts on river hydrology, drainage, flood conveyance, and riverine ecosystems.	in Chapter14, Table 14.2-1. The Master Plan embraces the 'Car-Free Area' concept and the 'Compact Street Approach' to maximize pedestrian space and the right to safe, accessible walking while restricting vehicle dominance in historical zones. This will not affect traditional festivals (Jatras) but will enhance heritage protection. With appropriate design and consultation, the concept is intended to avoid adverse effects on traditional festivals; this must be verified during the F/S and HIA. And it is expected that these projects to be effective when implemented simultaneously. ・ The SEA identifies key strategic environmental and social issues and findings to support decision-making at an early planning stage. Accordingly, issues raised by KMC, including accessibility, traffic diversion, parking, impacts on local businesses and residents, cultural heritage, public transport, and flood/climate resilience, are recommended for further consideration during the F/S stage. ・ The SEA does not prescribe specific detailed survey methodologies at this stage. The scope, level of detail, and appropriate methods for socio-economic, traffic, heritage, hydrological, and other assessments should be determined during the F/S based on the project design, site conditions, and issues identified through the SEA. The involvement of relevant Social, Heritage, and Legal Experts, as well as consultation with Sajha Yatayat and relevant NGOs/community organizations, should also be considered in subsequent stages.

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5.	KMC	・ The Tripureshwor section, where the MP proposes a flyover adjoining the Bagmati River corridor, comprises a significant number of historical, archaeological, cultural, and religious heritage sites. The proposed Thapathali–Tripureshwor River Corridor and the Bishnumati River Corridor Elevated Highway also require a comprehensive HIA because these riverbanks are closely associated with daily cultural and religious practices, including temples, traditional ghats (cremation sites), and ritual activities. The design of the elevated highways should ensure uninterrupted public access to the river side ghats for the performance of daily religious rituals and should also incorporate suitable access for equipment required for debris and solid waste removal to facilitate effective river maintenance. In addition, the assessment report does not provide adequate information on the Ishan City and recommended that a detailed assessment of its heritage significance and potential project impacts be included.	・ The SEA Report identifies Heritage Impact and Flooding Risk as key environmental and social risks in Chapter 14. As shown in Table 3.5-1, three elevated highway projects, Chabahil-Bagmati River Elevated Highway (No. 3), Bishnumati River Corridor Elevated Highway (No. 4), and Thapathali-Tripureshwor New River Corridor (No. 6) are still conceptual at the Master Plan stage. For these proposed elevated highways along the river corridors, a detailed and comprehensive Heritage Impact Assessment (HIA) is recommended at the F/S stage. HIA should consider, among other aspects, access to the river, potential impacts on heritage, and the quality of engineering design. These considerations are also recommended in Sections 6.2, 7.1, and 14.1.
6.	Kathmandu Metropolitan City, Office of Municipal Executive	・ Following the review of executive summary of the SEA report provided; the Kathmandu Metropolitan City should not be limited to the role of merely a "supporting agency" or "stakeholder." Instead, it should be legally recognized as a co-decision maker in the decision-making process to avoid overlapping during project implementation.	・ Kathmandu Metropolitan City (KMC) has been involved in all three technical working groups established for the Master Plan and has provided necessary suggestions and feedback. KMC has also been regularly consulted and invited to participate in relevant discussions and decision-making processes concerning the Master Plan, thereby contributing technical inputs, local perspectives, and institutional considerations. Thus, KMC is not merely a stakeholder, but an active member of all three Technical Working Groups established for the KVUTSMP. ・ We will consider these comments not only in the context of the SEA for the development of this MP, but also as feedback regarding Nepal's legal system. ・ To ensure that comments from stakeholders are taken into account in the content of the Master Plan, we adopted a flexible approach that was not strictly bound by existing laws and regulations. Specifically, we established three separate

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			Technical Working Groups (TWGs) covering urban planning, transportation planning, and the environment. Furthermore, regarding SEA—for which implementation details and specific requirements have not yet been finalized in legislation—we proactively incorporated it into the process and held three stakeholder consultation meetings.
		· The study team has mostly followed central/federal laws like EPA 2019 and EPR 2020 while preparing the Master Plan. Whereas, local level guideline such as the provisions made under the Kathmandu Metropolitan City Environment and Natural Resources Conservation Act, 2020 (2077 B.S.), Solid Waste Management Collection and Transportation Procedures, 2024 (2081 B.S.) as the overarching local legal framework has not been found to be addressed in the report.	· Considering their relevance to the implementation of the KVUTSMP, the applicable local-level laws have been summarized in Chapter 2, covering Kathmandu Metropolitan City, Lalitpur Metropolitan City, Bhaktapur Municipality, Madhyapur Thimi Municipality, and Suryabinayak Municipality.
		· In para 8 of the executive summary mentioned about the involuntary resettlement and squatters. However, the provision of compensation to a person without land ownership certificate has not been mentioned explicitly. She further suggested to the study team to clarify upon the provision of compensation in the report as there is no any provision of compensation in the local acts and further to clarify upon provision of compensation as per JICA guideline.	· We added the following supplementary explanation to Chapter 8. · The main gap between Nepal's Land Acquisition Act and the World Bank and JICA safeguard requirements is that the Nepalese system mainly focuses on compensation for legally recognized landowners and affected assets, while the World Bank and JICA frameworks take a broader approach to the impacts of involuntary resettlement. · Key gaps include support for non-title holders and vulnerable groups, compensation at full replacement cost, livelihood restoration, participatory resettlement planning, meaningful consultation, and measures to avoid or minimize resettlement impacts. Therefore, project-specific measures such as a Resettlement Action Plan (RAP), livelihood restoration assistance, additional support for vulnerable groups, and a grievance redress mechanism are required to address these gaps and achieve the safeguard requirements.

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		・ The report has emphasized the cultural heritage sites such as Thamel and Durbar Marg will be pedestalized with vehicle free-zone and HIA will be carried out. The main concern of the Kathmandu Municipality is to area comprises traditional festivals, guthi (local cultural groups) and chariot pulling festivals etc. therefore the study team is suggested to conduct consultation not only with the Department of Archaeology but also with Heritage Department under the Kathmandu Metropolitan City and the local Guthiyars (traditional guthi custodians/trustees) before proceeding with the project.	・ SEA proposes conducting Heritage Impact Assessment (HIA) when reviewing projects in cultural heritage areas. As outlined in Section 8.2.2, we understand that the HIA process involves not only the DOA but also other stakeholders, who are engaged as advisory participants in the consultation process.
		・ Further highlighted the pollution due to solid waste and demolition waste mentioned in para 4 and 5 of the executive summary mentioned that the valley produces 335 tons of solid waste daily and is problematic in operation of Sisdol Dumping site. However, a concrete plan for the safe disposal and management of the huge amount of demolition waste likely to be generated due to the implementation of flyover, tunnel and road widening projects proposed under the Master Plan has not been presented in the report. Likewise, she further suggested presenting the ultimate responsible body for the safe disposal of demolition waste and spoil in the Master Plan.	・ Several projects have been proposed in the MP, and we expect to reduce waste through measures such as balancing earthwork volumes across multiple projects and reusing and recycling by-products. This has been added to the EMP in Chapter 7.

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOID/JET
		・ In terms of public hearing and access to local stakeholders presented in Paragraph 10 of the executive summary mentioned about the grievance redress committee and its establishment; to establish the mechanism of committee comprising representatives from local wards and representatives from Kathmandu Metropolitan City.	・ Chapter 8 explains the challenge and proposal of GRM. A Grievance Redress Mechanism (GRM) provides project-affected people and stakeholders with a clear process to raise concerns and resolve environmental and social issues. ・ The GRM should be established at the F/S stage and remain active throughout the project, including environmental assessment, RAP preparation and implementation, and environmental and social management. It should provide accessible, transparent, fair, and time-bound procedures for resolving grievances. SEA proposed that A multi-tier Grievance Redress Committee (GRC) should be established, including project representatives, local authorities, and community members, with balanced participation of affected people. Committee members should receive training on grievance procedures and periodic refresher sessions.
7.	Department of Mines and Geology	1) To incorporate recommendation for the amendment of prevailing laws to notify the Council of Ministers and other government entity so that they should do to amend the prevailing laws to point out legal problems at the early stage of the project implementation resulting successful implementation of this SEA as well as Master Plan. 2) For lift parking especially adjoining the Thamel and three Durbar Square World Heritage Sites minimizing car free zone in these areas to ease social gathering of the local Newar community as these areas is culturally reach for the traditional festivals with significant numbers of traditional social gathering. Implementation of car free zones in these area likely to have significant impact upon the accessibility of locals also affecting elderly ones. 3) To refer Department of Mines and Geology for the maps and other geological reports used in this report.	1) Recommendations to the Cabinet and other government agencies regarding amendments to or enhancements of existing laws to facilitate the smooth implementation of the SEA and the Master Plan, while important observations concerning the national legal system that are relevant to other master plans as well, do not constitute environmental and social issues specific to this project. Therefore, in Section 14.2, “Legal Framework in Nepal,” a note was added not as a specific comment on this SEA and Master Plan, but as a general comment regarding the formulation and implementation of master plans in Nepal. 2) With regard to the construction and installation of parking facilities and the establishment of no-vehicle zones, it is necessary to make comprehensive and phased preparations, taking into account alternative means of access and coordination with public transportation. In this master plan, both projects are classified as short-term projects, and it is expected that they will function effectively.

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOID/JET
		4) Clarification on GEDSI (Gender Equality, Disability, and Social Inclusion), particularly the inclusion of the "D" (Disability), and questioned the relevancy of the D in GEDSI, further seeking its practical in Nepal instead of GESI (Gender Equality and Social Inclusion) in the Master Plan and the SEA Report.	3) In this report, we have referenced information from the DMG as the source for many of the maps and other existing geological data, and we have clearly cited the sources. 4) Based on several comments from stakeholders during previous stakeholder meeting, in line with the current policy framework, the SEA report updated the term "Gender Equality and Social Inclusion (GESI)" to "Gender Equality, Disability, and Social Inclusion (GEDSI)." Through measures such as the adoption of universal design in mass-transportation, accommodations for people with disabilities can be incorporated into urban transportation systems.
8.	Radio Nepal	・ The design of tunnels and other road infrastructure ensure uninterrupted reception of Radio Nepal broadcasts for all road users, particularly to facilitate the dissemination of emergency information and public service announcements.	・ Proposals regarding safety management and emergency response during disasters are important matters that cover not only natural disasters such as floods and torrential rains but also man-made disasters such as traffic accidents. To ensure the stable and effective operation of the urban transportation system, it is necessary to create an environment where public transportation users can continuously receive traffic information and safely use the transportation system—even when utilizing underground sections such as the proposed Chhabahil-Gaushala Underground Tunnel (No. 2 in Table 3.5-1) or underground mass transit facilities that may be constructed in the future. This content is also related to Emergency Road Network Projects (No. 20) and Traffic Signal including center system (No. 21), and this point will be emphasized again in Chapter 14. ・ Regarding the emergency communication service to be introduced, a detailed safety and emergency information system will be established during the feasibility study (F/S) phase, taking into consideration the effective systems and operational methods currently in use in Nepal.

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9.	National Federation of the Disabled Nepal (NFD-N)	・ A more diverse range of stakeholders are engaged during the consultation process, including organizations representing persons with disabilities, senior citizens, and other marginalized and vulnerable groups. He further suggested that, during the land acquisition and resettlement process the persons with disability might be affected severely; therefore, he recommended that the baseline information include disaggregated data (e.g., by gender, age, disability, and other relevant social categories) to support inclusive planning and decision-making ensuring the alternative and best solution for the quality and dignified life including easy accessibility. Furthermore, he emphasized the need to integrate Gender Equality, Disability, and Social Inclusion (GEDSI) considerations throughout the Master Plan and to ensure that proposed technologies, transport systems, and infrastructure are accessible and inclusive for all users so that a person with differently able could use the road and associated infrastructures independently without any difficulty facing any barriers which will make their life more independent and could live dignified life in the society. To maintain subsidy provisions allocating the mandatory reservation seats to senior citizens, disabled persons and children in the means of transportations as that sort of provision is not fully complied in current contexts by the service providers. Finally, to ensure the participants of disabled persons in the coming days and in further assessment stages like EIA stages so that the issues related to disabled persons could be identified at early stages of the project implementation identifying the appropriate solutions.	・ To discuss key GEDSI issues and challenges, for consideration in the SEA of KVUTSMP, we have held separate discussions—in the form of KIIs and FGDs—with representatives of organizations and agencies that provide support to socially vulnerable groups, such as people with disabilities and the elderly, as well as other GEDSI stakeholders, apart from the stakeholder consultations. The meeting minutes are provided in Appendix 7. ・ KVUTS, particularly through large-scale transport infrastructure development, may create GEDSI-related risks such as land acquisition impacts on vulnerable populations and exclusion caused by inadequate inclusive design. Accessibility and safety should therefore be ensured for PWDs, older persons, and pregnant women. Soft interventions, including bus operations, ticketing, route planning, and HR policies, should promote affordable, reliable, and equitable access to public transport. In addition, GBV and sexual harassment are major safety concerns that can significantly affect women's mobility and access to transport. And we addressed Chapter 9 (Section 9.1.1, Risk 4 Non-Compliance with Universal Design, and Risk 10 Digital Exclusion) and Chapter 14 (Table 14.2-1 'Limited Institutional Capacity' training). We highlight the following mandatory F/S and EIA requirements: (1) Socio-economic baseline surveys for the RAP must collect disaggregated data by disability type, age, and gender. (2) All proposed bus stops, mass transit stations, and footpaths must comply with JICA and international Universal Design standards (e.g., tactile paving, tactile maps, ramps with appropriate gradients, and elevators at pedestrian bridges). (3) Operational licensing (Section 3.5.3) will mandate transport operators to reserve seats and comply with government-mandated fare subsidies for PWDs and senior citizens. (4) PWD organizations will be formally included in subsequent project-level EIA/IEE consultations.

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10.	Nepal Environment Society	・ The School of Environmental Management and Sustainable Development (SchEMS), Pokhara University be included as an academic stakeholder in the upcoming stages of the study, noting that Tribhuvan University (TU) and Kathmandu University (KU) have already been involved in the stakeholder consultation process. Since this Master Plan will serve as the guiding document for the preparation of the Detailed Project Report (DPR), Environmental Assessment (EA), and subsequent project implementation, it is essential to comprehensively address key issues, including the potential impacts of large-scale groundwater extraction and the corresponding mitigation measures. ・ The Master Plan should incorporate reuse of underground water egressed during the tunnel construction. ・ A study team should carry out a comprehensive assessment of land use and land cover (LULC) changes, including the existing, projected, and proposed distribution of open spaces and green spaces. ・ The SEA should assess the potential impacts on the microclimate of Kathmandu Valley arising from air pollution and dust generated by the proposed project interventions. Changes to the urban environment, including increased dust and air pollution, could indirectly influence the valley's microclimatic conditions. Given the bowl-shaped topography of Kathmandu Valley, which can contribute to the accumulation and retention of pollutants and function as a carbon sink, these potential impacts should be carefully assessed and appropriate mitigation measures incorporated into the Master Plan. The study team use a computer model to get results for a better future scenario of microclimatic condition of the Kathmandu Valley. ・ Finally, he stressed the significant reduction of GHG by 2050 mentioned in the report. He suggested the study team clarify the calculation of GHG reduction whether this is only with the implementation of proposed projects incorporated in the	・ The SEA has not yet been conducted in accordance with Nepalese laws and regulations, and we think that the review framework will be discussed by the relevant ministries and agencies in the future. There are several academic institutions offering environmental and related programs; therefore, including all of them in the academic stakeholder list would be difficult. The universities who were invited into TWG and SHM were selected based on the suggestions of MoID and MoAFE, considering their proximity to the Kathmandu Valley. Furthermore, to provide relevant stakeholders the chance to submit opinions, the Draft SEA Report will be published on the MoID website along with a public notice in a national daily newspaper, and the report will remain available for one month to allow concerned stakeholders to review it and submit their comments and suggestions. It is likely that there will be opportunities to seek the opinions of academic experts during the FS phase as well, and we assume that candidates will be selected based on their expertise on a case-by-case basis. ・ We have added a proposal regarding groundwater reuse during construction to the EMP in Chapter 7. ・ In MP, the current land use was developed by using SPOT satellite image of 2021 for whole Kathmandu Valley, same year of the latest census. Development potential in Kathmandu Valley was analyzed with 7 factors; a) current land use, b) population density, c) distance from city center, d) distance from major road, e) angularity, f) existing development plan, g) reservation and disaster area. ・ The calculation of reductions of GHG has not considered the assumption of the use of EV in the SEA report. If the use of EV is considered, it is expected that the emission of CO2 will be more reduced.

S.No.	Organization	Opinions and suggestions provided verbally	Response from MOID/JET
		Master Plan or due to the significant use and operation of Electric Vehicles in the near future.	
11.	National Disaster Risk Reduction and Management Authority	・ The need to assess the water percolation and groundwater recharge capacity of project sites, particularly where underground infrastructure is proposed beneath public open spaces, such as Tundikhel. Such assessments should evaluate the potential impacts of large-scale groundwater extraction on the local hydrological regime and identify appropriate mitigation and groundwater management measures. He further stressed that the Study Team should adopt an integrated urban planning approach that incorporates urban biodiversity conservation into the design and development of transport infrastructure. In addition, he recommended placing greater emphasis on the protection and restoration of the riverine ecosystems and associated microclimates of the Manohara, Bagmati, and Bishnumati Rivers, recognizing their critical ecological functions and their importance to the environmental sustainability and climate resilience of the Kathmandu Valley.	・ Many of the proposed projects are in areas that have already been developed and include the renovation and expansion of sections where existing roads are congested. However, a note was added stating that, in areas where new above ground and underground structures will be built, the impact on urban green spaces including roadside trees and groundwater infiltration capacity should be assessed, and necessary measures should be taken. ・ The proposed River Corridor projects are based on the premise that existing river structures and the watershed will not be altered and are designed around the concept of maximizing the use of existing roadside areas. With regard to the impact on the existing river ecosystem, the top priority is to select construction methods that do not directly alter it. Furthermore, in light of recent urban flooding incidents, the project will implement appropriate conservation measures to prevent turbid water from flowing into the river during construction—such as during the timing of construction work or due to topsoil erosion. Additionally, as proposed in Chapter 7 of the Environmental and Social Management Plan (ESMP), the design will take geological, hydrological, and meteorological conditions into account to ensure that infrastructure structures are resilient to disasters.
12.	Nepal Environment Society	・ Conducting consultations with the indigenous communities of the Kathmandu Valley to integrate their traditional knowledge and cultural practices into the planning and development of urban infrastructure.	・ We had recognized that Since Kathmandu valley has been capital city of Nepal, many people from different parts of country have migrated, and there are more than 131 ethnic and caste groups who reside in different parts of the valley. from the secondary baseline survey. (Section 4.4.1). ・ In the preliminary environmental impact assessment in SEA, the impact on “ethnic minorities and indigenous peoples” has been rated as “B-: Some negative impacts are expected” or “C: The extent of the impact is unknown (further

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			consideration is needed, and the impact may become clear as the investigation progresses)." Since sufficient data is not available, it is necessary to conduct appropriate surveys of the affected residents to accurately assess the situation. (Table 6.1-2 and Table7.1-1) ・ During the FS phase, opportunities must be provided to consult with indigenous communities and assess whether there will be any impact on their cultural practices. If any proposed transport alignment affects lands traditionally used by indigenous communities, the preparation of an Indigenous Peoples Development Plan (IPDP) based on JICA Guidelines (2022) and the principle of Free, Prior, and Informed Consent (FPIC) is highlighted as a mandatory requirement during subsequent F/S and project-level EIA/IEE stages.
13.	Nepal Police, Women, Children and Senior Citizen Service Directorate	・ The Master Plan should incorporate effective measures to enhance safety in public transportation and prevent sexual harassment, particularly by addressing the safety and security concerns of women and other vulnerable passengers. 2,153 persons were taken under control and proceeded with required punishment legally due to using foul language harassing women in the public vehicles during the fiscal year 2082/83 B.S. in Kathmandu valley. The Nepal Police has been conducting safety campaigns to promote safe, secure, and efficient public transportation. As part of these initiatives, the Nepal Police has been deploying plain-clothes police personnel on public transportation to monitor and prevent incidents of gender-based violence (GBV), sexual exploitation and abuse (SEA), and sexual harassment (SH). Such personnel are responsible for identifying and controlling perpetrators and, where necessary, initiating appropriate legal proceedings in accordance with prevailing laws. To organize separate consultations with relevant organizations and stakeholders, including those working on gender and public safety, to	・ This critical social safety issue is integrated into Chapter 9 (Section 9.1.1 Risk 6 'Normalization of Harassment', and Risk 7 'Inadequate Accountability') ・ To discuss key GEDSI issues and challenges, for consideration in the SEA of KVUTSMP, we have held separate discussions—in the form of KIIs and FGDs—with representatives of organizations and agencies that provide support to socially vulnerable groups, such as people with disabilities and the elderly, as well as other GEDSI stakeholders, apart from the stakeholder consultations. The meeting minutes are provided in Appendix 7. ・ As part of its public transportation initiative, MP proposes measures such as installing in-vehicle security cameras (CCTV) and lighting at bus stops. In addition, it is expected to conduct educational and awareness-raising activities in collaboration with the police to prevent incidents of sexual harassment.

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		obtain adequate feedback and recommendations and ensure that these concerns are appropriately reflected in the Master Plan.	
14.	Kathmandu Metropolitan City, Office of Municipal Executive	・ The future transport infrastructure, including bus bays and bus stops, should be planned and designed in safe, accessible, and strategically located areas that adequately address the needs of children, women, older persons, and persons with disabilities, in line with universal accessibility principles. As the development of additional transport infrastructure will require substantial land, it is important to minimize urban sprawl and avoid excessive pressure on the city's limited land resources. Sufficient natural open spaces and green areas should be preserved to maintain urban biodiversity, ecosystem services, and environmental quality. ・ The population growth projections should not be based solely on increase of residential population. The Master Plan should also consider the anticipated growth in commercial activities, business districts, tourism, and the resulting increase in commuters, visitors, consumers, and travelers, all of which will influence future transport demand. ・ In addition to complying with the requirements of UNESCO and the Department of Archaeology (DoA), the planning and implementation process should take into account local cultural heritage, including community-level heritage sites, traditional practices, and culturally significant places that may give rise to concerns during project implementation. ・ Further, the Master Plan should clearly define the roles, responsibilities, and coordination mechanisms among the three tiers of government (federal, provincial, and local) for the planning, implementation, operation, and management of the overall urban mobility system, thereby minimizing institutional overlap and strengthening governance.	With regard to the issues identified, the SEA addresses them as follows: ・ Consideration of Universal Design: Based on the principles of universal design (Figure 3.5-29), detailed designs for bus stops and bus bays will be developed to ensure safe access and use by children, women, older persons, and other vulnerable users. ・ Prevention of Excessive Land Modification and Conservation of Green Areas To prevent excessive land modification associated with infrastructure development, the area subject to land alteration will be minimized as much as possible prior to construction. Design and construction methods that help conserve green belts and other green areas will also be considered. ・ Protection of Local Traditional Culture: Community-level cultural features, such as locally distinctive shrines in and around the construction areas, will be identified in advance and appropriately protected. ・ Implementation Framework: The overlap of mobility-related jurisdictions among the federal, state, and local governments is identified in Section 12.3. In addition, Table 14.2-1 in Chapter 14 (Implementation Framework) proposes specific measures to address these issues.

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15.	Nursing Officer, Department of Health Services	・ One section of the SEA Report indicates that GHG emissions could be reduced by approximately 21% by 2050. This would be very encouraging news if the proposed projects are successfully implemented. Such a reduction in greenhouse gas emissions could contribute to improved air quality and, consequently, help reduce health problems, particularly those related to respiratory and cardiovascular diseases.	・ Thank you for sharing your thoughts with us. We will take them into consideration for future reference.
		・ On Page 33 of the presentation report, the Bishnumati River Corridor is discussed, including several options for the proposed elevated highway. Among the alternatives, as a road user, I would prefer Option 1, which proposes constructing a road above the existing road. In my opinion, this would be a more appropriate and safer option than constructing a road structure directly over the river. A major structure over the river could create serious risks and operational challenges during natural disasters, such as earthquakes and river flooding. Therefore, Option 1 appears to be the preferable alternative, particularly if it is designed to accommodate high-capacity public buses. This approach could provide efficient public transportation while minimizing potential risks to human lives and property.	・ Thank you for sharing your thoughts with us. We will take them into consideration for future reference.

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		・ On Page 37 of the presentation report, the installation of off-street parking in the Ratnapark area, together with a proposal for a metro rail system. She informed that there has been considerable discussion regarding the feasibility and sustainability of railway projects in the Kathmandu Valley, particularly because such systems may increase Nepal's dependence on external technology, expertise, spare parts, and other resources. Instead of prioritizing the proposed metro rail system, she suggested that consideration could be given to road improvement and widening, supported by underground parking facilities, where technically and environmentally feasible. This approach could make greater use of locally available human resources and construction materials, including sand, stone, and other aggregates, thereby potentially contributing to greater local economic benefits and sustainability. From a transport management perspective, she expressed the view that improving the existing road network and promoting high-capacity public bus services may be more practical, and sustainable for Kathmandu Valley than immediately investing in a large-scale metro rail system. The experience of the existing Janakpur–Jaynagar railway also demonstrates some of the challenges associated with railway infrastructure, including relatively high operation and maintenance requirements, dependence on specialized human resources and technology, and difficulties associated with maintaining continuity of service, repairing equipment, and obtaining spare parts.	・ Once transport demand exceeds a certain level, it becomes difficult to provide adequate and safe transport services through road development alone, making the introduction of a mass transit system necessary. Based on this objective assessment, this MP also concludes that a mass transit system is required for the East-West Line. ・ The feasibility and sustainability of the railway project will be assessed through future Pre-FS and FS studies. These studies will also include a detailed review and careful evaluation of lessons learned from Nepal's previous railway projects. As pointed out in the comments, it is also important to develop the capacity of the personnel and organizations that will be responsible for the future operation and maintenance of the Mass transit system. As Mass transit system is planned with a medium-term target of 2040 in Master Plan, we expect the necessary studies to be carried out systematically from now, along with training to improve capabilities to international standards and the establishment of an organization capable of operating mass transit system.
16.	Department of Health Services	・ The commitments and recommendations identified in the Master Plan should be clearly stated; however, strong political commitment will be essential for the effective implementation of the projects and interventions proposed in the Master Plan. The Plan should also clearly define institutional responsibilities, coordination mechanisms, and implementation arrangements. Urban planning issues	・ Chapter 3 provides an overview of the proposals outlined in the Master Plan. To clarify the background of the Master Plan's development, the chapter explains the future urban structure, current traffic conditions, the need for the Master Plan based on traffic demand forecasts, and the strategic direction for a sustainable urban transportation system—in that order—and proposes the necessary projects. The SEA

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		should be comprehensively assessed, and population projections and future urban growth forecasts should be based on reliable and realistic data. ・ The Master Plan should also consider the social and behavioral aspects of urban mobility, including encouraging people to choose appropriate modes of transport according to trip distance and purpose. To promote sustainable and non-motorized transport, dedicated and safe footpaths and cycle lanes should be incorporated into the proposed transport network. To enhance road safety and public health, the Plan should consider establishing trauma care or emergency response facilities near major junctions and accident-prone locations, preferably within an appropriate distance to enable rapid emergency response and rescue. In addition, the Master Plan should explore the provision of integrated utility corridors along proposed road alignments to accommodate essential services such as water supply, drainage, electricity, telecommunications, and other underground utilities, thereby reducing repeated road excavation and improving the efficiency and sustainability of urban infrastructure.	assesses the feasibility of these proposals from environmental and social perspectives, while also identifying challenges and considerations for project implementation. We plan that the final SEA report will attach with Master Plan, which will be submitted to the Council of Ministers for formal approval. Once approved, the master plan is expected to secure political commitment. ・ In MP, JET utilized the population projection data prepared by National Statistical Office (NSO) in order to project the future urban population. For the daytime population, Household Interview Survey (2023) data prepared by this MP was utilized. Also, JET has considered Ishan Project, which is one of the large-scale new town projects proposed by KVDA. KVDA has shared names of five small- and large-scale new town projects which they are planning, but only Ishan Project has its expected population. JET has projected the population for Ishan Project in this MP by considering the migration within KV and from outside KV. ・ Similarly, the Node concept proposed in Comprehensive Physical Development Master Plan of Kathmandu Valley (KVDA MP), is considered. The sub city centers will be developed in Primary Node area which will be connected by node connecting roads. So, for the future urban structure, Node Concept of KVDA MP along with Ishan new town project is considered. ・ This is aligned with Chapter 3 (No. 16 Utility Corridor Network, No. 18 Cycling Path, No. 19 Road Safety) as proposed projects. The feasibility study (F/S) phase will involve a detailed examination of technical and site-specific issues.
17.	Department of Archaeology	・ The SEA and Master Plan comprise various projects located along or near historically and archaeologically significant sites, including Pashupati and the Chabahil–Gaushala Corridor, therefore the MP shall address archaeological artifacts and cultural heritage resources not only within	・ For cultural heritage impacts, we have included in Chapter 14 that Conduct Heritage Impact Assessment (HIA) for priority projects located within or near heritage-sensitive areas in accordance with the progress of project design during the Pre-F/S or F/S stages. The HIA should evaluate

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		designated archaeological sites but also those that may be located along roadsides and within or adjacent to the areas affected by the proposed projects. The Bishnumati River Corridor and other areas proposed as traffic-free zones are also considered important cultural heritage areas, although they are not listed as UNESCO World Heritage Sites. Nevertheless, the Department of Archaeology (DoA) accords archaeological and cultural importance to historical and cultural sites irrespective of their UNESCO designation. The Study Team is therefore advised to coordinate with the Kathmandu Metropolitan City Office, the Pashupati Area Development Trust (PADT), and the Department of Archaeology (DoA) if any further interventions are proposed along the Bishnumati River Corridor or other culturally and archaeologically sensitive areas. The SEA shall establish a Chance Find Procedure to be followed in the event that archaeological artifacts or other cultural heritage resources are discovered during the time of construction of the proposed projects. In such cases, all construction and excavation activities in the affected area shall be immediately suspended, and the Department of Archaeology shall be promptly notified and consulted for further guidance and appropriate action. ·	both tangible and intangible cultural heritage and recommend avoidance, minimization, mitigation, and monitoring measures through consultation with Department of Archaeology during F/S. The HIA will also address survey methods to be conducted before and during construction—including hydrological surveys, geological surveys, test excavations, and the "Chance Find Procedure"—as well as measures to be taken if buried cultural heritage is identified. · Based on the process of HIA mentioned in section 6.2.2, Advisory body to be decided by DOA, will be established The TOR of HIA must be reviewed by Advisory body. As your advice, we propose that the coordination mechanisms (including DoA, PADT, and local municipalities) are also established for examining the HIA process.
18.	Department of Environment	· The MP and SEA should address the timely rehabilitation of potholes and road surface inconsistencies to ensure the smooth and safe operation of vehicles. In addition to $PM_{2.5}$ and PM_{10}, the MP and SEA should also consider other key air pollutants, including SOx, NOx, ozone (O_3), and carbon monoxide (CO), in the preparation of the final SEA report. The available vehicle emissions test reports should also be reviewed and incorporated into the assessment, as appropriate. Furthermore, the MP should consider urban greenery and the urban heat island effect, give greater emphasis to local customs and traditions, and assess the	· The timely rehabilitation of potholes and road surface inconsistencies is important but that is general maintenance work, and not specific projects for Urban transport System MP · The latest available air quality data have been obtained and incorporated into the SEA report. It is recognized that NOx, and SOx, which are covering the National Air Quality Standards 2026 (Table 2.1-1), are important air pollutant parameters related to the transportation sector as well as

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		potential for land price escalation following the implementation of the Master Plan.	particulate matter. However, gaseous pollutant parameters are not regularly monitored at the available air quality monitoring stations. Consequently, data for the requested parameters were not available for inclusion in the baseline assessment. Section 14.2 of SEA report highlights the current lack of measurement data within the Kathmandu Valley as a "data gap" and mandates the "implementation of continuous on-site monitoring of gaseous pollutants" during the feasibility study (F/S) phase of subsequent projects. ・ Based on the latest study on Urban Heat Island (UHI) mentioned that Green spaces have decreased, with the Normalized Difference Vegetation Index (NDVI) dropping from 35.59% to 29.17%, intensifying the Urban Heat Island (UHI) effect, particularly in urban centers like Tribhuvan International Airport, Patan Industrial Area, Kritipur, and Kalanki. promoting low-carbon infrastructure, and improving urban planning to counteract the negative environmental and health impacts. The proposed mass rapid transit system can be considered a low-carbon infrastructure project, as it is expected to promote a modal shift from private vehicles to public transport and thereby reduce GHG emissions.
19.	Bhaktapur Municipality	・ As Bhaktapur City is attracting an increasing number of visitors, it is important to recognize that the city has strong community-driven practices and a distinctive living cultural heritage managed in a sustainable and inclusive manner. The local government is committed to preserving Bhaktapur as a living cultural museum. Accordingly, the Master Plan (MP) and Strategic Environmental Assessment (SEA) should adequately address key environmental and social	・ For cultural heritage impacts, we have included in Chapter 14 that Conduct Heritage Impact Assessment (HIA) for priority projects located within or near heritage-sensitive areas in accordance with the progress of project design during the Pre-F/S or F/S stages. The HIA should evaluate both tangible and intangible cultural heritage and recommend avoidance, minimization, mitigation, and

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		issues, including cultural heritage safeguards, air pollution, wastewater management, and the protection and sustainable management of Bhaktapur's historic urban environment, as well as the Hanumante and Manohara River corridors. Particular attention should also be given to land acquisition and resettlement impacts associated with proposed interventions along these river corridors. In addition, smart and accessible ticketing systems should be considered in MP to facilitate convenient and affordable transportation for students and local farmers who transport and sell agricultural products in Kathmandu and the surrounding areas.	monitoring measures through consultation with Department of Archaeology during F/S. ・ The main section of the Mass Transit East-West Line is planned to run along the Araniko Highway. The elevated railway structures will cross the Manohara and Hanumante Rivers. The spur line to the proposed depot site is planned along the left bank of the Manohara River. No construction work is planned within either river. Therefore, the project is not expected to directly alter the habitats or growth conditions of the existing river ecosystems. ・ ICT for Public Transport with IC card is proposed in the Public Transport improvement project of MP.

Source: JICA Expert Team

Table-4 Opinions and Suggestions Provided in Writing by the Participants of 3rd SHM

S.No.	Organization	Opinions and suggestions provided in written form	Response from MOID/JET
1.	Kathmandu Terai Fast Track Project, Nepal Army	・ KTFT road project linking to Kathmandu valley from Terai and Mid region is completing within 5 years which will change all the traffic dynamic of Kathmandu valley. The main time KTFT and other road links (dispersion road) will also increase by traffic volume. It should be considered in this Master plan. The Kanti Highway from Satdobato (of LMC) to Makawanpur and Dakshinkali Makawanpur road traffic should be considered.	・ The MP has considered the road network of the KTFT and Kanti Highway. The future traffic demand forecast reflected related plan and improvement plans based on the information collected from related organizations. However, although our team requested that the Nepal Army provide the future traffic demand information of the KTFT through MOID, this information has not been provided officially from the Nepal Army. Therefore, future traffic demand data and information will be reflected in the MP when it is updated.
2.	Madhyapur Thimi Municipality Engineer (Environment Depart ment)	・ Long-distance public transport vehicles should be required to terminate and operate from well-planned bus terminals located outside the Kathmandu Valley, thereby reducing traffic congestion within the Valley. ・ The river corridors of the Kathmandu Valley (Kathmandu, Lalitpur, and Bhaktapur districts) should be developed as a Fast Track Valley Ring Road and constructed at the earliest possible opportunity. ・ Existing bus stops should be upgraded, and public bus services should be promoted and expanded through the effective implementation of regulations governing public transport operations. Such regulations should include strict enforcement of measures such as allowing buses to stop only for designated time periods at authorized bus stops and prohibiting passenger pick-up and drop-off outside designated bus stops. ・ A formal incentive and enforcement mechanism should be established whereby drivers who consistently comply with traffic regulations are recognized and rewarded on a monthly and annual basis, while repeat traffic offenders are subject to stricter penalties, fines, and public disclosure through social media, with these provisions incorporated into the relevant traffic regulations.	・ MP proposed bus parks outside the Ring Road, which are integrated into Chapter 3 (Figure 3.5-4 Location of Bus Park and Table 3.5.-3 P03 and P04). The river corridor projects (Figure 3.5-1 No.6 and 15) serve to disperse Ring Road traffic. ・ Highlighting F/S and operational requirements: Formalizing transport cooperatives (P02), upgrading bus shelters (P05), and establishing operational licensing schemes (Table 3.5-4, Scenario 3) with driver behavioral incentive / penalty mechanisms are highlighted. And regarding bus operations management, based on Table 3.5-3 (P01 Operations Management, P03 Route Planning, P10 Driver Training), it is necessary to continuously review the system design at the feasibility study (F/S) stage and the items that must be incorporated into the operations management regulations.

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3.	Department of Mines and Geology Senior Division Geologist	・ Please add a sub-topic (Recommendation for the amendment of prevailing law of Nepal) in the recommendation chapter in order to notify the Council of Ministers and other government entity so that they should do to amend the prevailing laws resulting successful implementation of this SEA as well as Master Plan. ・ Please advocate for lift parking for the existing commercial building and new commercial building with small spaces so that car free zone can be changed into taxi free zone because without RAP similar to Pashupati area, the local people of Thamel and two Durbar square area might be severely affected especially elderly ones. ・ Please refer DMG for the maps and other geological reports used in this report.	・ Recommendations to the Cabinet and other government agencies regarding amendments to or enhancements of existing laws to facilitate the smooth implementation of the SEA and the Master Plan, while important observations concerning the national legal system that are relevant to other master plans as well, do not constitute environmental and social issues specific to this project. Therefore, in Section 14.2, “Legal Framework in Nepal,” a note was added not as a specific comment on this SEA and Master Plan, but as a general comment regarding the formulation and implementation of master plans in Nepal. ・ Regarding the construction and installation of parking facilities and the establishment of no-vehicle zones, it is necessary to make comprehensive and phased preparations, considering alternative means of access and coordination with public transportation. In this master plan, both projects are classified as short-term projects, and it is expected that they will function effectively. ・ In this report, we have referenced information from the DMG as the source for many of the maps and other existing geological data, and we have clearly cited the sources. ・
4.	Godawari Municipality Engineer	・ Special consideration should be given for ground water percolation during the construction of ground water structures as it has been greater issue in Kathmandu. ・ At the site of world heritage zone, considerations of world heritage should not be avoided.	・ Regarding ground water protection, establishing baseline conditions for groundwater levels, groundwater flow, and geological characteristics before construction, and to conduct geological and hydrogeological investigations along the proposed underground construction section during the feasibility study are recommended in Table 7.1-1. ・ For cultural heritage impacts, we have included in Chapter 14 that Conduct Heritage Impact Assessment (HIA) for priority projects located within or near heritage-sensitive areas in accordance with the progress of project design during the Pre-F/S or F/S stages. The HIA should evaluate both tangible and intangible cultural heritage and

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			recommend avoidance, minimization, mitigation, and monitoring measures through consultation with Department of Archaeology during F/S.
5.	Chandragiri Municipality Engineer	・ How can local communities, schools and young people be more actively involved in improving air quality? ・ How will the Strategic Environmental Assessment ensure measurable reductions in PM2.5 emissions, greenhouse gas emissions and noise pollution over the next 10-20 years? Will there be publicly available monitoring indicators to evaluate the success of the master plan? ・ How will the project ensure that future road and transport development protect urban forests, rivers and ecological corridors while addressing climate resilience?	・ It is expected that local communities, schools, and young people would be active stakeholders in air quality improvement under the Urban Transport Master Plan. Their participation will be promoted through environmental education, community-based air quality monitoring, campaigns to encourage walking, cycling, and public transport use, awareness campaigns, workshops, and other activities. ・ Each project under the MP will be required to conduct an IEE or EIA, depending on its scale, in accordance with Nepalese laws and regulations. As part of the IEE/EIA, baseline surveys will be conducted, followed by regular environmental monitoring during construction and operation based on a monitoring plan. Chapter 11 recommends ensuring the proper implementation of the environmental and social management plan and environmental and social monitoring and reporting the results. While the actual requirements will depend on the safeguard policies of the donor for each project, the JICA Guidelines for Environmental and Social Considerations require the results of monitoring to be disclosed to the public. ・ Improvements to the urban transportation system are expected to alleviate traffic congestion and improve air quality. As a result, it is anticipated that the habitats and growing conditions for local ecosystems will also improve. Further details regarding environmental conservation measures will be examined during the feasibility study (FS) phase.
6.	National Planning Commission	・ Is there any alignment or plan for alignment with the Kathmandu Vision 2040 program as stated in point 22 of budget for the fiscal year 2083/84?	・ The Government of Nepal's current fiscal year budget commits to implementing the Kathmandu Vision 2040 Plan and developing integrated urban infrastructure in the

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	Planning officer	・ Considering the major earthquakes in past and the recent 2015 earthquake and its impact, the plan for the open spaces should be considered in Strategic Environmental Assessment as well. ・ There is also need to consider climate resilient infrastructure and risk zone mapping to act accordingly for the disaster-prone zones.	Kathmandu Valley, including underpasses, flyovers, river corridors, parks, solid waste management, utility ducts, and underground electricity lines. It also emphasizes the protection and expansion of open spaces through special initiatives in coordination with provincial and local governments. In addition, the Budget proposes a Smart Urban Mobility Program, including electric public buses, charging stations, tracking systems, and smart bus parks (Government of Nepal, Budget Speech, FY 2083/84) ・ "Kathmandu Vision 2040" is a long-term, integrated urban development plan announced by the Government of Nepal in the draft national budget for fiscal year 2026/27 (2083/84 B.S.) to comprehensively improve and modernize urban services and infrastructure management in the Kathmandu Valley. ・ Kathmandu Vision 2040 and KVUTSMP are generally aligned in terms of their strategic direction, scope of activities, and timeline. The details are outlined below. 1). Strategic Direction & Vision Sustainable Urban & Transport Modernization: Both plans share the vision of relieving traffic congestion, reducing air pollution, promoting public transit electrification (e-mobility), and implementing smart urban mobility systems 2) Project Components / Interventions ・ Grade Separation & Intersections: Construction of underpasses (e.g., Maharajgunj Underpass) and coordinated signal/intersection improvements. ・ River Corridors & Utility Ducts: Upgrading riverside corridor roads along major rivers and constructing underground utility duct networks for cabling. ・ Public Transit Reform: Restructuring bus routes, and introducing ICT-based smart bus stops and transit management. 3) Timeline

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			・ Target Year 2040: KVUTSMP designates 2040 as its Phase 2 (Medium-Term) target year, aligning directly with the execution timeframe of Kathmandu Vision 2040's long-term infrastructure objectives ・ Open spaces designed with earthquakes and their impacts in mind are expected to be established by the national government and local governments as part of urban planning and land-use planning. When specific measures are being considered, urban transportation systems can be harmonized with these policies. ・ Similarly, if baseline information such as official hazard risk maps and hotspots has been established by government, it is necessary to adapt to those policies and their contents in the progress of design. ・ The SEA recommends selecting locations, structures, and construction methods that incorporate design conditions capable of withstanding natural disasters (such as floods and earthquakes) based on historical data and additional hydrological and geological surveys
7.	Lalitpur Metropolitan City Environmental Engineer	・ Please consider vehicle free zone at heritage place or World UNESCO Heritage. ・ Allocate side road or dedicate cycle lane and consider existing cycle lane. ・ Consider road separate road for Sanitary landfill site.	・ Car Free Zone plan and Cycling Path plan at Both KMC and LMC are included in MP (No.17 and 18, table 3.5-1) and it is expected that these measures to be effective when implemented simultaneously. ・ From the perspective of alleviating traffic congestion in the Kathmandu Basin and improving the transportation network, the construction of dedicated roads for waste transport vehicles has not been included in this master plan as a priority project.
8.	National Federation of Nepal Transport Entrepreneurs	・ It is recommended that this Master Plan be prepared based on a thorough understanding of the current socio-economic conditions of the Kathmandu Valley and Nepal as a whole, including consultations and assessments at the grassroots level. The Plan should also ensure that the investments	・ The target area of the Urban Transport Master Plan is the Kathmandu Valley, therefore, survey area for gathering natural and social environmental baseline information is set within Kathmandu, Lalitpur and Bhaktapur district. This urban transport master plan will help for not only transport

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	Treasurer	made by existing self-employed and small-scale transport operators are protected by providing reasonable opportunities for them to recover their investments and participate in the future transport system. At the same time, the Plan should avoid imposing an unnecessary financial burden on the country. ・ Furthermore, the Master Plan should be inclusive of existing transport entrepreneurs while effectively addressing the Valley's growing traffic congestion and deteriorating environmental conditions. It is hoped that this workshop will provide a clear direction for developing a transport system that contributes to a cleaner, greener, more efficient, and more beautiful Kathmandu Valley.	entrepreneurs but also private drivers to use urban transport system smoothly in their lives and economic activities. ・ Operator risks are analyzed in Section 12.3.3 and Chapter 14 (Table 14.2-1 'Operator Resistance'). SEA is highlighting F/S and operational requirements: Under Scenario 3 (Step-wise Control, Table 3.5-4), existing small operators and drivers must not be marginalized.
9.	National Women Commission Women Development Officer	・ Footpaths should be expanded to improve pedestrian safety, accessibility, and mobility. ・ A safe and secure public transport environment should be ensured by preventing all forms of violence, harassment, and abuse within public transport vehicles. ・ Adequate street lighting should be provided throughout the road network during nighttime, and CCTV cameras should be installed to enhance public safety and security. ・ Reserved seating and appropriate transport facilities should be provided for women, children, senior citizens, and persons with disabilities to ensure equitable, safe, and inclusive access to public transportation.	・ SEA addresses considerations of safety and harassment in Section 9.1.1 (Risk 4 'Systemic Non-Compliance with Universal Design', Risk 5 'Diverse Accessibility Needs and Lack of Training', and Risk 6 'Normalization of Harassment') and Chapter 14 (Table 14.2-1 'Institutional Capacity' countermeasures). As part of its public transportation initiatives, MP proposes measures such as installing in-vehicle security cameras (CCTV) and lighting at bus stops. The active adoption of universal design is expected for mass transit systems, which are being proposed as a new form of public transportation.
10.	Ministry of Women, Children, Gender and Sexual Minorities and Social Security Women	・ The program should be implemented in a manner that protects the environment while ensuring that women, children, and persons with disabilities are among its primary beneficiaries. Appropriate measures should be incorporated to maximize their access to, participation in, and benefits from the program.	・ MP is formulated aligned with MOID's GEDSI Operational Guidelines, which are introduced in Chapter 2, and Chapter 9. The detailed effective measures, facilities and service will be discussed through FGD and/or SHM in Feasibility Studies stage.

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	Development Officer		
11.	Suryabinayak Municipality Senior Engineer	・ Presented proposed Kathmandu Valley Urban Transport System Master Plan will be effective for safe, easy and timely access to public. I liked the proposal and wish to be applicable.	・ This supportive feedback is noted with appreciation.
12.	Chandragiri Municipality Engineer	Travel demand modelling- How much trips people make and where they travel when they travel, why they travel and which mode they choose. Traditional four step should be taken into consideration: ・ Trip generation: How many trips are produced and attracted by each zone ・ Trip distribution: O-D study and patterns; common method: Gravity model ・ Mode choice: predicts which transport mode travelers use e.g.: walking, cycling, bus, air, multinomial method ・ Traffic assignment: assign trips to specific roads or transit route estimates traffic volumes, speeds and congestion Congestion pricing, Metered parking, Multi storeyed parking, Ground water recharge, Socio economic analysis, Amsterdam- More bicycles than residents excellent public transport Chicago, New York, LA, park and ride (metro) Tokyo ・ Conventional multi storey parking garages ・ Mechanical parking system ・ Parking to work Focus on park and ride: ・ Park your vehicle in suburbs. There should be provision of huge parking in suburbs and just public transportation. ・ Land allocation would be great challenge to tackle with. ・ Compensation of land is something difficult to deal with. ・ Temples in the highway. ・ Intersection should be removed from highway while clover lead intersection seems to be impossible.	・ The four-step method was applied for the traffic demand forecast in this MP. The MP has considered the multi-storied parking, and economic analysis was done. Other measures and feedback by this comment will be referred to in the implementation stage of the MP.

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		・ Might be expensive, nothing other the underground subways would be option for already congested city like KTM.	
13.	Kathmandu Metropolitan City Senior Engineer (Architect)	Consider antiquity of Kathmandu Valley ・ The major development such as underground tunnel in Gaushala-Chabahil stretch should be diverted as the measure of why in SEA is undermined by why nots ・ The site has a history that is more than 2000 years old (Jayabageshwori/ Pashupati), Charumati Bihar area (Buddha era). Points need to be considered underground water table of water conduits lines can be damaged. Road expansion can damage roadside heritage overhead walkway should consider ・ Heritage height restrictions ・ Hence recommend for diversion in milsu with urban planning. ・ Heritage friendly planning: so that is locally accepted and endorsed by local level government	・ In the process of formulating MP, Consultations were held with the Department of Archaeology, and concerns and related issues were shared. At the stage of project concretization for implementing the MP (e.g., pre-FS or FS), necessary measures and considerations will be examined and discussed in light of the relevant legislation. ・ Potential impacts on tangible and intangible cultural heritage, including Pashupati, as well as on underground archaeological remains and historic underground water systems (Hiti), are recognized as issues in Chapter 14 (Table 14.2-1, “Impacts on Heritage”) and Chapter 3 (Table 3.5-1, No. 2). ・ At this stage, the following items are envisaged as part of the investigations/studies to be undertaken during the F/S stage. However, this list is not limited, and the TOR should be finalized based on the review and comments provided by the Advisory Body through the HIA process. 1)Conducting a comprehensive Heritage Impact Assessment (HIA) led by the Department of Archaeology (DoA); 2) Conducting detailed geological borehole investigations and groundwater-level surveys to identify and protect the flow paths of traditional stone water outlets (Hiti) and underground water channels located beneath the ground; and ・ 3) Conducting a technical reassessment if irreversible adverse impacts on heritage values are identified, including: consideration of alternative routes, including diversions via Kalopul–Chabahil and other options; and review of construction methods, such as the use of a TBM shield method to ensure sufficient clearance from heritage structures and underground water systems.

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14.	Civil Aviation Authority of Nepal Project Director, SASEC Airport Capacity Enhancement Project	From the perspective of CAA Nepal, Tribhuvan International Airport, Nepal's primary aviation gateway has not been adequately addressed in Master Plan and SEA. While the report comprehensively discusses road transport, public transport and mass transit, aviation has received very limited attention. Our recommendations are: ・ TIA should be recognized as a major multimodal transport hub. Further BRT, MRT or other mass transit system should provide direct and efficient connectivity to the airport. ・ Airport safeguarding requirements should be incorporated into the Master Plan. Future roads, flyover, bridges, high rise buildings, utility, corridors and other infrastructure around the airport must consider obstacles limitation surface (OLS), flight procedures, Navigational Aids, and aviation safety requirements. ・ SEA should include an assessment of aviation specific environmental and operational impacts, including aircraft noise, bird hazards, construction dusts, lighting, cranes, electromagnetic interference and emergency access to the airport. ・ CAAN should be included as a key stakeholder and technical coordination agency for all transport projects that may affect airport operation and / or future airport expansion. ・ With these additions, the KVUTS MP will truly become an integrated transport strategy that supports not only road transport but also Nepal's international aviation gateway, while ensuring safety, sustainability and long term infrastructure development.	・ **This comment is the same as comment No.1 of Table 3 and is addressed in response to comment No.1 of Table 3.** ・ The Master Plan considered the Tribhuvan International Airport (TIA) as one of the major transport hubs in the Kathmandu Valley. It also recognizes that, in advancing the Master Plan, it is important to identify and appropriately address specific operational and environmental issues related to aviation facilities. Specific airport safeguarding compliance, technical requirements to ensure seamless multi-modal coordination will be integrated through continuous consultations with relevant stakeholders during pre-F/S stage and/or F/S stage.
15.	Nepal Forum of Environmental Journalists-NEFEJ	IA-predictive tool, normally does not block project SEA as per JICA guidelines, spirit Nepalese EPA/ EPR ・ Sensitivity of Pashupatinath Area- Cultural Heritage Site, party to World Heritage Convention, Treaty Act, (1990),	・ With regard to HIAs, even if there is insufficient experience with their implementation within Nepal, we have determined that it is possible to establish and implement HIA Terms of Reference (TOR) by referring to international practices based on the World Bank's ESS8, guidance from

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	Executive member	section 9- recall case of ERIP in 1989, NIPPON koi was consultant. ・ Also check for Nagmati High Dam ・ See Laws- Pashupati Area Development Trust Act / Ancient Monument Act- legal provisions+ other relevant laws ・ HIA proposed however, no experience no legal provision ・ Ruled out-Chabahil- Gaushala tunnel, as no experience in tunnel in KTM + former lake ・ Ruled out- Chabahil -Bagmati river elevated Highway. ・ Wild proposal- Dhobi khola corridor road and/ or elevated highways to avoid Chabahil-Gaushala tunnel+ Chabahil - Bagmati river elevated highways. ・ Issue based preliminary (terminology?) impact assessment ・ In report cultural heritage-avoid works near (define) designated heritage zone. ・ Iv. 30 transboundary (need definition/ hybrid approach) and cultural heritage This SEA look 'cocktail' as JICA guideline followed +EPA (2019)/ EPR (2020) provisions- Nepal's EIA provisions for SEA analyzer Executive summary ・ Existing coordination mechanism? ・ EIA to consider 'heritage' through ToR. ・ Data gaps- required env. Monitoring during feasibility studies – unclear ・ Alternative analysis looks interesting	organizations such as UNESCO, and examples of HIA/CHIA implementation in other countries. ・ This issue is addressed in Chapter 14 (Table 14.2-1, "Impact on Heritage" and "Missing Data," and Section 14.1.2). ・ While the Chabahir–Gaushala underground tunnel—which would expand capacity while maintaining surface existing ring road in the Pashupatinath area—remains a strategic option, it is essential to conduct detailed geological and hydrogeological surveys (including assessments of groundwater levels and impacts on clay layers) during the F/S phase, as well as a comprehensive Heritage Impact Assessment (HIA) in accordance with the DoA and UNESCO guidelines. A comparative evaluation with alternative route proposals, including the Dhobi Khola corridor, will also be further scrutinized during the feasibility study (F/S) phase.
16.	Department of Health Services Nursing Officer	Page -21 Road network, outer ring road should be restored to manage transportation. Page 33, Bishnumati river corridor elevated road – structure option 1 is best in my (as a public user) opinion. This type of structure is preferable to combat and rescue the victims in emergency/ disaster situation as (floods, earthquakes) Page 37- 3.2 Installation of off-street parking underground shopping mall, parking is suitable	・ Outer ring road has been proposed as the necessary road project No.14(primary node connecting road. **This comment is the same as comment No.15 of Table 3 and is addressed in response to comment No.15 of Table 3.** ・ Once transport demand exceeds a certain level, it becomes difficult to provide adequate and safe transport services

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		Metro is out of our expertise, so it will not be sustainable in our country. ・ Transport Management ・ For sustainability- Widen road, Large capacity bus should be operated ・ Train is not preferable because human resources as well as maintenance and other resource are not in our country.	through road development alone, making the introduction of a mass transit system necessary. Based on this objective assessment, this MP also concludes that a mass transit system is required for the East-West Line. ・ The feasibility and sustainability of the railway project will be assessed through future Pre-F/S and F/S. These studies will also include a detailed review and careful evaluation of lessons learned from Nepal's previous railway projects. As pointed out in the comments, it is also important to develop the capacity of the personnel and organizations that will be responsible for the future operation and maintenance of the Mass transit system. As Mass transit system is planned with a medium-term target of 2040 in Master Plan, we expect the necessary studies to be carried out systematically from now, along with training to improve capabilities to international standards and the establishment of an organization capable of operating mass transit system.
17.	Department of Land Management and Archive Officer- Law	・ Regarding the Chabahil–Gaushala Tunnel: ・ What will be the total length of the proposed tunnel? ・ What is the estimated construction cost of the tunnel? ・ Has a cost–benefit analysis been carried out to compare the expected public benefits of the tunnel with its construction cost? ・ When mobilizing international loans or grant assistance, is it not necessary to undertake a comprehensive cost–benefit analysis before implementation? ・ Or will the project simply place an additional debt burden on future generations? ・ Is the construction of such a tunnel appropriate within or adjacent to a UNESCO World Heritage area? ・ Instead, consideration should be given to constructing a Kalopul–Chabahil–Boudha Tunnel, which may be a more suitable alternative.	・ The length of Tunnel is approximately 15.6 km. The master plan report also includes preliminary estimates of the approximate construction costs and a cost–benefit analysis. **For other concerns, the comment is the same as comment No.15 of Table 3 and is addressed in response to comment No.15 of Table 3. (or Above)**

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18.	Department of Health Services Civil Engineer	・ For short distance, the use of vehicle should be discouraged by policy (human behavioral change) ・ Separate and dedicated utility corridor should be provisioned. ・ This reform program for 'foot path' should be incorporated. ・ Cycle barter systems like Japan and China should be promoted. ・ Trauma center should be managed (established) in certain distance interval on road. ・	・ KVUTS MP has proposed several projects aimed at reducing car use. (No. 16 Utility Corridor, No. 18 Cycling Path, No. 19 Road Safety). Since all of these projects are proposed as short-term measures, we expect that implementing multiple projects simultaneously will lead to more effective results. The detailed effective measures, facilities and service will be discussed and designed through FGD and/or SHM in F/S stage.
19.	Kathmandu Metropolitan City Culture and Creative program coordinator Division chief	・ Local government should be given more leading role for natural, cultural and social intervention. ・ Rivers cannot be trained (!) so be mindful while recommending raised/ elevated road in parts of Bishnumati corridor road. ・ Heritage settlements like core area, Pashupati, Handigaun, Naxal are and have always been recommend for vehicle free or regulated areas for many years (since 1st master plan 1969B.S) the study team can also work on prerequisite for the same like alternative routes, parking are, service and goods transportations	・ One of the key objectives of this SEA is to strategically involve stakeholders from the decision-making stage of the planning process. Since the MP covers the entire Kathmandu Valley, including three districts, it is being prepared centrally as an integrated plan to ensure consistent quality and a common timeline across the entire area. At the same time, during the implementation of individual projects proposed in the MP, detailed information, opinions, and cooperation from each local government will become increasingly important. Therefore, we will continue to communicate and coordinate with the local governments and reflect their input in the implementation of individual projects. ・ The proposed River Corridor projects are based on the premise that existing river structures and the watershed will not be altered and are designed around the concept of maximizing the use of existing roadside areas. With regard to the impact on the existing river ecosystem, the top priority is to select construction methods that do not directly alter it. Furthermore, in light of recent urban flooding incidents, the project will implement appropriate conservation measures to prevent turbid water from flowing into the river during construction. Additionally, as proposed in Chapter 7 of the Environmental and Social Management Plan (ESMP), the design will take geological, hydrological, and meteorological conditions into account to

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			ensure that infrastructure structures are resilient to disasters. ・ For cultural heritage impacts, we have included in Chapter 14 that Conduct Heritage Impact Assessment (HIA) for priority projects located within or near heritage-sensitive areas in accordance with the progress of project design during the Pre-F/S or F/S stages. The HIA should evaluate both tangible and intangible cultural heritage and recommend avoidance, minimization, mitigation, and monitoring measures through consultation with Department of Archaeology during the F/S.
20.	Kirtupur Municipality Senior Divisional Engineer	・ The Master Plan should be prepared in a manner that ensures the development of urban transportation does not diminish or adversely affect the historical and religious significance of the Kathmandu Valley. ・ Since this is a Master Plan for the entire Kathmandu Valley, it would be beneficial to conduct separate consultation meetings with each local government, as far as practicable, to obtain their views and recommendations. Each local government may have roads of particular local importance, and due consideration should be given to how these roads can be effectively integrated with the broader transport network at the metropolitan and regional levels. ・ Rather than focusing solely on road widening, greater emphasis should be placed on the development and promotion of mass public transportation systems as a sustainable solution for urban mobility.	・ One of the key objectives of this SEA is to strategically engage stakeholders from the planning and decision-making stages. Since the MP covers the entire Kathmandu Basin (three districts), it is being developed centrally and in a unified manner to ensure consistent quality and timelines across the region, rather than being formulated separately for each area. On the other hand, when it comes to the implementation phase of the individual projects proposed in the MP, it will be crucial to receive more detailed information, feedback, and cooperation from each local government. Therefore, we plan to maintain ongoing communication with each local government and incorporate their input into the implementation of specific projects. ・ Once transportation demand exceeds a certain level, it becomes difficult to provide adequate and safe transportation services through road improvements alone, necessitating the introduction of a mass transit system. Based on this objective assessment, this MP has concluded that a mass transit system is also necessary for the Tozai Line. Furthermore, regarding the structure of the urban transportation system, three transportation development scenarios—including the “No Action” option—“Without Option”—were compared and evaluated

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			from environmental, social, technical, economic, and financial perspectives: Scenario 1: Comprehensive Mass Transit Network; Scenario 2: Transportation Improvements Centered on Road Construction; and Scenario 3: Integrated Transportation Strategy. Scenario 3 was adopted, and multiple road improvement projects—including a mass transit system connecting the east and west—were selected as priority projects. The proposal combines the introduction of mass transit with road improvements and public transit enhancement projects.
21.	Godawari Municipality Senior Engineer	· Quarry sites, haul routes, and construction waste management: The Master Plan should identify and assess potential quarry sites, transportation routes for quarry materials, and suitable locations and mechanisms for the collection, transportation, disposal, and management of construction and solid waste.	· Since the procurement of materials and other aspects of project implementation vary depending on the structure and construction methods, general feasibility is assessed even at the feasibility study (FS) stage, and detailed design—and, in some cases, construction—will be reviewed by the contractor during the construction phase. At the master plan stage, no restrictions are placed on the sources of procurement.
		· Institutional mandates and jurisdiction: The Plan should take into account the provisions of the Local Government Operation Act, 2017 (2074 B.S.), and clearly recognize the roles, responsibilities, and jurisdictions of the federal, provincial, and local governments to ensure effective coordination and implementation.	· The primary objective of this Master Plan is to support the improvement and development of the urban transport system in Kathmandu Valley. In its formulation, the relevant provisions of the Nepal Local Government Operation Act, 2017 (2074 B.S.), particularly those concerning local transport, road infrastructure, land use, and coordination among local governments, will be duly considered. The Master Plan will also seek to ensure appropriate coordination with the concerned municipalities and relevant government agencies.
		· Review of the legal framework: The Study Team should comprehensively review the prevailing laws, regulations, and policies, identify any legal constraints or implementation challenges, and ensure that the Master	· The Local Government Operation Act, 2017 has been reviewed, and a summary of its relevant provisions is presented in Chapter 2. In addition, the applicable laws and regulations relevant to the implementation of the Master Plan have been thoroughly reviewed, and their key

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		Plan is consistent with the applicable legal and institutional framework.	provisions have been summarized and incorporated into Chapter
		・ Protection of heritage core areas and traditional routes: The Master Plan should give due consideration to heritage core areas, including the protection and uninterrupted functioning of traditional chariot procession (Rath Yatra) routes, Jatra routes, and other culturally significant processional pathways. Appropriate design measures should be incorporated to preserve and facilitate these traditional.	・ For cultural heritage impacts, we have included in Chapter 14 that Conduct Heritage Impact Assessment (HIA) for priority projects located within or near heritage-sensitive areas in accordance with the progress of project design during the Pre-F/S or F/S stages. The HIA should evaluate both tangible and intangible cultural heritage and recommend avoidance, minimization, mitigation, and monitoring measures through consultation with Department of Archaeology during F/S.
		・ The land acquisition and compensation framework should adopt the principle of just and fair compensation, ensuring that affected property owners receive compensation reflecting the full replacement or fair market value of their assets. Any inconsistencies between this principle and the prevailing legal provisions should be identified and appropriately addressed.	Regarding Land acquisition and Resettlement, Nepal's Land Acquisition Act mainly focuses on compensating legally recognized landowners and affected assets, while the World Bank and JICA safeguard frameworks take a broader approach to involuntary resettlement impacts. Key gaps include support for non-title holders and vulnerable groups, full replacement-cost compensation, livelihood restoration, participatory resettlement planning, meaningful consultation, and measures to avoid or minimize resettlement. Therefore, project-specific measures such as a Resettlement Action Plan (RAP), livelihood restoration assistance, additional support for vulnerable groups, and a grievance redress mechanism are required to meet the safeguard requirements, with reference to international safeguard policies.
		・ Compliance with the Land Use Act, 2019 (2076 B.S.): The Master Plan should be prepared in accordance with the Land Use Act, 2019 (2076 B.S.), while taking into consideration the land use plans, zoning regulations, and development priorities of all municipalities within the Kathmandu Valley.	・ This Master Plan primarily focuses on the improvement and development of the urban transport system in Kathmandu Valley. In preparing the Master Plan, relevant land use plans, zoning provisions, and development priorities of the

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			municipalities within the Valley will be duly considered to ensure appropriate coordination and consistency with the applicable legal and planning framework. .
22.	Nepal Environment Society	· Involve SchEMS, Pokhara University as academic stakeholders for upcoming stages. · Incorporate LULC (land use land change) along with current expected and proposed open space and green space. · Since this is the guiding document for DPR, EA and implementation of the project, it is necessary to incorporate as much as topics such as huge water extraction and its possible mitigation measures. · Consider micro-climate too. This will in-turn impact Shivapuri-Nagarjun National Park (only protected area of Kathmandu Valley). · Incorporation of indigenous knowledge from indigenous communities of Kathmandu valley.	· There are several academic institutions offering environmental and related programs; therefore, including all of them in the academic stakeholder list would be difficult. The universities who were invited into TWG and SHM were selected based on the suggestions of MoID and MoAFE. · Since this Master Plan is an urban transportation system master plan, future transportation demand forecasts took into account development projects proposed by relevant agencies, such as new town plans, as well as urbanization trends based on population projections from the National Statistics Office (NSO). JET considered utilizing official land-use plans but was unable to obtain them from the relevant government agencies. Furthermore, the "Comprehensive Physical Development Master Plan (KVDA MP)", which has been under developing by KVDA since 2023 also highlights the urgent need to reflect valley-level land-use plans in the city's cadastral maps. To achieve this, appropriate coordination among the three administrative levels is essential. · The calculation of reductions of GHG has not considered the assumption of the use of EV in the SEA report. If the use of EV is considered, it is expected that the emission of CO2 will be more reduced.
23.	Kathmandu Metropolitan City Senior Planning	· In future, considering right market; safe location and design are to be indicated for child, women, and elder; bus bay, bus stop.	With regard to the issues identified, the SEA addresses them as follows: · Consideration of Universal Design: Based on the principles of universal design (Figure 3.5-29), detailed designs for bus stops and bus bays will be developed to ensure safe

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	Officer	・ More infrastructure occupies more land, pressurize spun city, we have to leave natural open space for natural biodiversity. ・ Population growth speculation, not increase but as business district and tourist flow will increase consumers, travelers ・ Beyond the UNESCO and DoA, small local cultural issue likely to raise during implementation phase, we have to take in consideration. ・ Powers, reallocation / distribution among 3 tier governments agencies regarding whole mobility system, government issues	access and use by children, women, older persons, and other vulnerable users. ・ Prevention of Excessive Land Modification and Conservation of Green Areas To prevent excessive land modification associated with infrastructure development, the area subject to land alteration will be minimized as much as possible prior to construction. Design and construction methods that help conserve green belts and other green areas will also be considered. ・ Protection of Local Traditional Culture: Community-level cultural features, such as locally distinctive shrines in and around the construction areas, will be identified in advance and appropriately protected. ・ Implementation Framework: The overlap of mobility-related jurisdictions among the federal, state, and local governments is identified in Section 12.3. In addition, Table 14.2-1 in Chapter 14 (Implementation Framework) proposes specific measures to address these issues.
24.	Tokha Municipality Kathmandu Engineer	・ The draft strategic Environmental Assessment should prioritize environmental protection, public participation, biodiversity conservation, pollution control and regular monitoring to support sustainable development.	・ Key concerns mentioned in the comment are fully addressed in Chapter 7 (ESMP and ESMoP) and Chapter 12 (Stakeholder Engagement). The EMP (Table 7.1-1) proposed mitigation measures to protect, avoid and/or minimize the environmental and social impacts. The ESMoP (Table 7.2-1) defines periodically air, noise and vibration, water quality monitoring which will be strictly enforced during F/S and construction stages with public disclosure of findings to ensure continuous participation.
25.	Department of Archeology, Ramshahpath, Kathmandu Engineer	・ The Kathmandu Valley Urban Transport System Master Plan should ensure the active involvement of the Department of Archaeology (DoA) in the planning and implementation process to safeguard the Valley's cultural heritage. To strengthen the implementation of Heritage Impact Assessments (HIAs), a roster of qualified heritage experts should be established and mobilized for projects	・ Key concerns mentioned in the comment are addressed in Chapter 14 (Table 14.2-1 'Heritage Impact'). The procedure of HIA based on DoA material is summarized in Section 6.2.2. The draft SEA report identifies UNESCO World Heritage Sites in the baseline and recognizes the high cultural sensitivity of the Pashupati area. Accordingly, the report recommends that a comprehensive Heritage

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		that may affect heritage resources. The planning and implementation process should aim to minimize adverse impacts on cultural heritage through effective coordination with local governments, local communities, and custodians of living heritage, ensuring that both tangible and intangible cultural values are adequately protected. ・ The Master Plan should give due recognition to the Protected Monument Zones (PMZs) designated by the Department of Archaeology, while also ensuring full compliance with UNESCO World Heritage conservation requirements and international best practices for the protection and management of cultural heritage. ・ As subsurface investigations and tunnel construction have the potential to adversely affect archaeological remains and heritage assets, the proposed Gaushala–Chabahil Tunnel should be carefully reassessed. Alternative alignments located outside the Protected Monument Zone (PMZ) of the Pashupati World Heritage Site should be evaluated to avoid or minimize potential impacts on the site's Outstanding Universal Value (OUV) and associated cultural heritage.	Impact Assessment (HIA), in coordination with the Department of Archaeology (DoA) and in accordance with the World Heritage Convention and national legislation, be undertaken and approved during the F/S stage prior to final design. ・ In the process of formulating MP, Consultations were held with the Department of Archaeology, and concerns and related issues were shared. The proposed Chabahil–Gaushala underground tunnel (No.2, Table 3.5-1) is considered a strategic option for maintaining the existing four-lane Ring Road at the surface while constructing a tunnel beneath it, should be carefully reassessed during F/S. Detailed geological, geotechnical, and hydrogeological assessments, including analysis of lake-basin clay conditions, groundwater recharge, and underground structures, will be required as part of the F/S. Alternative alignments, including the Dhobi Khola Corridor raised in the 3rd SHM, will also be comparatively assessed during the F/S to identify the most appropriate option while minimizing potential impacts on cultural heritage.
26.	Pashupati Area Development Trust Architect	・ The Pashupati Area covers an area of 264 hectares. It was inscribed on the UNESCO World Heritage List in 1979 due to its Outstanding Universal Value (OUV). Under the Ancient Monument Preservation Act, 2013 B.S. (1956 A.D.), the Government of Nepal declared the Pashupati Protected Monument Area in 2056 B.S. (1999/2000 A.D.). The protected area includes Wards 7, 8, and 9. ・ To preserve religious values, protect both tangible and intangible cultural heritage, and develop the Pashupati Area as an international pilgrimage destination, the Pashupati Area Development Trust (PADT) has prepared a Master Plan. ・ The Ring Road, Gaushala, and Chabahil corridors contain numerous historically and archaeologically significant	**This comment is the same as comment No.3 of Table 3 and is addressed in response to comment No.3 of Table 3.** ・ Furthermore, the Pashupati Area Development Trust Act, 1987, has been reviewed, and its relevant provisions have been incorporated into Chapter 2We have addressed the heritage impact assessment in Chapter 14 (Table 14.2-1 'Heritage Impact'). During the F/S, a comprehensive HIA in coordination with PADT, KMC, and DoA is highlighted as a mandatory requirement. ・ The Pashupati Area Master Plan is understood to be based on the premise of development that preserves cultural heritage, religious sites, and the natural environment, while also providing for infrastructure development, including

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		heritage structures, including temples, dabalis (traditional open platforms), rest houses, and chaityas (Buddhist shrines) on both sides of the road. Due to heavy traffic congestion, these archaeological and cultural heritage assets have experienced adverse physical impacts and are also affected by air pollution, dust, noise, and other forms of environmental pollution. ・ It was suggested that the views and recommendations of heritage experts should also be sought. Further discussions and consultations are considered necessary. ・ The Pashupati Area Master Plan envisions the Ring Road–Tilganga–Gaushala–Chabahil corridor as a heritage- and pilgrim-friendly corridor, and this objective should be taken into consideration during future transport planning. ・ The Tilganga–Tamraganga Road was constructed without obtaining the necessary approvals/consent, resulting in environmental damage. Consequently, there is now a need to close or discontinue its operation until the outstanding issues are appropriately addressed. ・	transportation systems and road However, the Master Plan has not been officially made publicly available. The engineering design of the Ring Road-Tilganga-Gaushala-Chabahil corridor must incorporate heritage-friendly principles, including pedestrian safety, dust suppression, noise barriers near monuments, and consultations with local Guthiyars (traditional custodians) to ensure the continuity of local religious practices. ・ The Master Plan embraces the 'Car-Free Area' concept and the 'Compact Street Approach' to maximize human space and walking rights while restricting vehicle dominance in historical zones. This will not affect traditional festivals (Jatras) but will enhance heritage protection. With appropriate design and consultation, the concept is intended to avoid adverse effects on traditional festivals; this must be verified during the F/S and HIA.
27.	Department of Archeology, Ramshahpath, Kathmandu Archeological Officer (World Heritage Conservation Section)	・ In addition to the Protected Monument Zones, the project should also give due consideration to other cultural heritage resources located within the project influence area. Along the proposed Chabahil–Gaushala corridor, particular attention should be paid to the Pashupati Protected Monument Zone, the Dhando Chaitya (a significant Licchavi-period monument), and the Ratna Park area, which includes archaeological remains associated with the historic Bhotahiti stone spout (Hiti) and Rani Pokhari. Appropriate measures should be taken to identify, protect, and conserve both above-ground and subsurface archaeological remains, as well as other heritage assets that may be affected by the project. ・ The project should undertake phased consultations with the Department of Archaeology (DoA), the Pashupati Area Development Trust (PADT), and the Kathmandu	・ With regard to impacts on cultural heritage, Chapter 14 includes a requirement to conduct a Cultural Heritage Impact Assessment (HIA) at the pre-F/S or F/S stage, in line with the progress of project design, for priority projects located within or near areas where cultural heritage needs to be considered. ・ At present, however, the specific procedures and methods for conducting HIA are not yet clearly established, and there is limited experience in implementing HIA. Therefore, it will be necessary to establish an appropriate HIA process and methodology through consultation with the relevant authorities as the HIA is carried out. ・ The HIA should assess both tangible and intangible cultural heritage and, in consultation with the Department of Archaeology (DOA) at the F/S stage, recommend measures to avoid, minimize, and mitigate impacts, as well

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		Metropolitan City (KMC) throughout the planning, design, and implementation stages. ・ If archaeological remains or cultural artifacts are discovered during project implementation, construction activities should be immediately suspended in the affected area. The Department of Archaeology should be promptly notified, and works should resume only after the Department has completed the necessary investigations and provided formal clearance in accordance with the applicable legal procedures. ・ A comprehensive Heritage Impact Assessment (HIA) should be carried out for the proposed tunnel alignment and the Ratna Park area. The HIA report should be submitted to the Department of Archaeology for review and approval, and project implementation should proceed only after the Department has granted the necessary clearance.	as appropriate monitoring measures. The HIA should also address the methods for surveys to be conducted before and during construction, including hydrological and geological surveys, test excavations, and a Chance Find Procedure, as well as the procedures to be followed if buried cultural heritage is identified. ・ In addition, based on the HIA process described in Section 6.2.2, an advisory body, with its composition determined in consultation with the DoA, should be established. The Terms of Reference (TOR) for the HIA should be reviewed by this advisory body. ・ Furthermore, based on the advice received, it is proposed to establish a coordination mechanism involving the DOA, PADT, and local authorities to help establish, coordinate, and review the HIA process and ensure its appropriate implementation.
28.	Bhaktapur Municipality Engineer	・ Bhaktapur operate with highly decentralized community drives governance focused on preserving 'The living cultural Museum. Some specific environmental and social argument to be done ・ Cultural heritage safeguards ・ Urban infrastructure concerns with air pollution ・ Hanumante river corridors restriction ・ Protection of traditional local livelihood ・ Roads with walkability framework (Solar street lamps etc.) ・ Mass population of students and farmers, so for themselves smart card ticketing system ・ HIA must be highly focused for protecting structural integrity along with local community level, trust (Guthis), also include DoA and other local historians rather than just urban transport planners ・ Syndicate and institutional resistance happening on current bus industries ・ Land acquisition and involuntary resettlement	・ In Chapter5：Scoping and Chapter 8 Impact assessment、potential environmental and social impact items are selected from 30 items. Cultural heritage, Hydrology, Accident, Land acquisition and resettlement and gender, as you pointed, are already selected and proposed the environmental and social mitigation measures ・ Since it is expected that traffic flow will be smoother by improvement road network and shifting vehicles from existing roads due to new mass transportation, air quality along the road will be improved. ・ For priority projects located in or near areas where cultural heritage needs to be considered, an HIA should be conducted at the pre-F/S or F/S stage to identify measures to avoid, minimize, and mitigate impacts on cultural heritage. The HIA procedures and implementation framework should be established through consultation and coordination with the DOA and other relevant authorities.

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		・ Gender based violence	・ ICT for Public Transport with IC card is proposed in the Public Transport improvement project of MP.
29.	Kathmandu Metropolitan City Engineer	・ Strategic Environmental Assessment is crucial for transport planning, construction and management. Climate change, air quality, land acquisition and resettlement risks, urban flooding and hydrology. ・ New projects for transport (Projects) should acquire all these key environment impacts. Such studies can be extremely helpful if studied earlier before the design phase for the future master-plans	・ As you pointed out, conducting an environmental and social assessment (SEA) at the very early stages of planning (during the development of the master plan) is the cornerstone of this SEA, and the basic concepts are clearly outlined in Figure 1.5-1 (Relationship between SEA and EIA) in Chapter 1. The scope definition in Chapter 5 (Table 5.1-1) and the impact assessments in Chapter 6 covering 30 environmental and social categories—including air quality, hydrology, flooding, and land acquisition—are expected to serve as guidelines for implementing “strategic avoidance and mitigation” prior to detailed examinations during the subsequent feasibility study (F/S) phase.
30.	Kathmandu Metropolitan City Senior Environment Engineer	・ New river corridor Thapathali-Tripureshwor and Bishnumati river corridor elevated highway also requires Heritage Impact Assessment as these river sides are related closely related to daily cultural rituals, temples, traditional ghats. ・ River corridor elevated highway should have access to the river ghats for performing daily rituals. These should also have access in equipment for debris and solid waste removal. ・ Ishan city; there is no any detail of assessment about the Ishan city.	・ The proposed River Corridor projects are based on the premise that existing river structures and the watershed will not be altered and are designed around the concept of maximizing the use of existing roadside areas. With regard to the impact on the existing river ecosystem, the top priority is to select construction methods that do not directly alter it. Furthermore, in light of recent urban flooding incidents, the project will implement appropriate conservation measures to prevent turbid water from flowing into the river during construction—such as during the timing of construction work or due to topsoil erosion. Additionally, as proposed in Chapter 7 of the Environmental and Social Management Plan (ESMP), the design will take geological, hydrological, and meteorological conditions into account to ensure that infrastructure structures are resilient to disasters.
31.	Kageshwori Manohara Municipality	・ Please consider all cultural heritage areas in master plan. ・ Should consider Pashupatinath areas in Master Plan	・ With regard to impacts on cultural heritage, Chapter 14 includes a requirement to conduct a Cultural Heritage Impact Assessment (HIA) at the pre-F/S or F/S stage, in line with the progress of project design, for priority projects

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	Engineer		located within or near areas where cultural heritage needs to be considered.
32.	Nagarjun Municipality Engineer	・ Informal settlers area (in maps) ・ Small decentralized core area in KV ・ Open space connectivity during disaster and road connectivity	・ Chapter 8 of the report focuses the challenges and implementation guidelines for land acquisition and resettlement associated with the Kathmandu Valley Urban Transport Master Plan. These critical challenges are also highlighted in Section 14.1.2.3. To conduct the consultation with affected households, It is important to prepare the Resettlement Action Plan (RAP), which harmonizes Nepal's domestic laws with international safeguard standards, including Livelihood Rehabilitation Plan (LRP) based on thorough surveys, establishing a Grievance Redress Committee (GRC) to ensure transparency, alongside continuous monitoring by external third-party agencies are important. ・ Safety management and emergency response to disasters are important issues that cover not only natural disasters, such as floods and torrential rainfall, but also human-induced disasters, such as traffic accidents. In this MP, Project No. 20: Emergency Road Network Project is proposed to support emergency response and rescue activities in the event of a disaster. Although this MP is intended to improve the urban transport system, it is important for each local government to ensure consistency with the transport-related projects proposed in this Urban Transport MP when considering open spaces to be designated as evacuation areas in the preparation of land-use plans. In particular, from the perspective of ensuring accessibility required for evacuation and rescue activities in the event of a disaster, coordination between evacuation areas and the emergency road network should also be taken into consideration.
33.	Kathmandu Metropolitan City	・ To cope with urban flooding; side drain can be used as rainwater recharge zone (rain garden concept) ・ (rainwater recharge concept during planning)	・ The SEA will provide the overall direction for drainage and stormwater management, taking into account the increasing risk of urban flooding due to heavy rainfall and

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	Senior Civil Engineer		urbanization. Specific and appropriate measures will be examined in detail during the subsequent feasibility study. ・ Urban flooding is influenced not only by road infrastructure but also by broader land-use changes, including the increase in impervious surfaces associated with urbanization and residential development. Therefore, these factors will be considered from a broader perspective, together with climate-resilient drainage and infrastructure, as well as emergency communication and response arrangements. ・
34.	Nepal Police, Women, Children and Senior Citizen Service Directorate Police Inspector	・ To reduce and prevent Gender-Based Violence (GBV) in public transportation and to enhance the safety and security of passengers, the Nepal Police has been implementing the "Safety Pin Campaign" targeting public transport services. In addition, the Nepal Police has been conducting various public awareness and outreach programs to promote safe public transportation and prevent GBV-related incidents. ・ Therefore, it is recommended that the Study Team strengthen coordination and consultation with relevant stakeholders, including the Nepal Police, transport operators, local governments, civil society organizations, and women's organizations, to develop more effective strategies for the prevention, control, and response to GBV in public transportation. Such collaborative efforts would contribute to creating a safer, more secure, and inclusive public transport system for all users. ・	**This comment is the same as comment No.13 of Table 3 and is addressed in response to comment No.13 of Table 3.** ・ This critical social safety issue is integrated into Chapter 9 (Section 9.1.1 Risk 6 'Normalization of Harassment', and Risk 7 'Inadequate Accountability') ・ To discuss key GEDSI issues and challenges, for consideration in the SEA of KVUTSMP, we have held separate discussions—in the form of KIIs and FGDs—with representatives of organizations and agencies that provide support to socially vulnerable groups, such as people with disabilities and the elderly, as well as other GEDSI stakeholders, apart from the stakeholder consultations. The meeting minutes are provided in Appendix 7. ・ As part of its public transportation initiatives, MP proposes measures such as installing in-vehicle security cameras (CCTV) and lighting at bus stops. In addition, it is expected to conduct educational and awareness-raising activities in collaboration with the police to prevent incidents of sexual harassment.
35.	Kathmandu Metropolitan City	・ Elevated highway proposed along Chabahil Bagmati River have Boudha stupa which is a world heritage site. Hence, required HIA in this project as well.	・ With regard to impacts on cultural heritage, Chapter 14 includes a requirement to conduct a Cultural Heritage Impact Assessment (HIA) at the pre-F/S or F/S stage, in

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	Senior Architect	・ Elevated highway along Bishnumati river corridor have high social and cultural impact. In context of Nepali culture, Bishnumati River have higher religious and cultural value. No. of religious and cultural activities (cremation, festivities etc.) are associated with river bank. Hence the Strategic projects shall not limit the easy access to these river bank on daily basis. ・ Relocation via alignment adjustment seems as one difficult approach in mitigation as per Kathmandu previous experience being on highly populated Kathmandu valley. ・ The assessment studies pollution about air quality, waste and soil, water quality etc. but the visual pollution aspect is missing. The elevated highway ia a narrow corridor along low rise buildings around these alignment can have visual pollution. The project shall assess (study) built environment created by these development projects.	line with the progress of project design, for priority projects located within or near areas where cultural heritage needs to be considered. ・ At present, however, the specific procedures and methods for conducting HIA are not yet clearly established, and there is limited experience in implementing HIA. Therefore, it will be necessary to establish an appropriate HIA process and methodology through consultation with the relevant authorities as the HIA is carried out.
36.	Department of Water Supply and Sewerage Management Senior Divisional Engineer	・ 1000 mm to 1400 mm size bulk distribution line for distribution of Melamchi water is at Chabahil-Gaushala section. Is relocation of this pipes needed while constructing Tunnel road at this section? Utility corridor at this section may be possible to relocate all utilities such as water pipes, sewerage, electricity line, telecom line etc. ・ Efficient drainage structures should be made in the junctions to drain out rain water accumulated during heavy rainfall. ・ There are numbers of waste water treatment plants under implementation and in plans within Kathmandu Valley, for the river water quality this is to be highlighted in the report. ・ For water and waste water related issued Kathmandu Valley Water Supply Management Board (KVWSMB) (the utility owner within Kathmandu valley) should be coordinated.	・ Chapter 5 (Scoping) and Chapter 6 (Impact Assessment) address the impact on Existing Social Infrastructure and Services. There is a possibility of conflict with the existing infrastructures due to the implementation of construction activities. Preparation of Infrastructure Diversion Plan is proposed as the mitigation measures (Table 7.1-1) ・ Section 4.2.5 explains that there are four wastewater treatment plants in the Kathmandu Valley.
37.	National Disaster Risk Reduction and	• Ecosystem; identifying key ecosystem species and propose trans/	**This comment is the same as comment No.11 of Table 3 and is addressed in response to comment No.11 of Table 3.**

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	Management Authority Conservation Officer	・ You have proposed action based on terrestrial ecosystem, however you have missed the water ecosystem. ・ Rehabilitation of urban forestry integrated with riparian vegetation restoration should be incorporated considering the future climate scenario considering the recently seen heatwave events and depraving of road networks in Europe. • Disaster: I would suggest to go through multi-hazard risk assessment framework and consider the fluvial flood ・ Green urban space management ・ Promotion of nature based solutions ・ Urban biodiversity- landscape ecology principles deviates from normal diversity • Policy ・ Insured e-flow mechanism ・ Integrated urban forestry through rehabilitation and restoration of degraded wetland ecosystem and riverine ecosystem. ・ Integrated urban space managed following nature based solutions. ・ Integrated approach on rodent, insects and reptiles management. ・ Consideration of risk informed land use planning ・ Depaving of European; less on land ・ Based on audience, presentation have to be improvised so that participant would more focus on policy level rather than plan level. ・ Multi hazard risk (e.g. Flood, heat wave.)	・ Many of the proposed projects are in areas that have already been developed and include the renovation and expansion of sections where existing roads are congested. However, a note was added stating that, in areas where new above ground and underground structures will be built, the impact on urban green spaces including road side trees and groundwater infiltration capacity should be assessed, and necessary measures should be taken. ・ The project, proposed under the working title “River Corridor,” is based on the premise that existing river structures and the watershed will not be altered, and is designed around the concept of maximizing the use of existing roadside areas. With regard to the impact on the existing river ecosystem, the top priority is to select construction methods that do not directly alter it. Furthermore, in light of recent urban flooding incidents, the project will implement appropriate conservation measures to prevent turbid water from flowing into the river during construction—such as during the timing of construction work or due to topsoil erosion. Additionally, as proposed in Chapter 7 of the Environmental and Social Management Plan (ESMP), the design will take geological, hydrological, and meteorological conditions into account to ensure that infrastructure structures are resilient to disasters.
38.	Department of Environment Science Kathmandu University	・ Considering the population growth and trend, rapid urbanization and Kathmandu being a transit and cultural hub, the KTM urban transport is very timely and crucial. ・ The SEA has 23 projects/ alternatives including provision of emergency exits and additional alteration which can complement the 23 alternatives.	・ In consideration that implementation details and specific requirements have not yet been finalized in legislation, we proactively incorporated it into the process and held three stakeholder consultation meetings and explained ‘What is SEA’ in Section 1.5.

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		・ The objectives and rationale behind MRT is well explained and logical: GH emission, reduction, pollution emission reduction. ・ the project could be a benchmark in the urbanizing areas/ region if it is successful 'environment friendly' ・ changing people's mind set is crucial ・ stakeholders perspective; logical with report ・ Airport connectivity with the proper MRT ・ Impacts project may have an important heritage sites ・ Flash flood ・ Radio transmission to be made accessible at underground infrastructure ・ Physically challenged friendly infrastructure ・ Inclusion of other Universities as stakeh ・ Observation1: stakeholder rs still seem to be confirmed with SEA and EIA ・ Observation 2: The project team has a big challenges	
39.	Radio Nepal Technical Officer	・ The underground transportation system should include a technical solution that allows passengers to listen to Radio Nepal throughout the underground. This will ensure continuous access to news, emergency information, public service announcements and other important broadcasts during travel. ・ As a Radio Nepal has received significant support from Japan over the years. It is requested that JICA also consider integrating Radio Nepal's broadcasting service into the Master Plan.	**This comment is the same as comment No.8 of Table 3 and is addressed in response to comment No.8 of Table 3.** ・ Proposals regarding safety management and emergency response during disasters are important matters that cover not only natural disasters such as floods and torrential rains but also man-made disasters such as traffic accidents. To ensure the stable and effective operation of the urban transportation system, it is necessary to create an environment where public transportation users can continuously receive traffic information and safely use the transportation system—even when utilizing underground sections such as the proposed Chhabahil-Gaushala Underground Tunnel (No. 2 in Table 3.5-1) or underground mass transit facilities that may be constructed in the future. This content is also related to Emergency Road Network Projects (No. 20) and Traffic Signal including center

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			system (No. 21), and this point will be emphasized again in Chapter 14. ・ Regarding the emergency communication service to be introduced, a detailed safety and emergency information system will be established during the feasibility study (F/S) phase, taking into consideration the effective systems and operational methods currently in use in Nepal.
40.	Kathmandu Metropolitan City Section Officer, Law and Human Right Department	Subject: Comments and Recommendations on the Draft Strategic Environmental Assessment (SEA) Report for the Kathmandu Valley Urban Transport System Master Plan Following a review of the Strategic Environmental Assessment (SEA) Report prepared for the Kathmandu Valley Urban Transport System Master Plan, the following legal and technical comments are submitted on behalf of the Kathmandu Metropolitan City (KMC) to ensure compliance with constitutional provisions, environmental sustainability, and social justice. 1) Jurisdictional Alignment and Co-decision Role Rationale: The Constitution of Nepal and Section 11(2), Clauses (Ñ), (Ta), and (Jha) of the Local Government Operation Act, 2017 (2074 B.S.) grant local governments exclusive authority over local roads, pedestrianization, local traffic management, and environmental regulation. Recommendation: In Chapter 11 (Implementation Structure) of the report, Kathmandu Metropolitan City should not be limited to the role of merely a "supporting agency" or "stakeholder." Instead, it should be legally recognized as a co-decision maker in the planning and decision-making process. The implementation of the Master Plan is unlikely to be feasible without the prior consent and active participation of the Kathmandu Metropolitan City.	1) The statutory roles and responsibilities of Kathmandu Metropolitan City (KMC) are duly acknowledged. However, Chapter 11 specifically addresses the institutional arrangements for implementing and monitoring the environmental measures under the SEA, including the EMP and EMoP, rather than the overall implementation or decision-making structure of the Master Plan. Accordingly, the relevant roles of KMC and other concerned authorities will be appropriately reflected within the scope of EMP/EMoP implementation and monitoring.

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		2) Compliance with Local Environmental Laws Rationale: Any large-scale infrastructure project implemented within the jurisdiction of Kathmandu Metropolitan City must fully comply with the applicable local environmental standards and regulations. Recommendation: In addition to the relevant federal legislation and the JICA Guidelines, Chapter 2 (Legal Framework) should mandatorily include the Kathmandu Metropolitan City Environment and Natural Resources Conservation Act, 2020 (2077 B.S.) and the Solid Waste Management Collection and Transportation Procedures, 2024 (2081 B.S.) as part of the overarching legal framework governing project implementation. 3) Legal Responsibility for Construction and Demolition (C&D) Waste Management Rationale: The construction of major roads, flyovers, and mass transit infrastructure will generate millions of tons of construction and demolition (C&D) waste, placing a substantial burden on the existing municipal solid waste management system. Recommendation: A clear provision should be incorporated into the Environmental and Social Management Plan (ESMP) (Chapter 7) specifying that the project proponent and/or contractor shall bear full technical and financial responsibility for the collection, transportation, treatment, and final disposal of all construction and demolition waste generated by the project.	2) The relevant local-level laws have been reviewed and incorporated into Chapter 2. 3) Waste management For each proposed project, EIA/IEE procedures are required during the feasibility study (FS) phase in accordance with Nepalese laws and regulations. As part of this process, an Environmental and Social Management Plan (ESMP) and an Environmental and Social Monitoring Plan (ESMoP) are formulated, and the project operator is required to implement both the EMP and the EMOP when carrying out the project.

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		4) Rights of Informal Settlers and Social Justice Rationale: Displacement of informal settlers who do not possess formal land ownership certificates, without appropriate mitigation measures, is likely to create significant social conflict and could delay or obstruct project implementation. Recommendation: In accordance with the JICA Guidelines for Environmental and Social Considerations (2022) and internationally recognized human rights principles, Chapter 8 of the report should explicitly ensure that displaced persons without formal land ownership or legal title are also entitled to fair compensation, livelihood restoration, and appropriate resettlement assistance.	4) Resettlement Issue Regarding Land acquisition and Resettlement, Nepal's Land Acquisition Act mainly focuses on compensating legally recognized landowners and affected assets, while the World Bank and JICA safeguard frameworks take a broader approach to involuntary resettlement impacts. Key gaps include support for non-title holders and vulnerable groups, full replacement-cost compensation, livelihood restoration, participatory resettlement planning, meaningful consultation, and measures to avoid or minimize resettlement. Therefore, project-specific measures such as a Resettlement Action Plan (RAP), livelihood restoration assistance, additional support for vulnerable groups, and a grievance redress mechanism are required to meet the safeguard requirements, with reference to international safeguard policies.
		5) Prior Informed Consent for Heritage Sites and Heritage Impact Assessment (HIA) Rationale: Kathmandu's historic inner-city areas, traditional Guthi routes, and UNESCO-listed heritage sites are highly sensitive from environmental, archaeological, and cultural perspectives. Recommendation: The report should include a mandatory provision requiring that Heritage Impact Assessments (HIAs) for infrastructure developments in and around heritage areas obtain prior informed consent not only from the Department of Archaeology but also from the Kathmandu Metropolitan City and the local Guthi custodians (Guthiyars) before project implementation proceeds.	5) Cultural heritage impact ・ With regard to impacts on cultural heritage, Chapter 14 includes a requirement to conduct a Cultural Heritage Impact Assessment (HIA) at the pre-F/S or F/S stage, in line with the progress of project design, for priority projects located within or near areas where cultural heritage needs to be considered. ・ At present, however, the specific procedures and methods for conducting HIA are not yet clearly established, and there is limited experience in implementing HIA. Therefore, it will be necessary to establish an appropriate HIA process and methodology through consultation with the relevant authorities as the HIA is carried out.
		Conclusion: The above five recommendations should be incorporated into both the Draft Strategic Environmental Assessment (SEA)	The objective of the SEA is to integrate environmental and social considerations into decision-making at an early stage of policies, plans, and programs, and to avoid or minimize significant environmental and social impacts through the

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		Report and the final Kathmandu Valley Urban Transport System Master Plan. Their inclusion will help ensure that the Master Plan is environmentally sustainable, legally compliant, socially equitable, and locally acceptable, while strengthening institutional coordination and facilitating effective implementation.	consideration of alternatives, thereby promoting sustainable development. The five recommendations provided have already been considered in the SEA. More specific and effective mitigation measures and their implementation arrangements will be examined in detail during the subsequent feasibility study, taking into account the characteristics of each proposed measure and project.

Source: JICA Expert Team