



Government of Nepal
Ministry of Physical Infrastructure and Transport
Department of Roads
Development Cooperation Implementation Division (DCID)
Jwagal, Lalitpur

Strategic Road Connectivity and Trade Improvement Project (SRCTIP)

Environmental and Social Management Plan
for
Periodic Road Maintenance

March 2020

Table of Contents

List of Tables	iii
Introduction	1
1.1 Background	1
1.2 Sub-component on Periodic Road Maintenance under Component 3.....	2
1.3 Scope of Periodic Maintenance	3
2. Legal and Policy Framework.....	4
2.1 GoN's relevant Acts, Regulations and Guidelines	4
2.2 World Bank Environmental and Social Framework.....	7
3. Environment & Social Risks	10
and Impacts	Error! Bookmark not defined.
3.1 Prerequisite to undertake Periodic Maintenance Activity.....	16
3.2 Planning & Implementation Measures, Environmental and Social Code of Conduct & Mechanisms.....	16
3.3 Institutional Arrangements of the ESMP for Periodic Maintenance	19
3.4 Social Accountability and Grievance Redress Mechanism (Project level GRM and Central GRM)	21

List of Tables

Table 1: Category of Periodic Maintenance Activities 10

Table 2: Periodic Maintenance Activities with E&S Impacts for Surface Maintenance. 11

Table 3: Periodic Maintenance Activities with E&S Impacts for Drainage Maintenance
..... 12

Table 4: Periodic Maintenance Activities with E&S Impacts for Roadside Maintenance
..... 13

Table 5: Periodic Maintenance Activities with E&S Impacts for Traffic Maintenance ... 14

Table 6: Periodic Maintenance Activities with E&S Impacts for Structures Maintenance
..... 14

Table 7: Periodic Maintenance Activities with E&S Impacts for Network Management 15

Table 8: Planning of the Sub-project activities with responsibility 16

Introduction

1.1 Background

The Government of Nepal (GoN) has requested the World Bank (WB) to support the preparation and implementation of the Strategic Road Connectivity and Trade Improvement Project (SRCTIP). The project development objective is to reduce time and costs of goods transit between Nepal and India, by improving the capacity and efficiency of trade and transport infrastructure and strengthening the institutions managing them. Achievement of this objective will be measured through the following key indicators:

- a. reduction in time and cost of movement of goods across project roads;
- b. reduction in time taken for sanitary and phyto-sanitary clearances for agri-trade;
- c. reduction in negative externalities related to road-traffic injuries/deaths and environmental impacts on project roads; and
- d. increase in the quality of Core Highway Network (within the SRN) through the *multi-year periodic maintenance program*.

This project has three components:

Component 1: Trade Facilitation

- a) Support for physical infrastructure, equipment, traffic flow, inspection and related border transit management systems that are required to absorb increasing traffic and trade volumes at key border crossing points including Birgunj, Bhairahawa and Biratnagar;
- b) Provision of equipment and training, and construction and/or renovation of lab buildings at key border locations with the target of achieving international accreditation in selected parameters; and,
- c) Knowledge support and capacity building for: continuous improvement of the trade policy environment; monitoring of trade performance; and development and implementation, and monitoring and evaluation, of targeted trade promotion measures.

This component will (a) augment infrastructure facilities and equipment at major border crossing points; (b) improve sanitary-phyto-sanitary management (SPS) to reduce the time taken for testing and hassles related to agricultural trade; and (c) support knowledge and capacity building for improving capacity for managing trade. The component is also expected to generate employment opportunities for women in the construction/renovation and in laboratories and their capacity development.

Component 2: Regional Connectivity Improvement

- a) Improvement of the existing Nagdhunga-Naubise-Mugling road to a 2-lane standard, including adoption of engineering measures to improve climate resilience, road safety, and involvement of citizens' engagement and beneficiary feedback mechanisms;

- b) Upgrading of the Kamala-Dhalkebar-Pathlaiya road from 2-lane to 4-lane, including adoption of engineering measures to improve climate resilience, road safety and involvement of citizens' engagement and beneficiary feedback mechanisms; and,
- c) Implementation of a safe corridor demonstration program (SCDP), covering a length of 250-300 km of Strategic Road Network (SRN) including the NNM and KDP roads, which will include support for enhanced enforcement of traffic rules and post-crash response.

This component comprises: (i) capital expenditures pertaining to the construction phase of NNM and KDP roads, and associated consultancy services for design, supervision of works and safety assessment activities; and (ii) works, goods, equipment and consultancy services for implementation of SCDP. Both road improvement and upgrade work will include engineering measures to improve climate resilience and road safety. The works on NNM and KDP road will include traditional item rate contracts or new contracting approaches with the provisions of road maintenance over a 5- to 8-year period after completion of the construction activity and receiving project completion certificate.

Component 3: Institutional Strengthening

- (a) Support for the National Road Safety Council through, inter alia:
 - I. establishment of an interim secretariat with seed funding for staffing and equipment; and
 - II. support for prioritized activities from the National Road Safety Action Plan (RSAP), including coordinating, monitoring and evaluating measures under the SCDP; monitoring the working of IT-MIS and the equipment service providers; supporting nation-wide roll-out of the web-based Road Accident Information Management System (RAIMS); and supporting training and peer-exchange programs.
- (b) Capacity enhancement of DoR for improved management of SRN through:
 - i. development and mainstreaming of road asset management system;
 - ii. support for training facilities and training in selected priority areas, including network-level safety assessments, quality, procurement, design of advanced structures, and management of environmental and social risks and impacts; and
 - iii. support for training and employment of local women for skilled employment opportunities in non-traditional transport sectors.
- (c) Support for ***periodic road maintenance***.

1.2 Sub-component on Periodic Road Maintenance under Component 3

The Periodic maintenance covers activities on a section of road at regular and relatively long intervals, and aims to preserve the structural integrity of the road. These operations tend to be large scale, requiring specialized equipment and skilled personnel. They cost more than routine maintenance works and require specific identification and planning for implementation and often even design. Activities can be classified as preventive, resurfacing, overlay, and pavement reconstruction. Resealing

and overlay works are generally undertaken in response to measured deterioration in road conditions. For a paved road repaving is needed about every eight years; for a gravel road re-graveling is needed about every three years¹.

1.3 Scope of Periodic Maintenance

The Strategic Roads under DOR's administration, for a periodic maintenance, out of the 13,000 km of a Strategic Road Network (SRN), 4,200 lane-km (corresponding to 2,050 km of various widths) has been identified. The criteria for this is that the traffic (AADT) should exceed 5,000.

Out of this 4,200 lane-km, only 3,450 lane-km will undergo periodic maintenance over 5 years through the USD 80M from the WB under the SRCTIP where traffic exceeding 2000 AADT (excluding motorcycles and NMT) throughout the country. And out of 3450 lane-km of periodic maintenance, 820 lane-km will undergo asphalt overlay and 2630 lane-km will undergo surface dressing.

The scheduling of Periodic Maintenance will be as follows:

1. Year-1 900 lane-km;
2. Year-2 600 lane-km;
3. Year-3 700 lane-km;
4. Year-4 800 lane-km;
5. Year-5 450 lane-km.

The Periodic Maintenance for roads with pavement type AMGB (Asphalt Mix over Granular Base) and STAM (Surface Dressing over Asphalt Mix) is asphalt overlay. Similarly, existing STGB (Surface Treatment over Granular Base) will receive DBST (Double Bituminous Surface Treatment) for periodic maintenance.

The Asphalt Overlay helps to rectify cracks and potholes and involves about 40mm layer of hot asphalt on the existing road. Similarly, the DBST means spreading hot bitumen and pebbles, rolling and spreading of hot bitumen and stone chips and rolling again.

Each of the periodic Maintenance contract will be about 50 lane-km long. This means no two bitumen heating facilities are likely to be closer than 50 km from each other.

As per DOR norms, 10% of the surface receiving periodic maintenance is estimated to be rehabilitated. This means constructing the road from earthwork, laying of sub-base/base to blacktopping.

1.4 Objective of the Environmental and Social Management Plan

This ESMP will be used by DoR to manage the environmental and social risks of the periodic road maintenance activities. Specifically, DoR will require contractors undertaking periodic road maintenance works to adapt and implement this generic ESMP, which will be included in the bidding documents and in the works contract with contractors.

¹Why road maintenance is important and how to get it done Sally Burningham and Natalya Stankevich

2. Legal and Policy Framework

Under the legal and policy framework, brief of legal acts, policies, regulations and guidelines of the GoN and the World Bank's Environmental and Social Standards have been discussed that are relevant and applicable to the Periodic Road Maintenance.

2.1 GoN's relevant Acts, Regulations and Guidelines

Constitution of Nepal, 2015

The constitution of Nepal, 2015 (2072 BS) is the fundamental law of Nepal. Environmental and Social sustainability is covered explicitly in the Constitution of Nepal, 2015. Article 30 under Right to clean environment provides inter alia that every person has a right to a clean and healthy environment claiming that (1) Every citizen shall have the right to live in a clean and healthy environment; (2) The victim shall have the right to obtain compensation, in accordance with law, for any injury caused from environmental pollution or degradation; and (3) This Article shall not be deemed to prevent the making of necessary legal provisions for a proper balance between the environment and development, in development works of the nation.

Local Government Operation Act, 2017

The Act, 2074 (2017) provides more autonomy to District Coordination Committees, Municipalities and Rural Municipalities. This act empowers the local bodies for the conservation of soil, forest, and other natural resources and implements environmental conservation activities.

Nepal Environmental Policy (NEP), 2018 (2076 BS)

Environment Policy, 2076 aims to manage natural resources efficiently and sustainably, to balance development efforts and environmental conservation to achieve sustainable development. It has also aimed to control pollution, solid waste management and promote greenery so that every citizen's right to live and clean environment will be secured.

The Environment Protection Act, 2019 (EPA)

An umbrella act is the principal regulatory frameworks to make the development programs and projects environment-friendly which are now enforced through appropriate regulatory measures. The act also highlights that any development project, before its implementation has to pass through environmental assessment depending upon the location, type and size of the projects.

The Environment Protection Rule, 1997 (amendments, 2017) (EPR)

With respect to the forthcoming needs of Environment Assessment for the SRN sub-projects, this regulatory provision bears the principal provisions for any project proponent involved in this program.

The preparation of Environmental Management Plan (EMP) is determined as a key part of environment assessment. The proponent is required to implement the mitigation measures prescribed in the EMP, while the environmental monitoring works shall be

performed by the concerned agency (ministries), and auditing by the Ministry of Forest and Environment in accordance with the provisions of the EPR 1997.

Soil and Watershed Conservation Act, 1982

In order to properly manage the watersheds of Nepal, the Soil and Watershed Conservation Act of Section 3 empowers the government to declare any area as a protected watershed area and carry out conservation related activities.

Forest Policy, 2014

The forest policy 2014 aims to strengthen the forest resources of Nepal emphasizing management of forest resource sustainably, increase productivity of forest area/sector and increase overall production from forest.

Forest Act, 2019

Forest Act considers forests as “resources oriented” rather than “use oriented”. Act empowers the government to provide the parts of the forest areas to implement projects. Section 49 of the Act prohibits reclaiming lands, setting fires, grazing, removing or damaging forest products, felling trees or plants, wild animals hunting and extracting boulders, sand and soil from the National forest without the prior approval.

Forest Rule, 1995

The Forest Rules 1995 (amendment, 1999) further elaborate legal measures for the conservation of forests and wildlife. Based on forest legislation, thirteen plant species are included in the level protection list. The Rule also stipulates that the entire expenses for cutting and transporting the forest products in a forest area to be used by the approved project shall be borne by the proponents of the project.

The Aquatic Animal Protection Act, 1961

This Act indicates an early recognition of the value of wetlands and aquatic animals, Section 3 renders punishable to any party introducing poisonous, noxious or explosive materials into a water source, or destroying any dam, bridge or water system with the intent of catching or killing aquatic life.

The National Wetland Policy, 2003

The National Wetland Policy, 2003 also includes the need for carrying out environment assessment in accordance with the provision of the existing laws for development projects and actions, which are planned for implementation nearby the wetland².

National Parks and Wildlife Conservation Act, 1973 and Rules

The National Parks and Wildlife Conservation Act, 1973 address for conservation of ecologically valuable areas and indigenous wildlife. The Act prohibits any movement of a person without written permission within the parks and the reserves (Article 4). The Act further prohibits wildlife hunting, construction of houses and huts, damage to plants and animals etc., within the reserve, without the written permission of the authorized person (Article 5). The Act has also listed 26 species of mammals, 9 species of birds and 3 species of reptiles as protected wildlife (Sch.1).

²Nepal is also a signatory to the RAMSAR Convention.

Mountain National Park Regulation, 1979

This regulation governs the Langtang National Park, Sagarmatha National Park, and Rara National Park³. Article 7 of this regulation prohibits carrying out physical activities within Mountain National Parks without a written permission of the warden.

The Buffer Zone Management Regulation, 1996

The Buffer Zone Management Regulation, 1996 has mandatory requirement to have permission of Warden to carry out activities within a buffer zone area.

Public Road Act (2031 BS)

The Public Road Act is the governing legislation for construction and operation of roads in Nepal. The Act prohibits the construction of permanent structures (buildings) in a defined distance from the rural road, i.e., the road agency has the authority over everything within the right of way.

Labor Act, 2017 (2074 BS)

The Act has provisions for the rights, interest, facilities and safety of workers and employees working in various sectors. The Act also requires the employment contract to include (a) remuneration, (b) benefits, and (c) terms of the employments of the Employee and such other matters as prescribed. It also stipulates basic labor camp establishment requirements at construction site.

Child-Related Act 1993 (2048 BS) and Child Labour Act 2001 (2056 BS)

The Child-Related Act 1993 and the Child Labour (abolition and regulation) Act, 2001 are the major acts related to child labour in Nepal. The Article 2 (Ka) of these acts refers "Child" to the children below 16 years of age. The Child Labour (Abolition and Regulation) Act is the most recent and revolutionary decision to overcome the child labour problem in Nepal.

Relevant Sectoral Policies and Guidelines Prepared by the DoR Environmental Management Guidelines, GESU/DoR, July, 1997

The Guideline, prepared by the Geo-Environment & Social Unit (GESU) of DoR, stipulates the integration of environmental mitigation measures in surveying, design, tender document preparation, contract document preparation, construction, maintenance, rehabilitation and operation of road projects.

Reference Manual for Environmental and Social Aspects of Integrated Road Development, MPPW (now MOPIT)/DoR, 2003

This Manual is designed to help integrate social and environmental considerations, including public involvement strategies, with technical road construction practices.

GoN Policies Supporting Vulnerable Communities

This policy highlights to provide sufficient considerations to poverty reduction especially for vulnerable groups.

2.2 World Bank Environmental and Social Framework

The World Bank's Environmental and Social Framework sets out the World Bank's commitment to sustainable development and mandatory requirement for the bank-funded operations such as the SRCTIP. Hence, the projects supported by World Bank are required to meet the following Environmental and Social Standards:

Environmental and Social Standard (ESS)1: Assessment and Management of Environmental and Social Risks and Impacts

The main objective of this standard is to identify, evaluate and manage the environment and social risks and impacts of the project in a manner consistent with the ESSs and to adopt a mitigation hierarchy approach to avoid, minimize, mitigate and compensate the environmental and social risks.

Environmental and Social Standard (ESS) 2: Labor and Working Conditions

The main objective of this standard is to promote safety and health at work, to promote the fair treatment, non-discrimination and equal opportunity of project workers and to protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers and primary supply workers, as appropriate and to prevent the use of all forms of forced labor and child labor

Environmental and Social Standard (ESS) 3: Resource Efficiency and Pollution Prevention and Management

The main objective of this standard is to avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities, to avoid or minimize project-related emissions of short and long-lived climate pollutants,³ to avoid or minimize generation of hazardous and non-hazardous waste. to minimize and manage the risks and impacts associated with pesticide use.

Environmental and Social Standard (ESS)4: Community Health and Safety

The main objectives of this standard is to anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstance, to promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure ,including dams, to avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials, to have in place effective measures to address emergency events, to ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.

Environmental and Social Standard (ESS) 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement

The main objective of this standard is to avoid involuntary resettlement or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives, to avoid forced eviction, to mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use by: (a) providing timely compensation for loss of assets at replacement.

Environmental and Social Standard (ESS) 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

The main objective of this standard is to protect and conserve biodiversity and habitats, to apply the mitigation hierarchy⁴ and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity, to promote the sustainable management of living natural resources, to support livelihoods of local communities including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities.

Environmental and Social Standard (ESS) 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities:

The main objective of this standard is to ensure that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource based livelihoods of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities and to avoid adverse impacts of projects on Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts.

Environmental and Social Standard (ESS) 8: Cultural Heritage:

The main objective of this standard is to protect cultural heritage from the adverse impacts of project activities and support its preservation, to address cultural heritage as an integral aspect of sustainable development, to promote meaningful consultation with stakeholders regarding cultural heritage, to promote the equitable sharing of benefits from the use of cultural heritage.

Environmental and Social Standard (ESS) 9: Financial Intermediaries: Not Applicable

Environmental and Social Standard 10: Stakeholder Engagement and Information Disclosure

The main objective of this standard is to establish a systematic approach to stakeholder engagement that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties, to assess the level of stakeholder interest and support for the project and to enable stakeholders views to be taken into account in project design and environmental and social performance, to promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them and to ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and form.

2.3 International Legal Provisions for Road and Bridge Projects

Nepal is signatory to many international conventions, which deal with the protection of environment and have to some extent also bearing on road project execution.

- The convention on Biological Diversity, June 12, 1992, Rio de Janeiro.
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1989
- The Vienna Convention for Protection of Ozone Layer, 1985

- UN Framework Convention on Climate Change, 1992
- The Agreement on the Network of Aquaculture Centres in Asia and the Pacific, 1988
- The Plant Protection Agreement for the South East Asia and the Pacific (as amended), 1956,
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora, (CITES), 1973
- The RAMSAR Convention (Convention on Wetlands of International Importance Especially as Water Fowl Habitat), 1971
- The Convention for Protection of the World Cultural and Natural Heritage, 1972
- The UN Convention to Combat Desertification, 1994

3. Environment & social risks and impacts

Works on the periodic maintenance will be limited to the existing Right of Way of the selected roads. The Periodic Maintenance Activities in this document have been demonstrated to be an effective and practical means of preventing or limiting harmful impacts to the environment. For each maintenance activity category, general mitigation measures are provided as guidelines to help ensure works are completed in compliance with environmental requirements.

When sensitive environmental values (such as watercourses, sensitive habitats and/or species at risk etc.) as well as quarrying of aggregates (river or land), dust generation during screening and aggregate and chips spreading process, nuisance related to heating and spreading of bitumen, labor and working conditions and community health and safety issues etc. are present, site-specific Environmental and Social Management Plan (ESMP) with mitigation measures will likely be required. Site specific mitigation measures shall be developed in consultation with an Environmental and Social Specialist (E&SSpecialist)/E&S Consultant. Maintenance contractors may also choose to involve Consultants to advise and assist on the selection and application of mitigation measures, use of alternative practices, and adherence to environmental permitting requirements.

The following table (table 1) is a quick reference guide that will determine the activities that are associated with each Periodic Maintenance activities and potential E&S risks.

Table 1: Category of Periodic Maintenance Activities

Category	Maintenance Activity
1. Surface Maintenance	Highway Pavement Patching and Crack Sealing
	Highway Surface Treatment
	Highway and Shoulder Grading and Re-shaping
	Dust Control and Base Stabilization
	Highway Surface and Shoulder Graveling
	Road Base Maintenance
	Surface Cleaning
	Debris Removal
	Cattle Guard and Crash Barrier Maintenance
	Raised Hard surfaced Infrastructure and Safety Device Maintenance
2. Drainage Maintenance	Ditch Maintenance
	Drainage Appliance Maintenance
	Shore, Bank and Watercourse Maintenance
3. Roadside Maintenance	Vegetation Control
	Brush, Tree and Danger Tree Removal
	Litter collection
	Rest Area Facility Maintenance
	Fence Maintenance
	Roadside Catchment Appurtenances Maintenance
4. Traffic Maintenance	Highway Crossing Infrastructure
	Sign System Maintenance
	Temporary Pavement Markings and Eradication

Category	Maintenance Activity
	Traffic Management
5. Structural Maintenance	Bridge Deck Maintenance
	Structures Cleaning Maintenance
	Structures Drainage Maintenance
	Bridge Joint Maintenance
	Bridge Bearing Maintenance
	Baily and Acrow Bridge Maintenance
	Structure Minor Coating
	Concrete Structure Maintenance
	Concrete Structure Maintenance
	Steel and Multiple Structure Maintenance
	Bridge Piling Maintenance
	Retaining Wall/Wing wall Maintenance
	Bridge Railing Maintenance
6. Network Management	Highway Incident Response
	Major Event Response
	Highway Inspection
	Highway Safety Patrol
	Communications

1. **Surface Maintenance** -Surface maintenance activities are undertaken to ensure public safety on the highway by maintaining smooth, clean, compacted, level and sealed surface conditions through the following activities, including: Highway Pavement Patching and Crack Sealing, Highway Surface Treatment, Highway and Shoulder Grading and Re-shaping, Dust Control and Base Stabilization, Highway Surface and Shoulder Gravelling, Road Base Maintenance, Surface Cleaning, Debris Removal, Cattle Guard Maintenance, Raised Hard Surfaced Infrastructure and Safety Device Maintenance etc. The E&S impacts relating to surface maintenance activities are summarized in the following table.

Table 2: Periodic Maintenance Activities with E&S Impacts for Surface Maintenance

<u>Potential Environmental and Social Impacts</u>	<u>Works with Potential to Cause Impacts</u>
Introduction of deleterious substances to a watercourse	<ul style="list-style-type: none"> • patching or sealing of paved surfaces using chemical compounds/treatments; • side casting or disposal of debris and other materials from surface cleaning; • repairs, grading, or shoulder maintenance disturbing existing surfaces (gravel) or introducing new materials; • release of other deleterious substances (dust emission materials etc.)
Contamination of surface waters, groundwater,	<ul style="list-style-type: none"> • over-spraying of road shoulders and dust emission; • side casting or disposal of debris and other materials from surface cleaning

riparian habitats	
Air quality	<ul style="list-style-type: none"> • Cleaning of aggregate from paved surfaces
Contributing to destabilization of soil surface	<ul style="list-style-type: none"> • repairs, grading, or shoulder maintenance disturbing existing surfaces • introducing new materials (gravel) without confirming it is free of invasive plants
Community Health and Safety,	<ul style="list-style-type: none"> • Blowing of dust by compressor before spreading hot bitumen on road surface. • Heating of bitumen. • Increased traffic.
Labor and Working Conditions	<ul style="list-style-type: none"> • Road works. • Establishment of labor camp
Temporary land use	<ul style="list-style-type: none"> • Temporary storage of spoils, waste materials, material storage, construction/maintenance areas
Temporary disruption of access to business activities	<ul style="list-style-type: none"> • Slow-down in traffic, road traffic diversions, etc

2. Drainage Maintenance

Drainage maintenance activities are undertaken to provide unobstructed drainage and to prevent erosion damage to Highways. Drainage maintenance activities include: Ditch Maintenance, Drainage Appliance Maintenance and Shore, Bank and Watercourse Maintenance. The E&S impacts relating to drainage maintenance activities are summarized in the following table.

Table 3: Periodic Maintenance Activities with E&S Impacts for Drainage Maintenance

Potential Environmental and Social Impacts	Works with Potential to Cause Impacts
Introduction of deleterious substances to a watercourse	<ul style="list-style-type: none"> • Removal of obstructions, debris or channel maintenance; • Installation, repairs or replacement of drainage appliances.
Damage to roadside watercourses, riparian/fish habitats	<ul style="list-style-type: none"> • Bank erosion installation or repair with materials that aren't clean (silt- laden) or causing bank disturbance; • Improper storage or disposal of materials associated with bank erosion repair / drainage appliances; • Side casting or improper disposal of debris, sediment and

	vegetation.
Disturbance of wildlife species (e.g. birds/bats)	<ul style="list-style-type: none"> • Drainage appliance maintenance disturbing birds, bird nests or bats.
Contributing to de-stabilization of soil surface	<ul style="list-style-type: none"> • Ditch maintenance resulting in disturbed areas which aren't properly re-vegetated; • Improper disposal of debris, sediment and vegetation removed from ditches, watercourses, or drainage appliances.

3. Roadside Maintenance

Roadside maintenance activities are undertaken to improve visibility and facilitate drainage, maintain clean and tidy Highways, ensure Rest Area facilities are clean, restore the functionality of fences and provide safe passage of pedestrians and animals over/under or beside Highways. Roadside Maintenance activities include: Vegetation Control, Brush, Tree and Danger Tree Removal, Litter Collection, Rest Area Facility Maintenance, Fence Maintenance, Roadside Catchment Appurtenances Maintenance and Highway Crossing Infrastructure etc. The E&S impacts relating to roadside maintenance activities are summarized in the following table.

Table 4: Periodic Maintenance Activities with E&S Impacts for Roadside Maintenance

Potential Environmental and Social Impacts	Works with Potential to Cause Impacts
Introduction of deleterious substances to a watercourse	<ul style="list-style-type: none"> • Exposing erodible soils and promoting sediment discharge; • Fence repairs (cement-based products and wood preservatives); • Improper storage or disposal of sewage.
Damage to roadside watercourses, riparian/fish habitats	<ul style="list-style-type: none"> • Damaging or disturbing riparian habitats, exposing erodible soils or causing stream bank erosion; • Fence repairs resulting in damage or disturbance to riparian habitats.
Disturbance of wildlife species (e.g., birds)	<ul style="list-style-type: none"> • Disturbing birds (especially bats underneath of culverts) and their nests near water courses.

Contributing to top soil surface de-stabilization	<ul style="list-style-type: none"> • Brushing or mowing resulting in alteration of existing vegetation.
Noise and Air Pollution	<ul style="list-style-type: none"> • Noise due to compressor and road roller and other heavy machineries; • Dust blowing while cleaning the road surface.

4. **Traffic Maintenance** - Traffic maintenance activities are undertaken to regulate and facilitate the safe and orderly flow of traffic, keep highway users safe and minimize traffic delays. Traffic Maintenance activities include: Sign System Maintenance, Temporary Pavement Markings and Eradication and Traffic Management. The E&S impacts relating to traffic maintenance activities are summarized in the following table.

Table 5: Periodic Maintenance Activities with E&S Impacts for Traffic Maintenance

Potential Environmental and Social Impacts	Works with Potential to Cause Impacts
Introduction of deleterious substances to a watercourse	<ul style="list-style-type: none"> • Sign system maintenance resulting in disturbed existing surfaces (gravel) or introducing new materials; • Improper storage and disposal of chemical compounds (e.g. paint).
Contributing to soil surface de-stabilization	<ul style="list-style-type: none"> • Sign system maintenance resulting in disturbed areas which aren't properly re-vegetated.

5. **Structures Maintenance** - Structures maintenance activities are undertaken to provide safe, stable, free draining, clean and structurally sound structures and extend the service life of bridges. Structure Maintenance activities include: Bridge Deck Maintenance, Structures Cleaning Maintenance, Structures Drainage Maintenance, Bridge Joint Maintenance, Bridge Bearing Maintenance, Bailey and Bridge Maintenance, Structure Minor Coating, Concrete Structure Maintenance, Steel, Aluminum, and Multiple Structure Maintenance, Bridge Piling Maintenance, Retaining Wall Maintenance, Bridge Railing Maintenance etc. The E&S impacts relating to structural maintenance activities are summarized in the following table.

Table 6: Periodic Maintenance Activities with E&S Impacts for Structures Maintenance

Potential Environmental and Social Impacts	Works with Potential to Cause Impacts
---	--

Potential Environmental and Social Impacts	Works with Potential to Cause Impacts
Introduction of deleterious substances to a watercourse	<ul style="list-style-type: none"> • Structures cleaning, repairs or painting (e.g., sediments, oils, painted chips, cement-based products, epoxies, paints or sealants); • Retaining structure cleaning, debris removal or repairs from retaining structures near watercourses; • Multi-plate structure repairs (sediment, cement-based products, epoxies, sealants);
Damage to roadside watercourses, riparian/fish habitats	<ul style="list-style-type: none"> • Structures repairs resulting in changes to stream channel, banks or vegetation; • Extraction of water for cleaning resulting in disruption of flow, habitat damage (including erosion) or death of fish; • Side casting or improper disposal of debris resulting from cleaning and debris removal from retaining structures.
Disturbance of wildlife species (e.g. birds/bats)	<ul style="list-style-type: none"> • Noise from machines and equipment; • Poaching by workers.
Contributing to de-stabilization of top soil	<ul style="list-style-type: none"> • Structures maintenance resulting in disturbed areas which aren't properly re-vegetated; • Brushing resulting in alteration of existing vegetation.
Temporary land use	<ul style="list-style-type: none"> • Temporary storage of spoils, waste materials, material storage, construction/maintenance areas
Temporary disruption of access to business activities	<ul style="list-style-type: none"> • Slow-down in traffic, road traffic diversions, etc

6. **Network Management-** Network Management activities are undertaken to ensure the safety of Highway Users, monitor and respond to highway conditions, re-establish traffic flow and communicate in a timely manner with the public, stakeholders and the Province. Network Management activities include: Highway Incident Response, Major Event Response, Highway Inspection, Highway Safety Patrol and Communications. The E&S impacts relating to network management activities are summarized in the following table.

Table 7: Periodic Maintenance Activities with E&S Impacts for Network Management

Potential Environmental Impacts	Works with Potential to Cause Impacts
--	--

Introduction of deleterious substances to a watercourse

- Clean-up and removal of abandoned vehicles or materials;
- Clean up of cargo/dangerous goods.

7. **OHS issues related with Asphalt Overlay and Surface Dressing-** Exposure to asphalt fumes can cause headaches, skin rashes, sensitization, fatigue, reduced appetite, throat and eye irritation, cough, and skin cancer etc. Two main other hazards associated with working with asphalt are fires and explosions and inhalation of the substance's fumes. PPE recommended when handling heated asphalt:

- Loose clothing in good condition with collars closed and cuffs buttoned at the wrist;
- Thermally insulated gloves with gauntlets that extend up the arm and worn loosely so that they can easily be flipped off if covered with hot asphalt;
- Boots with tops at least 6 inches (150 mm) high and laced without openings;
- Pants without cuffs which extend over the tops of the boots;
- Safety shoes at least 6 inches (150 mm) high and laced;
- Long handled sprayers with flexible hoses should be used when emulsified asphalts are applied by hand for tack coats, or when cut-back asphalts are applied by hand for prime coats.

3.1 Prerequisite to undertake Periodic Maintenance Activity

- The activity will be limited within existing RoW prescribed by the DoR;
- No additional acquisition of land nor voluntary land donation;
- No relocation of structures and utilities;
- No access restriction to land, natural resources and business activities ;
- No additional major structural requirements (such as culverts, bridge, new alignment etc.)

3.2 Planning & Implementation Measures, Environmental and Social Code of Conduct & Mechanisms

The Periodic Maintenance requires effective mechanism, process and institutional set up to implement interventions to mitigate the impacts due to its activities. A short summary of project planning in tabular form including stages, steps and responsibility is presented in the table 8 below:

Table 8: Planning of the Sub-project activities with responsibility

Sub-Project Stages	Environment and Social Activities	Responsibility
Sub-Project Identification	Selection of subproject: Brief outline of E&S issues with initial desk review, site visit and consultation etc.	DoR-DCID
Sub-Project Screening	E&S screening and consultation	DoR-DCID's E&S unit DoR-GESU
Review and Approval	ESMP preparation	DoR-DCID Contractors

		E&S Specialist /E&S Consultant
Execution of Periodic Maintenance	ESMP Implementation	Contractors
Monitoring and Reporting	ESMP supervision, monitoring and reporting	DoR-DCID's E&S unit DoR-GESU DoR-Divisional Road Office (DRO)

a. Planning/Screening

- Identify environmental and social issues that require consideration, based on a desk review, field assessments, and/or advice from an E&S Specialist and Consultants. *Environmental issues may include, but are not necessarily limited to, the following: watercourses, sensitive habitats, invasive plants and species at risk. Social issues may include potential for disruption of access to homes and business, temporary use of land for material storage and construction-related services, etc.*
- Determine general mitigation measures that applies to the periodic maintenance activity.
- If there are environmental values that require special consideration such as those identified above, obtain the advice of an E&S Specialist/Consultant, which may include site specific mitigation measures.
- Determine other relevant steps such as engaging with regulators, applying for permits, and identifying mitigation plans as necessary.
- Site-specific conditions might present additional issues that shall be addressed in planning and undertaking the works.
- Consult with nearby local communities during field assessments to understand if there are specific social issues to be considered in maintenance works

b. Timing of Works

- Maintenance activities are preferably undertaken during periods of dry weather as this allows easier control of deleterious materials and runoff.
- If the schedule requires working in the rain (or other inclement weather), the work area shall be isolated and appropriate erosion and sediment controls shall be installed to prevent the release of sediment-laden water and or other deleterious substances into watercourses and sensitive habitats. Particularly for surface maintenance activities requiring the application of patching and sealing components, tar, asphalt and dust control materials.
- During drainage maintenance, culverts should be surveyed for the presence of nesting birds or roosting bats prior to work commencing. Culverts where wildlife have been determined to be “not present” do not require scheduling/implementation of environmental timing windows, buffers or

exclusionpractices.

c. Site Management

- Organize the work site (including access routes, laydown areas and equipment and materials storage) to avoid impacts to the environment.
- Disclose information about the nature and scope of works, timing of works, and potential impacts to local communities along the route, and discuss potential for use of land as temporary material holding sites
- Where land is required for temporary use, discuss and negotiate compensation for temporary use of land.
- Avoid disturbing sensitive habitats (including watercourses), or obtain the advice of an E&S Specialist/E&S Consultant if avoidance is not practical.
- Minimize soil exposure and removal of vegetation to prevent establishment of invasive plants.
- Plan proactively for erosion and sediment control. Prior to beginning work, anticipate what techniques will be needed and arrange for materials.
- Regularly monitor and maintain sediment controls and remove when no longer needed (e.g. vegetative cover on seeded areas is adequate to control erosion).
- Dispose of excess materials, excavated soils, and removed debris a minimum of 30 meters away from any watercourse and avoid any sensitive habitats. If excavated materials or any other erodible materials are to be left on site, ensure they are placed in a manner that will prevent the introduction of sediment to any watercourse.
- Re-vegetate (seed) areas of exposed soils to reduce the risk of invasive plant establishment or sediment entering water bodies. Conduct seeding in the pre-monsoon to obtain maximum germination. Conduct Seeding/Bio-engineering in accordance with Standard Specifications/Guidelines of Roadside Bio-Engineering works for stabilizing road slopes published by the DoR.
- Depending on the nature of works, undertake basic traffic measures to enhance community safety during works. This may include signage and man-manning specific locations to divert traffic flow

d. Equipment Use

- Ensure all equipment used on site are well maintained and free of fluid leaks.
- Refuel and lubricate equipment on dry land a minimum of 30 meters away from watercourses. Use drip trays to contain any spillage during equipment maintenance.
- Ensure equipment operators use the right PPEs during works

e. Material Handling and Containment

- Have a spill response plan in place and spill kits on site.
- Limit the application of surface treatments to the road surface and avoid over-spraying near watercourses and at watercourse crossings.
- Maintain suitable buffers between materials storage and watercourses and sensitive habitats.

- Use temporary covers (e.g. tarps and/or straw/other erosion control materials) to keep erodible materials dry and prevent sediment mobilization.
- Ensure that all hazardous material (chemicals, sealants, patching materials, surface treatments and dust control materials) storage, use and disposal is in accordance with applicable regulations and information contained in their Safety Data Sheets.
- Mix hazardous materials a minimum of 30 meters away from any watercourse or sensitive habitats.
- Transfer and load any hazardous and/or deleterious substances at a designated site away from any watercourses or sensitive habitats. Use caution during loading of trucks and transport to minimize loss of materials.
- If potentially deleterious materials (e.g., cement-based products) are used for repair works, ensure raw material and wash water will not be released to any watercourse. Ensure that all deleterious substances are handled with care.
- Where possible, sweep up loose material or debris. Any material likely to pose a risk of contamination to soil, surface water or groundwater shall be disposed of appropriately off-site.

f. Handling Hazardous Materials (Bitumen and Asphalt etc.)

- An appropriate plan from Contractor compulsory and approved by Resident Engineer for safe handling and storage of hazardous materials.
- Emergency Preparedness Plan from Contractor compulsory and approved by Resident Engineer in case of major accidents associated with improper handling or spills of hazardous materials.
- Firefighting training for laborers mandatory.
- Used lubricants, oils and unused materials, scarified old road surface materials collected appropriately and recycled (as appropriate and where applicable) or disposed off to the site appropriately in a manner not causing any harm or degradation to the environment.
- Bitumen Heater shall be prescribed.
- Bitumen drums shall be stored at designated locations.
- Work time with Bitumen shall be confined to maximum 4 consecutive hrs./day to prevent respiratory hazards.

g. Dust Control and Base Stabilization

- Dust control materials are best applied to pre-wetted surfaces.
- Avoid applying dust control materials in the rain or to saturated surfaces.
- Limit the application of dust control material to the road surface - avoid over-spraying and prevent runoff.

h. Surface Cleaning

- Consider the potential impacts of side casting collected materials. If collected material is to be disposed within the highway right of way, designate disposal sites away from watercourses and sensitive habitats.

3.3 Institutional Arrangements of the ESMP for Periodic Maintenance

The following institutions are key player for executing the Periodic Maintenance Works. The roles and responsibilities and their scope are briefly discussed below:

A. Development Cooperation Implementation Division (DCID)

The DCID is one of the key Divisions of Department of Roads (DoR) which undertake all donor funded projects except ADB funded projects. Project Coordination Units (PCU) under DCID prepares the detail design reports, Initial Environmental Examination (IEEs), Environmental and Social Impact Assessment (ESIAs), Resettlement Action Plan (RAP), Indigenous Peoples Development Plan (IPDPs) and performs E&S risk management.

DCID has bilateral and multilateral units. These units prepares document for the bilateral and multilateral funds and loan support respectively. Both units coordinate the donor agency and respective projects. It also evaluates the activities of bilateral and multilateral projects and does the needful action for proper implementation of those projects. Both the units bridge the function of donor agency, the project and related consultants. DCID forwards the progress status and reports of the projects to the planning division of DoR.

B. Geo-Environment and Social Unit (GESU)

The GESU's mandate is to study and recommend geo-technical, environmental and social issues pertaining to **roads** and bridge building and compliance monitoring of projects under World Bank assistance in close coordination with its important stakeholder, Ministry of Forest and Environment. . It has mandated as well "to conduct the geo-environmental, social assessment and compliance monitoring of roads and bridges for construction under the departments of roads irrespective of donor assistance. At the same time, it is also mandated to develop land acquisition plan, resettlement action plan, vulnerable community development plan, and gender plan" for DOR projects.

C. Construction Supervision Consultant (CSC)

The CSC can be termed as the one who is completely independent and professional engineer and performs well detailed engineering services to his client on an agreed sum of money. The prerequisites of a consulting engineer are that they have to be registered in the state or the country resides to perform as a supervision consultant. The consulting engineer must be remain unbiased with the recommendation laid by them and should be devoid of any influence.

D. Contractor

The Contractor is responsible to plan, execute, supervise, inspect and direct a construction project from start to finish regardless of the scope of the project. The contractor ensures that the project complies with the ESMP and all the specifications as outlined in the contract documents.

E. Sub-Contractor

Subcontractor/Supplier is an institution, awarded a portion of an existing contract by a principal or general contractor. Subcontractor/Supplier performs work under a contract with a general contractor. Essentially, a Subcontractor/Supplier will perform and abide by all the obligations of the principal or general contractor's contract, including compliance to ESMP and all specifications in the contract documents.

F. E&S Specialist/E&S Consultant

E&S Specialist/E&S Consultant will be consulted and/or hired by the Contractor/Sub-contractor to prepare the site-specific ESMP for the periodic maintenance work.

3.4 Social Accountability and Grievance Redress Mechanism (Project level GRM and Central GRM)

The social accountability mechanisms will be established for all sub-projects. The key approaches that would be adopted for ensuring social accountability would be any or a combination of participatory processes guiding social audit, citizen score card and report card to acquire feedback on performance of the sub projects and record citizens' recommendations for improvement. The social accountability mandate will be further strengthened through a strong grievance redress mechanism.

In order to address the incoming grievances two level grievance redresses committee will be formed; one at the project level and next at the Central Level.

All grievances relating to the project including engagement with PAPs when road works will be carried out, social issues, nuisance due to project activities etc. but not limited to will be referred to the Project Level Grievances Redress Mechanism (GRM). The projects Level GRM consist of a Project Level Grievance Redress Committee (GRC). The project level GRC will record all the grievances at project site and analyzed the grievances. The project level GRC will tries settling the incoming grievance at site level. If the grievance fails settle at project level GRC then the project Level GRM forward the grievance to central level GRM with recommendation for further action to Central Level Grievances Redress Committee (GRC). Nonetheless, there are least chance that situation will occur to forward grievance to higher level as road periodic maintenance will be confined within RoW.

The central level GRC will take a decision and inform the complaining party regarding the decision it has made through appropriate channel. If the complaining party is not satisfied with the decision from central level GRC they can appeal to the courts for final determination of the case. If court process is initiated, works shall not proceed on the point of impacts until the case is finally determined.

The functions of the GRC will include: (i) to provide redress to aggrieved project affected persons (PAPs) in all respects; (ii) oversee the implementation of mitigation measures where complainants are deemed to receive cash or mitigation measures in lieu of complaints;

The GRC will only deal/hear the issues related to Road Periodic Maintenance works and individual grievances. The committee will give its decision/verdict within 15 days after hearing the aggrieved PAPs. Final verdict of the GRC will be given by the Chairman/Head of GRC in consultation with other members of the GRC and will be binding to all other members.