## CENTRAL MINDANAO HIGH STANDARD HIGHWAY PROJECT (CDO - MALAYBALAY SECTION)

Provinces of Misamis Oriental & Bukidnon Region X (Northern Mindanao)

Department of Public Works and Highways in cooperation with JICA



Central Mindanao High Standard Highway Project (CDO - Malaybalay Section)

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#### 1.0 BASIC PROJECT INFORMATION

PROJECT DETAILS				
Name of project	project Central Mindanao High Standard Highway Project (CDO - Malaybalay Section)			
Project location	Barangay	Municipality/City	Province	Region
	Bugo, Puerto, Balubal	Cagayan de Oro	Misamis Oriental	X (Northern Mindanao)
	Casinglot, Natumolan	Tagoloan	Misamis Oriental	X (Northern Mindanao)
	Alae, San Miguel, Damilag, Diclum, Sankanan, Tankulan, Ticala, Mambatangan	Manolo Fortich	Bukidnon	X (Northern Mindanao)
	Puntian, Villa Vista, Culasi, Poblacion, Kisolon, San Roque	Sumlao	Bukidnon	X (Northern Mindanao)
	Poblacion, La Fortuna, Cawayan, Kibenton, Capitan, Bayong, Impalutao	Impasug-ong	Bukidnon	X (Northern Mindanao)
	Patpat (Lapu-Lapu), Kalasungay, Dalwangan, Barangay 10, Sumpong	Malaybalay	Bukidnon	X (Northern Mindanao)
Project length	65.6 km			
Project status	Proposed			
Type of project	Roads and Bridges			
Project category*	Category A:ECP (3.4.1 Roads, new construction, NATIONAL ROAD: $\geq$ 20.0 km (length with no critical slope) OR $\geq$ 10.0 km (length with critical slope))			
Project cost	Approximately PhP70,000,000,000.00			
Construction period	2.5 years			
Manpower	Construction: 50,000			
PROPONENT DETAILS				
Name	Department of Public Works an	d Highways Central C	Office	
Authorized	Constante A. Llanes, Jr.			
representative	Director IV, Planning Service			
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EIA PREPARER	Amet-Asia, Inc.			
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\*Revised Guidelines for Coverage Screening and Standardized Requirements under the Philippine EIS System (EMB Memorandum Circular 005 July 2014)



#### 2.0 PROJECT DESCRIPTION

The proposed Central Mindanao High Standard Highway Project (Cagayan de Oro - Malaybalay Section) ("*Project*", "*alignment*") is part of the Phase II of the Master Plan on High Standard Highway Network Development. The objectives of the plan were to improve the transport efficiency in the region and contribute to enhancing the connectivity between the cities of Cagayan de Oro and Malaybalay as well as the economic development of the surrounding area.

The proposed Project will be spearheaded by the Department of Public Works and Highways (DPWH) with the assistance of the Japan International Cooperation Agency (JICA).

#### 2.1 Project location and area

The Project having a length of 65.6 kilometers will traverse 30 barangays of four municipalities and two cities in the Provinces of Misamis Oriental and Bukidnon in Region X (Northern Mindanao). The general location and jurisdiction maps and the host barangays are shown in **Figure 1**, **Figure 2**, and **Table 1** respectively.

Province	City/Municipality	Barangay	Province	City/Municipality	Barangay
	Cagayan de Oro City	Bugo		Impasug-ong	Poblacion
Micamic		Puerto			La Fortuna
Oriontal		Balubal			Cawayan
Onentai	Tagoloan	Casinglot			Kibenton
		Natumolan			Capitan Bayong
	Manolo Fortich	Alae	Bukidnon		Impalutao
		San Miguel		Malaybalay	Patpat (Lapu-Lapu)
		Damilag			Kalasungay
		Diclum			Dalwangan
		Sankanan			Brgy. 10
		Tankulan			Sumpong
Pukidnon		Ticala	Total: 2	Total: 6	Total: 30
BURIUNION	Mambatangan		Source: JIC	A Study Team	
	Sumilao	Puntian			
	Villa Vista Culasi Poblacion Kisolon San Roqu	Villa Vista			
		Culasi			
		Poblacion			
		Kisolon			
		San Roque			

#### Table 1. Jurisdictions of the Project alignment

Following Annex 2-2 of the Revised Procedural Manual of DAO 2003-30<sup>1</sup>, the Direct Impact Area (DIA) is the 65.6-kilometer alignment. The barangays listed in **Table 1** are the Direct Impact Barangays (DIB).

The Indirect Impact Area (IIA) was initially assumed as areas within one kilometer (1km) from the center of the alignment. In addition, barangays adjacent to the DIB will be considered as Indirect Impact Barangays. The initial impact areas are shown in **Figure 3**.

<sup>&</sup>lt;sup>1</sup> Direct impact area (DIA) is initially delimited during the Pre-EIA Study Stage as the area where ALL project facilities are proposed to be constructed/situated and where all operations are proposed to be undertaken

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Figure 1. General location of the proposed Project







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#### Figure 3. Initial impact area map



#### 2.2 Project rationale

For decades, Mindanao has lagged in terms of economic and infrastructure development compared to the rest of the Philippines due to a long-standing conflict. It had the highest poverty incidence of the Philippines' three island groups. After a comprehensive peace agreement between the Philippine government and the Moro-Islamic Liberation Front (MILF), it is expected that the economic development of Mindanao will be accelerated.

Infrastructure development is crucial in the attainment of inclusive and sustainable economic growth. Connectivity, mobility, and safety were the three elements identified in the Northern Mindanao Regional Development Plan 2017-2022 in developing the transport infrastructure in the region.

The national highways connect the various regional growth centers and four strategic development areas (SDAs) in the region. The region's connectivity resulted to increased gains in the trade and services sectors and in intra-and inter-regional efficiency of the movement of people, goods, and services.

The region however faces major challenges in the transport sector which primarily result to traffic congestion in key cities and poor connectivity in rural production and lagging areas. Traffic congestion is a primary problem in main thoroughfares in urban areas due to concentration of motor vehicles and narrow road network. Unpaved local roads cause slow growth of rural areas due to poor linkage of production areas to market centers.

In 2010, the DPWH and JICA formulated a Master Plan on High Standard Highway (HSH) Network Development Phase I to formulate various measures to address traffic congestion particularly in highly urbanized areas. Examples of these measures were development of expressway network, construction of bypasses and ring roads at regional cities, and widening of existing roads.

The Master Plan covered areas within a 200-kilometer radius from Metro Manila, Metro Cebu, and the Tagum-Davao-General Santos Corridor that has only 3,460 kilometers of HSH. In 2019, DPWH and JICA discussed the proposed second phase of the road master plan focusing on the Central Mindanao HSH as one of the high priority projects.

The proposed Project is expected to improve the road transport network in Mindanao through the improvement of its national roads and provide linkages between the cities of Cagayan de Oro in Misamis Oriental and Malaybalay in Bukidnon. The Project is also seen to improve the economic situation of the surrounding municipalities.

#### 2.3 Project components

The alignment will have a 60-meter road right of way (RROW) with five interchanges constructed near urban centers. Other components of the Project are shown in **Table 2**.

Component	Number
AASHTO Girder	32
Steel Bridge	3
Steel Box Girder	6
Underpass	13
Overpass	14
Interchange	5

#### Table 2. Major and number of Project components

Source: JICA Study Team

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Figure 4. Interchanges of the Project alignment



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#### 2.3 Project phases, key environmental aspects, wastes, issues, built-in measures

The potential key impacts and options for mitigation or enhancement during the Pre-construction, Construction, and Operation and Maintenance phases are shown in **Table 3** to **Table 5**. The key impacts were based on Impact Management Plan Template in Annex 2-17 and Annex 2-7a Technical Scoping Checklist of the Revised Procedural Manual (DAO 2003-30).

Environmental component likely to be affected	Potential Impact	Options for Prevention or Mitigation or Enhancement
LAND COMPONENT		
Land Use and Classification	Compatibility with existing land use	Secure zoning clearances from LGUs
	Compatibility with classification as an ECA	Consider ECAs in the Detailed Engineering Design (DED) phase
	Land tenure issue/s	- Conduct parcellary survey
		- Prepare a Property Compensation Plan (PCP)
	Impairment of visual aesthetics	Prepare a Buffer Zone Plan (BZP)
	Devaluation of land value due to improper solid waste	Prepare the following:
	management	<ul> <li>Spoils Management Plan (SMP)</li> </ul>
		<ul> <li>Construction Waste Management Plan (CWMP)</li> </ul>
		<ul> <li>Road Debris and Waste Removal Plan (RDWRP)</li> </ul>
		<ul> <li>Road Maintenance Waste Management Plan (RMWMP)</li> </ul>
Geology/Geomorphology	Change in surface landform and geomorphology	Consider smallest landform changes possible during the DED
		Prepare a Slope Protection Plan (SPP)
	Change in sub-surface geomorphology	Conduct Geotechnical Investigation and consider its recommendations
	Inducement of geo-hazards	during the DED
	Geo-, hydrological, and meteorological hazards	Include susceptibility of the Project site to geo- and hydrological hazards at the DED
Pedology	Soil erosion	Prepare a Soil Erosion Management Plan (SEMP)
Terrestrial ecology	Vegetation removal and loss of habitat	- Complete census of flora and fauna at the RROW
	Threat to existence and loss of important local species	- Consider locations of significant vegetation types and populations
	Threat to abundance, frequency and distribution of	during DED
	important species	<ul> <li>Secure a Tree Cutting Permit from the DENR</li> </ul>
	Hindrance to wildlife access	- Prepare the following:
		<ul> <li>Construction Vegetation Removal Plan (VRP)</li> </ul>
		Construction Vegetation and Tree Planting Program (CVTPP)

#### Table 3. Potential impacts and options for mitigation or enhancement (Pre-construction phase)



Environmental component likely to be affected	Potential Impact	Options for Prevention or Mitigation or Enhancement
		<ul> <li>Tree Transfer and Balling Plan (TTBP) for affected mature trees</li> <li>Tree Survival and Monitoring Plan (TSMP)</li> <li>Vegetation and Tree Planting Program during Operations (VTPPO)</li> <li>Biodiversity Conservation Plan (BCP)</li> <li>Prepare a Wildlife Monitoring Plan (WMP)</li> </ul>
PEOPLE COMPONENT		
Displacement of settlers, property, and access	<ul> <li>Displacement or disturbance of properties</li> <li>Change/conflict in land ownership</li> <li>Change/conflict Right of way</li> <li>Impact on public access</li> </ul>	<ul> <li>Prepare a Property Compensation Plan (PCP)</li> <li>Prepare Resettlement Action Plan (RAP)</li> </ul>
In-migration	Proliferation of informal settlers	Prepare an Informal Settler Monitoring and Management Plan (ISMMP)
Physical cultural resources	Impacts on physical cultural resources	Prepare a Chance Find Management Plan (CFMP)
Public health and safety	Threat to public health and safety	Prepare a Construction Health and Safety Plan (CHSP) and Road Safety Plan (RSP)
Benefits from the project	Enhancement of employment and livelihood opportunities	Prepare a Local Community Hiring Plan for (LCHP)
Traffic	Traffic congestion	Prepare a Traffic Management Plan (TMP)

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#### **Environmental Component Likely to Potential Impact Options for Prevention or Mitigation or Enhancement** be Affected LAND COMPONENT Land Use and Classification Impairment of visual aesthetics Proper implementation of the Construction Plan and BZP Devaluation of land value due to improper solid waste Proper implementation of the Construction Plan and CWMP management Geology/Geomorphology - Change in surface landform and geomorphology - Proper implementation of the Construction Plan - Change in sub-surface geology - Proper implementation of the Construction Plan, SEMP, SMP, and SPP - Inducement of subsidence, liquefaction, landslides, mud/debris flow, etc. - Effects of geo- and hydrological hazards - Soil erosion Pedology Change in soil quality or fertility - Proper implementation of the Construction Plan, SEMP, SMP, and CWMP - Provide oil sumps in staging areas - Proper storage and disposal of used oil and other hazardous wastes in staging areas and active construction sites Terrestrial ecology - Vegetation removal and loss of habitat - Proper implementation of the Construction Plan, CVRP, CVTPP, BZP, and - Threat to existence and loss of important local TTBP species - Proper compliance to Tree Cutting Permit conditions Threat to abundance, frequency and distribution of - Strict implementation of a "No Hunting and No Collecting" policy - Limit the development activities within the RROW. important species Hindrance to wildlife access WATER COMPONENT Hydrology/Hydrogeology - Change in drainage morphology - Proper implementation of the Construction Plan - Inducement of flooding Provide temporary drainage system - Depletion of water resources - Provide detention ponds in the immediate drainage - Water use competition - Formulate a Flood Management Plan (FMP) for the operation phase - Implement water conservation measures Water quality Degradation of surface water quality - Proper implementation of the Construction Plan - Housekeeping practices - Provide onsite sanitary facilities at the staging areas - Provide adequate drainage leading to siltation ponds - Threat to existence and loss of important local - Proper implementation of the Construction Plan, CWMP, SMP, and SEMP Freshwater ecology

#### Table 4. Potential impacts and options for mitigation or enhancement (Construction phase)



Environmental Component Likely to be Affected	Potential Impact	Options for Prevention or Mitigation or Enhancement
	<ul> <li>species</li> <li>Threat to abundance, frequency and distribution of important species</li> </ul>	<ul> <li>Provide cover, bunds, and drainage canal leading to silt ponds for stockpiles</li> <li>Provide onsite sanitation facilities at the staging areas</li> <li>Provide cover on vehicles carrying construction materials</li> <li>Provide oil sumps in staging areas</li> <li>Proper storage and disposal of used oil and other hazardous wastes in staging areas and active construction sites</li> </ul>
AIR COMPONENT		
Meteorology/Climatology	Change in micro climate due to greenhouse gas emissions	<ul> <li>Proper implementation of the Construction Plan</li> <li>Regular and proper maintenance of motor vehicles and heavy equipment</li> <li>Optimize schedule of vehicle use</li> <li>Regular and proper maintenance of onsite power generators</li> </ul>
Air Quality (& Noise)	Degradation of air quality	<ul> <li>Proper implementation of the Construction Plan</li> <li>Implement dust suppression methods, e.g., water application and vehicle speed restriction</li> <li>Optimize the use of heavy equipment and motor vehicles</li> <li>Compacting of exposed soil surfaces</li> <li>Provide tarpaulin cover on trucks loaded with construction materials</li> <li>Regular maintenance of heavy equipment and motor vehicles</li> <li>Regular maintenance of standby generator</li> <li>Prohibit engine idling in parking areas</li> </ul>
	Increase in ambient sound levels	<ul> <li>Proper implementation of the Construction Plan</li> <li>Provide and maintain mufflers of gasoline or diesel engines powered equipment</li> <li>Establish barriers and shielding stationary vibrating equipment</li> </ul>
PEOPLE COMPONENT		
Displacement of settlers, property, and access	<ul> <li>Displacement or disturbance of properties</li> <li>Change/conflict in land ownership</li> <li>Change/conflict Right of way</li> <li>Impact on public access</li> </ul>	Proper implementation of the RAP and PCP
In-migration	Proliferation of informal settlers	Proper implementation of the Informal Settler Monitoring and Management Plan



Environmental Component Likely to be Affected	Potential Impact	Options for Prevention or Mitigation or Enhancement
Cultural/Lifestyle	Cultural or lifestyle changes (especially on Indigenous People)	Proper orientation of migrant workers on IP culture and lifestyle
Physical cultural resources	Impacts on physical cultural resources	Proper implementation of the Chance Find Management Plan
Delivery of basic services	Threat to delivery of basic services /resource competition	Proper implementation of the Informal Settler Monitoring and Management Plan
Public health and safety	Threat to public health and safety	Proper implementation of the Construction Plan, CWMP, CHSP, and RSP - Regular and proper maintenance of heavy equipment and vehicles
Benefits from the project	Enhancement of employment and livelihood opportunities	Proper implementation of the Local Community Hiring Plan
	<ul> <li>Increased business opportunities and associated economic activities</li> <li>Increased revenue of LGUs</li> </ul>	<ul> <li>Proper implementation of the Local Community Hiring Plan</li> <li>Purchase supplies from local sources</li> <li>Provide livelihood opportunities if possible</li> <li>Prompt payment of taxes and other legal fees</li> </ul>
Traffic	Traffic congestion	Proper implementation of the Traffic Management Plan

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#### **Environmental Component Likely to Potential Impact Options for Prevention or Mitigation or Enhancement** be Affected LAND COMPONENT Land Use and Classification Impairment of visual aesthetics Sustained implementation of the Buffer Zone Plan Devaluation of land value due to improper solid waste Proper implementation of the RMWMP Sustained implementation of RDWRP management Geology/Geomorphology - Change in surface landform and geomorphology Sustained implementation of the SPP and SEMP - Inducement of subsidence, liquefaction, landslides, mud/debris flow, etc. Effects of geo- and hydrological hazards - Undertake assessment of slope protection measures after heavy rain or seismic events - Maintain drainage system - Regular inspection of road and structure integrity Pedology Soil erosion Sustained implementation of the SPP and SEMP Terrestrial ecology - Loss of habitat Proper implementation of the TSMP, VTPPO, BCP and WMP - Threat to existence and loss of important local species - Threat to abundance, frequency and distribution of important species - Hindrance to wildlife access WATER COMPONENT Hydrology/Hydrogeology Change in drainage morphology Sustained implementation of the Slope Protection Plan Regular inspection and maintenance of alignment drainage Inducement of flooding Proper implementation of the Flood Management Plan Water Quality Degradation of surface water quality - Regular inspection and maintenance of alignment drainage - Adequate drainage system - Permanent storm water detention ponds - Slope protection or grass strips - Erosion Control Plan - Wastewater treatment (underpasses) Freshwater ecology - Threat to existence and loss of important local species Regular inspection and maintenance of alignment drainage and habitat - Adequate drainage system - Threat to abundance, frequency and distribution of - Permanent storm water detention ponds - Slope protection or grass strips species

#### Table 5. Potential impacts and options for mitigation or enhancement (Operation and Maintenance phases)



Environmental Component Likely to be Affected	Potential Impact	Options for Prevention or Mitigation or Enhancement
		<ul> <li>Erosion Control Plan</li> <li>Wastewater treatment (underpasses)</li> </ul>
AIR COMPONENT		
Meteorology/Climatology	Change in micro climate due to greenhouse gas emissions	Proper implementation of the Vegetation and Tree Planting Program during Operations
Air Quality (& Noise)	Degradation of air quality	Proper implementation of the Vegetation and Tree Planting Program during Operations abd Vehicle Emission Testing Program
	Increase in ambient sound levels	Install barriers in built-up areas of the alignment (structural or vegetative)
PEOPLE COMPONENT		
In-migration	Proliferation of informal settlers	Proper implementation of the Informal Settler Monitoring and Management Plan
Public health and safety	Threat to public health and safety	Proper implementation of the Road Safety Plan
Benefits from the project	<ul> <li>Enhancement of employment and livelihood opportunities</li> <li>Increased business opportunities and associated economic activities</li> <li>Increased revenue of LGUs</li> <li>Easier transportation of people and goods</li> </ul>	Proper maintenance of the alignment
Traffic	Traffic congestion	Sustained implementation of the Traffic Management Plan



### 2.4 Project cost and duration

Project implementation is expected to take five years with 2.5 years of construction. The Feasibility Study is currently being undertaken and planned to be finished before the end of 2021. The Project will be opened to the public by 2026. The indicative Project timeline is shown in **Figure 5**. The indicative Project cost is 70 billion pesos (PhP70,000,000,000.00).





Source: JICA Study Team

#### 2.5 Manpower

The manpower requirement to construct the alignment and its components is approximately 50,000.

### 3.0 ANNEXES

Photographs of the Project site and the NAMRIA map showing the Project are shown in Annexes 3.1 and Annexes 3.2 respectively.

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#### 3.1 Photographs of the Project site







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#### 3.2 NAMRIA map showing the Project site

