# DATA COLLECTION SURVEY ON NATIONAL LOGISTICS IN THE REPUBLIC OF THE UNION OF MYANMAR

FINAL REPORT
VOLUME 2 : APPENDIX

#### **MARCH 2018**

### **JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

Kensetsu Gijyutsu Center, Ltd. Nippon Koei Co., Ltd.

The Overseas Coastal Area Development Institute of Japan Nittsu Research Institute and Consulting, Inc.

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# Data Collection Survey on National Logistics in the Republic of the Union of Myanmar Final Report

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# **Appendix 1**

# **Profile of Proposed Projects**

The project profiles of the projects prioritized under Group-A, B, C and D with "Expected Key Potential Impact and Mitigation Measures for Target Projects" for selected priority projects under Group-A and B are shown in this section.

# (1) SOFT COMPONENTS

The total 22 projects below are proposed to be carried out at the beginning of the plan period or prior to the implementation of major / large scale infrastructure developments projects as listed in the group of physical components of the master plan.

Sector	Logistics Project ID	Title of Project
Logistics	LGP-01	Improvement of Laws and Regulations for Logistics -Truck transport-
	LGP-02	Improvement of Laws and Regulations for Logistics
		(Foreign cargo handling, other than MACCS (Myanmar Automated
		Customs Clearance System))
	LGP-03	Capacity Building Program for Logistics System Management
	LGP-04	Training for Trainers of MOTC Aiming at Guiding Private Sector to Improve
		the Performance of the Logistics Industry
	LGP-05	Promotion of FDI / Domestic Investments for Integration and
		Modernization of Logistics Service Sector
	LGP-06	Enhancement of the containerization and palletization
Road	LGP-07	Improvement of Road Safety Program (TA + pilot projects)
Railway	LGP-08	Study on Legal System for accessibility improvement in freight railway
		services
	LGP-09	Study on Myanmar – Thailand Railway Link
	LGP-10	Study on Mandalay – Muse New Railway Line Development Project (431.00) km
	LGP-11	Study on Mandalay – Tamu New Railway Line Development Project (500.25) km
	LGP-12	Study on High Speed Railway Linking Between Yangon and Hanthawaddy
Waterborne	LGP-13	Legislation of Port Law
	LGP-14	Dawei Port Development Project (Study)
Inland	LGP-15	National Inland Waterway Master Plan Study
Waterway	LGP-16	Vessel Safety Improvement
	LGP-17	Strengthening Organization of IWT
	LGP-18	Enhancement of University (Human Resource Development, incl.
		Equipment Installation)
	LGP-19	Improvement of Statistics (Data Collection)
	LGP-20	Enhancement of Ship Registration and Categorization
	LGP-21	Enhancement of Captains and Helmsmen Education System
	LGP-22	Improvement of Bonded Transport

Sub-Sector	Logistics				
Reference No.	LGP-01				
Project Title		of Laws and Regula	tions for Logistics		
,	-Truck transpo		J		
Organizer	MOTC,				
Cooperator	MOTC, MOC,				
		Summary of project			
Purpose			Location		
Unfortunately, the long not developed in Myconsists of various player.	yanmar. While Id	ogistics activity	Nation wide		
<ol> <li>In Myanmar the trainstage of developments and the business and the stage of developments.</li> <li>Unfortunately, the souther ASEAN count regulations need to the business standard.</li> </ol>	ent. Various leve and provide ope ervice standard ries. Some kind be established	Is of players can rations. is poorer than of entry in order to grow			
Rationale			Project plan		
<ol> <li>Myanmar adopts the principle of ASEAN multimodal transport agreement for truck operators. There are 3 components: 1) good reputation. 2) Experience 3) financial background for entry.</li> <li>Detailed factors for entry are neither fixed nor clarified.</li> <li>Establish the entry regulation in order to foster business operators and to keep the service standard while ensuring fair competition.</li> <li>Identify the detailed for entry regulation -Necessarily experience -Financial background -Necessary resources and other resources human resources)</li> </ol>			ion perience (q ground purces (Equurces as	lualify) uipment	
Necessary res	ource	Estimated Cost (US\$ million)	Sched	lule	
			Calendar year	Start	End
Expert (truck operation)		US\$ 1.0mil.	1. Preparation	2017	2018
Expert (legal framework	)	US\$ 1.0mil.	2. Drafting	2018	2018
			3 Discussion with	2017	2018
			private sectors	0010	0000
			4. Finalizing draft	2019	2020
Total Estimated Cost		LICE O Omil	5. Enforcement	2020	-
Total Estimated Cost Expected result		US\$ 2.0mil.	Planned actions		1
	ogietice provido	re		ted to ide	otify the
<ol> <li>Activating safety and environment-friendly transport</li> <li>Upgrading service standard s</li> <li>situation, demand, and capability the transport industry.</li> </ol>					
Necessity of Technical Assistance					
1.Technical feasibility st	udy				
Remark			etry has been beavily r		

In advanced counties (EU, USA and Japan), the truck industry has been heavily regulated since the 1980s. After industry standards were established, entry regulations were deregulated. In Myanmar, local operators are likely to have insufficient resources for investment. This situation makes the transport market disorderly and the market cannot provide profits for both users and operators until some kind of qualified transporters appear. Advanced countries had experienced the following steps: 1) Entry regulation, 2) fostering industry and standards 3) Deregulation of entry 4) Competition 5) Cost reduction. The disorderly deregulation for entry makes it difficult for operators to hold resources for qualified practice because their competitiveness is likely to depend on "cost".

Sub-Sector	Logistics					
Reference No.	LGP-02					
Project name	Improvement of Laws a	nd Regulations for Logistics				
		(Foreign cargo handling, other than MACCS (Myanmar Automated				
	Customs Clearance Sys	stem))				
Executing agency	Customs					
Cooperator	MOTC, MOC, private so	ector				
	Summary	y of project				
Purpose		Location				
	d procedure along with	Nation wide				
the MACCS						
		D : (B)				
Background and Ration		Project Plan				
Since 2016 Nov, MACC		To to manufacto to a fallonda and a sol	ć			
regional framework for h		To formulate for following legal	rramework	C:		
transport, bonded area to		Transit procedure				
bonded inventory facility  Now just the time only p		-Transit procedure				
		-Bonded transport				
transportation between began as a test case. The		-Bonded area (inland place) -Container duty exempt /te	omporori,	import		
bonded transportation, v		scheme	emporary	import		
fixed as soon as possible		Scrienie				
Necessary resource		Schedule				
1100000aiy 1000aioo	(US\$ million)	Schedule				
1. Expert (customs,	US\$ 2.5mil.	Calendar year	Start	End		
MACCS linkage)	US\$ 1.0mil.	1. Preparation	2017	2018		
2. Expert (business	·	2. Drafting	2018	2019		
activity expert for		3 Discussion with private	2018	2019		
bonded cargo		sectors				
handling)		4. Finalizing draft	2019	2020		
		5. Enforcement	2020			
				_		
Total Estimated Cost	US\$ 3.5mil.					
Expected result	<u> </u>	Planned actions		I.		
1.Facilitation on foreign	cargo handing	Pre-survey is expected to ident	ifying the			
2.Activating customer's		situation, demand, capability of				
through facilitating imp		industry.				
bonded/transit transpo						
Necessity of Technical A		1				
Law and regal fram						
2. Business circumsta						
	· ·					
4. Linkage with MACC	_					
Remark						
			-			

Sub-Sector	Logistics				
Reference No.	LGP-03				
Project name	Capacity Building Pro	gram for Logistics	System Managen	nent	
Organizer	MOTC,				
Cooperator	MOTC, MOC, private	sector			
•		ary of project			
Purpose		Location	า		
2. Poor finance back	around of truckers: t				
	cient capacity to deve	,			
fleets. Some kind of					
program seems necess	sary for upgrading fleet	s.			
Rationale	7 10 0		Project plan		
	economic developmen	t. it is definitely	Promoting t	ruck ass	ociation
	ng transport quality. Un		capability to		
	city of truckers constrain		truckers sta		
truck fleets.		3 1 3	service leve		
2. Some kind of finance	cial support program pro	ovides incentives	2. The following	ng progra	ams are
	. In order to do this, Jap		taken into a		
	system, the flow of wh		the associa		Ū
	ck associations⇒privat		1) Develor	oment or	r truck
	sociations is to keep tra	•		r's capal	
using official funds.		,,	2) Financia	al assista	ance to
	tion activity can provide	benefit for	procure	truck fle	ets
	ustrial development, no		3) Training	and ed	ucation
	out also for relatively so		for drive	ers/ fleet	
	, sharing equipment an		manage	ement	
	e contract and so on)	· ·			
Necessary resources	s Estimated cost		Schedule		
	(US\$ million)				
Expert (truck	US\$ 0.5mil.	Calendar year		Start	End
Association and rela	ited	1. Preparation		2017	2018
soft Component)		2. Association de	velopment plan	2019	2020
2. Expert (finance sche	eme US\$ 0.5mil.	3. Financial sche	me	2019	2020
for procurement of		4. Finance		2022	
vehicles and ships)		5. Soft componer	nt program	2018	2022
		6.Enforcment		2025	
Total	US\$ 1.0mil.				
Expected result		Planned actions			
Truck fleet develope			opment for truck a	associati	on
Replacement of aged truck to     2.Funding					
contemporary ones	3.Monitoring				
3. Transport service s		4.Other related truck industry development			
4. Safety/eco-friendly transport scheme initiated by association (safety of					
5. Cost reduction maintenance, fleet management practice etc)				etc)	
6. Keeping profitability					
Necessity of Technical Assistance					

- Association management
- 2. Financial plan for installing qualified trucks
- 3. Program formulation for truck industry development, including manger and driver
- 4. Collaboration with the public sector to keep industry development as well as secure customer satisfaction (institutional scheme).

Reference No.   LGP-04   Training for Trainers of MOTC Aiming at Guiding Private Sector to Improve the Performance of the Logistics Industry   MOTC, MOCom	Sub-Sector I	ogistics.			
Improve the Performance of the Logistics Industry					
Executing agency Customs, private sector  Summary of project  Purpose Location  Training the administrative staffs of MOTC / MOCom to enable them to guide the private sector to improve the performance of the private sector through the improvement and encouragement of logistics provider's capability  Background and Rationale Project Plan  1. Since qualified logistics service is based on advanced practice and technology, training is indispensable. The administrative staffs of MOTC / MOCom are needed to be trained to become the trainers to guide the private sector for improved performance of the logistics services.  2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4. Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  Expected result 1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers  4. Programming official certification system 5. Periodical checks				rivate S	ector to
Customs, private sector   Summary of project   Location	•	•	oc of the Logistics madelly		
Summary of project  Purpose Training the administrative staffs of MOTC / MOCom to enable them to guide the private sector to improve the performance of the private sector through the improvement and encouragement of logistics provider's capability  Background and Rationale 1. Since qualified logistics service is based on advanced practice and technology, training is indispensable. The administrative staffs of MOTC / MOCom are needed to be trained to become the trainers to guide the private sector for improved performance of the logistics services.  2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  US\$ 1.0mil.  Calendar year Start End  Planned actions  1. Pre-survey is expected to identify the situation, demand, and capability of the transport industry.  2. Location for training center, if required.  Necessity of Technical Assistance  1. Instructor selection  2. Finance  3. Programming official certification system  5. Periodical checks		•	r		
Purpose Training the administrative staffs of MOTC / MOCom to enable them to guide the private sector to improve the performance of the private sector through the improvement and encouragement of logistics provider's capability  Background and Rationale 1. Since qualified logistics service is based on advanced practice and technology, training is indispensable. The administrative staffs of MOTC / MOCom are needed to be trained to become the trainers to guide the private sector for improved performance of the logistics services. 2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance. 3. Similar practice is necessary to be activated to provide qualified logistics service. 4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource  Estimated cost (US\$ million)  Depending on training menu  US\$ 1.0mil.  Minimum)  Expected result 1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance 1. Instructor selection 2. Finance 3. Programming official certification system 5. Periodical checks 4. Programming official certification system 5. Periodical checks	Cooperator	•			
Training the administrative staffs of MOTC / MOCom to enable them to guide the private sector to improve the performance of the private sector through the improvement and encouragement of logistics provider's capability  Background and Rationale  1. Since qualified logistics service is based on advanced practice and technology, training is indispensable. The administrative staffs of MOTC / MOCom are needed to be trained to become the trainers to guide the private sector for improved performance of the logistics services.  2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource  Estimated cost (US\$ million)  Depending on training menu  US\$ 1.0mil.  Winimum)  Expected result  1. Upgrading logistics quality  2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection  2. Finance  3. Programming official certification system  5. Periodicial checks	Purpose	Summar			
MOCom to enable them to guide the private sector to improve the performance of the private sector through the improvement and encouragement of logistics provider's capability    Background and Rationale		atoffa of MOTC /			
sector to improve the performance of the private sector through the improvement and encouragement of logistics provider's capability    Background and Rationale			Nationwide		
Background and Rationale  1. Since qualified logistics service is based on advanced practice and technology, training is indispensable. The administrative staffs of MOTC / MOCom are needed to be trained to become the trainers to guide the private sector for improved performance of the logistics services.  2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  US\$ 1.0mil.  Calendar year Start End  Calendar					
Background and Rationale 1. Since qualified logistics service is based on advanced practice and technology, training is indispensable. The administrative staffs of MOTC / MOCom are needed to be trained to become the trainers to guide the private sector for improved performance of the logistics services.  2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  Depending on training menu  Expected result 1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard Necessity of Technical Assistance 1. Instructor selection 2. Finance 3. Programming of ficial certification system 5. Periodical checks					
Background and Rationale  1. Since qualified logistics service is based on advanced practice and technology, training is indispensable. The administrative staffs of MOTC / MOCom are needed to be trained to become the trainers to guide the private sector for improved performance of the logistics services.  2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource  Estimated cost (US\$ million)  Depending on training menu  US\$ 1.0mil.  Minimum)  Expected result  1. Upgrading logistics quality  2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection  2. Friance  3. Training of trainers  4. Programming official certification system  5. Periodical checks	ı ·	•			
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indispensable. The administrative staffs of MOTC / MOCom are needed to be trained to become the trainers to guide the private sector for improved performance of the logistics services.  2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4."Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  US\$ 1.0mil.  Expected result  1. Upgrading logistics quality  2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection  2. Finance  3. Training of trainers  4. Programming official certification system  5. Periodical checks			0 0 0	key	
MOTC / MOCom are needed to be trained to become the trainers to guide the private sector for improved performance of the logistics services.  2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  Depending on training menu  Lus\$ 1.0mil. (Minimum)  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Training of trainers 3. Training of trainers 4. Programming official certification system 5. Periodical checks	advanced practice and to	chnology, training is	components:		
become the trainers to guide the private sector for improved performance of the logistics services.  2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource  Estimated cost (US\$ million)  Depending on training menu  US\$ 1.0mil.  Calendar year  Schedule (depending on training menu)  Calendar year  Start End  2019 2022  Total Estimated Cost (Minimum)  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks	indispensable. The admi	nistrative staffs of			
-Truck fleet management (for efficient/safety) -Driver (for eco/driving, safety) -Polk lift/Crane operator -Customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  Depending on training menu  US\$ 1.0mil.  Calendar year Start End -Customs license holders -Schedule (depending on training menu)  Calendar year Start End -Customs license holders -Customs licens	MOTC / MOCom are nee	ded to be trained to	-Warehouse operation (bonded	or not bo	nded)
Services.  2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  Depending on training menu  Schedule (depending on training menu)  Calendar year Start End  2019 2022  Total Estimated Cost (US\$ 1.0mil. (Minimum)  Expected result  1. Upgrading logistics quality  2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection  2. Finance  3. Training of trainers  4. Programming official certification system  5. Periodical checks	become the trainers to g	uide the private sector	-Inventory control		
2. As a precedent, it is indicated that training for MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  US\$ 1.0mil. Calendar year Start End  2019 2022  Total Estimated Cost (US\$ 1.0mil. (Minimum)  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks	for improved performanc	e of the logistics		ficient/saf	fety)
MACCS process was implemented for renewal for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  US\$ 1.0mil.  Minimum  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks					
for customs procedure, aiming at facilitation of speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4."Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  Depending on training menu  US\$ 1.0mil.  Calendar year Start End 2019 2022  Calendar year Start End 2019 2022  Depending on training menu  Start End 2019 2022  Depending on training menu  Planned actions  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks					
speedy clearance.  3. Similar practice is necessary to be activated to provide qualified logistics service.  4."Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  Depending on training menu  Expected result  1. Upgrading logistics quality  2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection  2. Finance  3. Training of trainers  4. Programming official certification system  5. Periodical checks			-Customs license holders		
3. Similar practice is necessary to be activated to provide qualified logistics service.  4. "Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  Depending on training menu  Schedule (depending on training menu)  Calendar year Start End  2019 2022  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  202 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  202 20  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  2019 202  20		iming at facilitation of	-		
to provide qualified logistics service.  4."Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  Depending on training menu  Schedule (depending on training menu)  Calendar year Start End  2019 2022  Calendar year Start End  Calendar year	1				
4."Diploma" system seems to be effective for keeping training status at a high level.  Necessary resource Estimated cost (US\$ million)  Depending on training menu  US\$ 1.0mil.  Calendar year Start End  2019 2022  Total Estimated Cost (Minimum)  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks					
Necessary resource   Estimated cost (US\$ million)					
Necessary resource (US\$ million)  Depending on training menu  US\$ 1.0mil.  Menu  US\$ 1.0mil.  Calendar year  Start  End  2019 2022  100 100 100 100 100 100 100 100 1					
Calendar year   Start   End					
menu    2019   2022	-	(US\$ million)	,		<u>,                                      </u>
Total Estimated Cost (Minimum)  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks	Depending on training	US\$ 1.0mil.	Calendar year	Start	End
(Minimum)  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks	menu			2019	2022
(Minimum)  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks					
(Minimum)  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks					
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(Minimum)  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks					
(Minimum)  Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks					-
Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks	Total Estimated Cost	US\$ 1.0mil.			
Expected result  1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks					
1. Upgrading logistics quality 2. Enhancing safety and transparency for service standard 3. Location for training center, if required.  Necessity of Technical Assistance 1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks	, ,	I	Planned actions		<u> </u>
2. Enhancing safety and transparency for service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks		litv		ntify the s	situation
service standard  Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks	, , , , , , , , , , , , , , , , , , , ,	•			
Necessity of Technical Assistance  1. Instructor selection 2. Finance 3. Training of trainers 4. Programming official certification system 5. Periodical checks		anoparonoy ioi			
Instructor selection     Finance     Training of trainers     Programming official certification system     Periodical checks	<u> </u>				
<ul><li>2. Finance</li><li>3. Training of trainers</li><li>4. Programming official certification system</li><li>5. Periodical checks</li></ul>					
<ul><li>3. Training of trainers</li><li>4. Programming official certification system</li><li>5. Periodical checks</li></ul>					
<ul><li>4. Programming official certification system</li><li>5. Periodical checks</li></ul>					
5. Periodical checks					
Noman					
	Kemark				

	Logistics			
	LGP-05			
		nestic Investments for Integration a	nd	
	Modernization of Logist	tics Service Sector		
8 8 7	MOTC, MOCom			
Cooperator	Private sector			
	Summar	y of project		
Purpose		Location		
<ol> <li>Modernize the logistic</li> </ol>		Nationwide		
2. Preparation of necess				
regulations covering t				
transport, warehousing				
development of truck				
3. Preparation of financi				
operating freight trans	sport and logistics			
services.		Drain at Dlan		
Background and Rational		Project Plan	lava fav tl	
Current domestic logi		Organizing project stakehold		
forwarders, trucking o		establishment of new truck to	erminais	,
waterway transport co	are fragmented thus a	<ul><li>logistics parks, etc.</li><li>Learning sessions of the out</li></ul>	line and	
rationalization of logis		practical operation of moder		
organization is neede		services	ii logisiic	3
logistics performance		<ul> <li>Legislation of necessary law</li> </ul>	e and	
whole	or myaninar as a	regulations for realization and practical		
Enhancement of logis	stics activities of FDI	operation of modern logistics services		
logistics providers to		Establishment of logistics data and		
logistics providers to		information sharing system		
international standard		Establishment of cargo / truck – inland		
and services.		waterway transport – coasta		
3. Grading of domestic I	ogistics providers	matching system		5
Necessary resource	Estimated cost (US\$ million)	Schedule (depending on train	ning mei	nu)
Depending on training	US\$ 1.0mil.	Calendar year	Start	End
menu		Preparation	2018	2019
		Execution	2019	2020
		ZXCCdion	20.0	
			<u> </u>	<del> </del>
				_
Total Estimated Cost	US\$ 1.0mil.		<u> </u>	
(Minimum)				
Expected result				
Increase of freight transport efficiency and Request of technical assistance from advanced				
reduction of transport cost countries in view of logistics services				
Necessity of Technical As		Total in the in the global of the	.500	
Technical assistance is no				
Remark				
	organized the Myanma	r Transport Logistics Federation a	nd GMS	Freight
1 110 Own CO Has alleady	organized the mydrina	Transport Logistics i cuciation al	IG CIVIO	. roigin

The UMFCC has already organized the Myanmar Transport Logistics Federation and GMS Freight Forwarding Association. These two newly created organizations will be reinforced to be the core organization for promotion of modernization and grading up of Myanmar's logistics sector.

	1 10,601				
Sub-Sector	Logistics				
Reference No.	LGP-06				
Project name	Enhancement of the co	ntainerization and palletizatior	)		
Executing agency	MOTC, MOCom				
Cooperator	Private sector				
	Summar	y of project			
Purpose		Location			
Modernize the freight	transport especially	Nationwide			
for long distance hau					
2. Rationalize the transp					
containers and pallets that ensure the					
elimination of vanning					
operation cost as we					
such operation.					
3. Speedier door-to-doo	or operation can be				
realized.	•				
4. Increase the load fac	tor				
Background and Rationa	le	Project Plan			
1. Most of the domestic		<ul> <li>Organizing project stake</li> </ul>	holders for the	ne	
done by ordinary truc		introduction of container			
against rain and dete		<ul> <li>Learning sessions for co</li> </ul>			
cargoes are problema	atic;	palletization process			
2. The cargoes are tran	s-loaded, loaded and	<ul> <li>Establishment of domes</li> </ul>	tic container	and	
unloaded manually th	ius the cost incurred	pallet manufacturing cor	mpanies		
for such operation;					
3. If the cargoes are cor	ntainerized various				
charges needed for s	toring, trans-loading,				
loading and unloadin					
devanning can be av	oided thus the				
transport charges car	n be rationalized.				
Nia a a a a a a a a a a a a a a a a a a	Estimated and	Cabadala (dan arabiran a			
Necessary resource	Estimated cost (US\$ million)	Schedule (depending or	n training me	nu)	
Depending on training	US\$ 1.0mil.	Calendar year	Start	End	
menu	Ο Ο Φ Τ.ΟΠΙΙΙ.	Preparation	2018	2019	
Theria		Execution	2019	2020	
		Execution	2019	2020	
Total Fatimets d Cost	1100 4 0!!			-	
Total Estimated Cost	US\$ 1.0mil.				
(Minimum)		Diamandantina		I	
Expected result		Planned actions		h	
Increase of freight trans		Request of technical assista		avanced	
reduction of transport co		countries in view of logistics	services		
Necessity of Technical As					
Technical assistance is n	eeaea.				
Remark					
		r Transport Logistics Federation			
		d organizations will be reinford		core	
organization for promotion of modernization and grading up of Myanmar's logistics sector.					

Serial No.:	D			
Sub-Sector	Road			
Reference No.	LGP-07	- 10 ( / D / /TA		
Project Title		Road Safety Program (TA + pi		
Executing Agency		ruction, MOTC and Communi	cation	
Relevant Ministry	RTAD, Traffic Po			
Ohioativaa		of the Project		
Objectives		Location		
2. Increase Skills of truck drives a substandard of "sight-substandard of "sight-substa	(Example of pilot project: Improvement of sub-standard vertical alignment)  Project Plan (outline)  Through the technical assistance, heavy vehicle driver standards, a road safety improvement			
requirement of ASEAN Transpo	ort Strategic Plan	program (term-wise) and road safety design manual will be prepared.4 Pilot project(s) will be implemented for future road safety improvement action by GoM.		
Input	Estimated Cost (US\$ million)	Schedule		
1) Identification of the cause	US\$ 2.0mil.	Calendar Year	Start	End
of accidents		1. Preparation	2016	2017
2) Establish a road safety		2. Feasibility Study		
improvement program		3. Funding Arrangement	2017	2017
(short and long term		4. Execution	2017	2020
program) 3) Road safety improvement pilot project(s) (installation of road safety devices, improvement of vertical alignment, etc.)		5. Commissioning	2020	2020
Total Estimated Cost	US\$ 2.0mil.			
Result of Evaluation				
Expected Output	Action Plan			
<ul> <li>Heavy vehicle driver standate</li> <li>training campaign</li> <li>Road safety improvement pro</li> <li>Road safety design manual</li> <li>Pilot project</li> </ul>	training campaign - Road safety improvement program - Road safety design manual			
Necessity of Technical Assistar	nce			
Remarks				

Sub-Sector	Railway				
Reference No.	LGP-08				
Project Title		m for Accessibility limp	rovoment in Er	night Pailway	
Project fille	Services	III IOI Accessibility IIIIIpi	ovement in Fit	eigiil Kallway	
Executing Agency	MR				
Relevant Ministry	MOTC				
Troisvant iviiniony		f the Project			
Objectives	Oddino of		ocation		
To enhance bulk cargo train	nsportation by railway	_	<del>ocalion</del>		
To enhance cross-border t					
Rationale		Project Plan (outline)			
- Railway Law is not ass	sumed cross-border	Following task is inclu	ded on the stu	dy	
transportation		-Review the relevant I	aw on freight tr	ansportation	
- For intermodal transpo	rtation enhancement,	by railway			
the soft components s	nall be reviewed.	-Propose the attractive	e scheme for ir	ntermodal	
		(including cross borde			
		-Propose private-own		romote bulk	
		cargo transport by rail			
		-The other laws impro		e proposed	
		for freight railway pror	notion		
Input	Estimated Cost (US\$ million)	Schedule			
Railway Law Study	US\$ 0.35mil.	Calendar Year	Start	End	
Training Law Grady	000	1. Preparation	2018	2018	
		2. Feasibility Study	2018	2018	
		3. Funding Arrangement	-	-	
		4. Execution	-	-	
		5. Commissioning	-	_	
Total Estimated Cost	US\$ 0.35mil.	o. commissioning			
Result of Evaluation	ΟΟψ 0.3311111.				
result of Evaluation					
Expected Output		Action Plan			
Logistic Law is improved for	or intermodal freight	Feasibility Study shall be started soon.			
transportation	or intermodal freight	T casibility Ctady strain	be started soc	711.	
Necessity of Technical Ass	istance				
14cccssity of Technical 7 (3c	istarioc				
Remarks					

Sub-Sector	Railway			
Reference No.	LGP-09			
Project Title	Study on Myanmar -	- Thailand Railway Link		
Executing Agency	MR			
Relevant Ministry	MOTC			
•	Outline o	f the Project		
Objectives		Location		
To enhance railway of transportation between Mya	cross-border cargo anmar and Thailand	Yango Study on Thai- Myan Railway Connectivity	ımar	yuzayat
Rationale -Linkage between Myanmar and Thailand has been studied so farKOIKA studied Thanbyuzayat- Three Pagoda railway route in 2007 but the project has stopped due to environmental issueState Railway of Thailand studied Dawei-Namtok railway route in 2015 but the project also not proceed due to project costThe highest volume importer is Thailand and the linkage between Myanmar and Thailand is		Project Plan (outline) The study will find the between Myanmar and updated demand forec	d Thailand in vi	
important. Input	Estimated Cost (US\$ million)	Schedule		
Feasibility Study	US\$ 1.0 mil.	Calendar Year	Start	End
. casionity clady	σοφ 1.ο 11m.	1. Preparation	2018	2018
		Feasibility Study	2019	2020
		3. Funding Arrangement	-	-
		4. Execution		_
		5. Commissioning		-
Total Estimated Cost	US\$ 1.0 mil.	J. Commissioning	-	-
Result of Evaluation	υσφ 1.0 IIIII.			
	anagad aggarding to			
New railway alignment is pr				
updated demand forecastin				
Necessity of Technical Assi	stance			
_				
Remarks				
Canagana batwaan Myanr	nar and Thailand is n	eeded		

Seriai No					
Sub-Sector	Railway				
Reference No.	LGP-1				
Project Title	•	on Mandalay – M	luse New Railway Line Developr	nent Projed	<u>ct</u>
Executing Agency	MR				
Relevant Ministry	MOTO				
		Outline of	the Project		
To meet with increasing cargo demand on the regional transportation naturals:		Location Muse-Lasho-Kyaukmae-Pyinoo (431.0) Km	olwin-Mand	; lalay	
<ul> <li>the regional transportation network;</li> <li>To improve and expand the existing infrastructure;</li> <li>To upgrade the efficiency of operation of linkage between Muse the border city of Myanmar with China and Mandalay as a central hub of northern Myanmar: and</li> <li>To enhance railway cross-border cargo transport between Myanmar and China, and also to connect Trans Asian Railway (TAR) network.</li> </ul>			Rulli MYANDIAN  Mandalus  Mandalus	China sand	
Rationale	Rationale		Project Plan (outline)		
<ul> <li>It is an important part of Myanmar-China international passageway that provide an access to the sea port for China;</li> <li>It is an important part of western Corridor for Trans-Asia Railway network.</li> <li>It enhances the economic and trade exchange in large volume through the logistics corridor by a rapid freight transport</li> </ul>		To prepare a detailed ar Feasibility Study report.	u compre	lerisive	
mean. Input		Estimated Cost (US\$ollar)	Schedule		
Feasibility study on the		US\$ 5.0 mil.	Calendar Year	Start	End
development of a railway			1. Preparation	2018	2019
linking Muse and Manda			2. Feasibility Study	2020	2022
with standard gauge and					
ton axle load railway trad					
The estimated cost of the					
project is US\$ 5.0 billion					
Total Estimated Cost for	F/S	US\$ 5.0 mil.			
Expected Output			Action Plan		-
<ul> <li>Lower the transport cost</li> <li>Shorter the lead time</li> </ul>		Conduct feasibility study			
Necessity of Technical A	ssistan	ce			
Technical and Financial					
Remarks		-			

Serial No					
Sub-Sector	Railway				
Reference No.	LGP-11	N 5 "			
Project Title		amu New Railway Line Developme	ent Projed	ct	
Executing Agency	MR				
Relevant Ministry	MOTC				
	Outline of	the Project			
Objectives		Location		;	
		Tamu-Kalay-Kalewa-Segyi-Mony	wa-Mand	dalay	
	creasing cargo demand		Metrodi		
on the regional tran		Tumu-Mandalay Rail Line Project  Proposed Alignment	4		
To improve and exp	and the existing	Time-Kalay-Kadawa-Kagaji-Monywa- Mandalay (500.24 km)(\$10.65 mile)	al and		
infrastructure;	ionovot operation and	The state of the s	1		
	eiency of operation and				
	n Tamu the border city	SAGAING DIVISION	70		
	dia and Mandalay as a	KALAN TO THE TOTAL THE TOTAL TO THE TOTAL TOTAL TO THE TO	Marian Major		
<ul><li>central hub of north</li><li>To enhance railway</li></ul>		KHINO	The same of the		
	Ayanmar and India; and	acon acon	- day		
To connect Trans As		GANGAW YOUNG MONTHA CHANG OO	The same of the sa		
network.	sian Rahway (TAR)		demanders Seconds		
network.		PAKONKU MARANA	Name of Street, or other Parks		
Rationale		Project Plan (outline)	Transport of the Parket		
	ontinuously strives to		nt of mis	sing rail	
strengthen diplomate		<ul> <li>To finalize the route alignment of missing rail link between India and Myanmar.</li> </ul>			
investment relation		To make a Feasibility Study			
<ul> <li>Existing railway line</li> </ul>		The study will find a feasible railway route			
Gangaw - Kalay is a		To meet updated demand forecast.			
	es not meet with an	To most apactod domand to	roodot.		
international standa					
Input	Estimated Cost (US\$ollar)	Schedule			
Feasibility study on the	US\$ 3.0 mil.	Calendar Year	Start	End	
development of a railway	·	1. Preparation	2018	2019	
linking Tamu and Manda		2. Feasibility Study	2020	2022	
with standard gauge and		2.1 oddiomity otday	2020		
ton axle load railway trad					
Total Estimated Cost for	F/S US\$ 3.0 mil.				
Expected Output	COW 0.0 Hill	Action Plan	1	<u>I</u>	
Lower the transport cost		Proposed to the Government of India in line with			
Shorter the lead time		the SASEC program to arrange the technical			
Charter and read anne		assistance to conduct the F/S		.oui	
Necessity of Technical A	ssistance				
Technical and Financial Viability Study					
Remarks					

Sub-Sector	Railway					
Reference No.	LGP-12					
Project Title	Study on High S Hanthawaddy	peed Railway	Linking	Between	Yangon	and
Executing Agency	MR					
Relevant Ministry	MOTC					
Tread varie reminerry		of the Project				
Objectives		Location				
To develop a new rail	way link as a rapid	Alignment Imag	ie .			
access for the passer between Yangon and Hanthawaddy Interna location is around 77 Yangon.	125 35 92 77 100 Nances	nawaddy Airpned)	RW001 RW013	n Area Detail	awa SEZ	
		Source: NTMP,	JST Edit	ed	IW021	
Rationale		Project Plan (outline)				
<ul> <li>A rapid passenger tra needed to meet with t demand for accessing</li> </ul>	he passenger	<ul> <li>New railwa</li> </ul>	y line will d Hantha	be prepare waddy plan		n
Input	Estimated Cost (US\$ million)		Sch	edule		
Feasibility study on the	US\$ 3.0 mil.	Calendar Ye	ar	Start	End	d
high speed railway		1. Preparation		2018	201	
system linking between		2. Feasibility St	udy	2020	202	
the Hanthawaddy						
International Airport and						
Yangon City						
Total Estimated Cost	US\$ 3.0 mil.					
Expected Output		Action Plan				
A rapid access connecting between the Hanthawaddy International Airport and Yangon City		Conduct the fea	asibility st	udy		
Necessity of Technical Ass	sistance					
Feasibility study is needed						
Remarks						
The target year of comple	ting the Hanthawaddy	International Airp	ort is 202	3.		

Sub-Sector	Waterborne Transport			
Reference No.	LGP-13			
Project Title	Legislation of Port Law	S		
Executing Agency	Myanma Port Authority	(MPA)		
Relevant Ministry	MOTC and Communic			
	Outline of	the Project		
Objectives		Location		
The objectives of the Proje		Nation W	ide	
1. Prepare a basic port d				
2. Prepare a national por				
3. Prepare a port layout   so as to materialize well-b				
development.	alanceu nalional ianu			
Rationale		Project Plan		
The National Port Develop		Amendment of Port Laws		
exist at present. The new				
formulated in April 2015 in				
"Port Act", the determination regulated but no concept of				
management system is sti	•			
is possible for the private				
utilize the public water are	•			
private entity owns the lan	•			
area. In addition, there is				
Act" which requires the es				
nation-wide port location p	lan and the necessary			
functions and capacities o				
national viewpoint which a				
well-balanced country dev				
Input	Estimated Cost (US\$ million)	Schedul	e	
1. Amendment of current	US\$ 1.0mil.	Calendar Year	Start	End
port laws		1. Preparation	2018	2018
		2. Feasibility Study	2019	2020
		3. Funding Arrangement		
		4. Execution		
		5. Commissioning		
Total Estimated Cost	US\$ 1.0mil.			
Result of Evaluation				
Expected Output		Action Plan		
Port development plans in	order.	Request of technical assists	ance to car	ry out the
		Project		
Necessity of Technical Assistance				
Technical assistance is ne				
Remarks				

	Project				
Sub-Sector	Waterborne Transport				
Reference No.	LGP-14				
Project Title	Study on Dawei SEZ F	Port Development Project			
Executing Agency	Myanma Port Authority				
Relevant Ministry	MOTC				
		the Project			
Objectives		Location			
<ol> <li>To develop the area as industrial development and chemical industry area as west (India, Africa and GMS and AEC zone.</li> <li>To develop the area as port at the southern part and area as port area.</li> </ol>	(light industry, heavy and energy). a logistic gate to the Middle East) from a deep-sea gateway	Manufacture of the second of t	PHU NAM ROW CHECKPOINT V M A R		
Rationale		Project Plan (outline)			
<ol> <li>A wide land area of 20,000 ha is secured and a part of road, reservoir, residential area and land filling is completed.</li> <li>A deep-water area is available for the port development.</li> <li>This area has the potential to be a core of Myanmar's economic development.</li> <li>This area is designated as the west side gate of the south coastal corridor of GMS.</li> </ol>		Initial Layout Plan      Further detailed study is a formulation of a layout		he	
Input	Estimated Cost (US\$ million)	Schedul	е		
2. Feasibility Study		Calendar Year	Start	End	
		1. Preparation	2018	2018	
		2. Feasibility Study	2019	2020	
		3. Funding Arrangement			
		4. Execution			
	5. Commissioning				
Total Estimated Cost					
Result of Evaluation	1		1		
Expected Output		Action Plan			
Economic developme increase in logistics in	-	Conduct of a feasibility study			
Necessity of Technical Ass					
1 Conduct of a faceibilit					

1. Conduct of a feasibility study

The Data Collection Survey for Development Planning in Tanintharyi Region and Dawei SEZ (DPTD) is on-going.

Reference No. LGP-15 Project Title National Inland Waterway Master Plan Study (incl. Pilot Project) Executing Agency DWIR and IWT Relevant Ministry MOTC  Outline of the Project  Outline of the Project  Outline of the Project  Location and Project Plan (outline)  1. To designate National Inland Waterways for systematic development  2. To make a Masterplan of phased development in accordance with road and railway transport development  3. To announce National Inland Waterways controlled by Myanmar Government Rationale  1. Even though the current condition of the waterway transport network has deteriorated, many people are utilizing inland waterway transport.  2. However the routes of roads and railways are designated in Myanmar and there is a Masterplan for road and railways development.  3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Input	Sub-Sector Inland Water Transport					
Project Title			noport			
Relevant Ministry  NOTC  Objectives  1. To designate National Inland Waterways for systematic development accordance with road and railway transport development?  2. To make a Masterplan of phased development in accordance with road and railway transport development?  3. To announce National Inland Waterways controlled by Myanmar Government  Rationale  1. Even though the current condition of the waterway transport network has deteriorated, many people are utilizing inland waterway transport.  2. However the routes of roads and railways are designated in Myanmar and there is a Masterplan for road and railways development.  3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.4: Sittwe-Upstream (Thanlyin River)  Input  Estimated Cost (US\$ million)  US\$ 2.0mil.  Masterplan for each national inland waterway Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost  US\$ 3.0mil.  Expected Output  Action Plan  Action Plan  Action Plan  - Preparation of Masterplan Study is needed.			Vaterway Master Plan Study (incl. Pilot P	roiect)		
Objectives  1. To designate National Inland Waterways for systematic development 2. To make a Masterplan of phased development in accordance with road and railway transport development 3. To announce National Inland Waterways controlled by Myanmar Government Rationale 1. Even though the current condition of the waterway transport network has deteriorated, many people are utilizing inland waterway transport network has deteriorated in Myanmar and there is a Masterplan for road and railways are designated in Myanmar and there is a Masterplan for road and railways development. 3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Input Estimated Cost (US\$ million)  - Establishment of Masterplan for each national inland waterway Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost US\$ 3.0mil.  Expected Output Action Plan  - Preparation of Masterplan Study is needed.						
Objectives  1. To designate National Inland Waterways for systematic development  2. To make a Masterplan of phased development in accordance with road and railway transport development  3. To announce National Inland Waterways controlled by Myanmar Government  Rationale  1. Even though the current condition of the waterway transport network has deteriorated, many people are utilizing inland waterway transport.  2. However the routes of roads and railways are designated in Myanmar and there is a Masterplan for road and railways development.  3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No. 1: Delta-Myitkyina (Ayeyawaddy River)  No. 2: Delta-Myitkyina (Ayeyawaddy River)  No. 3: Delta-Sagaing Division (Chindwin River)  No. 4: Sittwe-Upstream (Kaladan River)  No. 5: Mawlamyine-Upstream (Thanlyin River)  1. Figure: Location of Each National Inland Waterway  No. 1: Delta-Myitkyina (Ayeyawaddy River)  No. 3: Delta-Sagaing Division (Chindwin River)  No. 4: Sittwe-Upstream (Kaladan River)  No. 5: Mawlamyine-Upstream (Thanlyin River)  1. Preparation 2017 2017  2. Master Plan Study 2018 2018  3. Pilot Project 2019 2019  2. Master Plan Study 2018 2018  3. Pilot Project 2019 2019  2. Master Plan Study 2018 2018  3. Pilot Project 2019 2019  2. Master Plan Study 2018  3. Pilot Project 2019 2019  2. Master Plan Study 2018  3. Pilot Project 2019 2019  2. Master Plan Study 2018  3. Pilot Project 2019 2019  2. Preparation 2017 2017  2. Master Plan Study 2018  3. Pilot Project 2019 2019  4. Preparation 2017  4. Prep						
Location and Project Plan (outline)	,	Outline	of the Project			
1. To designate National Inland Waterways for systematic development 2. To make a Masterplan of phased development in accordance with road and railway transport development 3. To announce National Inland Waterways controlled by Myanmar Government Rationale 1. Even though the current condition of the waterway transport network has deteriorated, many people are utilizing inland waterway transport. 2. However the routes of roads and railways are designated In Myanmar and there is a Masterplan for road and railways development. 3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River) No.5: Mawlamyine-Upstream (Thanlyin River)  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.5: Mawlamyine-Upstream (Thanlyin River) No.6: Mawlamyine-Upstream (Thanlyin River) No.7: Delta-	Objectives					
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development in accordance with road and railway transport development  3. To announce National Inland Waterways controlled by Myanmar Government  Rationale  1. Even though the current condition of the waterway transport network has deteriorated, many people are utilizing inland waterway transport.  2. However the routes of roads and railways are designated In Myanmar and there is a Masterplan for road and railways development.  3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Schedule  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.5: Mawlamyine-Upstream (Thanlyin River)  Schedule  Calendar Year Start End 1. Preparation 2017 2017 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Pilot	for systematic developm	ent		-		
and railway transport development 3. To announce National Inland Waterways controlled by Myanmar Government Rationale 1. Even though the current condition of the waterway transport network has deteriorated, many people are utilizing inland waterway transport. 2. However the routes of roads and railways are designated In Myanmar and there is a Masterplan for road and railways development. 3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No. 1: Delta-Myitkyina (Ayeyawaddy River) No. 2: Delta-Sagaing Division (Chindwin River) No. 3: Delta-Sagaing Division (Chindwin River) No. 4: Sittwe-Upstream (Kaladan River) No. 5: Mawlamyine-Upstream (Thanlyin River) No. 5: Mawlamyine-Upstream (Thanlyin River) No. 5: Mawlamyine-Upstream (Thanlyin River) US\$ 2.0mil.  US\$ 2.0mil.  US\$ 2.0mil.  US\$ 1.0mil.  US\$ 1.0mil.  US\$ 1.0mil.  Preparation 2017 2017 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 2. Master Plan Study			KACHIN STATE			
3. To announce National Inland Waterways controlled by Myanmar Government Rationale  1. Even though the current condition of the waterway transport network has deteriorated, many people are utilizing inland waterway transport.  2. However the routes of roads and railways are designated In Myanmar and there is a Masterplan for road and railways development.  3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Input  Estimated Cost (US\$ million)  US\$ 2.0mil.  Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost  US\$ 3.0mil.  Expected Output  - National Inland Waterway Masterplan  - Preparation of Masterplan Study is needed.						
Controlled by Myanmar Government Rationale  1. Even though the current condition of the waterway transport network has deteriorated, many people are utilizing inland waterway transport. 2. However the routes of roads and railways are designated In Myanmar and there is a Masterplan for road and railways development. 3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River) No.5: Mawlamyine-Upstream (Thanlyin River) No.5: Mawlamyine-Upstream (Thanlyin River) No.5: Mawlamyine-Upstream (Schedule US\$ 2.0mil. Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost US\$ 3.0mil. Expected Output - National Inland Waterway Masterplan - Preparation of Masterplan Study is needed.			SHAEO	110.5		
Rationale  1. Even though the current condition of the waterway transport network has deteriorated, many people are utilizing inland waterway transport.  2. However the routes of roads and railways are designated In Myanmar and there is a Masterplan for road and railways development.  3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Input  Estimated Cost (US\$ million)  - Establishment of Masterplan for each national inland waterway Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost Expected Output  - National Inland Waterway Masterplan  - Preparation of Masterplan Study is needed.		-	KYAUK TOKE BY!			
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deteriorated, many people are utilizing inland waterway transport.  2. However the routes of roads and railways are designated In Myanmar and there is a Masterplan for road and railways development.  3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Input  Estimated Cost (US\$ million)  - Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost  US\$ 3.0mil.  Expected Output  - National Inland Waterway Masterplan  Action Plan  - Preparation of Masterplan Study is needed.			MON YMA E GARD WARNARY			
inland waterway transport.  2. However the routes of roads and railways are designated In Myanmar and there is a Masterplan for road and railways development.  3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Input  Estimated Cost (US\$ million)  - Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost Expected Output  - National Inland Waterway Masterplan  - Preparation of Masterplan Study is needed.			STATE	2		
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development. 3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Input  Estimated Cost (US\$ million)  - Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost US\$ 3.0mil.  Expected Output  - National Inland Waterway Masterplan  - Preparation of Masterplan Study is needed.			MALVIAY O			
3. DWIR has responsibility for the maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Input  Estimated Cost (US\$ million)  - Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost Total Estimated Cost - T	a Masterplan for road an	d railways	PYAY STATE			
maintenance of navigation channels but it is difficult because of financial and technical issues.  Figure: Location of Each National Inland Waterway No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Input  Estimated Cost (US\$ million)  - Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost Total Estimated Cost Schedule  US\$ 1.0mil.  Expected Output  Action Plan  - Preparation of Masterplan Study is needed.			SHINE DALING MTONE BO			
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No.1: Delta-Myitkyina (Ayeyawaddy River) No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  - Establishment of (US\$ million)  - Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost - Calendar Year Start End - 1. Preparation 2017 2017 - 2. Master Plan Study 2018 2018 - 3. Pilot Project 2019 2019 - 3. Pilot Project 2019 2019 - Calendar Year Start End - 1. Preparation 2017 2017 - 2. Master Plan Study 2018 2018 - 2. Master Plan Study 2018 2019 - Calendar Year Start End - 1. Preparation 2017 2017 - 2. Master Plan Study 2018 2018 - Calendar Year Start End - 2. Master Plan Study 2018 2018 - 2. Master Plan Study 2019 2019 - Calendar Year Start End - 2. Master Plan Study 2018 - 2. Master Plan Study 2018 - 2. Master Plan Study 2018 - 2. Master Plan Study 2019 - 2. Master Plan Study 2018 - 2. Master Plan Study 2017 - 2.	technical issues.					
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No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  - Establishment of (US\$ million) - Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost - National Inland Waterway Masterplan  No.2: Delta-Yangon (Ayeyawaddy River) No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Schedule  - National Inland Waterway Masterplan  - Preparation  Schedule  - National Inland Waterway Masterplan  - Preparation - Preparation of Masterplan Study is needed.					ay	
No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  - Establishment of (US\$ million) - Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost Estimated Cost US\$ 3.0mil.  No.3: Delta-Sagaing Division (Chindwin River) No.4: Sittwe-Upstream (Kaladan River) No.5: Mawlamyine-Upstream (Thanlyin River)  Schedule  Calendar Year Start End 1. Preparation 2. Master Plan Study 2. Master Plan Study 3. Pilot Project 4. Action Plan 4. Preparation of Masterplan Study is needed.			1	•		
No.4: Sittwe-Upstream (Kaladan River)			-			
Input Estimated Cost (US\$ million)  - Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost (US\$ 1.0mil. Schedule    US\$ 2.0mil.   Calendar Year   Start   End     1. Preparation   2017   2017     2. Master Plan Study   2018   2018     3. Pilot Project   2019   2019			,	River)		
Input Estimated Cost (US\$ million)  - Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost US\$ 3.0mil.  Expected Output - National Inland Waterway Masterplan  Estimated Cost (US\$ million)  Calendar Year Start End 1. Preparation 2017 2017 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019  - Start End 1. Preparation 2017 2017 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019  - Action Plan - Preparation of Masterplan Study is needed.			·			
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- Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost  - Establishment of US\$ 2.0mil.  US\$ 2.0mil.  - Calendar Year  1. Preparation 2017 2017 2. Master Plan Study 2018 2018 3. Pilot Project 2019 2019 3. Pilot Project 2019 2019 4. Calendar Year  - Action Plan  - Preparation - Preparation of Masterplan Study is needed.	la a suf	Fatina at a d O a at	Oak adula			
- Establishment of Masterplan for each national inland waterway - Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost  Expected Output  - National Inland Waterway Masterplan  US\$ 2.0mil.  1. Preparation 2. Master Plan Study 2. Master Plan Study 2. Master Plan Study 3. Pilot Project 2019 2019 2019 2019 3. Pilot Project 2019 2019  Action Plan - Preparation of Masterplan Study is needed.	input		Schedule			
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national inland waterway Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost Expected Output  National Inland Waterway Masterplan  2. Master Plan Study 3. Pilot Project 2019 2019 2019 3. Pilot Project  Conditions		ΟΟΨ <b>Ζ.</b> ΟΙΙΙΙΙ.				
- Pilot Project of route mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost  Expected Output  - National Inland Waterway Masterplan  US\$ 1.0mil.  3. Pilot Project  2019  2019  3. Pilot Project  Action Plan  - Preparation of Masterplan Study is needed.						
mapping including Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost Expected Output - National Inland Waterway Masterplan  Surveys of natural US\$ 3.0mil.  Action Plan - Preparation of Masterplan Study is needed.		US\$ 1 0mil				
Surveys of natural conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost US\$ 3.0mil.  Expected Output Action Plan  - National Inland Waterway Masterplan - Preparation of Masterplan Study is needed.	II =	200	201	<del>5   2</del>	010	
conditions of each river such as water depth, current, wind, etc.  Total Estimated Cost  Expected Output  - National Inland Waterway Masterplan  Conditions of each river  US\$ 3.0mil.  Action Plan  - Preparation of Masterplan Study is needed.						
current, wind, etc.  Total Estimated Cost  Expected Output  - National Inland Waterway Masterplan  Current, wind, etc.  US\$ 3.0mil.  Action Plan  - Preparation of Masterplan Study is needed.	,					
Total Estimated Cost US\$ 3.0mil.  Expected Output Action Plan  - National Inland Waterway Masterplan - Preparation of Masterplan Study is needed.	such as water depth,					
Expected Output Action Plan - National Inland Waterway Masterplan - Preparation of Masterplan Study is needed.						
- National Inland Waterway Masterplan - Preparation of Masterplan Study is needed.		US\$ 3.0mil.				
- Partial Route Map by Pilot Project			- Preparation of Masterplan Study is ne	eded.		
	- Partial Route Map by Pilot	Project				

Sub-Sector	Inland Water Transport		
Reference No.	LGP-16		
Project Title	Vessel Safety Improvement and TA (incl. Law)		
Executing Agency	DMA		
Relevant Ministry	MOTC		
O discount de Desire (			

#### Outline of the Project

#### Objectives

- 1. To enhancement the rules and regulations regarding the safety of ships.
- 2. To prepare appropriate ship safety standards, safety practices and standard of competence required for its marine personal.
- To prepare systematic safety records for registered vessels.
- 4. To improve the specific obligation to save lives and protect the marine environment.

#### Rationale

- 1. Many accidents occurred in the inland waterways
- 2. There are many aged vessels without sufficient maintenance.
- 3. There are many overloaded vessels.
- 4. Inland Vessel Law entered into force in Myanmar on 5th March 2015, but the rules and regulations and standard for the safety are insufficient.
- 5. DMA requested a long-term expert for improvement of safety standards in the past but did not get assigned one.

6. MLIT officials will visit Myanmar in March 2017.



Location and Project Plan (Outline)

Source: Myanmar Time Figure: Aung Takon 3 ferry which sank in Rakhine on 13th March 2015.

6. MEH OHICIAIS WIII VISIL MYAHIHAI III MATCH 2017.				
Input	Estimated Cost	Schedule		
	(US\$ million)			
- Provide assistance on rules	2.0	Calendar Year	Start	End
and regulations and safety		1. Preparation	2017	2017
standards.		2. Rule making	2018	2018
<ul> <li>Technical assistance for the</li> </ul>	1.0	3. Technical Assistance	2019	2019
vessel safety improvement				
<ul> <li>Technical assistance for</li> </ul>	1.0			
capacity building and human				
resource development				
Total Estimated Cost	4.0			

#### Expected Output Action Plan

- Human resource development such as safety experts and technicians.
- Reporting the cause of accidents and systematic data keeping.
- Reduce accidents caused by old, damaged & overloaded vessels.
- Technical Assistance for the rules and regulations and safety standards.

#### **Necessity of Technical Assistance**

- Experts for securing safety and standardized dockyards are needed.
- A long-term expert for safety standards is needed.

#### Remarks

Sub-Sector	Inland Water Transport
Reference No.	LGP-17
Project Title	Strengthening Organization of IWT
Executing Agency	IWT
Relevant Ministry	MOTC

# Outline of the Project Location and Project Plan (outline)

#### Objectives

- To improve the expertise and knowledge of IWT's staff such as the pilot technology
- 2. To acquire the know-how for the operation and management except for the technical matter
- 3. To strengthen the IWT's organization along with the human resources development with a long-term perspective based on the above

#### Rationale

- 1. In recent years, budgets and human resources for IWT are limited.
- The barge for the transport of container cargo was built by JICA project.
- 3. IWT donated three ships and steel materials from Japan



Source: The Irrawaddy Website

Figure: Old Passenger Ship Operated by IWT

Input	Estimated Cost (US\$ million)	Schedule		
- Technical assistance	US\$ 1.0mil.	Calendar Year	Start	End
<ul> <li>Dispatch of experts</li> </ul>	US\$ 1.0mil.	1. Preparation	2017	2017
with the long-term		2. Technical Assistance	2018	2018
support		Dispatch of long-term experts	2019	2021
Total Estimated Cost	US\$ 2.0mil.			
Expected Output		Action Plan		
- Turnaround of fiscal soundness of IWT		- Determination of project executing agency		

#### **Necessity of Technical Assistance**

- Technical assistance for management, account, marketing operation etc.

#### Remarks

Sub-Sector	Inland Water Transport  LGP-18			
Reference No.				
Project Title	Enhancement of University (Human Resource Development, incl. Equipment Installation)			
Executing Agency	Myanmar Maritime University, Myanmar Mercantile Marine College			
Relevant Ministry	MOTC			
	Outline of	the Project		
Objectives		Location and Project Plan (outling	ne)	
<ol> <li>To improve university and other educational institutions</li> <li>To develop human resources in universities and educational institutions.</li> <li>To increase the number of qualified graduates in the maritime industry.</li> </ol> Rationale <ol> <li>The lecturer and student ratio of MMU is large.</li> <li>The amount of annual intake for students is limited because of the limited number of lecturers.</li> <li>Maritime background lecturers are needed for more effective education for students.</li> <li>The research laboratories and equipment are needed to be repaired and new laboratories and equipment should be introduced.</li> </ol>		Myanmar Mercantile Marine College  Myanmar Maritime University  Googlearth  Figure: Location of Myanmar Maritime University and Myanmar Mercantile Marine College		
Input	Estimated Cost (US\$ million)	Schedule		
- Technical assistance	US\$ 2.0mil.	Calendar Year	Start	End
(training, symposium		1. Preparation	2017	2017
and seminar) - Introduction of		Installation of laboratories and equipment	2018	2018
scholarship programs		3. Technical Assistance	2018	2020
<ul> <li>Installation of research</li> </ul>	n			
laboratories and				
equipment				
Total Estimated Cost	US\$ 2.0mil.			
Expected Output		Action Plan		
<ul> <li>Improvement in universities and development in human resources in the maritime transport sector.</li> <li>Increase in the number of qualified graduates in the marine industry.</li> <li>Necessity of Technical Assistance</li> </ul>		- Installation of new lab apparatus, hardware, software and technical assistance.		
		mposiums, seminars, and training		
Remarks				
TOTION				

Sub-Sector	Inland Water Transport				
Reference No.	LGP-19				
Project Title	Improvement of Statistics (Data Collection)				
Executing Agency	DMA, IWT & DWIR				
Relevant Ministry					
Outline of the Project					
Objectives		Location & Project Plan	(Outline)		
1. To understand the cu	rrent situation based on	2 d76 - AUG.			
the collected data.		the property again, with	Acres 1 and and all along	\$ 650 B	
2. To contribute to the b	udgetary measures	1.8 mm 502 W/35 PMC	1915 219.7 (2018 2.95)	a gar	
	blishment of investment	1.42014 551   K17 909	245 544 8 15 10 5 544,	736	
plans.		10000 240 185 453 1	284 7285 1184 227	895	
3. To analyze the past v		6.5 Jul 540 744 948	212 2242 1126 221		
	ts for port statistics and	8 5 20 507 192 585	124 2247 1086 22 -	338	
future port developme	ent plans.	10 8 206 594 780 798	100 SEN 480 500		
Rationale	Manmar has begin to	1) 16/4 (MS 59C 197 397	1017 2014 152 198 1016 2011 191 196	815	
The Government of N     establish a statistical		14.4 cole 214 325 463	1021 219.0 73 193	20 657	
2. The electric data reco	•	10 0106 498 409 450 18.8.8015 504 720 724	199 219.7 915 19. 788 288 900 188		
introduced instead of		13.62019 551 127 901	978 (18.5 895 187 966 (18.1 881 186	15 209	
3. DMA has a list of regi		2018 pots 482 747 715 0	158 2196 867 184 174 2184 891 188	77 648	
cargo and passenger		28 H. 1048 148 660 666 0	91 260 918 19	2 800	
	priate for establishment	11. 12. 14. 14. 14. 14. 14. 14. 14. 14. 14. 14	196 1188 919 19	पढ़ इस्। सड़ इस्।	
	to collect and tabulate		167 218 1 401 19	18 755	
both private and publ		The state of the s	786 2155 317 181 130 214.9 397 181		
4. A systematic format f	or statistics recording	29 ENG 388 590 536 8	148 5141 331 18		
shall be introduced for	r statistical	1 3 8 29K 428 596 522 8	10 2 EF PISTS FOR	45 603	
improvement in the p	ort sector.	Man 577 935 917 1	MA 201 TAX 13	145 513 )	
5. Technical assistance		Source: DWIR			
	nning shall be provided.	Sample of Statistica		written)	
Input	Estimated Cost	Sche	edule		
4. Undefice the edge.	(US\$ million)	0-1	Ott	F1	
Updating the data	US\$ 1.0mil.	Calendar Year	Start	End	
collection system.  2. Separating the data		Preparation     Execution	2017	2017	
recording items for m	ore	3. Commissioning	2018 2019	2018	
systematic recording		3. Commissioning	2019	-	
technological	~,				
assistance.					
Total Estimated Cost	US\$ 1.0mil.				
Expected Output	•	Action Plan	•	•	
- Systematically records	ed data of operations	- Computerization of the	ne statistical	data from	
and cargo volume of e	ach vessel to	hand written records.			
understand the curren					
- Reduction of data arra					
- Good analysis of current data to consider					
future development plans.					
Necessity of Technical A					
- Proper system for Dat	a Arrangement and				
Management.					
Remarks					

Sub-Sector	Inland Water Transport			
Reference No.	LGP-20			
Project Title		gistration and Categorization		
Executing Agency	DMA			
Relevant Ministry	MOTC			
	Outline of th	e Project		
Objectives		Location and Project Plan (Out	line)	
<ol> <li>To understand the curthe registration and care a license for so that it can provide ship safety</li> <li>To provide reliable da</li> <li>To assign the required vessel</li> <li>To ensure the construction complied with their grant and the same and the same are complied.</li> <li>DMA has a list of registration and the same are complied.</li> </ol>	ategorization data or each vessel to operate a point of reference on the for ship repairers of class or grade to a ction of vessels to be ading system distered vessels but the ted into only few classes. or of Ship Act was ation law is under the ling to DMA. Ohp engines are not DMA.	Registration Procedure  Registration Section (Nautical)  Ship Registration Application for Registration Proof of Ownership Approval of Name Port of Registry Masters Name Particulars of Ship Carving Note Certificate of Registry  Source: JICA Study Team  Figure: Ship Information of a Information procedure	nical Section  Survey  oval of Plan  Machiner  age Measur  Line Assign  y Equipmen  y Radio Survings  icate of Survings	s y Survey ement ment t Survey evey
Input	Estimated Cost (US\$ million)	Schedule		
- Technical Assistance f	or US\$ 2.0mil.	Calendar Year	Start	End
Vessel Categorization		1. Preparation	2017	2017
		2. Execution	2018	2018
TALES AND A	1104 0 0 "	3. Commissioning	2019	-
Total Estimated Cost	US\$ 2.0mil.	A sties Dies		
Expected Output	izad data for bath assatzl	Action Plan	201	
<ul> <li>Systematically categorized data for both coastal and inland vessels to understand the current situation</li> <li>Good analysis of current data to consider future development plan.</li> <li>Necessity of Technical Assistance</li> </ul>		Technical assistance for vess categorization	sei	
- Vessel Categorization				
Remarks				

Sub-Sector	Inland Water Transport  LGP-21				
Reference No.					
Project Title	Helmsmen Education Syst	em			
Executing Agency	DMA and IWT				
Relevant Ministry	MOTC				
	Outline of the Pro	oject			
Objectives		Location and Project Plan	(Outline	9)	
		Source: IWT Figure: Pilot Operation of Cherry 1, 2 & 3  Source: Unique Marine Training Center Website (The training facilities are not enough)			
Input	Estimated Cost	Figure: A DMA-Appro-	ved Iraii	ning	
	(US\$ million)		T =:		
- Technical Assistance	US\$ 2.0mil.	Calendar Year	Start	End	
(Training and Seminar	•	1. Preparation	2017	2017	
- Training Facilities	US\$ 1.0mil.	2. Technical Assistance	2018	2018	
Total Estimated Cost	US\$ 3.0mil.				
Result of Evaluation					
Evanated Output		Action Plan			
Expected Output		Action Plan			
<ul> <li>Skillful captains for inland water transport</li> <li>Inland water transport will become more safe and convenient</li> </ul>		Training and seminars f operations and safety	or ship		
Necessity of Technical Assistance					
- Trainers from maritime background					
- Training Facilities					
Remarks					
Romano					

Sub-Sector	Inland Water Transport	
Reference No.	LGP-22	
Project Title	Improvement of Bonded Transport	
Executing Agency	Custom Department	
Relevant Ministry	MOTC, Ministry of Trade, Ministry of Finance	
Outline of the Project		

#### Objectives

- 1. To find the best way to coordinate the logistics system to save time and cost
- 2. To provide seamless and efficient movement of cargos between one transport mode to another
- 3. To reduce the number of custom clearance steps in cargo transport.
- 4. To reduce transport time and cost so that the unit price of cargoes becomes lower
- 5. To provide efficient and smooth custom procedures for bonded transport operators

#### Rationale

Remarks

- 1. Myanmar is in a geographically strategic position to greatly benefit both South Asia and Southeast Asia.
- 2. Most transport routes often require the use of several different modes of transport.
- 3. Major coastal and inland ports shall become the logistic hubs and handle the transshipment of cargoes in future.
- 4. Custom processes in Myanmar are complicated and take a long time.
- 5. It takes time for custom clearing cargoes at the transit ports unless the cargos are bonded transported, so that the unit price of the cargo become higher.
- 6. Bonded transport should be introduced to reduce

Location and Project Plan (Outline)





Source: JICA Study Team

Figure: Inland/ Oversea Container Vessel

transport time and cost.				
Input	Estimated Cost	Schedule		
	(US\$ million)			
- Technical Assistance	US\$ 1.0mil.	Calendar Year	Start	End
(Custom Clearance)		1. Preparation	2017	2017
- Buildings (administration	US\$ 2.0mil.	2. Feasibility Study	2018	2018
building, bonded warehouse		3. Funding Arrangement	2019	2019
and custom office)		4. Pilot Project	2020	2020
- Pilot Project	US\$ 1.0mil.	4. Execution	2020	2021
		5. Commissioning	2021	-
Total Estimated Cost	US\$ 4.0mil.			
Expected Output		Action Plan		
- Easier and more convenient transit of cargo from one		- Technical assistant	in	custom
mode of transport to another		procedure		
- Efficient custom clearance syst	- Pilot project shall be done			
- Reduced transport time and cost				
Necessity of Technical Assistance				
- Technical assistance in custom	procedures			

# (2) HARD COMPONENTS

Sub-Sector	Logistics			
Reference No.	LLP-01			
Project Title	Expansion and Improvement	of Existing Yangon Truck Te	rminal	
	MOTC, Yangon Regional Government			
Relevant ministries	vant ministries Yangon City Development Committee, Forwarder Association,			
Truck Association				
Outline of the Project				
Objectives		Location or project plan		
1. Aimed at truck termin	nal development focusing or		ruck tern	ninal at
Yangon municipal area	delivery, the current termina	Baying Naung Truck Tern	ninal	
lags far behind internation				
2. A lacking of parking are	a is significant			
Rational				
	the terminal is already at full	Image of Existing Tru	ıck Term	inal
	no more room for future		and the second	F COLUMN TO SERVICE A
cargo handling expar			The shifting	
	nd time can be lowered			
	insport cost reduction, as idle	<b>计划</b>		
times can be reduced			VENEZIA DE	Mary Town
	al facility attribute to a ne, through expanded parking	<b>"是这么时间</b>		
	lie, through expanded parking ling/unloading facilities and	"" 1000 1000 1000 1000 1000 1000 1000 100	<b>高麗麗</b>	THE STATE
	nechanical cargo handling).	2000年1月1日日本		The Control of the Co
	eneficial for increasing truck			
turn-around ratio, res				
opportunities and rec				
Input Estimated Cost		Schedule	)	
·	(US\$ million)			
1.Parking lot	US\$ 6.0 mil.	Calendar year	Start	End
2.Warehouse (incl. loadin	g and US\$ 10.0 mil.	1. Preparation	2018	2018
unloading space)		2. Feasibility Study	2018	2019
3.Management office	US\$ 1.0 mil.	3. Funding Arrangement	2019	2020
		4. Execution	2021	2022
		5. Commissioning	2022	-
Total	US\$ 17.0 mil.			
Expected output		Action plan		
1. JIT delivery	Shorten truck dwell	Infrastructure should		
2. Inventory control	times from 27 hours			tment
3. Speedy delivery	to 6 hours	2. Common parking are	ea to be	
4. Customer satisfaction		provided		
5. Elimination of opportun	ity for	3. Warehouses should	be lease	ed to
losses	ade	private operators.	الاحمم	
6. Improvement of driver work conditions  4. A feasibility study is needed to determine the size and scale of				
conditions		facilities in detail	na scale	OI
Noossity on Toobnics! As	ssistance	iaciiiles iii detali		
Necessity on Technical As  1. Technical and financial				
	viability analysis al facility including access road	1		

- 2. Design of truck terminal facility including access road
- 3. Introduction and training on warehouse operations

#### Remark

The Truck association and the highway transport association have already started a discussion with Yangon Municipal Authority for expansion of parking lot.

Project –Expansion and	Improvement of Existing Yangon Truck Terminal Project
Key Potential Impacts	Mitigation Measures
Pollution Control	<u> </u>
< Construction Phase > • Deterioration of air quality due	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water</li> </ul>
to particulate matter such as dust and gaseous emissions from construction equipment and vehicular traffic	<ul> <li>sprinkling within the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to</li> </ul>
generated from construction sites  • Losing of top soil and	prevent hygiene problems due to water contamination     Conservation and restoration of top soils of the construction sites
vegetation cover due to excavation and back filling  • Deterioration of soil quality	Avoidance of accidental spills
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to activities of trucks</li> </ul>	Appropriate maintenance of trucks
<ul> <li>Wastewater generated from heavy cleaning, workshops and maintenance activities</li> </ul>	<ul> <li>Installation of wastewater treatment system</li> <li>Reuse of treated water by removal of suspended solids, oil and grease, organic matter and neutralization of pH through waste water treatment plant</li> </ul>
Natural Environment	
<ul> <li>Construction Phase &gt;</li> <li>Effect on flora near construction area in case of accidental back filling</li> </ul>	Avoidance of accidental back filling
< Operation Phase > • Impact to local drainage due to accidental oil spill	Avoidance of accidental oil spill     Provision of adequate drains to accommodate increased run-off
Social Environment	
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE      Provision of detaur with adequate sign board and instruction.
Operation Phase > <ul> <li>Possible to occur the traffic accidents</li> </ul>	<ul> <li>Provision of detour with adequate sign board and instruction</li> <li>Provision of speed limit</li> </ul>

		•			
Sub-Sector	Logistics	3			
Reference No. LLP-02					
Project Title	Establish	nment of New Yangon	Truck Terminal at Ywatagyi		
Executing Agency MOTC, Yangon Regional Gove			rnment		
Relevant ministries Yangon City Development Commi					
		Outline of the Pro	oject		
Objectives			Location or project plan		
<ol> <li>Aimed at truck terminal development focusing on Yangon municipal area delivery, the current terminal lags far behind World standards.</li> <li>Concerned parties already agreed to establish a new terminal which should meet with global standards (according to the highway transport association)</li> </ol>			Several terminals (at least two) seem necessary at the following locations in consideration of the size of Yangon CityBeside Ywathargyi Railway ICD at a crossing point with the Yangon Outer Ring Urban Highway		
Rational					
<ol> <li>Current small size of the terminal is already at full capacity and there is no more room for future cargo handling expansion.</li> <li>High truck turn-around time can be lowered thereby achieve a transport cost reduction, as idle times can be reduced.</li> <li>Developing a terminal facility attribute to a reduction of dwell time, through expanded parking lots, provision of loading/unloading facilities and speedy operations (mechanical cargo handling). These actions are beneficial for increasing truck turn-around ratio, resulting in increased business</li> </ol>			Image of New Truck Terminal		
opportunities and reductions of cost.  Input Estimated Cost (US\$ million)		Schedule			
		(+	Calendar year	Start	End
1.Parking lot		US\$ 13.0mil.	1. Preparation	2018	2018
2.Warehouse (incl. loadir	ng and	US\$ 30.0mil.	2. Feasibility Study	2018	2019
unloading space)		US\$ 3.0mil.	3. Funding Arrangement	2019	2020
3.Management office			4. Execution	2021	2022
			5. Commissioning	2022	-
Total		US\$ 46.0mil.			
Expected output			Action plan	-	•
1. JIT delivery		Shorten truck dwell	Infrastructure should be	e develo	ped
2. Inventory control times from 27 hours		and provided by public	investme	ent	
3. Speedy delivery to 6 hours		2. Warehouses should be	leased	to	
Customer satisfaction		private operators.			
5. Elimination of opportunity for		3. A feasibility study is needed to			
losses	* * * * * * * * * * * * * * * * * * * *			scale of	
6. Improvement of driver work facilities in detail					
conditions					
Necessity on Technical A	ssistance	9			

#### Necessity on Technical Assistance

- 1. Technical and financial viability analysis
- 2. Design of truck terminal facility including access road
- 3. Introduction and training on warehouse operations

#### Remark:

The Truck association and the highway transport association have already started a discussion with Yangon Municipal Authority for new truck terminal.

Project – Establishment of New Yangon Truck Terminal Project at Ywatagyi			
Key Potential Impacts	Mitigation Measures		
Pollution Control			
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust and gaseous emissions from construction equipment</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling within the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
<ul> <li>and vehicular traffic</li> <li>Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries</li> <li>Wastewater from construction activities with suspended impurities</li> </ul>	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment</li> </ul>		
Wastewater disposal from the workers camp and sludge generated from construction sites	traps  • Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination		
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>		
<ul><li>Operation Phase &gt;</li><li>Noise and vibration due to activities of trucks</li></ul>	Appropriate maintenance of trucks		
Wastewater generated from heavy cleaning, workshops and maintenance activities	<ul> <li>Installation of wastewater treatment system</li> <li>Reuse of treated water by removal of suspended solids, oil and grease, organic matter and neutralization of pH through waste water treatment plant</li> </ul>		
Natural Environment			
<ul> <li>Construction Phase &gt;</li> <li>Effect on flora near construction area in case of accidental back filling</li> </ul>	Avoidance of accidental back filling		
< Operation Phase > <ul> <li>Impact to local drainage due to accidental oil spill</li> </ul>	Avoidance of accidental oil spill     Provision of adequate drains to accommodate increased run-off		
Social Environment			
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction		
Possible to occur the accidents     Operation Phase >	<ul> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> <li>Provision of detour with adequate sign board and instruction</li> </ul>		
Possible to occur the traffic accidents	Provision of speed limit		

Sub-Sector	Logistics				
Reference No. LLP-03					
Project Title				ne	
Executing Agency Customs, MOC, Chamber of commer					
Relevant Ministry MOTC,					
Outline of the Project					
Objectives			Location or project plan		
Development for a control of the control of th			<ul> <li>2 locations are candid</li> </ul>	ates loca	ations:
achieve a faster trai			New Toold		New Bridge
operation connectin	ig iviyanmar a	ina i naliana.			
2. The narrow Kawkar	eik mountain	road and bridge			
constraints were rer			Candidate 2 Myawadyee	Trade 1	
full-loaded containe			Zone	!	
			Road		Bridge
			Cand	lidate 1	
Rationale			Project plan		
Mountain road deve				19	
enables full loaded Currently, transship					27
manually.	ment operation	ons are carried out			
ASEAN standards a	alreadv involv	e containers in	Company of the Compan		
practice, which can	•				A STATE OF THE PARTY OF THE PAR
time reduction as w				- MARIE	
damages. As a resu			A STATE OF THE PARTY OF THE PAR	1000	
will increase and lea			٨		. 11
3. In addition to hardware aspects, it is necessary to			Container switching pra	actice (in	nage)
consider the way to organize service providers  Input Estimated cost		Schedule	•		
Input		(US\$ million)	Scriedule	,	
1. Land preparation (4,	000M2)	US\$ 4.0mil.		Start	End
2. Parking lot	,0002	US\$ 2.5mil.	Calendar year	0.0	
3. Empty van storage(2	000M3)	US\$ 2.0mil.	1. Preparation	2016	2017
4. CIQ	,	US\$ 1.5mil.	2. Feasibility study	2016	2017
5.Reach stacker/mobile	hydraulic	US\$ 3.0mil.	3.Funding arrangement	2017	2018
crane		1100 00 "	4. Execution	2018	2019
3.Empty container hand	dling	US\$ 2.0mil.	5.Commissioning	2019	-
equipment 4.Wrokshop		US\$ 1.0mil.			
5.Warehouse		US\$ 2.0mil.			
J. Wateriouse		σοφ 2.σ			
Total Expected cost		US\$ 18.0mil.			
Expected output		Action plan			
Shorten truck dwell		Shorten dwell	1. Feasibility study is ne		_
2. Reduction of transs	hipment	time from 10	determine the size an	id scale o	of
costs	****	hours to 2 hours	facilities in detail	onac:	tion
Ensure safety of cargoes     Complete				เนบท	
Necessity of Technical assistance strategy					
Training on the operation of reach stackers					
Training on control and management of empty containers/chassis					
Remark					
1. Participation of forwarders association, chamber of commerce, etc. are indispensable					
i					

Project - Container 9	Switching Station Development at Myawaddy Trade Zone
Key Potential Impacts	Mitigation Measures
Pollution Control	minigation measures
< Construction Phase >	•
<ul> <li>Deterioration of air quality</li> </ul>	
due to particulate matter	Coverage of truck carrying soil, sand and stone to avoid spilling
such as dust and gaseous	Adequate dust suppression measures such as regular water sprinkling within the construction sites.
emissions from construction	sprinkling within the construction sites
equipment and vehicular	<ul> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>
traffic	generator sets
Noise and vibration due to	Use of low noise construction equipment
movement of vehicles, and	Construction activities carried out in daytime
operation of light and heavy	Provision of protective gears such as ear plugs etc. to construction
construction machineries	personnel exposed to high noise levels
Wastewater from	Provision of silt fencing near water bodies
construction activities with	Control of quality of construction wastewater emanating from the
suspended impurities	construction site through suitable drainage system with sediment
Wastewater disposal from	traps
the workers camp and	Provision of proper sanitation facilities at the construction site to
sludge generated from	prevent hygiene problems due to water contamination
construction sites	
<ul> <li>Losing of top soil and</li> </ul>	Conservation and restoration of top soils of the construction sites
vegetation cover due to	Avoidance of accidental spills
excavation and back filling	
Deterioration of soil quality	
< Operation Phase >	Appropriate maintenance of trucks
Noise and vibration due to	
activities of trucks	
Wastewater generated from	Installation of wastewater treatment system
heavy cleaning, workshops	Reuse of treated water by removal of suspended solids, oil and
and maintenance activities	grease, organic matter and neutralization of pH through waste
Natural Environment	water treatment plant
< Construction Phase >	Avoidance of accidental back filling
Effect on flora near	- Avoidance of accidental back filling
construction area in case of	
accidental back filling	
< Operation Phase >	Avoidance of accidental oil spill
Impact to local drainage due	Provision of adequate drains to accommodate increased run-off
to accidental oil spill	The state of the s
Social Environment	
<construction phase=""></construction>	Provision of detour with adequate sign board and instruction
Disturbance of vehicle traffic	
and pedestrian passage	
Possible to occur the	Installation of security and maintain safety prevention measures
accidents	and devices, and providing of appropriate PPE
< Operation Phase >	Provision of detour with adequate sign board and instruction
<ul> <li>Possible to occur the traffic</li> </ul>	Provision of speed limit
accidents	

Sub-Sector		Logistics			
Reference No.		LLP-04			
Project Title		Cross-border Trade Facility coupled with Container Switching Yard			ning Yard
•		at Three Pagoda Pass			
Executing Agency		MOTC, Customs			
Relevant ministries		MOTC, Customs			
		Outline of the	1		
Objectives			Location or project plan		
<ol> <li>Establishment of container needed to achieve faster tra- connecting Myanmar and Til</li> </ol>	anssh	nipment operations	Three Pagoda Pass of with Thailand	on Myanmai	's border
Rationale			Project plan		
<ol> <li>Three pagoda route will be a short-cut route for Bangkok/Yangon, involving the highest potential for providing the fastest service.</li> <li>In order to realize this advantage, it is necessary to provide a smooth cargo transshipment system as well as roads development. (Container switching system as at other ASEAN borders)</li> </ol>					
			Container switching		nage)
Input		Estimated Cost (US\$ million)	Sche	dule	
1. Land preparation (5,000M2)		US\$ 5.0mil.	Calendar Year	Start	End
2. Parking lot		US\$ 4.5mil.	1. Preparation	2018	2018
3. Empty van storage(4.000N	<i>l</i> (2)	US\$ 4.0mil.	2. Feasibility Study	2018	2019
4. CIQ		US\$ 1.5mil.	3. Funding	2019	2019
5. Reach stacker/mobile		US\$ 4.5mil.	Arrangement		
hydraulic crane		110¢ 2.0:	4. Execution	2020	2025
3. Empty container handling		US\$ 3.0mil.	5. Commissioning	2026	
equipment		US\$ 2.0mil.			
<ul><li>4. Wrokshop</li><li>5. Small warehouse</li></ul>		US\$ 2.0mil.			
J. Oman warehouse		US\$ 26.5mil.			
Result of Evaluation				•	
Expected Output			Action Plan		
Shorten truck dwell     times     Reduction of transport costs	1. 2.	Target: 2hrs 30 % less than the transport costs incurred on the Myawaddy route	<ol> <li>Collaboration with road development between the Myanmar and Thai parties</li> <li>Feasibility study is needed to determine the size and scale of facilities in detail</li> <li>Formulating operator organization strategy</li> </ol>		
Necessity of Technical assist					
Training on operations of rea					
Training on control and mana	agem	ent of empty contain	ners/chassis		

Remarks

1. Participation of forwarders association, chamber of commerce, etc. are indispensable

Project – Cross-border Trade Facility coupled with Container Switching Yard at Three Pagoda Pass			
Key Potential Impacts	Mitigation Measures		
Pollution Control	_		
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling within the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
<ul> <li>Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries</li> <li>Wastewater from construction activities with suspended impurities</li> </ul>	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment</li> </ul>		
Wastewater disposal from the workers camp and sludge generated from construction sites	traps  • Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination		
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>		
<ul><li>Operation Phase &gt;</li><li>Noise and vibration due to activities of trucks</li></ul>	Appropriate maintenance of trucks		
Wastewater generated from heavy cleaning, workshops and maintenance activities	<ul> <li>Installation of wastewater treatment system</li> <li>Reuse of treated water by removal of suspended solids, oil and grease, organic matter and neutralization of pH through waste water treatment plant</li> </ul>		
Natural Environment			
<ul> <li>Construction Phase &gt;</li> <li>Effect on flora near construction area in case of accidental back filling</li> </ul>	Avoidance of accidental back filling		
< Operation Phase > • Impact to local drainage due to accidental oil spill	<ul> <li>Avoidance of accidental oil spill</li> <li>Provision of adequate drains to accommodate increased run-off</li> </ul>		
Social Environment	Description of determinists adaptive to allow be and an director of		
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction		
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE  Providing of detaurable adequate sign beard and instruction.		
Operation Phase > <ul> <li>Possible to occur the traffic accidents</li> </ul>	<ul> <li>Provision of detour with adequate sign board and instruction</li> <li>Provision of speed limit</li> </ul>		

	,			
Sub-Sector	Logistics			
Reference No.	LLP-05			
Project Title	Establishment of Yangon Multi-modal Logistics Complex			
Executing Agency	MOTC, YCDC			
Relevant ministries	Myanmar Railway, MOC, YCDC			
	Outline of the			
Objectives				
	e logistics service through	• •		
the logistics hub		<u> </u>	ngon), 2)	Yangon
<b>3</b>				
Rational		YCDC		
	Logistics Complex is	Component-1		
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	lished adjacent to the New			
	nal and Ywathagy ICD to	Trans-loading Function	Inventory Control	Function
	services for international			
	al transit cargoes and	/ J	Private Walend	us
domestic cargoes.	G			U. C.
		OACT 1		
2. Multi-modal logistics	s hub can be benefit for	Customs Clearance	Private Warehor	uses
Logistics performan	ce, including reduction of		1 min	1
cost.				
		Tollar (Countries	Trucking	H
		Trucking of Container	<u> </u>	<b>↓</b>
			Client Cl	lient
		Image of logistics hub		
Input	Estimated Cost	Schedule		
	(US\$ million)			
1. Truck pool	US\$ 15.0mil.	Calendar year	Start	
2. Warehouses (incl.	US\$ 45.0mil.	1. Preparation	2020	2021
loading/unloading facilities				
3. Rail siding	US\$ 5.0mil.	3. Funding Arrangement	2023	2023
		4. Execution	2024	2028
		5. Commissioning	2029	2030
				-
Total estimated cost	US\$ 65.0mil.			
Expected output		Action plan		
1. Reinforcement of co	ollaboration amongst	1. Determination of project	site	<del></del>
different transport m	nodes	2. Determination of project	executing	g
	oty van pool, customs	agency		
clearance, (bonded)	<b>.</b>	3. Feasibility study is need		
	Iting in a comprehensive	the size and scale of fac		
logistics service		4. Selection of qualified de	veloper a	nd
3. Promotion of investment for manufacturing operators				
sectors in this area				
Necessity of Technical A				
Technical and finance	cial feasibility study			
Inventory management evotem installation				

- Inventory management system installation
   Truck movement/parking management

#### Remark

Warehouse facility is leased not only to logistics providers but also to other businesses including manufacturing, wholesalers and retailers

Project – Establishment of Yangon Multi-modal Logistics Complex			
Key Potential Impacts	Mitigation Measures		
Pollution Control	•		
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling within the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries     Wastewater from construction	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> <li>Provision of silt fencing near water bodies</li> </ul>		
activities with suspended impurities  • Wastewater disposal from the workers camp and sludge generated from construction sites	<ul> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>		
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to activities of trucks and machines</li> </ul>	Appropriate maintenance of trucks and machines		
Wastewater generated from heavy cleaning, workshops and maintenance activities	<ul> <li>Installation of wastewater treatment system</li> <li>Reuse of treated water by removal of suspended solids, oil and grease, organic matter and neutralization of pH through waste water treatment plant</li> </ul>		
Natural Environment			
<ul> <li>Construction Phase &gt;</li> <li>Effect on flora near construction area in case of accidental back filling</li> </ul>	Avoidance of accidental back filling		
< Operation Phase > • Impact to local drainage due to accidental oil spill	Avoidance of accidental oil spill     Provision of adequate drains to accommodate increased run-off		
Social Environment			
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction		
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE  Provides of deterministic devices and providing of appropriate and provides and pro		
Operation Phase > <ul> <li>Possible to occur the traffic accidents</li> </ul>	<ul> <li>Provision of detour with adequate sign board and instruction</li> <li>Provision of speed limit</li> </ul>		

Sub-Sector	Logistic	es .			
Reference No.	LLP-06				
Project Title	City Truck Terminal Development Project (Bago)				
Executing Agency	icy MOTC, Each municipal				
Relevant ministries					
Outline of the Project					
Objectives			Location or project plan		
It is aimed truck terminal development focusing local municipal area delivery.			Bago		
Rational			Project plan		
Currently, suburban logistics standard is poor, Enlargement of delivery lot/size is most basic way to reduce the transport cost even transship cost is necessary, thus smooth transshipment from/to large sized truck is key issue, especially for agriculture, construction goods.      The warehouse is also indispensable to realize full-load truck delivery. So collaboration of truck and warehouse is necessary for large size truck operation.      Input Estimated Cost (US\$ million)      Parking lot US\$ 3.0mil.      Warehouse (incl. loading and unloading space)      Management office US\$ 1.0mil.		Even for local areas, the develor regional truck terminal is essent facilities should focus on the link the connection Yangon/Mandala as well as municipal/inter-region Along with the development of infunction, regional economy can speedy and JIT time basis cargo Schedule  Calendar year  1. Preparation  2. Feasibility Study  3. Funding Arrangement  4. Execution  5. Commissioning	ial. Thes kage betway and re hal delive nventory enjoy sm	e ween gional ry. nooth,	
Total		US\$ 7.0.mil			
		υσφ 7.υ.ππ	Action plan		
<ul> <li>Expected output</li> <li>1. JIT delivery</li> <li>2. Inventory control</li> <li>3. Speedy delivery</li> <li>4. Customer satisfaction</li> <li>5. Elimination on opportunity loss</li> <li>6. Improvement driver's occupational condition</li> <li>7. Shorten truck dwell time</li> </ul> <ul> <li>Action plan</li> <li>Infrastructure is recommended to be developed and provided by public investment</li> <li>Warehouse is recommended to be leased to private operators.</li> <li>Feasibility study is needed to determine the Size and scale of facilities in details</li> </ul>					
Necessity on Technical	Assistand	ce			
<ol> <li>Technical and financial viability analysis</li> <li>Design of truck terminal facility including access road</li> <li>Introduction and training of warehouse operations</li> </ol>					
Remark					

Project – City	Truck Terminal Improvement Project (6 Cities)
Key Potential Impacts	Mitigation Measures
Pollution Control	
< Construction Phase >	•
Deterioration of air quality due to particulate matter such	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water</li> </ul>
as dust and gaseous	sprinkling within the construction sites
emissions from construction equipment and vehicular traffic	<ul> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>
Noise and vibration due to movement of vehicles, and	<ul><li>Use of low noise construction equipment</li><li>Construction activities carried out in daytime</li></ul>
operation of light and heavy construction machineries	<ul> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>
Wastewater from construction	Provision of silt fencing near water bodies
activities with suspended impurities  • Wastewater disposal from the	<ul> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> </ul>
workers camp and sludge generated from construction sites	<ul> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>
Losing of top soil and vegetation cover due to excavation and back filling     Deterioration of soil quality	<ul> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>
< Operation Phase >	Appropriate maintenance of trucks
Noise and vibration due to activities of trucks	7 Appropriate maintenance of trucks
Wastewater generated from	Installation of wastewater treatment system
heavy cleaning, workshops and maintenance activities	<ul> <li>Reuse of treated water by removal of suspended solids, oil and grease, organic matter and neutralization of pH through waste water treatment plant</li> </ul>
Natural Environment	
<ul> <li>Construction Phase &gt;</li> <li>Effect on flora near construction area in case of accidental back filling</li> </ul>	Avoidance of accidental back filling
< Operation Phase >	Avoidance of accidental oil spill
Impact to local drainage due to accidental oil spill	Provision of adequate drains to accommodate increased run-off
Social Environment	
<construction phase=""></construction>	Provision of detour with adequate sign board and instruction
Disturbance of vehicle traffic and pedestrian passage	
Possible to occur the	Installation of security and maintain safety prevention measures
accidents	and devices, and providing of appropriate PPE
< Operation Phase > • Possible to occur the traffic accidents	<ul> <li>Provision of detour with adequate sign board and instruction</li> <li>Provision of speed limit</li> </ul>

Sub-Sector	Logisti	CS			
Reference No.	LLP-07				
Project Title			opment Project (Mawlamyine)		
Executing Agency		, Each municipal	, , , , , , , , , , , , , , , , , , , ,		
Relevant ministries			mmittee, truck association		
		Outline of t	he Project		
Objectives			Location or project plan		
It is aimed truck term local municipal area of the second se		elopment focusing	Mawlamyine		
Rational	ichvery.		Project plan		
Currently, suburban logistics standard is poor, Enlargement of delivery lot/size is most basic way to reduce the transport cost even transship cost is necessary, thus smooth transshipment from/to large sized truck is key issue, especially for agriculture, construction goods.  4. The warehouse is also indispensable to realize full-load truck delivery. So collaboration of truck and warehouse is necessary for large size truck operation.  Input Estimated Cost (US\$ million)  1. Parking lot US\$ 3.0mil. 2. Warehouse (incl. loading and unloading space) 3. Management office US\$ 1.0mil.		Even for local areas, the develor regional truck terminal is essent facilities should focus on the line the connection Yangon/Mandala as well as municipal/inter-region Along with the development of it function, regional economy can speedy and JIT time basis cargon Schedule  Calendar year  1. Preparation  2. Feasibility Study  3. Funding Arrangement  4. Execution  5. Commissioning	tial. Thes kage betway and re nal delive nventory enjoy sn	e ween gional ery. nooth,	
Total		LICE 7.0 mil			
Total		US\$ 7.0.mil	Action plan		
Expected output		Chartan dwall		lad ta ba	
<ul> <li>1. JIT delivery</li> <li>2. Inventory control</li> <li>3. Speedy delivery</li> <li>4. Customer satisfaction</li> <li>5. Elimination on opportunity loss</li> <li>6. Improvement driver's occupational condition</li> <li>7. Shorten truck dwell time</li> </ul> <ul> <li>Shorten dwell time from 27 hours to 6 hours</li> <li>Warehouse is recommended to be developed and provided by public investment</li> <li>Warehouse is recommended to be least private operators.</li> <li>Feasibility study is needed to determine Size and scale of facilities in details</li> </ul>					
Necessity on Technical	Assistan	ce			
Technical and financial viability analysis     Design of truck terminal facility including access road     Introduction and training of warehouse operations					
Remark					

Sub-Sector	Logisti	CS .			
Reference No.	LLP-08				
Project Title			opment Project (Dawei)		
Executing Agency		, Each municipal			
Relevant ministries			mmittee, truck association		
		Outline of t			
Objectives			Location or project plan		
It is aimed truck term local municipal area d		elopment focusing	Dawei		
Rational	onvory.		Project plan		
Currently, suburban logistics standard is poor, Enlargement of delivery lot/size is most basic way to reduce the transport cost even transship cost is necessary, thus smooth transshipment from/to large sized truck is key issue, especially for agriculture, construction goods.      The warehouse is also indispensable to realize full-load truck delivery. So collaboration of truck and warehouse is necessary for large size truck operation.    Input   Estimated Cost (US\$ million)		Even for local areas, the development of a regional truck terminal is essential. These facilities should focus on the linkage between the connection Yangon/Mandalay and regional as well as municipal/inter-regional delivery. Along with the development of inventory function, regional economy can enjoy smooth, speedy and JIT time basis cargo delivery.  Schedule  Calendar year Start End  1. Preparation 2018 2019  2. Feasibility Study 2020 2021		e ween egional ery. nooth, y.  End 2019 2021	
3. Management office		US\$ 1.0mil.	3. Funding Arrangement	2020	2022
			4. Execution	2022	2024
			5. Commissioning	2024	2025
T ( )		1100 7 0			
Total		US\$ 7.0.mil	A stiss a law		
Expected output		01	Action plan	1. 14. 1.	
<ol> <li>JIT delivery</li> <li>Inventory control</li> <li>Speedy delivery</li> <li>Customer satisfaction</li> <li>Elimination on opportunity loss</li> <li>Improvement driver's occupational condition</li> <li>Shorten dwell time from 27 hours to 6 hours</li> </ol>		<ul> <li>Infrastructure is recommended by investment</li> <li>Warehouse is recommended private operators.</li> <li>Feasibility study is needed Size and scale of facilities in the state of the state of</li></ul>	public ed to be le to determ		
Necessity on Technical A	Assistan	ce	1		
Technical and financial viability analysis     Design of truck terminal facility including access road     Introduction and training of warehouse operations					
Remark					

Sub-Sector	Logictic	00			
Reference No.	Logistic				
Project Title			opment Project (Magway)		
Executing Agency		, Each municipal	opinient i roject (wagway)		
Relevant ministries			mmittee, truck association		
TOO VAITE THINISTICS	I Widilion	Outline of t			
Objectives		Oddinio or t	Location or project plan		
•	inal day	olonmont focusing	Magway, south of the city close t	o Magwa	11/
It is aimed truck terminal development focusing local municipal area delivery.			railway station as well as a poter port development		
Rational			Project plan		
<ol> <li>Currently, suburban logistics standard is poor, Enlargement of delivery lot/size is most basic way to reduce the transport cost even transship cost is necessary, thus smooth transshipment from/to large sized truck is key issue, especially for agriculture, construction goods.</li> <li>The warehouse is also indispensable to realize full-load truck delivery. So collaboration of truck and warehouse is necessary for large size truck operation.</li></ol>			Even for local areas, the develor regional truck terminal is essent facilities should focus on the line the connection Yangon/Mandala as well as municipal/inter-region Along with the development of it function, regional economy can speedy and JIT time basis carg  Schedule  Calendar year  1. Preparation  2. Foosibility Study	tial. Thes kage between all deliver nventory enjoy sno delivery Start 2018	e ween gional ery. nooth, /.
and unloading space)		US\$ 1.0mil.	2. Feasibility Study	2020	2021
3. Management office			3. Funding Arrangement	2020	2022
			Execution     Commissioning	2022	2024
Total		US\$ 7.0.mil			
Expected output	'		Action plan		
1. JIT delivery 2. Inventory control 3. Speedy delivery 4. Customer satisfaction 5. Elimination on opportunity loss 6. Improvement driver's occupational condition 7. Shorten truck dwell time  Shorten dwell time from 27 hours to 6 hours  Unfrastructure is recommended to be developed and provided by public investment  Warehouse is recommended to be least private operators.  Feasibility study is needed to determine Size and scale of facilities in details					
Necessity on Technical and Technical and financial 2. Design of truck termin 3. Introduction and train	al viabilit nal facilit	y analysis y including access			

Sub-Sector	Logisti	CS.			
Reference No.	LLP-10				
Project Title			opment Project (Pyay)		
Executing Agency		, Each municipal	opmont roject (r ydy)		
Relevant ministries			mmittee, truck association		
Troiovant miniotrioo	ividilioi	Outline of t			
Objectives			Location or project plan		
1. It is aimed truck term	inal dev	elopment focusing	Pyay, close to Pyay railway stat	ion as w	ell as a
local municipal area c			potential site for the river port de		
Rational			Project plan		
Currently, suburban logistics standard is poor, Enlargement of delivery lot/size is most basic way to reduce the transport cost even transship cost is necessary, thus smooth transshipment from/to large sized truck is key issue, especially for agriculture, construction goods.  10. The warehouse is also indispensable to realize full-load truck delivery. So collaboration of truck and warehouse is necessary for large size truck operation.    Input   Estimated Cost (US\$ million)     1. Parking lot   US\$ 3.0mil.     2. Warehouse (incl. loading and unloading space)   3. Management office   US\$ 1.0mil.		Even for local areas, the develor regional truck terminal is essent facilities should focus on the line the connection Yangon/Mandala as well as municipal/inter-region Along with the development of if function, regional economy can speedy and JIT time basis carg  Schedule  Calendar year  1. Preparation  2. Feasibility Study  3. Funding Arrangement  4. Execution  5. Commissioning	tial. Thes kage betway and re nal delive nventory enjoy sn	e ween gional ery. nooth,	
Total		US\$ 7.0.mil	A .:		
Expected output		Ole antere alcuell	Action plan		
<ul> <li>1. JIT delivery</li> <li>2. Inventory control</li> <li>3. Speedy delivery</li> <li>4. Customer satisfaction</li> <li>5. Elimination on opportunity loss</li> <li>6. Improvement driver's occupational condition</li> <li>7. Shorten truck dwell time</li> </ul> Shorten dwell time from 27 hours to 6 hours <ul> <li>b Infrastructure is recommended to be developed and provided by public investment</li> <li>Warehouse is recommended to be leased private operators.</li> <li>Feasibility study is needed to determine to Size and scale of facilities in details</li> </ul>					
Necessity on Technical	Assistan	ce	ı		
Technical and financial viability analysis     Design of truck terminal facility including access road     Introduction and training of warehouse operations					
Remark					

Sub-Sector	Logistic	CS			
Reference No.	LLP-11				
Project Title	City Tru	uck Terminal Develo	opment Project (Taungyi)		
Executing Agency		, Each municipal			
Relevant ministries	Munici	oal development co	mmittee, truck association		
		Outline of t	he Project		
Objectives			Location or project plan		
1. It is aimed truck term	inal deve	elopment focusing	Taungyi or Heho		
local municipal area d	elivery.				
Rational			Project plar		
Currently, suburban logistics standard is poor, Enlargement of delivery lot/size is most basic way to reduce the transport cost even transship cost is necessary, thus smooth transshipment from/to large sized truck is key issue, especially for agriculture, construction goods.      The warehouse is also indispensable to realize full-load truck delivery. So collaboration of truck and warehouse is necessary for large size truck operation.      Input Estimated Cost (US\$ million)      Parking lot US\$ 3.0mil.      Warehouse (incl. loading and unloading space)      Management office US\$ 1.0mil.		Even for local areas, the devergional truck terminal is ess facilities should focus on the the connection Yangon/Mandas well as municipal/inter-reg Along with the development function, regional economy of speedy and JIT time basis can schedule  Calendar year  1. Preparation  2. Feasibility Study  3. Funding Arrangement	ential. Thes linkage bety dalay and re gional delive of inventory an enjoy sn argo delivery  Start  2018  2020  2020	ee ween egional ery. nooth, y. End 2019 2021 2022	
-			4. Execution	2022	2024
			5. Commissioning	2024	2025
Total		US\$ 7.0.mil			
Expected output		ΟΟΨ 7.0.11111	Action plan		1
1. JIT delivery 2. Inventory control 3. Speedy delivery 4. Customer satisfaction 5. Elimination on opportunity loss 6. Improvement driver's occupational condition 7. Shorten truck dwell time		<ul> <li>Infrastructure is recommendeveloped and provided land investment</li> <li>Warehouse is recommender private operators.</li> <li>Feasibility study is needed Size and scale of facilities</li> </ul>	by public ded to be le d to determ		
Necessity on Technical A					
<ol> <li>Technical and financial viability analysis</li> <li>Design of truck terminal facility including access road</li> <li>Introduction and training of warehouse operations</li> </ol>					
Remark					

Sub-Sector	Logisti	CS			
Reference No.	LLP-12				
Project Title	City Tr	uck Terminal Devel	opment Project (Pathein)		
Executing Agency	MOTC	, Each municipal			
Relevant ministries	Munici	pal development co	mmittee, truck association		
		Outline of t	he Project		
Objectives			Location or project plan		
It is aimed truck terming local municipal area d		elopment focusing	Pathein close to the existing Pa	athein rive	port
Rational	•		Project plan		
Currently, suburban logistics standard is poor, Enlargement of delivery lot/size is most basic way to reduce the transport cost even transship cost is necessary, thus smooth transshipment from/to large sized truck is key issue, especially for agriculture, construction goods.  14. The warehouse is also indispensable to realize full-load truck delivery. So collaboration of truck and warehouse is necessary for large size truck operation.    Input   Estimated Cost (US\$ million)     1. Parking lot   US\$ 3.0mil.     2. Warehouse (incl. loading and unloading space)   US\$ 1.0mil.		Even for local areas, the deve regional truck terminal is esse facilities should focus on the li the connection Yangon/Manda as well as municipal/inter-regi Along with the development of function, regional economy caspeedy and JIT time basis can speedy and JIT time basis can Schedule  Calendar year  1. Preparation  2. Feasibility Study  3. Funding Arrangement  4. Execution  5. Commissioning	ntial. Thes nkage bet alay and re onal delive f inventory in enjoy sn	se ween egional ery. nooth,	
			J T		
Total		US\$ 7.0.mil			
Expected output	1		Action plan	1 1. 1	
1. JIT delivery 2. Inventory control 3. Speedy delivery 4. Customer satisfaction 5. Elimination on opportunity loss 6. Improvement driver's occupational condition 7. Shorten truck dwell time			<ul> <li>Infrastructure is recommer developed and provided by investment</li> <li>Warehouse is recommend private operators.</li> <li>Feasibility study is needed Size and scale of facilities</li> </ul>	y public ed to be le to determ	eased to
Necessity on Technical A	Assistan	ce			
<ol> <li>Technical and financial viability analysis</li> <li>Design of truck terminal facility including access road</li> <li>Introduction and training of warehouse operations</li> </ol>					
Remark					

Google earth

#### **Project Profile**

Sub-Sector	Logistics		
Reference No.	LLP-13		
Project Title	Establishment of Mandalay Multi-modal Logistics Complex		
Executing Agency	MOTC, MOC, MCDC		
Relevant ministries	Mandalay City Development Committee, Mandalay truck association		
Outline of the Project			
Objectives Location or project plan			

- 1. Aimed at truck terminal development focusing on Mandalay and the northern part of Myanmar. The situation at the Mandalay terminal is better than at Yangon, where a relatively large warehouse is already equipped. Even at the Mandalay terminal, the following are observed: poor parking lots. loading/unloading spaces, storage spaces and inferior cargo handling operations.
- 2. The Mandalay truck terminal development focuses not only on a truck terminal function but also on intermodal transport, warehouse management, empty container functions

#### Rationale

- Development of truck terminal and warehouse can lead to transport cost reductions and provide higher inventory service, better working environment development. The short truck turn-around time leads to transport cost reductions.
- It is necessary to achieve efficient connections to other modal terminals.
- It is also important to consider the feasibility of returning empty container by rail or waterways. If possible, the empty containers can return at a lower cost.



the size and scale of facilities in detail

Input	Estimated Cost (US\$ million)	Schedule		
Parking lots	US\$ 15.0mil.	Calendar year	Start	End
2. Warehouses (incl. loading	US\$ 20.0mil.	1. Preparation	2018	2019
and unloading spaces)		2. Feasibility Study	2020	2021
3. Management office	US\$ 5.0mil.	3. Funding Arrangement	2017	2019
4. Empty container depots	US\$ 5.0mil.	4. Execution	2022	2023
		5. Commissioning	2024	2025
Total	US\$ 45.0mil.			
Expected output		Action plan		•

		zi i dadidiniy diday				
3. Management office	US\$ 5.0mil.	3. Funding Arrangement	2017	2019		
4. Empty container depots	US\$ 5.0mil.	4. Execution	2022	2023		
		5. Commissioning	2024	2025		
Total	US\$ 45.0mil.					
Expected output		Action plan				
<ol> <li>Shorten truck dwell times</li> </ol>	Shorten truck dwell	1. Infrastructure will be deve	eloped ar	nd		
2. Empty return container	times from 27 hours	provided by public investi	ment			
fees reduced	to 6 hours	2. Warehouses are recomm		be		
		leased to private operator				
		3.Feasibility study is needed	d to dete	rmine		

#### Necessity on Technical Assistance

- 1. Technical and financial viability analysis 2. Design of truck terminal facilities including access roads
- 3. Introduction and training on warehouse operations 4. Introduction and training on empty containers and inland depot operations (to connect to other transport modes)

Proiect – Establis	Project – Establishment of Mandalay Multi-modal Logistic Complex				
Key Potential Impacts	Mitigation Measures				
Pollution Control	•				
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling within the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>				
<ul> <li>Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries</li> <li>Wastewater from construction activities with suspended</li> </ul>	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the</li> </ul>				
<ul> <li>impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	construction site through suitable drainage system with sediment traps  • Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination				
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>				
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to activities of trucks and machines</li> </ul>	Appropriate maintenance of trucks and machines				
Wastewater generated from heavy cleaning, workshops and maintenance activities	<ul> <li>Installation of wastewater treatment system</li> <li>Reuse of treated water by removal of suspended solids, oil and grease, organic matter and neutralization of pH through waste water treatment plant</li> </ul>				
Natural Environment					
<ul> <li>Construction Phase &gt;</li> <li>Effect on flora near construction area in case of accidental back filling</li> </ul>	Avoidance of accidental back filling				
< Operation Phase > • Impact to local drainage due to accidental oil spill	<ul> <li>Avoidance of accidental oil spill</li> <li>Provision of adequate drains to accommodate increased run-off</li> </ul>				
Social Environment					
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction				
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE				
Operation Phase > <ul> <li>Possible to occur the traffic accidents</li> </ul>	<ul> <li>Provision of detour with adequate sign board and instruction</li> <li>Provision of speed limit</li> </ul>				

	Project Pr	тотне		
Sub-Sector	Logistics			
Reference No.	LLP-14			
Project Title	Establishment of Bago Multi-modal Logistics Complex			
Executing Agency	MOTC, Customs	-		
Relevant ministries	Myanmar Railway			
	Outline of the	e Project		
Objectives		Location or project plan		
Providing comprehensive	e logistics service through	Connecting point for		
the logistics hub		1) expressway(Mandalay/Ya	angon)、	
		2)industrial area 3) New por		
		4)Bangkok/Yangon route	•	
Rational		Project Plan (outline)		
<ol> <li>Bago is at an interse corridors:</li> </ol>	ection of two important	Function of Modal Shift and Linkage between	Component-2 Funtion of Storing and D Goods as a Logistics Cer	
	nd Yangon-Bangkok			
	tes cross each other. An	Trans-loading Function	Inventory Control F	
Accumulation of ind		/ Unloading	Private Wareho	us
expected.		Railway, Container airway Storing		
4. Multi-modal logistics	s hub can be benefit for	IWT \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	- 1	
Logistics performan	ce, including reduction of	Customs Clearance	Private Warehou	ises
cost.			1 1 min	1
		<b>5</b> (m)		
		Tarable of Countries	Trucking	+
		Trucking of Container	<u>↓                                    </u>	
			Client Cli	ient
		Image of logistics hub		
Input	Estimated Cost	Schedule		
	(US\$ million)			
1.Truck pool	US\$ 15.0mil.	Calendar year	Start	End
2.Warehouses (incl.	US\$ 45.0mil.	1. Preparation	2018	2019
loading/unloading facilities		2. Feasibility Study	2019	2021
3.Rail siding	US\$ 5.0mil.	3. Funding Arrangement	2017	2019
		4. Execution	2021	2023
		5. Commissioning	2023	2025
		1. Preparation	2025	-
Total estimated cost	US\$ 65.0mil			<u> </u>
Expected output		<ul><li>Action plan</li><li>Determination of project</li></ul>		
	Reinforcement of collaboration amongst			
different transport modes		-	roject ex	recuting
2. Enforcement of empty van pool, customs		agency	مامط <u>+</u> ما-	torm:
clearance, (bonded) storage, delivery,		Feasibility study is nee  the size and seals of fea-		
transshipment, resulting in a comprehensive		the size and scale of fac	unues in d	etali
logistics service	ment for manufacturing			
3. Promotion of investr sectors in this area	Herit for manufacturing			
Necessity of Technical A	esistance			
Technical and finance				
	ent system installation			

- 2. Inventory management system installation
- 3. Truck movement/parking management

### Remark

Warehouse facility is leased not only to logistics providers but also to other businesses including manufacturing, wholesalers and retailers

Project – Establi	Project – Establishment of Bago Multi-modal Logistics Complex				
Key Potential Impacts	Mitigation Measures				
Pollution Control	<b>y</b>				
< Construction Phase >	Coverage of truck carrying soil, sand and stone to avoid spilling				
Deterioration of air quality due	Adequate dust suppression measures such as regular water				
to particulate matter such as	sprinkling within the construction sites				
dust and gaseous emissions	Use of low emission construction equipment, vehicles and				
from construction equipment	generator sets				
and vehicular traffic	generator sets				
Noise and vibration due to	Use of low noise construction equipment				
movement of vehicles, and	Construction activities carried out in daytime				
operation of light and heavy	Provision of protective gears such as ear plugs etc. to				
construction machineries	construction personnel exposed to high noise levels				
Wastewater from construction					
	Provision of silt fencing near water bodies				
activities with suspended	Control of quality of construction wastewater emanating from the				
impurities	construction site through suitable drainage system with sediment				
Wastewater disposal from the	traps				
workers camp and sludge	Provision of proper sanitation facilities at the construction site to				
generated from construction	prevent hygiene problems due to water contamination				
sites					
Losing of top soil and	Conservation and restoration of top soils of the construction sites				
vegetation cover due to	Avoidance of accidental spills				
excavation and back filling					
Deterioration of soil quality					
< Operation Phase >	Appropriate maintenance of trucks and machines				
Noise and vibration due to					
activities of trucks and					
machines					
<ul> <li>Wastewater generated from</li> </ul>	Installation of wastewater treatment system				
heavy cleaning, workshops	Reuse of treated water by removal of suspended solids, oil and				
and maintenance activities	grease, organic matter and neutralization of pH through waste				
	water treatment plant				
Natural Environment					
< Construction Phase >	Avoidance of accidental back filling				
Effect on flora near					
construction area in case of					
accidental back filling					
< Operation Phase >	Avoidance of accidental oil spill				
Impact to local drainage due to	Provision of adequate drains to accommodate increased run-off				
accidental oil spill	<b>'</b>				
Social Environment					
<construction phase=""></construction>	Provision of detour with adequate sign board and instruction				
Disturbance of vehicle traffic					
and pedestrian passage					
Possible to occur the	Installation of security and maintain safety prevention measures				
accidents	and devices, and providing of appropriate PPE				
< Operation Phase >	Provision of detour with adequate sign board and instruction				
Possible to occur the traffic	Provision of speed limit				
accidents	1 TO TIGHT OF OPOOR HITHE				
accidente					

Su	Sub-Sector Road				
Reference No. LRP-01					
		aw-Mandalay Expressway (Upgrading)			
Executing Agency Ministry of Constru			<u> </u>		
	levant Ministry				
		Outline	e of the Project		
Ob	jectives		Location		
	Reduce cargo transp	ort time on the			
	north-south corridor between Yangon and Mandalay		Yangon-Nay Pyi Taw-Mandalay Expressway (Implementation of the section 0-64km will be supported by ADB.)		
2.	Shift heavy vehicle traffic to the expressway from the arterial road (NH-1)				
3.	Reduce traffic accide	nts on NH-1			
Ra	tionale		Project Plan (outline)		
1.	Limitation of heavy ve	ehicle use on the	Section 0-64km:		
	expressway		<ul> <li>Construction of inner sh</li> </ul>	oulder (1.5m	n) and outer
2.	Increase of traffic acc	cidents on NH-1 by	shoulder (2.5m)		
	heavy vehicles		- AC overlay construction	on the exist	ing
			pavement		
			Construction of a drainage system along the median		
			- Installation of safety fac	ilities	
Inp	out	Estimated Cost	Schedule	muco	
۳.۰۰		(US\$ million)	Consulate		
1.	Section 0-64km:	40	Calendar Year	Start	End
-	Improvement of the		1. Preparation	2018	2018
	expressway		2. Feasibility Study	2017	2018
-	Installation of road		3. Funding Arrangement	2017	2018
	safety facilities		4. Execution	2018	2020
2.	TA for the toll road	1	5. Commissioning	2020	2020
	management				
	organization				
	Other sections	453			
	tal Estimated Cost	494			
_	sult of Evaluation				
	nuge transport cost rec	auction attainable	Action Plan		
⊏X	pected Output  Reduce traffic	Γ	Action Plan		
-	accidents on NH-1		Scope of works has been d	liegueead ba	tween MOC
_	Reduce cargo		Scope of works has been discussed between MOC and ADB in March 2017.		
	transportation time		and ABB in March 2017.		
Ne	cessity of Technical As	ssistance	ı		
			oll road) management organiz	zation such a	as a toll road
			ry is expected to be introduce		
	marks				
1					

Sub-Sector	Road			
Reference No.	LRP-02			
Project Title		Mandalay-Muse Road		
Executing Agency Ministry of Construct				
Relevant Ministry	Triminetry or Cornetrate			
- resevant immetry	Outline	of the Project		
Objectives				
Objectives  1. Ensure redundancy of logistics for border trade between Myanmar and China  2. Strengthen existing Mandalay-Muse Road capacity for both cargoes and passengers  3. Reduce traffic accidents between Mandalay and Muse		:Alt.3 (New Road)  LA SHIO		
Rationale		(Proposed Alterna Project Plan (outline)	tive Routes	
Ease traffic congestion	n between Mandalav	The existing Mandalay-Lashio-Muse Road has		
and Muse	·	mountainous sections with	hairpin alig	nment and
2. National security enha		traffic volume (cargo vo		
redundancy logistic route	e for border trade	Increase of road capacity	•	d to meet
		future cargo transport dema		
Input	Estimated Cost	Schedu	le	
	(US\$ million)	0.1	0, ,	I
Three routes are under	664.0	Calendar Year	Start	End
Three routes are under study by FS.	664.0	1. Preparation	2010	2010
Widening of the		2. Feasibility Study	2018	2019
existing road or new		3. Funding Arrangement	2020	2022
alignment will be		Execution     Commissioning	2020	2022
determined in FS.		5. Commissioning		
(450 km long)				
Total Estimated Cost	664.0			
Result of Evaluation	-		•	•
Reduce transport risks				
Expected Output		Action Plan		
Reduce traffic congestion by		- Funding arrangement (F	easibility St	tudy in on
heavy vehicles		going.)	,	•
Necessity of Technical A				
			<u> </u>	
Remarks				
In case of the widening of	of the existing road, the	e Goat Twin Viaduct will be in	cluded in th	e project.

Project – Alternative Route of Mandalay-Muse Road				
Key Potential Impacts	Mitigation Measures			
Pollution Control	9			
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>			
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>			
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>			
<ul> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> <li>Proper disposal of used bentonite slurry</li> </ul>			
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to the traffic</li> </ul>	Provision by speed limit			
Natural Environment				
<ul> <li>Construction Phase &gt;</li> <li>Increased incidence and duration of floods due to obstruction of natural drainage courses by the embankment</li> <li>Loss of flora due to felling of</li> </ul>	<ul> <li>Provision of adequate drains along the route</li> <li>Augmentation of capacity of existing drainage works</li> <li>Provision of adequate drainage works for smooth passage of runoff to avoid flooding and formation of water pool</li> <li>Compensation for forest land and trees to be felled in forest area</li> </ul>			
trees along the ROW	<ul> <li>and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> </ul>			
Operation Phase > <ul> <li>Impact to local drainage due to formation of road embankment</li> </ul>	Provision of longitudinal drains of sufficient capacity on both sides of the car road to accommodate increased run-off.			
Social Environment	Oppose and a sistence with a s			
<pre-construction phase=""> <ul> <li>Loss of livelihood and properties</li> </ul></pre-construction>	Compensation and assistance package will be planned in the Rehabilitation and Resettlement Plan, separately from the EIA.			
<ul> <li>Construction Phase &gt;</li> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction			
Possible to occur the accidents	<ul> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> </ul>			

Sub-Sector	Road
Reference No.	LRP-03
Project Title	Myota-Tada U Road
Executing	Ministry of Construction
Agency	
Relevant Ministry	

Outline of the Project

#### Objectives

- Ensure logistics access road for the industrial zone (IZ) at Myota
- 2. Separation of heavy vehicle traffic from the communication road to reduce traffic accidents
- 3. Upgrading of airport access road (gateway road)



(Proposed Road)

#### Rationale

- Myota IZ is under operation without appropriate access road
- 2. Causeway structures constantly hinder access to IZ
- 3. Villages, school on the existing access road
- 4. Access road from the airport to the expressway shall be upgraded as an international gateway to Mandalay
- Project Plan (outline)
- Construction of new alignment between Tada U and Myota IZ applying high standard design including road safety facilities (40km)
- Upgrading of the airport access road (6km)

Input	Estimated Cost (US\$ million)	Sched	dule	
- Construction of	,	Calendar Year	Start	End
new road to IZ	92.0	1. Preparation		
<ul> <li>Upgrading of the</li> </ul>		2. Feasibility Study	2019	2020
airport access road		3. Funding Arrangement		
		4. Execution	2021	2024
		5. Commissioning		
Total Estimated Cost	92.0			

Result of Evaluation

Transport cost reduction attainable. Ensure all year / all-weather efficient passage of road traffic.

Expected Output Action Plan

Fast and safe access to IZ
 International gateway

- Feasibility study shall be required.

Necessity of Technical Assistance

Remarks

Project – Myota-Tada U Road				
Key Potential Impacts	Mitigation Measures			
Pollution Control				
<ul> <li>Construction Phase &gt;         <ul> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> <li>Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries</li> </ul> </li> <li>Wastewater from construction</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> <li>Provision of silt fencing near water bodies</li> </ul>			
activities with suspended impurities     Wastewater disposal from the workers camp and sludge generated from construction sites	<ul> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>			
<ul> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> <li>Proper disposal of used bentonite slurry</li> </ul>			
<ul><li>Operation Phase &gt;</li><li>Noise and vibration due to the traffic</li></ul>	Provision by speed limit			
Natural Environment				
<ul> <li>Construction Phase &gt;</li> <li>Increased incidence and duration of floods due to obstruction of natural drainage courses by the embankment</li> <li>Loss of flora due to felling of trees</li> </ul>	<ul> <li>Provision of adequate drains along the route</li> <li>Augmentation of capacity of existing drainage works</li> <li>Provision of adequate drainage works for smooth passage of runoff to avoid flooding and formation of water pool</li> <li>Compensation for forest land and trees to be felled in forest</li> </ul>			
along the ROW	Compensation for forest land and trees to be felled in forest area and private land     Mixed plantation consisting of flowering shrubs and evergreen ornamental trees			
<ul> <li>Operation Phase &gt;</li> <li>Impact to local drainage due to formation of road embankment</li> <li>Social Environment</li> </ul>	Provision of longitudinal drains of sufficient capacity on both sides of the car road to accommodate increased run-off.			
<pre><pre-construction phase=""> • Loss of livelihood and properties</pre-construction></pre>	Compensation and assistance package will be planned in the Rehabilitation and Resettlement Plan, separately from the EIA.			
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction			
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE			

Sub-Sector Road				
Reference No.	LRP-04			
Project Title	Yangon Urban Expr			
Executing Agency	Ministry of Construct	ction		
Relevant Ministry	YCDC			
	Outl	line of the Project		
Objectives		Location	_	
Construction of R	2-1, R2-2(south half	1.00		
	galardon Road) and	Que .		
	JEX (Refer to RHS	a M A		
figure)		C XIX	5	
2. Reduce travel t	ime on the route	ATT	Po	1
to/from Yangon Pe			Road No. 7 Ivo	1
to/nom rangom	Oit	H AUL	(No)	84)
3. Reduce traffic cor	ngestion in the CBD	11 X 1 AL		X C
	gistic route from the	1 / / / / / / / / / / / / / / / / / / /	XX	
built-up area	<b>9</b>	THA EL	R. Rosello	
'		Wsection	A Do	
4. Connection with	the new truck		Section 8	29/
	ed in the western			
1	a) and the existing			
terminal (Bayint N				
tommar (Bayını 1	iaurig)		\$ Section	1
Rationale		Project Plan (outline)	1 11 11 11 11 11 11	
Ease traffic conges	tion in Yangon City	Construction of R2-1, R	2-2 (south-half)	and W Section
2. Fast access for Yar		of YUEX	(	
	<b>3</b>	with ON/OFF ramps to t	the existing port	road
Input	Estimated Cost	Schedule		
	(US\$ million)			
- R2-1 section	869	Calendar Year	Start	End
(6.5km elevated)		1. Preparation	2018	2019
- R2-2 section	579	2. Feasibility Study	2020	2021
(9.1km elevated)	(1,158/2)	3. Funding	2022	2023
- W section		Arrangement		
(7.9km at-graded)	293	4. Execution	2024	2027
- ITS facilities		5. Commissioning	2028-	
Total Estimated Cost	1,741			
Expected Output		Action Plan		
Reduce traffic conges	stion in Yangon city	- Feasibility study shall be conducted.		
center		- Pre-FS was conducted by YUTRA in 2013.		
Necessity of Technica	ıl Assistance : Establi	ishment of Toll Road Auth	ority	
Remarks				

There is the port road along Strand Street that is exclusively provided for port related vehicles. The western-half section of YUEX can connect with this road by ON/OFF ramps to release heavy vehicles on the arterial road in the City.



Project – Yangon Urban Expressway (YUEX) West Sections Key Potential Impacts  Mitigation Measures  Pollution Control  < Construction Phase >  • Coverage of truck carrying soil, sand and so	
Pollution Control	
	tone to avoid
Deterioration of air quality due	
to particulate matter such as • Adequate dust suppression measures such	n as regular water
dust, especially during dry sprinkling on unpaved haul roads and vulne	
season, and gaseous emissions the construction sites	
from construction equipment  • Use of low emission construction equipmen	nt, vehicles and
and vehicular traffic generator sets	
Noise and vibration due to     Use of low noise construction equipment	
movement of vehicles, and  • Construction activities carried out near residue.	dential area
operation of light and heavy preferably in daytime	
construction machineries  • Provision of protective gears such as ear pl	
construction personnel exposed to high noise	se levels
Wastewater from construction     Provision of silt fencing near water bodies	
activities with suspended  • Control of quality of construction wastewate	
impurities the construction site through suitable drains	age system with
Wastewater disposal from the sediment traps	
workers camp and sludge  • Provision of proper sanitation facilities at the	
generated from construction site to prevent hygiene problems due to wa	ter contamination
Sites	
<ul> <li>Disruption and loss of productive top soil from</li> <li>Adequate measures like adequate drainage consolidation and slope stabilization</li> </ul>	e, embankment
agricultural fields due to  • Conservation and restoration of top soils of	the construction
creation of borrow pits and sites	the construction
development of detour section  • Avoidance of accidental spills	
Losing of top soil and vegetation     Proper disposal of used bentonite slurry	
cover due to excavation and	
back filling	
Deterioration of soil quality	
< Operation Phase > • Provision by speed limit	
Noise and vibration due to the	
traffic	
Natural Environment	
Construction Phase > <ul> <li>Provision of adequate drains along the rout</li> </ul>	
Increased incidence and     Augmentation of capacity of existing drainal	
duration of floods due to  • Provision of adequate drainage works for sr	
obstruction of natural drainage runoff to avoid flooding and formation of wa	iter pool
courses by the embankment	a falla III f
Loss of flora due to felling of     Compensation for forest land and trees to be a see and private land.	be relied in forest
trees along the ROW area and private land	ube and
<ul> <li>Mixed plantation consisting of flowering shr evergreen ornamental trees</li> </ul>	นมร สาน
	canacity on both
<ul> <li>Operation Phase &gt;</li> <li>Impact to local drainage due to</li> <li>Provision of longitudinal drains of sufficient sides of the car road to accommodate incre</li> </ul>	
formation of road embankment	assa run-un.
Social Environment	
Construction Phase > <ul> <li>Provision of detour with adequate sign boar</li> </ul>	rd and instruction
Disturbance of vehicle traffic	
and pedestrian passage	
Possible to occur the accidents     Installation of security and maintain safety process.	orevention
measures and devices, and providing of ap	

Cub Costor	Dood			
Sub-Sector Reference No.	Road LRP-05			
Project Title		g Road (YORR) East Section		
Executing Agency	Ministry of Constru			
Relevant Ministry YCDC		uction		
Relevant Ministry		ne of the Project		
Objectives	Outil	Location		
Reduce travel time on the route     between Thilawa SEZ and East-West     Economic Corridor (EWEC)		Location		5/4
Reduce travel time on the route between Thilawa SEZ and NH-1 toward upper Myanmar		Ywathergyi Truck Terminal (proposed)	Bago-Kyailton Enpr	
Reduce traffic congestion in the CBD by splitting the logistic route from the built-up area		YANGON		
Connection with the truck terminal (multi				F.
Rationale		Project Plan (outline)		
Ease traffic congestic		Outer ring road has been pla		
2. Ease access for Thila		alleviate traffic congestion in Yangon central area.		
3. Land available before	urban sprawl	Multi truck terminal has	been pro	oposed in
1	Territoria (Cont	Ywathargyi.		
Input	Estimated Cost (US\$ million)	Schedule	<del>,</del>	
- 55km long new heavy		Calendar Year	Start	End
loaded urban outer	570	1. Preparation	2018	2019
ring road (upgrade to		2. Feasibility Study	2020	2020
expressway will be		3. Funding Arrangement	2021	2021
implemented later)		4. Execution	2022	2028
- 1.0km long Bago River Bridge		5. Commissioning	2028	
- ITS System				
Total Estimated Cost	570			
Result of Evaluation	1 370		L	<u> </u>
Considerable reduction	of transport cost			
and ensure higher spee	•			
Expected Output	a or cargo transit	Action Plan		
Reduce traffic congest	ion			
in Yangon center	1011	<ul><li>Feasibility study shall be conducted.</li><li>Optimum route shall be determined in</li></ul>		
in rangon center				ngon Outer
		consideration of the connection with Yangon Outer Ring Road.		
Necessity of Technical A	ssistance	9		
Establishment of Toll Ro				
Remarks				
	go-Kvaikto Express	sway will be much effective.		
	.g, a =p100.	,		

Project – Yangon Outer Ring Road (YORR) East Section			
Key Potential Impacts	Mitigation Measures		
Pollution Control			
< Construction Phase >	Coverage of truck carrying soil, sand and stone to avoid		
Deterioration of air quality due to	spilling		
particulate matter such as dust,	Adequate dust suppression measures such as regular water		
especially during dry season,	sprinkling on unpaved haul roads and vulnerable areas of the		
and gaseous emissions from	construction sites		
construction equipment and	Use of low emission construction equipment, vehicles and		
vehicular traffic	generator sets		
Noise and vibration due to	Use of low noise construction equipment		
movement of vehicles, and	Construction activities carried out near residential area		
operation of light and heavy	preferably in daytime		
construction machineries	Provision of protective gears such as ear plugs etc. to		
100	construction personnel exposed to high noise levels		
Wastewater from construction     activities with supported.	Provision of silt fencing near water bodies		
activities with suspended	Control of quality of construction wastewater emanating from the construction site through quitable draining a system with		
<ul><li>impurities</li><li>Wastewater disposal from the</li></ul>	the construction site through suitable drainage system with		
workers camp and sludge	<ul><li>sediment traps</li><li>Provision of proper sanitation facilities at the construction site</li></ul>		
generated from construction sites	to prevent hygiene problems due to water contamination		
Disruption and loss of productive	Adequate measures like adequate drainage, embankment		
top soil from agricultural fields	consolidation and slope stabilization		
due to creation of borrow pits and	Conservation and restoration of top soils of the construction		
development of detour section	sites		
Losing of top soil and vegetation	Avoidance of accidental spills		
cover due to excavation and	Proper disposal of used bentonite slurry		
back filling	- 1 Topor dioposar or doed sententile starry		
Deterioration of soil quality			
< Operation Phase >	Provision by speed limit		
Noise and vibration due to the	, , , , , , , , , , , , , , , , , , , ,		
traffic			
Natural Environment			
< Construction Phase >	Provision of adequate drains along the route		
<ul> <li>Increased incidence and duration</li> </ul>	Augmentation of capacity of existing drainage works		
of floods due to obstruction of	Provision of adequate drainage works for smooth passage of		
natural drainage courses by the	runoff to avoid flooding and formation of water pool		
embankment			
Loss of flora due to felling of	Compensation for forest land and trees to be felled in forest		
trees along the ROW	area and private land		
	Mixed plantation consisting of flowering shrubs and evergreen		
One vetice Dhase	ornamental trees		
< Operation Phase >	Provision of longitudinal drains of sufficient capacity on both     sides of the part road to accommodate increased run off		
Impact to local drainage due to     formation of road ambankment	sides of the car road to accommodate increased run-off.		
formation of road embankment  Social Environment			
<pre><pre-construction phase=""></pre-construction></pre>	• Componentian and assistance package will be planted in the		
<ul> <li>Loss of livelihood and properties</li> </ul>	Compensation and assistance package will be planned in the  Rehabilitation and Resettlement Plan, separately from the EIA		
Construction Phase >	Rehabilitation and Resettlement Plan, separately from the EIA.		
<ul> <li>Disturbance of vehicle traffic and</li> </ul>	Provision of detour with adequate sign board and instruction		
pedestrian passage			
Possible to occur the accidents	Installation of security and maintain safety prevention		
- 1 Ossible to occur the accidents	measures and devices, and providing of appropriate PPE		
	moderno dia devices, dia providing of appropriate i i L		

Sub-Sector	Road				
Reference No.	LRP-06				
Project Title	Hanthawaddy Airport Access Road				
Executing Agency	Ministry of Construction				
Relevant Ministry	MOTC				

Outline of the Project

Location

Objectives

- 1. Reduce travel time on the route to/from the proposed Hanthawaddy International Airport (HIA)
- 2. Promote Bago industrial zone (IZ)



		CONTRACTOR OF THE PARTY OF THE	The second secon	A STATE OF THE PARTY OF THE PAR
Rationale	Project Plan (outline)			
Well existing access road		Construction of inte	rnational c	design standard
2. HIA will be opened by 202	3.	highway to access the	HIA	
Input	Estimated	Schedule		
	Cost			
	(US\$ mill)			
- Construction of new road	79.0	Calendar Year	Start	End
(9.5km))		1. Preparation	2018	2019
- ITS facilities		2.Feasibility Study	2019	2019
		3. Funding	2019	2019
		Arrangement		
		4. Execution	2020	2023
		5. Commissioning	2023	
Total Estimated Cost	79.0			
Result of Evaluation				
Expected Output		Action Plan		
Reduce traffic congestion		- Feasibility study shall be conducted.		
in Yangon center				
Necessity of Technical Assistance				
Remarks	Remarks			

Hanthawaddy International Airport is expected to be commissioned in 2023.

Project -Hanthawaddy Airport Access Road				
Key Potential Impacts	Mitigation Measures			
Pollution Control				
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> </ul>			
vehicular traffic	Use of low emission construction equipment, vehicles and generator sets			
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>			
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>			
<ul> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> <li>Proper disposal of used bentonite slurry</li> </ul>			
<ul> <li>Deterioration of soil quality</li> <li>Operation Phase &gt;</li> <li>Noise and vibration due to the traffic</li> </ul>	Provision by speed limit			
Natural Environment				
<ul> <li>Construction Phase &gt;</li> <li>Increased incidence and duration of floods due to obstruction of natural drainage courses by the embankment</li> </ul>	<ul> <li>Provision of adequate drains along the route</li> <li>Augmentation of capacity of existing drainage works</li> <li>Provision of adequate drainage works for smooth passage of runoff to avoid flooding and formation of water pool</li> </ul>			
Loss of flora due to felling of trees along the ROW	<ul> <li>Compensation for forest land and trees to be felled in forest area and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> </ul>			
<ul> <li>Operation Phase &gt;</li> <li>Impact to local drainage due to formation of road embankment</li> </ul>	Provision of longitudinal drains of sufficient capacity on both sides of the car road to accommodate increased run-off.			
Social Environment				
<pre><pre-construction phase=""></pre-construction></pre>	Compensation and assistance package will be planned in the			
Loss of livelihood and properties	Rehabilitation and Resettlement Plan, separately from the EIA.			
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction			
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE			

Sub-Sector	Road				
Reference No.	LRP-07				
Project Title	New Expressway between Bago and Kyaikhto				
Executing Agency	Ministry of Construction				
Relevant Ministry	,				
	Outline of	the Project			
Objectives		Location			
1. Enlarge road capacity Economic Corridor (E. 2. Reduce travel time or of the existing Payage-Kyaiktiyo Road  3. Reduce traffic accide road by splitting the locommunication road in the locommunica	EWEC).  n EWEC by short-cut yi (or Thilawa)  nts on the existing ogistic route from the	Route will be further studied by FS.  OPTION-1  YANGON			
Rationale  1. Strengthen of EWEC road capacity for both passenger and cargo 2. Existing Payagyi-Kyaiktiyo Road is going to be saturated by 2030.		(Optional Routes)  Project Plan (outline)  Construction of the new alignment along EWEC between Yangon/Bago and Kyaiktiyo for a shortcut the existing Payagyi-Kyaiktiyo Road. The project road shall be designed for heavily loaded vehicles.			
Input	Estimated Cost (US\$ Million)	Schedule			
- 70km long (Option-1) ne	w 770.0	Calendar Year	Start	End	
heavy loaded expresswa	ay	1. Preparation	2018	2018	
road		2. Feasibility Study	2019	2020	
- 1.5km long Sittan River		3. Funding Arrangement	2019	2020	
Bridge		4. Execution	2021	2025	
		5. Commissioning	2025		
Table 10 10 1	7700				
Total Estimated Cost	770.0				
Result of Evaluation	Annuary				
Considerable reduction of transport cost		Action Dlan			
Expected Output		Action Plan		ı	
Reduce travel time Reduce traffic accident	L: 105km > 70km V: 50km/h > 60km/h (1.0 hour reduce)	<ul> <li>Feasibility study shall be conducted.</li> <li>Optimum route shall be determined in consideration of the connection with Yangon Outer Ring Road.</li> </ul>			
Necessity of Technical Assistance					
Establishment of Toll Road Authority					
Remarks					
Synchronization with Yangon Outer Ring Road will be much more effective.					

Project – N	Project – New Expressway between Bago-Kyaikto			
Key Potential Impacts	Mitigation Measures			
Pollution Control				
< Construction Phase >	Coverage of truck carrying soil, sand and stone to avoid			
Deterioration of air quality due to	spilling			
particulate matter such as dust,	Adequate dust suppression measures such as regular water			
especially during dry season,	sprinkling on unpaved haul roads and vulnerable areas of the			
and gaseous emissions from	construction sites			
construction equipment and	Use of low emission construction equipment, vehicles and			
vehicular traffic	generator sets			
Noise and vibration due to	Use of low noise construction equipment			
movement of vehicles, and	Construction activities carried out near residential area			
operation of light and heavy	preferably in daytime			
construction machineries	Provision of protective gears such as ear plugs etc. to			
	construction personnel exposed to high noise levels			
Wastewater from construction	Provision of silt fencing near water bodies			
activities with suspended impurities	Control of quality of construction wastewater emanating from			
Wastewater disposal from the	the construction site through suitable drainage system with			
workers camp and sludge	sediment traps			
generated from construction sites	Provision of proper sanitation facilities at the construction site			
Discribed to the second of the	to prevent hygiene problems due to water contamination			
Disruption and loss of productive	Adequate measures like adequate drainage, embankment     appalidation and along stabilization.			
top soil from agricultural fields	consolidation and slope stabilization			
due to creation of borrow pits and development of detour section	Conservation and restoration of top soils of the construction sites			
Losing of top soil and vegetation				
cover due to excavation and	Avoidance of accidental spills     Drapar diagonal of used bentonite alumn			
back filling	Proper disposal of used bentonite slurry			
Deterioration of soil quality				
< Operation Phase >	Provision by speed limit			
Noise and vibration due to the	Trovision by speed innit			
traffic				
Natural Environment				
< Construction Phase >	Provision of adequate drains along the route			
<ul> <li>Increased incidence and duration</li> </ul>	Augmentation of capacity of existing drainage works			
of floods due to obstruction of	Provision of adequate drainage works for smooth passage of			
natural drainage courses by the	runoff to avoid flooding and formation of water pool			
embankment	, i			
Loss of flora due to felling of	Compensation for forest land and trees to be felled in forest			
trees along the ROW	area and private land			
	Mixed plantation consisting of flowering shrubs and evergreen			
	ornamental trees			
< Operation Phase >	Provision of longitudinal drains of sufficient capacity on both			
Impact to local drainage due to	sides of the car road to accommodate increased run-off.			
formation of road embankment				
Social Environment				
<pre><pre><pre></pre></pre></pre>	Compensation and assistance package will be planned in the      Debabilitation and Board laws at Plans and Assistance package will be planned in the			
Loss of livelihood and properties	Rehabilitation and Resettlement Plan, separately from the EIA.			
<construction phase=""></construction>	Provision of detour with adequate sign board and instruction			
Disturbance of vehicle traffic and     adaptrian page 2				
pedestrian passage	I hotellation of acquity, and resistain actations are the			
Possible to occur the accidents	Installation of security and maintain safety prevention      management and devices, and providing of appropriate RDF.			
	measures and devices, and providing of appropriate PPE			

Project Profile						
Sub-Sector		Road				
Reference No.		LRP-08				
Project Title	_	Thaton Bypass Road				
Executing Agency		Ministry of Construction				
Relevant Ministry						
T tolovanie iviii iloti y		Outl	ine of t	the Project		
Objectives				Location		
			kisting m the		Thaton Bypa	
	Uac	Tior local resident		3	T.	
Rationale				ct Plan (outline)		
<ol> <li>Strengthen of EWEC road capacity for both passenger and cargo</li> <li>Existing Payagyi-Thaton Road is going to be saturated by 2030.</li> </ol>		short	truction of the new cut the Thaton city. ned for heavily loaded	The project re		
Input		Estimated Cost (US\$ million)	Sche	dule		
- 30km long new hea	VV	200.0		Calendar Year	Start	End
loaded expressway			1. Pre	eparation	2018	2019
road				asibility Study	2020	2021
				nding Arrangement	2021	2022
				ecution	2023	2025
				mmissioning	2026	
			0.00	g	2020	
Total Estimated Cost		200.0				
Result of Evaluation						
Considerable reducti	on d	of transport cost				
Expected Output	<u> </u>	or transport door	Action	n Plan		_
Reduce travel time Reduce traffic accident  L: 45km > 30km V: 40km/h > 60km/h (0.5 hour reduce)			asibility study shall be	conducted.		
Necessity of Technical Assistance						
Remarks						

## **Expected Key Potential Impact and Mitigation Measures for Target Project**

	Project – Thaton Bypass Road
Key Potential Impacts	Mitigation Measures
Pollution Control	gans modea.oo
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>
<ul> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> <li>Proper disposal of used bentonite slurry</li> </ul>
< Operation Phase >  • Noise and vibration due to the traffic	Provision by speed limit
Natural Environment	
<ul> <li>Construction Phase &gt;</li> <li>Increased incidence and duration of floods due to obstruction of natural drainage courses by the embankment</li> </ul>	<ul> <li>Provision of adequate drains along the route</li> <li>Augmentation of capacity of existing drainage works</li> <li>Provision of adequate drainage works for smooth passage of runoff to avoid flooding and formation of water pool</li> </ul>
<ul> <li>Loss of flora due to felling of trees along the ROW</li> </ul>	<ul> <li>Compensation for forest land and trees to be felled in forest area and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> </ul>
<ul> <li>Operation Phase &gt;</li> <li>Impact to local drainage due to formation of road embankment</li> </ul>	Provision of longitudinal drains of sufficient capacity on both sides of the car road to accommodate increased run-off.
Social Environment	
<pre-construction phase=""> <ul> <li>Loss of livelihood and properties</li> </ul> <construction phase=""></construction></pre-construction>	<ul> <li>Compensation and assistance package will be planned in the Rehabilitation and Resettlement Plan, separately from the EIA.</li> <li>Provision of detour with adequate sign board and instruction</li> </ul>
Disturbance of vehicle traffic and pedestrian passage	1 Tovision of detodi with adequate sign board and instruction
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE

Sub-Sector	Road
Reference No.	LRP-09
Project Title	Three Pagoda Pass Road (Upgrading)
Executing Agency	Ministry of Construction
Relevant Ministry	

#### Outline of the Project

#### Objectives

- Enlarge road capacity of East-West Economic Corridor (EWEC).
- 2. Reduce travel time on EWEC
- 3. Logistics route for the regional hub port in Mon State (Kyaikami)
- 4. Poverty reduction of Kayin State providing market access



(Corruption of minor bridge in 2016)



(Corruption of millor	bridge in 2010)			
Rationale		Project Plan (outline)		
Strengthen of EWEC road capacity for both passenger and cargo     Existing Thaton-Myawaddy Road is going to be saturated by 2030.		Upgrading of the on-going construction project by widening to 4-lane. The project road shall be designed for heavily loaded vehicles.		
Input	Estimated Cost (US\$ million)	Schedule		
- 100km long road		Calendar Year	Start	End
upgrading works for	325.0	1. Preparation	2018	2018
heavily loaded traffic		2. Feasibility Study	2019	2019
		3. Funding Arrangement	2019	2019
		4. Execution	2020	2024
		5. Commissioning	2025	
Total Estimated Cost	325.0			
Result of Evaluation				
Expected Output		Action Plan		
Ensure national redundancy of logistics lifeline for border trade		- Feasibility study shall be	conducted.	
Necessity of Technical As	Necessity of Technical Assistance			
Remarks				

Gateway for the proposed new regional hub port of Mon State at Kyaikami

## **Expected Key Potential Impact and Mitigation Measures for Target Project**

Construction Phase	Project – Three Pagoda Pass Road (Upgrading)			
Construction Phase >     Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic      Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries      Wastewater from construction activities with suspended impurities      Wastewater disposal from the workers camp and sludge generated from construction sites      Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section      Losing of top soil and vegetation cover due to excavation and back filling     Deterioration of soil quality      Construction Phase >     Loss of low emission construction equipment, vehicles and vulnerable areas of the construction equipment, vehicles and venicular sprinkling on unpaved haul roads and vulnerable areas of the construction sites      Use of low noise construction equipment, vehicles and generator sets      Use of low noise construction equipment, vehicles and valnerable areas of the construction sites      Use of low noise construction equipment, vehicles and valnerable areas of the construction sites      Use of low noise construction equipment, vehicles and valnerable drainage apprehable areas of the construction sites      Use of low noise construction equipment, vehicles and valnerable drainage apprehable areas of the construction sites      Verovision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels      Construction pass such as ear plugs etc. to construction sterior for sit through suitable drainage system with sediment traps      Provision of lit fencing near water bodies      Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps      Provision of proper sanitation facilities at the construction sites      Adequate measures like adequate drainage, emb	Key Potential Impacts	Mitigation Measures		
Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic      Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries      Wastewater from construction activities with suspended impurities      Wastewater disposal from the workers camp and sludge generated from construction sites      Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section      Losing of top soil and vegetation cover due to excavation and back filling     Deterioration of soil quality      Construction activities carried out near residential area preferably in daytime     Provision of silt fencing near water bodies     Control of quality of construction wastewater emanating from the workers camp and sludge generated from construction site through suitable drainage system with sediment traps  Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination  Adequate measures like adequate drainage, embankment consolidation and slope stabilization  Conservation and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section  Losing of top soil and vegetation cover due to excavation and back filling  Deterioration of soil quality  Coperation Phase >  Noise and vibration due to the traffic  Natural Environment  Construction Phase >  Compensation for forest land and trees to be felled in forest area and private land  Mixed plantation consisting of flowering shrubs and evergreen ornamental trees  Provision of detour with adequate sign board and instruction ornamental trees	Pollution Control			
<ul> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> <li>Operation Phase &gt;</li> <li>Loss of flora due to felling of trees along the ROW</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction size exposed to high noise levels</li> <li>Provision of silt fencing near water bodies</li> <li>Construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Proper disposal of used bentonite slurry</li> <li>Provision by speed limit</li> <li>Compensation for forest land and trees to be felled in forest area and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> <li>Provision of detour with adequate sign board and instruction</li> </ul>	Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment	<ul> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and</li> </ul>		
<ul> <li>activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> <li>Operation Phase &gt;         <ul> <li>Noise and vibration due to the traffic</li> </ul> </li> <li>Natural Environment</li> <li>Construction Phase &gt;         <ul> <li>Compensation for forest land and trees to be felled in forest area and private land mornamental trees</li> </ul> </li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> <li>Proper disposal of used bentonite slurry</li> <li>Provision by speed limit</li> <li>Compensation for forest land and trees to be felled in forest area and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> <li>Provision of detour with adequate sign board and instruction</li> </ul>	movement of vehicles, and operation of light and heavy	<ul> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to</li> </ul>		
<ul> <li>productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> <li>Operation Phase &gt;         <ul> <li>Noise and vibration due to the traffic</li> </ul> </li> <li>Natural Environment</li> <li>Compensation for forest land and trees to be felled in forest area and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> </ul> <li>Social Environment</li> <li>Construction Phase &gt;         <ul> <li>Provision of detour with adequate sign board and instruction</li> </ul> </li>	activities with suspended impurities  • Wastewater disposal from the workers camp and sludge generated from construction sites	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Operation Phase &gt;         <ul> <li>Noise and vibration due to the traffic</li> </ul> </li> <li>Natural Environment         <ul> <li>Construction Phase &gt;</li></ul></li></ul>	productive top soil from agricultural fields due to creation of borrow pits and development of detour section  • Losing of top soil and vegetation cover due to excavation and back filling	<ul> <li>consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>		
<ul> <li>Construction Phase &gt;         <ul> <li>Loss of flora due to felling of trees along the ROW</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> </ul> </li> <li>Social Environment</li> <li>Compensation for forest land and trees to be felled in forest area and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> </ul> <li>Provision of detour with adequate sign board and instruction</li>	< Operation Phase > <ul> <li>Noise and vibration due to the traffic</li> </ul>	Provision by speed limit		
<ul> <li>Loss of flora due to felling of trees along the ROW</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> <li>Social Environment</li> <li>Construction Phase &gt;</li> <li>Provision of detour with adequate sign board and instruction</li> </ul>				
Construction Phase > • Provision of detour with adequate sign board and instruction	Loss of flora due to felling of trees along the ROW	<ul><li>area and private land</li><li>Mixed plantation consisting of flowering shrubs and evergreen</li></ul>		
The state of the s				
and pedestrian passage	Disturbance of vehicle traffic	Provision of detour with adequate sign board and instruction		
<ul> <li>Possible to occur the accidents</li> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> </ul>	Possible to occur the accidents			

Sub-Sector	Road
Reference No.	LRP-10
Project Title	Mawlamyine Peripheral Road
Executing	Ministry of Construction or Mon State Government
Agency	
Relevant Ministry	

#### Outline of the Project

#### Objectives

- Enlarge road capacity of East-West Economic Corridor (EWEC).
- Reduce travel time on EWEC
- Logistics route for the regional hub port in Mon State (Kyaikami) and the on-going industrial zone (IZ)





Project Plan (outline)

Currently HV is entering in the city through NH-8. Before increase the trade volume, the logistics route (to/from GMS and Dawei) shall be diverted from CBD area of Mawlamyne City.



Gyaing (Zarthapyin) Bridge and Atran Bridge will be constructed. The bridges can accept HV releasing the current loading restriction.



Mawlamyine Ring Road was proposed by 3-City MP with DUHD, MoC in 2016.

# Rationale 1. Strengthen of EWEC road capacity for both passengers and cargoes 2. Reduce traffic congestion and accidents in Mawlamyine City

Construction of the peripheral road to detour CBD area of Mawlamyine City. The project road shall be designed for heavily loaded vehicles.

New truck terminal is to be developed along this peripheral road.

Input	Estimated Cost (US\$ million)	Schedule		
- 5.5km long road		Calendar Year	Start	End
upgrading works for	8.0	1. Preparation	2018	2018
heavy loaded traffic		2. Feasibility Study	2019	2019
		3. Funding Arrangement	2019	2019
		4. Execution	2020	2022
		5. Commissioning	2022	
Total Estimated Cost	8.0			
Expected Output		Action Plan		
Improve EWEC corridor				

#### **Necessity of Technical Assistance**

#### Remarks

Gateway for the proposed new regional hub port of Mon State at Kyaikami

## **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project -Mawlamyine Peripheral Road			
Key Potential Impacts	Mitigation Measures		
Pollution Control			
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>		
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> <li>Proper disposal of used bentonite slurry</li> </ul>		
< Operation Phase >  Noise and vibration due to the traffic	Provision by speed limit		
Natural Environment			
< Construction Phase > • Loss of flora due to felling of trees along the ROW	<ul> <li>Compensation for forest land and trees to be felled in forest area and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> </ul>		
Social Environment			
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction		
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE		

Sub-Sector	Road	
Reference No.	LRP-11	
Project Title	Pong Taung-Pone Nyar Tunnel between Magway and Sagain	
Executing Agency	Ministry of Construction	
Relevant Ministry		

## Outline of the Project Location

#### Objectives

- Strengthen the logistics corridor between Myanmar and India
- 2. Provision of border access for the industrial zones (Kale, Monywa, Myota, Mandalay)
- 3. Poverty reduction providing market access for agricultural products



(Land slide on the existing Monywa Gangaw Road)

ROAD PLAN OF MAGNINAY-SAGAIN TUNNE.

GOOgle earth

Congression

Final Road Priorite OF MAGNINAY-SAGAIN TUNNEL

ROAD PROFILE OF MAGNINAY-SAGAIN TUNNEL



Rationale		tionale	Project Plan (outline)		
ĺ	1.	Frequent road closure by slope	Construction of 2 road tunnels to ensure all-weather		
		landslip disasters	logistics access for the Myanmar-India corridor		
	2.	Limited capacity of cargo transport			
		to/from Indian border			

to/nom maian border				
Input	Estimated Cost	Schedule		
	(US\$ million)			
- 6km (4km+2km)		Calendar Year	Start	End
long road tunnel	190.0	1. Preparation	2018	2018
- Construction of new		2. Feasibility Study	2019	2019
alignment of		3. Funding Arrangement	2020	2020
approach road		4. Execution	2021	2026
(10km)		5. Commissioning	2027	
Total Estimated Cost	190.0			
Expected Output		Action Plan		
Strengthen the		- Feasibility study shall be co	nducted.	_
Myanmar-India trade				

Necessity of Technical Assistance

#### Remarks

corridor

KOIKA committed to carry out the feasibility study (as of Dec. 2017).

## **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project – Pong Taung-Pone Nyar Tunnel between Magway and Sagaing			
Key Potential Impacts	Mitigation Measures		
Pollution Control	initigation moderates		
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> <li>Noise and vibration due to</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> <li>Use of low noise construction equipment</li> </ul>		
movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>		
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> <li>Proper disposal of used bentonite slurry</li> </ul>		
< Operation Phase > • Noise and vibration due to the traffic	Provision by speed limit		
Natural Environment     Construction Phase >     Loss of flora due to felling of trees along the ROW	<ul> <li>Compensation for forest land and trees to be felled in forest area and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> </ul>		
<ul> <li>Social Environment</li> <li>Construction Phase &gt;</li> <li>Disturbance of vehicle traffic and pedestrian passage</li> <li>Possible to occur the accidents</li> </ul>	Provision of detour with adequate sign board and instruction		
• Fussible to occur the accidents	<ul> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> </ul>		

Sub-Sector	Road
Reference No.	LRP-12
Project Title	Fast Shan Plateau Access Road (Yin Mar Bin-Kalaw)
Executing Agency	Ministry of Construction
Relevant Ministry	

#### Outline of the Project

#### Objectives

- Strengthen logistics corridor between Meiktila and Shan State
- 2. Promote rural development by fast and safe access to a large consumption market
- Poverty reduction in Shan State providing domestic market access for agricultural products



Location

ROAD PLAN OF DRISTING AND PROPOSED MEXITILA-KALAW ROAD

Plan Mar Bin

(Ind. 1/1)

(Ind. 1/1)

(Ind. 2/1)

Rationale		Project Plan (outline)		
1. Fragile mountainous r	oad	Construction of 52km length new alignment		
2. Less accessibility to m	narketplace	including 2 road tunnels (1.6km+3.0km)		
3. Limited capacity of ca	rgo transport to/from			
the border				
Input	Input Estimated Cost (US\$ million)			
- Construction of 52km		Calendar Year	Start	End
length new alignment	365.0	1. Preparation	2018	2018
- 4.6km (1.6km+3.0km)		2. Feasibility Study	2019	2020
long road tunnel		3. Funding Arrangement	2021	2022
		4. Execution	2023	2028
		5. Commissioning	2029	
Total Estimated Cost	365.0			
Expected Output		Action Plan		
Strengthen rural		- Feasibility study shall be conducted.		
productivities in Shan				
State				
Necessity of Technical Ass	sistance			
O/M capacity building for I	oad tunnel			
Remarks				

## **Expected Key Potential Impact and Mitigation Measures for Target Project**

Drainet Fact Chan Distance Access Dood (Vin Mar Bin Kalaus)			
	han Plateau Access Road (Yin Mar Bin-Kalaw)		
Key Potential Impacts	Mitigation Measures		
Pollution Control	Coverne of tweetenessing and and stone to eval anilling		
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>		
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> <li>Proper disposal of used bentonite slurry</li> </ul>		
Operation Phase > <ul> <li>Noise and vibration due to the traffic</li> </ul>	Provision by speed limit		
Natural Environment			
<ul> <li>Construction Phase &gt;</li> <li>Increased incidence and duration of floods due to obstruction of natural drainage courses by the embankment</li> <li>Loss of flora due to felling of trees along the ROW</li> </ul>	<ul> <li>Provision of adequate drains along the route</li> <li>Augmentation of capacity of existing drainage works</li> <li>Provision of adequate drainage works for smooth passage of runoff to avoid flooding and formation of water pool</li> <li>Compensation for forest land and trees to be felled in forest area and private land</li> </ul>		
< Operation Phase >	<ul> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> <li>Provision of longitudinal drains of sufficient capacity on both</li> </ul>		
Impact to local drainage due to formation of road embankment     Social Environment	sides of the car road to accommodate increased run-off.		
	Componentian and assistance package will be planned in the		
<pre-construction phase=""> <ul><li>Loss of livelihood and properties</li></ul></pre-construction>	<ul> <li>Compensation and assistance package will be planned in the Rehabilitation and Resettlement Plan, separately from the EIA.</li> </ul>		
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction		
Possible to occur the accidents	<ul> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> </ul>		

Sub-Sector F	Road			
	.RP-13			
	Construction of Br Tamu-Kyigone-Kal	ridges on India-Myanmar-Th aywa Road)	ai Trilatera	Highway
	Inistry of Construction			
Relevant Ministry	minory or contact	0.0011		
Troiovant immetry	Outline o	of the Project		
Objectives	- Cumio C	Location		
Strengthen of the logistic (Monywa-Tamu)     De-bottleneck of the logistic logi		Tam Total	Kalewa	DIAPTON .
(Wooden slab bridge	on AH 1)	(Tamu-Kyigone-Kalewa Road: TKK Road)		
Rationale		Project Plan (outline)		
De-bottleneck of Asian High (AH 1) meeting the requirem Lumpur Transport Strategic	ents of the Kuala	MOU was signed in August 2016 between India and Myanmar on the agreement of the construction of 69 bridges, including approach roads in the Tamu-Kyigone-Kalewa section of the Trilateral Highway, which will establish better connectivity between India and Myanmar.		
Input	Estimated Cost (US\$ million)	Schedule	•	
- Construction of 69 bridges	, , , , , , , , , , , , , , , , , , , ,	Calendar Year	Start	End
on AH 1	54.0	1. Preparation		
		2. Feasibility Study		
		3. Funding Arrangement		
		4. Execution	2018	2021
		5. Commissioning		
Total Estimated Cost	54.0			
Result of Evaluation				
Expected Output		Action Plan		
Eliminate impassable bottlenecks for heavy trucks		Monitoring implementation of	of the projec	et
Necessity of Technical Assis	tance	•		
Remarks				

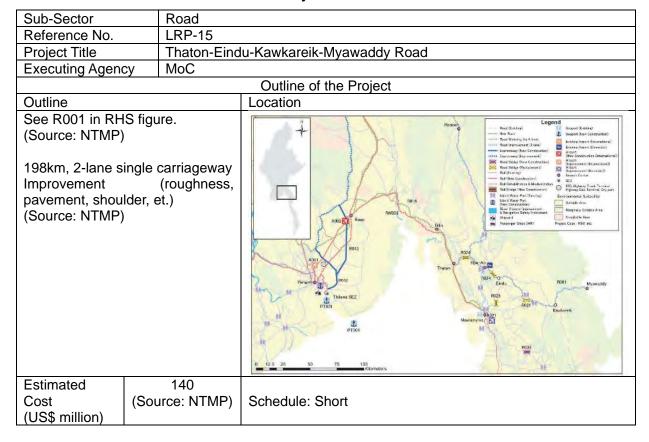
## **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project – Construction of Bridges on India-Myanmar-Thai Trilateral Highway (Tamu-Kyigone-Kalewa Road)			
Key Potential Impacts	Mitigation Measures		
Pollution Control			
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling within the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
<ul> <li>Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries</li> </ul>	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>		
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>		
< Operation Phase > <ul> <li>Noise and vibration due to the traffic</li> </ul>	Provision of speed limit		
Natural Environment			
<ul> <li>Construction Phase &gt;</li> <li>Increased incidence and duration of floods due to obstruction of natural drainage courses by the construction activities</li> </ul>	<ul> <li>Provision of adequate drains along the route</li> <li>Provision of adequate drainage works for smooth passage of runoff to avoid flooding and formation of water pool</li> </ul>		
Social Environment			
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction		
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE		

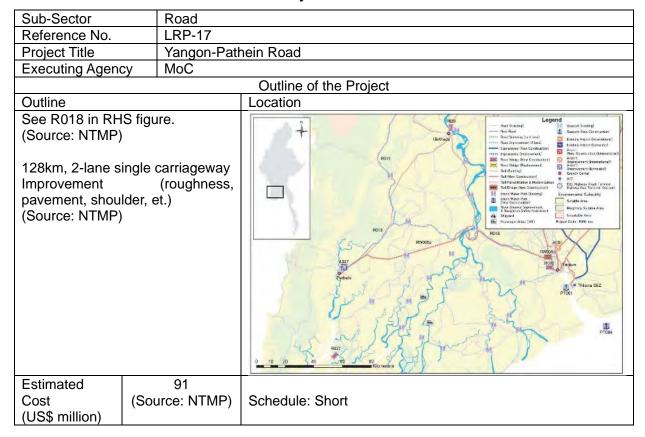
Cub Cootor	Dood	-		1
Sub-Sector Reference No.	Road LRP-14			
Project Title		and		
,	Ann-Kyaukpyu Ro Ministry of Constru			
Executing Agency Relevant Ministry	Willistry of Consti	uction		
Relevant Wilhistry	Outli	ing of the Project		
Objectives	Outil	ne of the Project Location		
Objectives		Location	3	
Access to/from Kyaukpyu Port		Naurigdawskyun Asingyukyun Asingyukyun Ryaukiyyu  Cay Taung T Data Sio, NOAA U.S. Navy, NGA, GEBCO US Dept of State Geographer Image Limidast / Copermoun	Control of the Contro	Arakan Mountain
Rationale		Project Plan (outline)	( Seattle	
Limitation of heavy	vehicle use	Road widening and improve	ment of the ex	kisting road
,		between Ann and Kyaukpyu		3
Input	Estimated Cost (US\$ million)	Schedule		
- Road improvement of		Calendar Year	Start	End
180km existing road	460.0	1. Preparation		
		2. Feasibility Study		
		3. Funding Arrangement		
		4. Execution		
		5. Commissioning		
		3		
Total Estimated Cost	460.0		1	
Result of Evaluation			U.	
Expected Output		Action Plan		
- Reduce cargo				
- Reduce cargo transport time	Assistance			
- Reduce cargo	Assistance			
Reduce cargo transport time  Necessity of Technical A	Assistance			
- Reduce cargo transport time	Assistance			
Reduce cargo transport time  Necessity of Technical A	Assistance			

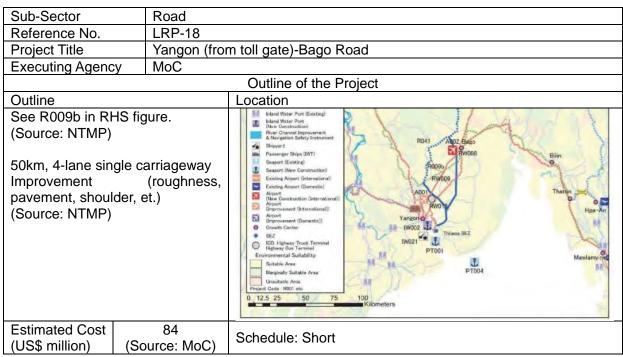
## **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project – Ann-Kyaukpyu Road			
Key Potential Impacts	Mitigation Measures		
Pollution Control	mitigation moasures		
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>		
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> <li>Proper disposal of used bentonite slurry</li> </ul>		
< Operation Phase >  • Noise and vibration due to the traffic	Provision by speed limit		
Natural Environment			
<ul> <li>Construction Phase &gt;</li> <li>Increased incidence and duration of floods due to obstruction of natural drainage courses by the embankment</li> <li>Loss of flora due to felling of</li> </ul>	<ul> <li>Provision of adequate drains along the route</li> <li>Augmentation of capacity of existing drainage works</li> <li>Provision of adequate drainage works for smooth passage of runoff to avoid flooding and formation of water pool</li> <li>Compensation for forest land and trees to be felled in forest</li> </ul>		
trees along the ROW	<ul> <li>area and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> </ul>		
<ul> <li>Operation Phase &gt;</li> <li>Impact to local drainage due to formation of road embankment</li> </ul>	<ul> <li>Provision of longitudinal drains of sufficient capacity on both sides of the car road to accommodate increased run-off.</li> </ul>		
Social Environment			
<pre-construction phase=""> <ul> <li>Loss of livelihood and properties</li> </ul></pre-construction>	<ul> <li>Compensation and assistance package will be planned in the Rehabilitation and Resettlement Plan, separately from the EIA.</li> </ul>		
Construction Phase > <ul> <li>Disturbance of vehicle traffic and pedestrian passage</li> </ul>	Provision of detour with adequate sign board and instruction		
Possible to occur the accidents	<ul> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> </ul>		

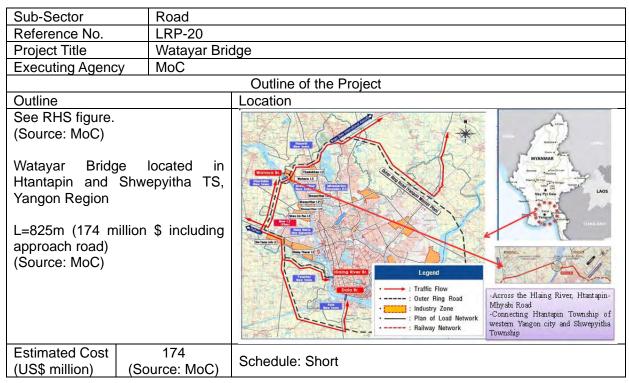


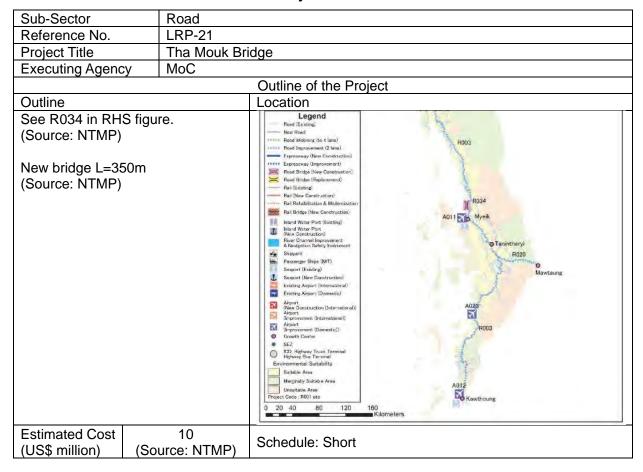
Sub-Sector	Road Sub-S	Sector		
Reference No.	LRP-16	LRP-16		
Project Title	Gyaing (Kav	vkareik) Bridge, Gyaing (Zathapyin) Bridge, Atran Bridge		
<b>Executing Agency</b>	MoC			
		Outline of the Project		
Outline		Location		
See R021 (Gyai Bridge, R025 (Gya Bridge, R026 (A RHS figure. (Source: NTMP)	aing (Zathapyin)	House's Legand  May Chintas  The Was of the Same of Third		
Gyaing (Kawkareik) Bridge L=810m (77 million \$)		101 Proper District Page Care Fills vo.		
Gyaing (Zathapyin) Bridge L=880m (103 million \$)		Treaming 1 19502 SEA POST SEA		
Atran Bridge L=780m (69 million \$) (Source: MoC)		Massamples (5) P1004  0 12.5 25 50 75 130 P1004		
Estimated Cost (US\$ million)	249 (Source: MoC)	Schedule: Short		

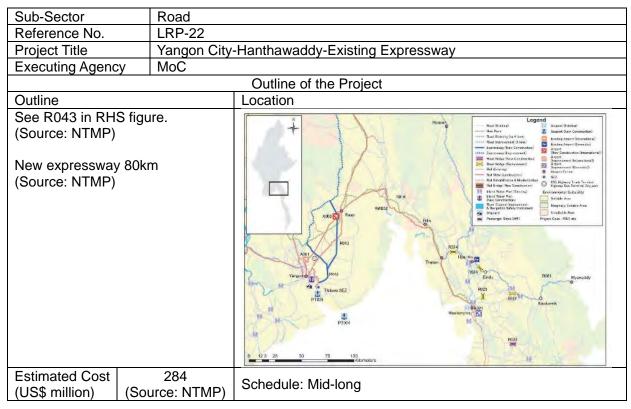


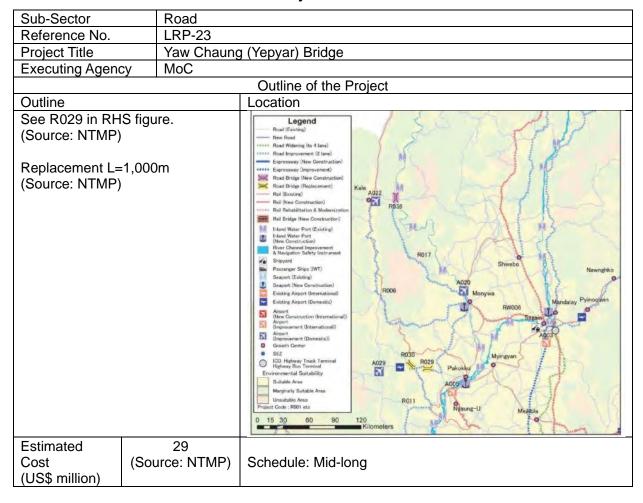


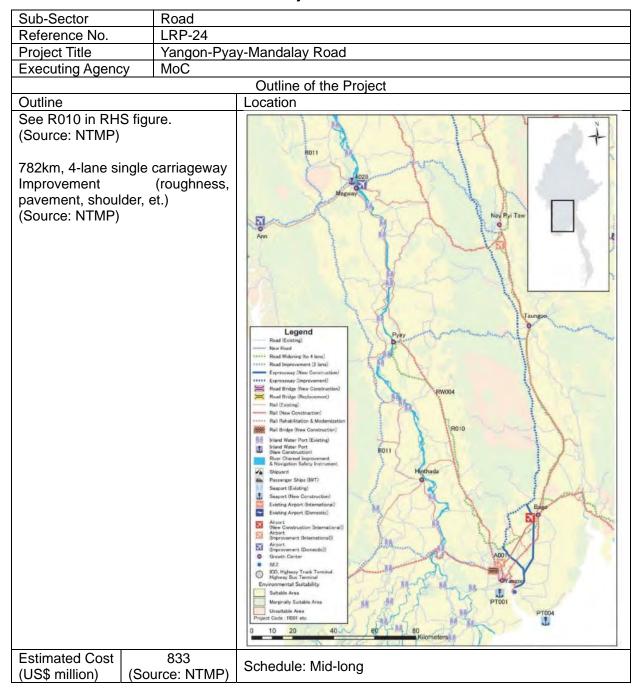
Sub-Sector	Road	Road		
Reference No.	LRP-19			
Project Title	Payagyi-Ma	wlamyine-Thanbyuzayat Road		
Executing Agence	y MoC			
		Outline of the Project		
Outline		Location		
See R016 in RH3 (Source: NTMP) 270km, 2-lane si Improvement pavement, shoul (Source: NTMP)	ngle carriageway (roughness,	Howard States and Stat		
Estimated	287			
Cost (US\$ million)	(Source: NTMP)	Schedule: Short		



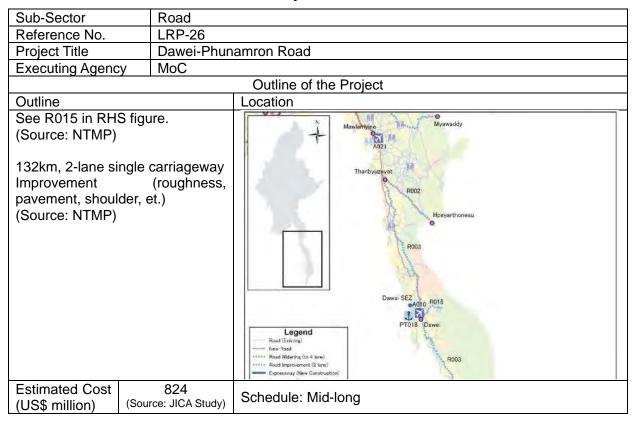




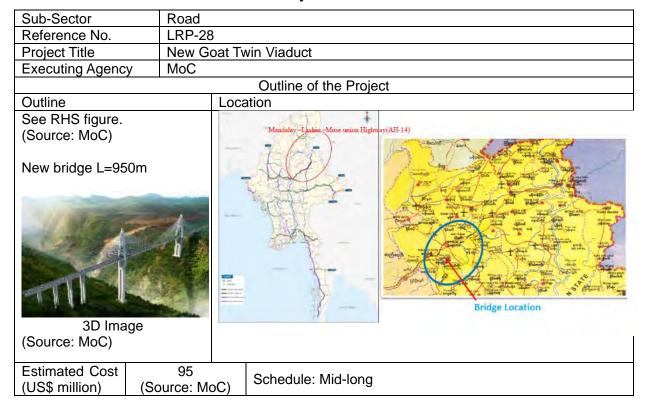


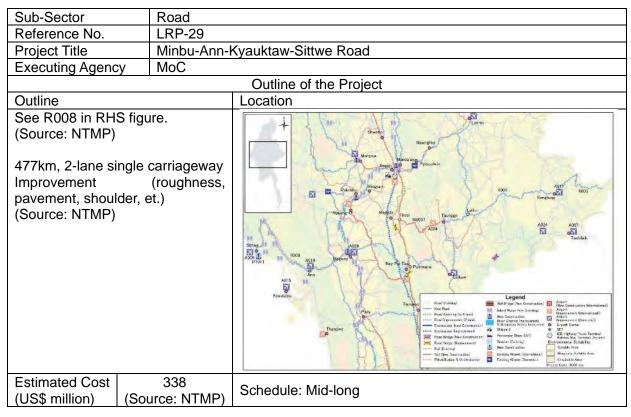


Sub-Sector	Road	Road		
Reference No.	LRP-25			
Project Title	Mandalay-La	ashio-Muse Road		
Executing Agend	y MoC			
		Outline of the Project		
Outline		Location		
See R012 in RH (Source: NTMP)  459km, 2-lane si Improvement pavement, shoul (Source: NTMP)	ngle carriageway (roughness,	Logand Real Britany Real Real Britany Real Real Real Britany Real Real Real Real Real Real Real Real		
Estimated Cost (US\$ million)	322 (Source: NTMP)	Schedule: Mid-long		

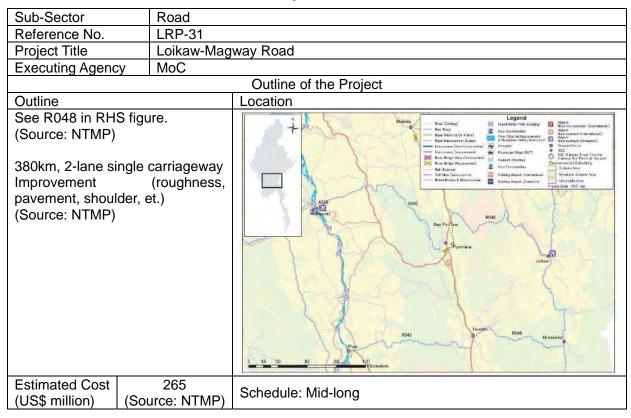


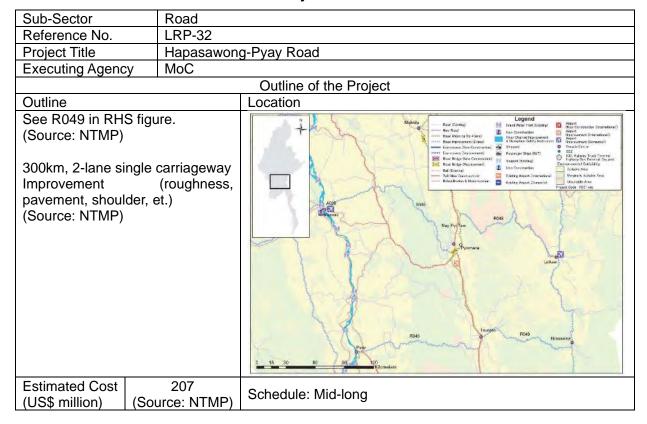
Sub-Sector	Roa	ad .		
Reference No.	LRF			
Project Title		o-Mandalay Road		
Executing Agency	Mo		adiay Roda	
	11.0		Outline of the Project	
Outline		Locat		
See R009a in RHS (Source: NTMP)  604km, 4-lane carriageway Improvement pavement, shoulde (Source: NTMP)	(rough	single	RW001  RW001  RW001  RW001  RW001  RW001  RW001	
			R009a  R027  R027  R009a  RW001  RW009  RW009  RW009  RW001  R009a  R009a  R009a  R009a  R009a  R009a  R009a  R009a	
	643 ource:	Sche	dule: Mid-long	
	ΓMP)			

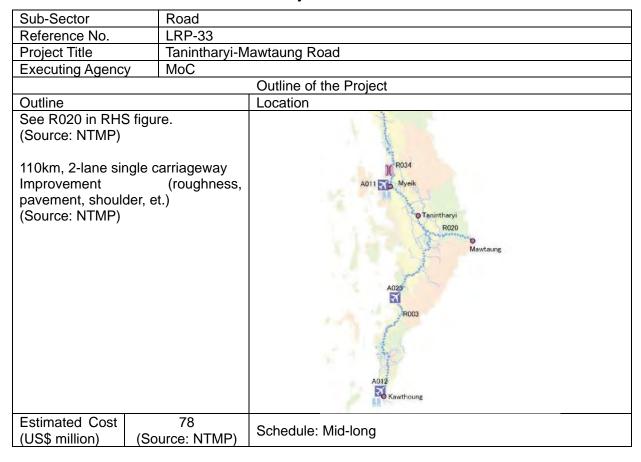


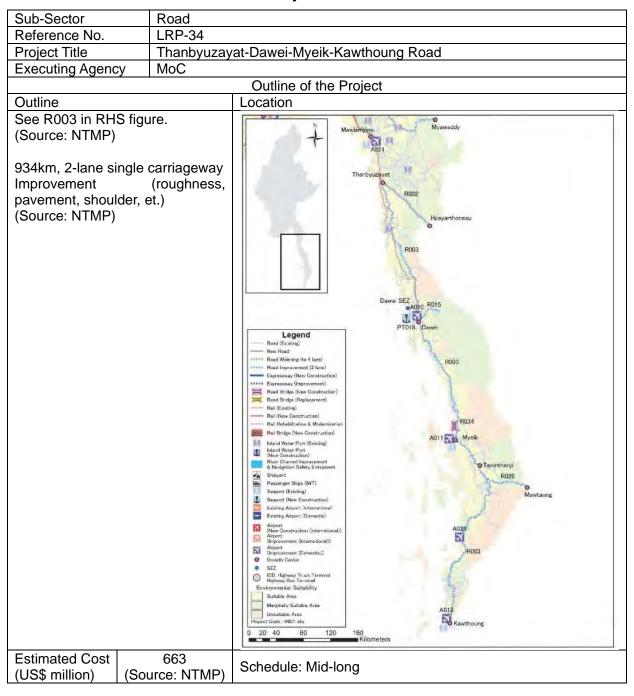


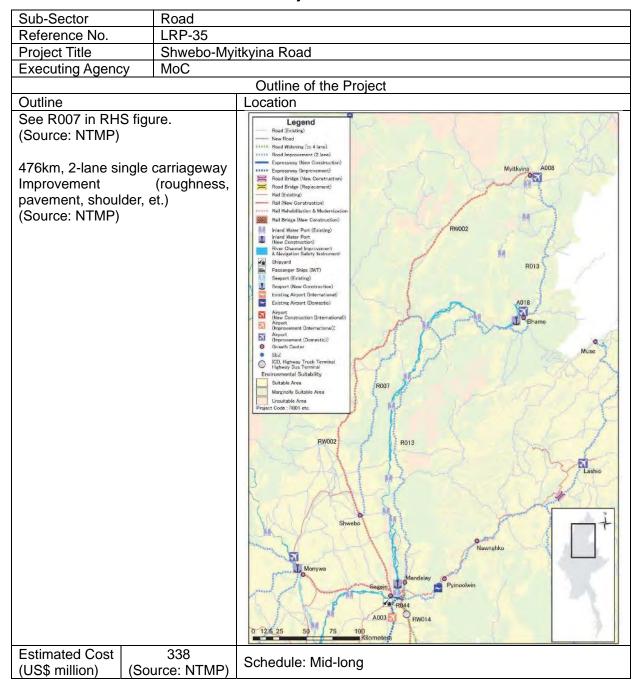
Sub-Sector	Road	Road		
Reference No.	LRP-30	LRP-30		
Project Title	Mandalay Cir	rcular Expressway		
Executing Agency	MRG/MoC/M	ICDC		
		Outline of the Project		
Outline		Location		
See R044 in RHS fig (Source: NTMP)  New expressway 70 (Source: NTMP)		To disting the control of the part of the		
Estimated Cost	240	coaleté Zook		
	Source: NTMP)	Schedule: Mid-long		



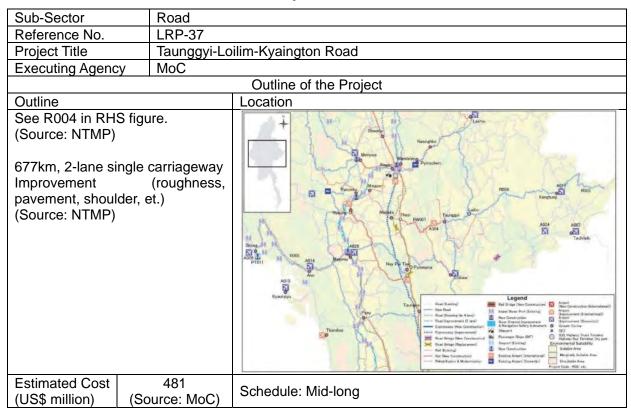


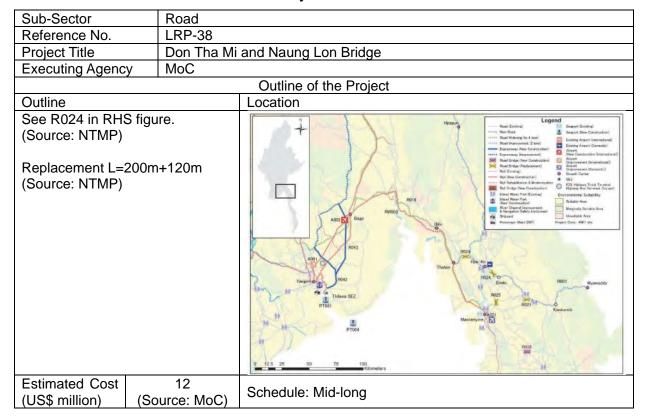


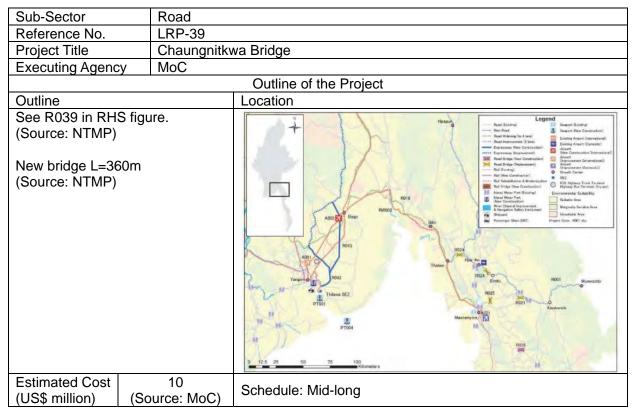


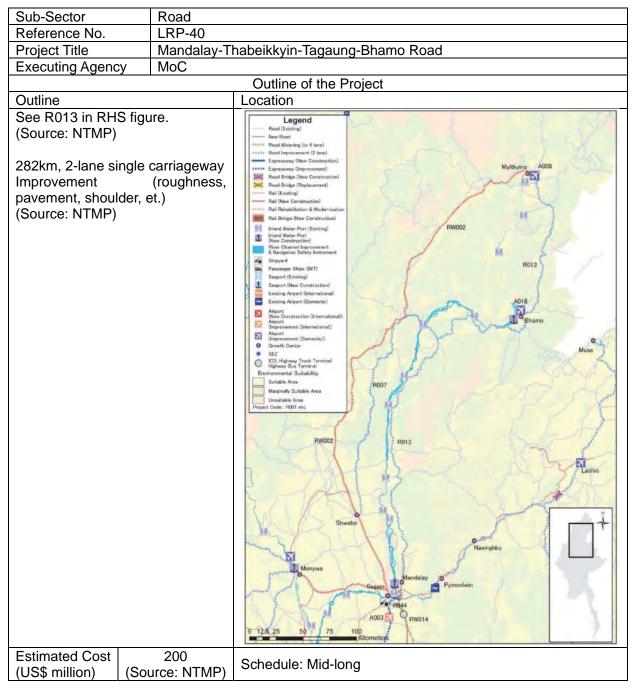


Sub-Sector	Road	Road		
Reference No.	LRP-36	LRP-36		
Project Title	Shwebo-Ye	U-Kalaywa Road		
<b>Executing Agency</b>	MoC	•		
		Outline of the Project		
Outline		Location		
200km, 2-lane sing Improvement pavement, shoulde	(roughness, er, et.)	Rankalu  We u  Shweb  Shweb  Inage Short gib gentra  Budaunggan  Google earth		
Estimated Cost	207 (Source: MoC)	Schedule: Mid-long		
(US\$ million)	(Source: MoC)			







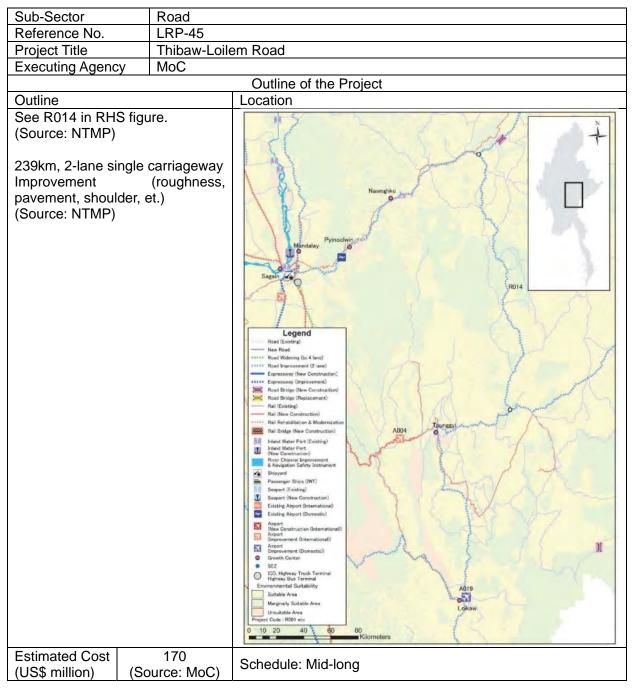


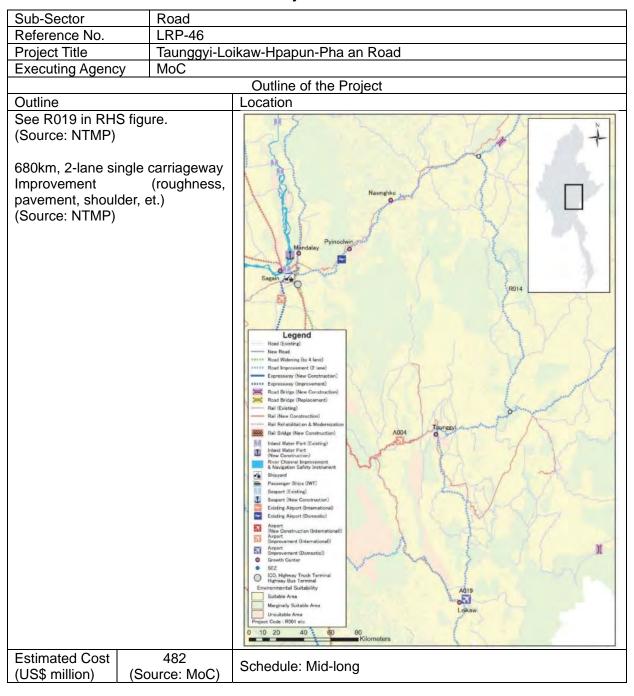
Sub-Sector	Road	Road		
Reference No.	LRP-41			
Project Title	Monywa-Pale	Monywa-Pale-Gangaw-Kalaymyo Road		
Executing Agency	MoC	<u> </u>		
	•	Outline of the Project		
Outline		Location		
Outline See R006 in RHS figure. (Source: NTMP)  311km, 2-lane single carriageway Improvement (roughness, pavement, shoulder, et.) (Source: NTMP)		R017  Shwebo  Nawnghko  A020  Monywa  RW006  Sagain  A033  A033  R011  RNaung-U  MonRala		
Estimated Cost (US\$ million)	221 (Source: MoC)	Schedule: Mid-long		

Sub-Sector	Road			
Reference No.	LRP-42			
Project Title	Monywa-Yarg	Monywa-Yargyi-Kalewa Road		
<b>Executing Agency</b>	MoC			
		Outline of the Project		
Outline		Location		
See R017 in RHS figure. (Source: NTMP)		Kale A022		
186km, 2-lane sing Improvement pavement, shoulde (Source: NTMP)	(roughness, er, et.)	R017 Shwebo Nawrighko A020 Monywa RW006 R030 R029 Pakoku Myingyan A005 R011 Nyaung-U Melikila		
Estimated Cost (US\$ million)	132 (Source: MoC)	Schedule: Mid-long		

Sub-Sector	Road	Road		
Reference No.	LRP-43			
Project Title	Yaw Chaung	Yaw Chaung (Ohn Taw) Bridge		
Executing Agence	y MoC			
		Outline of the Project		
Outline		Location		
See R030 in RHS figure. (Source: NTMP)  Replacement L=760m (Source: NTMP)		Legend Read (Skintery) Neer Incut Read Midering (to 4 Line) Read Midering (to 4 Line) Expression (Neer Openstruction) Expression (Neer Openstruction) Read Bridge (Neer Openstruction) Read Bridge (Neer Openstruction) Read Bridge (Neer Openstruction) Real Rehabilisation & Modernization Real Bridge Neer Openstruction) Real Rehabilisation & Modernization Real Bridge Neer Openstruction) Real Rehabilisation & Modernization Real Bridge Neer Openstruction) Real Rehabilisation & Modernization Real Reha		
		Passenger Ships (IVIT) Seaport (Estating) Seaport (Estating) Seaport (Estating) Seaport (International) Estating Arport (International) Policy (International) Apport (International) A		
Estimated Cost	21 (Source: NTMP)	Schedule: Mid-long		
(US\$ million)		Conduction that long		

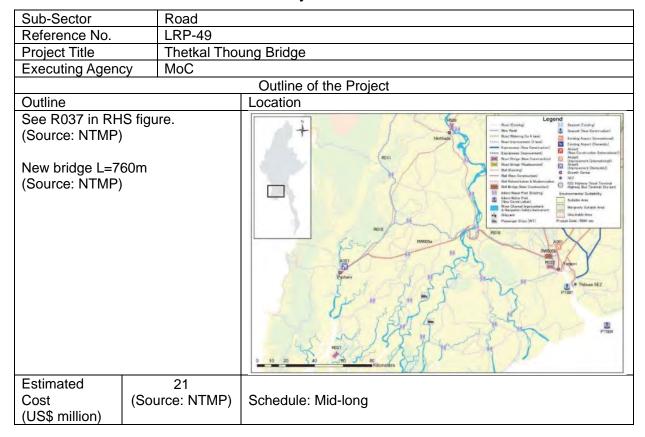
Sub-Sector	Road		
Reference No.	LRP-44		
Project Title	Thanlwin (Tarsotph	na) Bridge	
Executing Agency	MoC		
	Outline	e of the Project	
Outline		Location	
See R040 in RHS figure.			
(Source: NTMP)			
New bridge L=305m			
(Source: NTMP)			
Estimated Cost	9	Schedule: Mid-long	
(US\$ million) (S	Source: NTMP)	Ochedule. Mid-long	

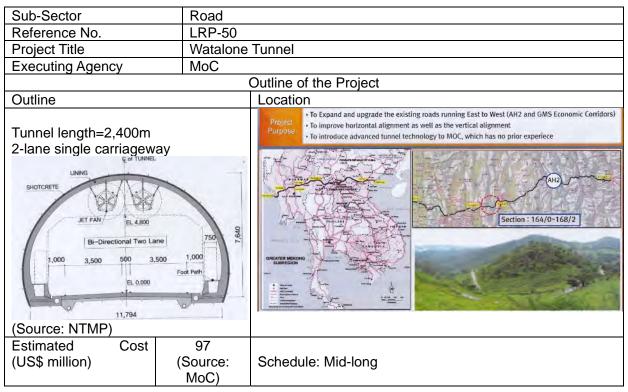


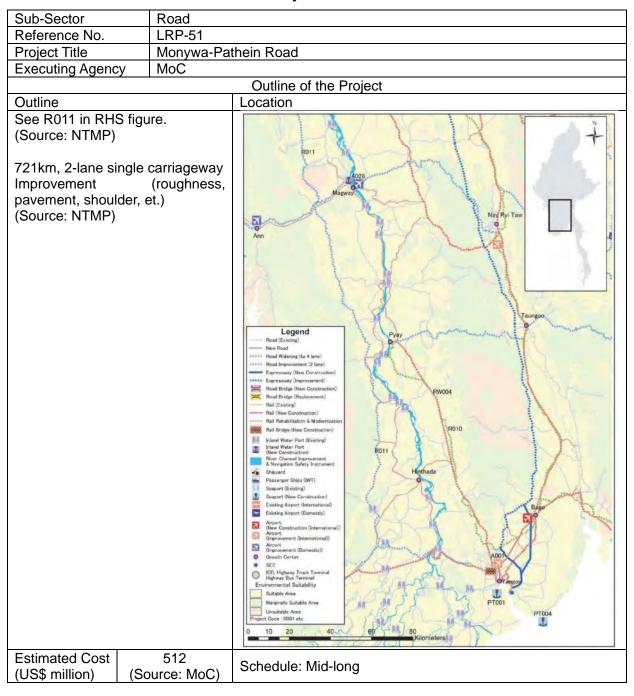


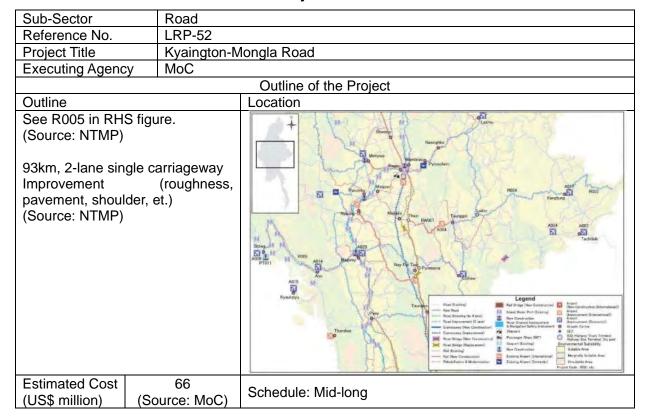
Sub-Sector	Road			
Reference No.	LRP-47			
Project Title	Hlaing River	Hlaing River Bridge		
Executing Agence		-		
		Outline of the Project		
Outline		Location		
See R032 in RH (Source: NTMP) New bridge L=1, (Source: NTMP)	-	Rest   Section   Section		
Estimated	42			
Cost	(Source: NTMP)	Schedule: Mid-long		
(US\$ million)				

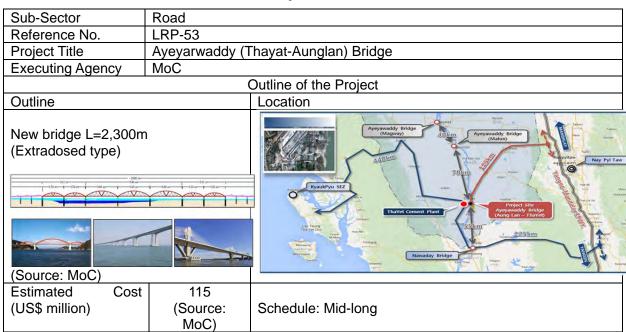
	Project	Profile
Sub-Sector	Road	
Reference No.	LRP-48	
Project Title	Hinthada Bri	dge
Executing Agency	MoC	
	Outline of	the Project
Outline		Location
40 (Source: MoC)	2,254m  107m 317m 417m 422m  110m 517m 317m 510cm 5105m  110m 517m 100cm 5105m  110m 100cm 100cm 100cm  110m 100cm 100cm  110m 100cm 100cm  110m 100cm 100cm  110m 100cm  110cm  110c	Hinthada Bridge  Hinthada Bridge    Hinthada Bridge   Hinthada Bri
Estimated Cost (US\$ million)	202 (Source: NTMP)	Schedule: Mid-long











Sub-Sector	Road						
Reference No.	LRP-54	LRP-54					
Project Title	Thanlwin	(Kunlone) Bridge					
Executing Agency	MoC						
		Outline of the Project					
Outline		Location					
New bridge L=240m  (Source: MoC)		Asia World Backing Plant  Apparation applied (a) (g, a we)  solvery Epitrolo (b/c 36)  Asia World Backing Plant  apparation applied (a) (g, a we)  solvery Epitrolo (b/c 36)  (a) Asia World To (eve as)  (a) Asia World To (eve as)  (b) Asia World To (eve as)  (c) Asia World To (eve as)					
Estimated Cost (US\$ million)	15 (Source: MoC)	Schedule: Mid-long					

Sub-Sector	Road	
Reference No.	LRP-55	
Project Title	Ayeyarwaddy (k	(athar) Bridge
Executing Agency	MoC	
	Ou	tline of the Project
Outline		Location
New bridge L=under p	lanning	nel thar hettikel Chin yPin Na Bar Na Bar Katha Katha Katha Katha Ayeyarwaddy Bridge (Katha)
Estimated Cost (US\$ million)	93 (Source: MoC)	Schedule: Mid-long

Sub-Sector	Road					
Reference No.	LRP-	LRP-56				
Project Title	Chine	dwin (Phaungbyin) Bridge				
Executing	MoC					
Agency						
		Outline of the Project				
Outline		Location				
planning (Source: MoC)	=under	To Tamu  Basis & restion  In any Schrol No.2  Paung by in  Paung by in  Economic Bank				
Estimated	25	Cohodulo: Mid long				
	Source MoC)	Schedule: Mid-long				

#### Serial No.:

Sub-Sector	Railway
Reference No.	LFP-01
Project Title	Development of Freight Railway Station/ ICD at Yangon and Mandalay
Executing Agency	MR
Relevant Ministry	MOTC

Outline of the Project Location

Objectives

1. To start container freight transportation service by railway as a block train by preparation of railway logistic hub in the axis of Yangon – Mandalay main corridor ends i.e., Yangon and Mandalay.

2. To promote freight railway demand between Yangon and Mandalay.

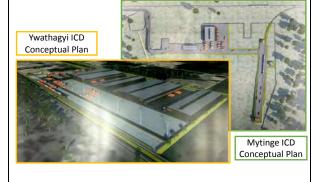
Conceptual Plan proposed by developers



Aspectational Center Vangon

Applicational Special Francis Control Con

(Phase-2) New ICD development in Mitinge





Rationale

- 1. Handling facilities and freight stations is not designed for container transportation. Containers are used as wagon and it is not handled thus the container transportation service by railway has not commenced substantially.
- 2. Not only import/export cargo but also national cargo will be handled. Thus the ICD is functioned for national logistic hub as well.
- 3. The concession agreement will be signed soon between MR and developers.
- 4. Dry port development is planned in Ywathargyi (Yangon) and Mitinge (Mandalay) by MR.
- 5. Mitinge new ICD shall be developed after exceeding the demand 800,000 TEU/year

Project Plan (outline)
MR has a
responsibility to
prepare railway track
therefore the plan
shall be reviewed for
actual operation.

Input	Estimated Cost	Schedule		
(Phase-1) Ywathargyi ICD	US\$ 40 mil.	Calendar Year	Start	End
Mitinge ICD (Phase-1)	US\$ 40 mil.	1. Preparation	-	-
Mitinge New ICD	US\$ 40 mil.	2. Feasibility Study	-	-
Spur Line Development	US\$ 120 mil.	3. Funding Arrangement	2017	2017
8km		4. Execution	2018	2019
Total Estimated Cost	(Phase-1) \$ 80mil.	5. Commissioning	2020	-
	(Phase-2) \$160mil.			
Expected Output		Container block train servi	ce is comme	enced
Necessity of Technical Assis	etance			

Necessity of Technical Assistance Remarks

Up to 800,000 TEU/ year demanded, inside radius 50km from the Dry Port cannot be planned any other ICDs.

#### Serial No.:

Sub-Sector	Railway			
Reference No.	LFP-02			
Project Title	Freight Station Development Project at Thilawa Area with Thilawa Line			
-	Improvement Project			
Executing Agency	MR			
Relevant Ministry	MOTC			

#### Outline of the Project

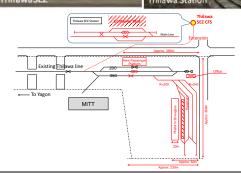
Location

### Objectives

- 1. To introduce containerized railway system
- 2. To utilize of Thilawa Area as an international freight center
- 3. To reduce traffic congestion by modal shifting to railway







#### Rationale

- 1. The north south axis demand will be sharply increased and streams into Thilawa port.
- 2. Thilawa SEZ company residents are increased.
- 3. Thilawa access line will be the important line for freight and passenger transport due to the future development of Thilawa area as a main port, huge SEZ, and a one of sub-center in Yangon.
- 4. However, the current access railway line to Thilawa is single track and guite poor condition not enough to be the corridor between Yangon and Thilawa

Project Plan (outline)

Phase-1: New freight station will be constructed besides existing Thilawa Passenger station. The existing platform will be moved to opposite side and prepare container yard there. Whole Thilawa Line Improvement and Double Tracking (26.2km) excepting Thanlwin Br.

**Phase-2:** The line will be extended to Thilawa SEZ area loop line and new station will be constructed in the port area and SEZ. Thanlyin Bridge double tracking works included.

		3	<u> </u>	
Input	Estimated Cost	Schedule (Phase1/	Phase-2)	
Freight sta. yard (Phase-1)	US\$ 21mil.	Calendar Year	Start	End
Track improvement and	US\$ 1,035mil.	1. Preparation	2018/2020	2018/2020
double tracking (Phase-1)		2. Feasibility Study	2018/2020	2020/2022
Double tracking for	US\$ 450mil.	3. Funding	2021/2023	2021/2023
Thanlwin Bridge. (Phase-2)		Arrangement		
SEZ freight sta. yard	US\$ 11mil.	4. Execution	2022/2024	2024/2026
(Phase-2)		5.commissioning	2024/2027	-
Total Estimated Cost	US\$ 1,517 mil.			
Expected Output		Action Plan		

Container Handling Capacity < TEU/year> (Phase-1) 350,000 (Phase-2) 1 million

Feasibility Study shall be started soon.

Necessity of Technical Assistance

Technical assistance is needed

#### Remarks

Land acquisition and resettlement should be completed prior to the commencement of the construction works. There are rooms to extend existing railway beyond Thilawa station to southern plots. The feasibility shall be confirmed in the further study.

Serial No.:				
Sub-Sector	Railway			
Reference No.	LFP-03			
Project Title	Procurement of Locomotives and Container Freight Wagons			
Executing Agency	MR			
Relevant Ministry	MOTC			
	Outline of	f the Project		
Objectives		L	.ocation	
To enhance container blo	ck train service,			
procure necessary rolling	stock.	Diesel Locomotive		
		Flat Bed Wagon		
Rationale		Project Plan (outline)		
MR has started operations	on container freight			
transportation service. Ho				
poorly maintained wagon		✓ Four trains opera	ition a day is as	ssumed.
shortage of fairly maintair		Duralis Daraturas	•	
freight railway service.		Van for Crew 26	<u>24</u> 1	Loco.
2. Although dry port deve	lopment project is	20' 20'	20' 20' • • 20'	20'
on-going by MR and deve	elopers, to commence		<del></del>	**
fully block train transporta				
of rolling stocks would be	short.			
Input	Estimated Cost	Schedule		
Procurement of Locomoti		Calendar Year	Start	End
- 7 cars (6 trains sets will		1. Preparation	2018	2018
used, 1 set is for backup)	US\$ 30 mil.	2. Feasibility Study	2018	2018
Procurement of wagons		3. Funding Arrangement	2018	2019
- 28 wagons x 7 sets (6 tr		4. Execution	2019	2021
sets will be used, 1 set is	for	5. Commissioning	2021	-
backup)		3		
Total Estimated Cost	US\$ 61 mil.			
Expected Output		Action Plan		
Number of freight trains in	ncreased	Feasibility Study for rolling stock procurement shall be started soon.		
Necessity of Technical As	sistance			
Remarks				
Container Transportation	by Railway has started	between Yangon and F	aleik. The num	ber of trains
will be increased according				
Number of train set need	ed shall be studied in fe	asibility study with the p	period of procur	ement.

Seriai No.:	Б. "					
Sub-Sector	Railway					
Reference No.	LFP-04					
Project Title	Bulk Cargo Freight Railway Improvement					
Executing Agency	MR					
Relevant Ministry	MOTC					
		Outline of th	ne Project			
Objectives			Location			
-To enhance the bulk c	argo	=	Sample layout of bulk y	ard by cargo	)=	
transport by railway.	J	[Oil]				
		OIL Handling Yard at Lo	ading Site Existing Line Cement Hand	dling Yard at Loading Site	Existing Line	
		Oil Tank Oil Tank		Sailo		
			Oil Tank Oil Tank Pileline Pileline Pit Pit			
		ļ				
		[Gravel]				
		Gravel Ha	andling Yard at Loading Site			
		<u> </u>	X	Exis	sting Line	
			Han	ding Yard	<b>⊣</b>	
Rationale			Project Plan (outline)			
<ul> <li>Major transport mo</li> </ul>	de on bulk car	rgo is by truck.	The project includes facilities of railway track			
- Railway transport of	arries heavy o	cargo in one	and the yard only. Har	ndling facility	such as	
time. In view of traf	fic congestion	, railway	pipeline, pit and dump	trucks is co	ncessionaire	
transportation shall			in charge.			
- The commodity is a	assumed such	ı as oil,	The exact location of t		ll be	
cement and gravel			determined in feasibili	ty study.		
Input	Estimated		Schedule			
Oil terminal (loading		US\$ 16mil.	Calendar Year	Start	End	
and unloading both	(per one	terminal set)	1. Preparation	2018	2018	
sites)			2. Feasibility Study	2019	2020	
Cement Terminal		US\$ 12mil.	3. Funding Arrangement	2021	2021	
(loading and unloading	(per one	terminal set)	4. Execution	2022	2023	
both sites)			5. Commissioning	2024	-	
Gravel Terminal	,	US\$ 16mil.				
(loading and unloading	(per one	terminal set)				
both sites)		110¢ 4 "				
Shunting yard		US\$ 4mil.				
preparation		1100 10 "				
Total Estimated Cost US\$ 48mil.			Action Plan			
-	Expected Output					
			Feasibility Study for rolling stock procurement			
increased.			shall be started soon.			
Necessity of Technical	Assistance					
Remarks	1 1 2	<del> </del>				
Project cost is variable						

#### Serial No.:

Sub-Sector	Railway
Reference No.	LFP-05
Project Title	Yangon Outer Ring Freight Railway Development Project
Executing Agency	MR
Relevant Ministry	MOTC

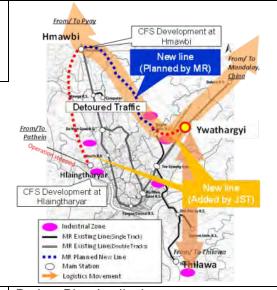
Outline of the Project Location

Objectives

- To detour freight railway traffic in YGN center area
- 2. To suburbanize distribution center
- 3. To centralize the cargo from western side of Myanmar

#### **Alignment Image**





rationale
1. MR conducted the feasibility study between
Dagon university and Hmawbi station

- 2. Dry port is planned at Ywathargyi and it will be the hub of logistics
- 3. Yangon city area is heavy congested

### Project Plan (outline)

- -New alignment planned between Dagon university and Hmawbi and the loop line to Ywathargyi (Phase-1)
- Container Freight Station (CFS) also be constructed in North Okkalapa Industrial Zone
- Western half will be developed in phase-2

		- Western hair will be developed in phase-2		
Input	Estimated Cost	Schedule (Phase-1/	Phase-2)	
Eastern half new line const.	US\$ 555mil.	Calendar Year	Start	End
(Ywathargyi ~ Hmawbi sta.		1. Preparation	2020/2022	2020/2022
37km; Phase-1) with		2. Feasibility Study	2020/2022	2022/2024
passenger stations		3. Funding	2022/2025	2023/2025
2 container freight stations	US\$ 16mil.	Arrangement		
Ywathargyi Loop Line	US\$ 47mil.	4. Execution	2023/2026	2025/2028
(6.5km)		5. Commissioning	2026/2029	-
Western half new line const.	US\$ 465mil.			
(Hmawbi ~ Hlaingtharyar sta.				
31km; Phase-2)				
1 container freight sta. and	US\$ 48mil.			
bridge				
Total Estimated Cost	App.			
	US\$ 1,130mil.			
Expected Output	Action Plan			
Railway traffic is detoured from Yangon CBD			-	_
Area				

Necessity of Technical Assistance

Technical assistance is needed.

Remarks

Alignment shall be studied.

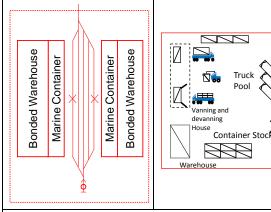
#### Serial No.:

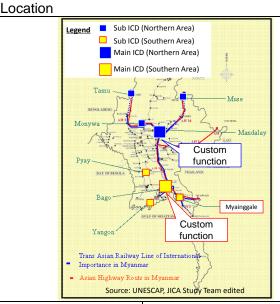
Sub-Sector	Railway
Reference No.	LFP-06
Project Title	ICDs Development proposed by UNESCAP
Executing Agency	MR
Relevant Ministry	MOTC

Outline of the Project

Objectives
To support logistics hub improvement in Myanmar

Image of Main ICD Image of Sub ICD





Rationale

Remarks

- Eight (8) ICDs are proposed to develop as intergovernmental agreement in 2013 by UNESCAP.
- Two (2) ICDs i.e., Ywathargyi in Yangon and Mitinge in Mandalay have been tendered and those are under progress of the development between MR and developers so far.
- The other six (6) ICDs i.e., Bago, Muse, Tamu, Monywa, Pyay and Mawlamyine ICD are not studied for future development.
- Myaingkalay is 40km northern away from Mawlamyine. It connected rail and the way to Myawaddy, the border to Thailand. The one is the candidate for ICD instead of Mawlamyine.
- The function shall be set according to the necessity. The Major ICD and Sub ICD functions are proposed. In detail shall be studied in the FS.

Project Plan (outline)

- The feasibility study includes as follows;
- -To Identify the location of freight station
- -To analyze the cargo demanded by each location
- -To study connectivity with access road
- -To study the requirement functions on each location
- -Train operation plan
- -To estimate preliminary cost
- -To prioritize the ICD development

		aov	Ciopinoni	
Input	Estimated Cost	Schedule		
ICD development	US\$ 20 mil.	Calendar Year	Start	End
	x 6 Locations	1. Preparation	2018	2018
		Feasibility Study	2019	2020
		3. Funding Arrangement	2021	2021
		4. Execution	2022	2023
		5. Commissioning	2024	
Total Estimated Cost	US\$ 120mil.			
Expected Output		Action Plan		
The Freight Hub will be introduced in Myanmar		Feasibility Study shall be started soon.		
Necessity of Technical A	Necessity of Technical Assistance			
Technical assistance is r	needed.			

· · · · · · · · · · · · · · · · · · ·				
Sub-Sector	Railway			
Reference No.	LFP-07			
Project Title	Intermediate Freig	ht Station Improvement	t	
Executing Agency	MR			
Relevant Ministry	MOTC			
	Outline of	f the Project		
Objectives		L	_ocation	
-To connect between axis of Yangon – Mandalay line and regional area  =Image of Intermediate Station Layout= Approx. 500m  Approx. 30m Approx. 30m Approx. Station Layout= Existing Line		— Railway — Existing Railway Ca Intermediate Freig On-going dry port	rgo Movement ht Sta.	
Patianala				
Rationale  -Container freight railway service is planned between Yangon and Mandalay.  -The cargo shall be collected not only Yangon and Mandalay, but also other regions.  -The intermediate station functions as a deliver center to/from sub regions on Yangon-Mandalay		Project Plan (outline) The project includes a -Container yard -Handling line x 2 *Bago station for Pha for Phase-2 developn	se-1, Thazi and	Nay Pyi Taw
-The intermediate station funcenter to/from sub regions or				
<ul> <li>The intermediate station function center to/from sub regions or axis.</li> </ul>	n Yangon-Mandalay	Schedule (Phase-1/P	hase-2)	
-The intermediate station funcenter to/from sub regions or axis.  Input	Yangon-Mandalay  Estimated Cost	Schedule (Phase-1/P	, , , , , , , , , , , , , , , , , , , ,	End
-The intermediate station funcenter to/from sub regions or axis.  Input  Container Freight station	Estimated Cost US\$ 8mil.	Calendar Year	Start	End 2019/2023
-The intermediate station funcenter to/from sub regions or axis.  Input	Yangon-Mandalay  Estimated Cost	Calendar Year  1. Preparation	Start 2019/2023	2019/2023
-The intermediate station funcenter to/from sub regions or axis.  Input  Container Freight station	Estimated Cost US\$ 8mil.	Calendar Year 1. Preparation 2. Feasibility Study	Start 2019/2023 2019/2023	2019/2023 2019/2023
-The intermediate station funcenter to/from sub regions or axis.  Input  Container Freight station	Estimated Cost US\$ 8mil.	Calendar Year 1. Preparation 2. Feasibility Study 3. Funding Arrangement	Start 2019/2023 2019/2023 2020/2024	2019/2023 2019/2023 2020/2024
-The intermediate station funcenter to/from sub regions or axis.  Input  Container Freight station	Estimated Cost US\$ 8mil.	Calendar Year 1. Preparation 2. Feasibility Study 3. Funding Arrangement 4. Execution	Start 2019/2023 2019/2023 2020/2024 2021/2025	2019/2023 2019/2023
-The intermediate station funcenter to/from sub regions or axis. Input Container Freight station development	Estimated Cost US\$ 8mil. x 3 locations	Calendar Year 1. Preparation 2. Feasibility Study 3. Funding Arrangement	Start 2019/2023 2019/2023 2020/2024	2019/2023 2019/2023 2020/2024
-The intermediate station funcenter to/from sub regions or axis.  Input  Container Freight station development  Total Estimated Cost	Estimated Cost US\$ 8mil.	Calendar Year 1. Preparation 2. Feasibility Study 3. Funding Arrangement 4. Execution 5. Commissioning	Start 2019/2023 2019/2023 2020/2024 2021/2025	2019/2023 2019/2023 2020/2024
-The intermediate station funcenter to/from sub regions or axis. Input Container Freight station development  Total Estimated Cost Expected Output	Estimated Cost US\$ 8mil. x 3 locations  US\$ 24mil.	Calendar Year 1. Preparation 2. Feasibility Study 3. Funding Arrangement 4. Execution	Start 2019/2023 2019/2023 2020/2024 2021/2025 2022/2026 will be s	2019/2023 2019/2023 2020/2024 2021/2025 
-The intermediate station funcenter to/from sub regions or axis.  Input  Container Freight station development  Total Estimated Cost	Estimated Cost US\$ 8mil. x 3 locations  US\$ 24mil.	Calendar Year 1. Preparation 2. Feasibility Study 3. Funding Arrangement 4. Execution 5. Commissioning  Action Plan Feasibility Study commencement of	Start 2019/2023 2019/2023 2020/2024 2021/2025 2022/2026 will be s	2019/2023 2019/2023 2020/2024 2021/2025 
-The intermediate station funcenter to/from sub regions or axis.  Input Container Freight station development  Total Estimated Cost Expected Output  Necessity of Technical Assist	Estimated Cost US\$ 8mil. x 3 locations  US\$ 24mil.	Calendar Year 1. Preparation 2. Feasibility Study 3. Funding Arrangement 4. Execution 5. Commissioning  Action Plan Feasibility Study commencement of	Start 2019/2023 2019/2023 2020/2024 2021/2025 2022/2026 will be s	2019/2023 2019/2023 2020/2024 2021/2025 
-The intermediate station funcenter to/from sub regions or axis.  Input  Container Freight station development  Total Estimated Cost  Expected Output	Estimated Cost US\$ 8mil. x 3 locations  US\$ 24mil.	Calendar Year 1. Preparation 2. Feasibility Study 3. Funding Arrangement 4. Execution 5. Commissioning  Action Plan Feasibility Study commencement of	Start 2019/2023 2019/2023 2020/2024 2021/2025 2022/2026 will be s	2019/2023 2019/2023 2020/2024 2021/2025 

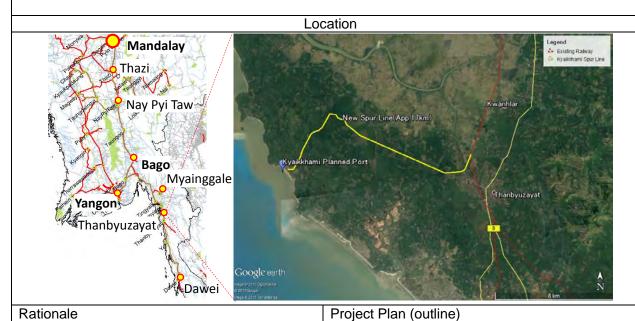
Serial No.:				
Sub-Sector I	Railway			
	LFP-08			
Project Title	Yangon - Pyay Line improvement (Pyay – Hmawbi)			
	MR .	· •		
	MOTC			
		f the Project		
Objectives		Location		
- To utilize Pyay Line for	r freight transportation	Pyay	Pyay Impro	Bago
Rationale		Project Plan (outline)		
-	1			
Input	Estimated Cost	Schedule		
Track improvement	US\$ 308mil.	Calendar Year	Start	End
(220km)		1. Preparation	2025	2025
Freight station	US\$ 6mil.	Feasibility Study	2025	2026
development in Pyay		3. Funding Arrangement	2027	2027
*Handling facilities are not		4. Execution	2028	2030
included.		5. Commissioning	2031	2031
Total Estimated Cost	US\$ 314mil.			
Expected Output	<del>-</del> · · · · · · · · · · · · · · · · ·	Action Plan		1
Pyay line functions not only for passenger but also freight use.				
Trecessity of Technical Ass	Necessity of Technical Assistance			
Remarks				
	ov China fund			
The project also planned by China fund.				

Serial No.:	D. II			
Sub-Sector	Railway			
Reference No.	LFP-09	2.0		
Project Title		Myaingkalay CFS Development Project		
Executing Agency	MR			
Relevant Ministry	MOTC			
		f the Project		
Objectives				
improvement between Myanmar and Thailand	To enhance the transport improvement between Myanmar and Thailand via Myawaddy with			
Rationale  - 35 bogie wagons with ha use as bulk transportation.  - The cargo from Thailand demanded at Myaingkala reloaded into railway as of the cargo from the cargo fro	n by railway by truck is ay and it can be	Project Plan (outline) The project includes; -Myaingkalay contained development	er freight statior	1
transportation	Fatimated Coat	Cabadula		
Input	Estimated Cost	Schedule	Ctowt	
Freight station	US\$ 14mil.	Calendar Year	Start	End
development		1. Preparation	2018	2018
*Handling facilities are not included.		2. Feasibility Study	2018	2018
included.		3. Funding Arrangement	2019	2019
		4. Execution	2020	2020
Total Fatimated Cost	1100 44	5. Commissioning	2021	-
Total Estimated Cost	US\$ 14mil.			
Myaingkalay is used for inter				
between truck and railway from Necessity of Technical Assist				
Remarks	ance			

#### Serial No.:

Sub-Sector	Railway
Reference No.	LFP-10
Project Title	Kyaikkhami Freight Terminal Development and Upgrading of Bridges
Executing Agency	MR
Relevant Ministry	MOTC
_	Outline of the Project
Objectives	

-To utilize the proposed new grain terminal port as the intermodal hub.



rationalo		i rojoot i lair (oaliilo)		
- Kyaikami is the candidate for deep sea port		The project includes:		
in Myanmar.		-Spur line between Kyaikami planned port and		
- The area is not far from		railway.		
it would be better to trans	sport long distance	-Railway yard for bulk cargo development		
by railway.		- Long span bridge (L	=2.3km) impro	vement works
, ,		included	, .	
Input	Estimated Cost	Schedule		
New Spur line (17km)	US\$ 255mil.	Calendar Year	Start	End
Freight Station	US\$ 25mil.	1. Preparation	2021	2021
Development (Oil, Cement		2. Feasibility Study	2021	2021
and gravel terminal,		3. Funding Arrangement	2022	2022
shunting yard included)		4. Execution	2023	2024
Railway Bridge	US\$ 135mil.	5. Commissioning	2025	2025
Rehabilitation				
Total Estimated Cost	US\$ 415 mil.			
Expected Output		Action Plan		
Railway cargo is transported from Kyaikami			-	
port.				
Necessity of Technical Assis	Necessity of Technical Assistance			
Remarks				

Kyaikami port development plan has not fixed yet and the plan shall be determined accordingly.

#### Serial No.:

Sub-Sector	Railway
Reference No.	LFP-11
Project Title	Improvement of Yangon CBD Freight station
Executing Agency	MR
Relevant Ministry	MOTC

#### Outline of the Project

# Objectives Location 1. To introduce containerized railway system Phase-3

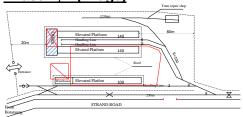
- To utilize existing freight station
- 3. To increase non-railway revenue
- 4. To enhance urban development in Yangon CBD

### MR



Container delivery service will operated by

### Phase-1, 2 (Image)



#### Rationale

- Existing car loading service needs manual handling and takes longer deliver time of freight railway
- 2. Cargo is left at station yard until train departure or forwarder arrival and it worsen cargo condition.
- 3. Freight train operation causes traffic congestion in CBD area, it will be needed to close in long term

#### Project Plan (outline)

<u>Phase-1:</u> Container yard and handling facility preparation with car loading service continued in Yangon and Mandalay freight station (one station each)

<u>Phase-2:</u> Container centralized freight station development in Yangon and Mandalay freight station (one station each)

<u>Phase-3:</u> Stop freight railway service and shrink freight station function to container center operated in Yangon freight station. The saved area will be used for development purpose.

		purpose.		
Input	Estimated Cost	Schedule (Phase-	1/Phase-2/Phas	e-3)
Phase-1	US\$ 4 mil.	Calendar Year	Start	End
Phase-2	US\$ 4 mil.	1. Preparation	2017/2020/	2017/2020/
Phase-3	US\$ 2 mil.		2024	2024
*Handling facilities are not	(per station)	<ol><li>Feasibility Study</li></ol>	2017//	2017//
included.			2024	2025
		3. Funding	2017/2020/	2018/2021/
		Arrangement	2025	2025
		4. Execution	2018/2021/2	2018/2021/
			016	2026
		5.	2018/2021/	2018/2021/
		Commissioning	2026	2026
Total Estimated Cost	US\$ 10 mil.			
Expected Output		Action Plan		
Capacity of container handling <teu year=""></teu>		Feasibility Study shall be started soon.		

(Phase-1) 15,000 (Phase-2) 27,000 Necessity of Technical Assistance

Operation know-haw from JRF

Remarks

Station selection shall be involved MR for phase-1 and phase-2. The timing shall be deeply discussed for freight railway service closure with MR in phase-3.

#### Serial No.:

Sub-Sector	Railway	
Reference No.	LFP-12	
Project Title	Thilawa Bago New Line Development	
Executing Agency MR		
Relevant Ministry MOTC		
Outline of the Project		

Outline of the Project

Objectives

Location

- 1. To detour existing Thanlyin bridge
- 2. To improve track axle load

### **Alienment Image**





### Rationale

- 1. The north south axis demand will be sharply increased and streams into Thilawa Area from China
- 2. Hanthawaddy international airport will be constructed and the industrial zone is planned
- Project Plan (outline)
- -New alignment will be planned crossing Bago river
- -The Length of route is approximately 60km.
- -Possible to avoid resettlement
- -The route mainly along road and river for less land acquisition

		acquisition		
Input	Estimated Cost	Schedule		
-New track (57km)	US\$ 855 mil.	Calendar Year	Start	End
-Bridge preparation	US\$ 20 mil.	1. Preparation	2025	2025
		2. Feasibility Study	2025	2026
		3. Funding Arrangement	2027	2027
		4. Execution	2028	2030
		5. Commissioning	2031	2031
Total Estimated Cost	App. US\$ 875 mil.			
Expected Output		Action Plan		
Carrying capacity	1.6 times (Axle load 12.5			
tons to 20tons)				
Nie seelt, of Technical Assistance				•

#### **Necessity of Technical Assistance**

### Remarks

### **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project - Thilawa Bago New Line Development			
Key Potential Impacts	Mitigation Measures		
Pollution Control	a Coverage of truck corruing soil sand and stone to avoid		
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>		
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Disruption and loss of productive top soil from agricultural fields due to creation of borrow pits and development of detour section</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> <li>Proper disposal of used bentonite slurry</li> </ul>		
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to movement of trains and related facilities</li> </ul>	New technologies incorporated to lower noise and vibration generation with respect to structures and rolling stocks     Use of long welded rails     Appropriate maintenance of locomotives and tracks		
Wastewater generated from rail depot, train washing, heavy cleaning, workshops and maintenance activities	Installation of wastewater treatment system     Reuse of treated water by removal of suspended solids, oil and grease, organic matter and neutralization of pH through waste water treatment plant		
Natural Environment	a Dravisian of adaquate drains along the track		
<ul> <li>Construction Phase &gt;</li> <li>Increased incidence and duration of floods due to obstruction of natural drainage courses by the embankment</li> </ul>	<ul> <li>Provision of adequate drains along the track</li> <li>Augmentation of capacity of existing drainage works</li> <li>Provision of adequate drainage works for smooth passage of runoff to avoid flooding and formation of water pool</li> </ul>		
<ul> <li>Loss of flora due to felling of trees along the ROW</li> </ul>	<ul> <li>Compensation for forest land and trees to be felled in forest area and private land</li> <li>Mixed plantation consisting of flowering shrubs and evergreen ornamental trees</li> </ul>		
Operation Phase > <ul> <li>Impact to local drainage due to formation of railway embankment</li> </ul>	Provision of longitudinal drains of sufficient capacity on both sides of the track to accommodate increased run-off.		
Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water bodies	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents		
<ul> <li>Restriction of the movement of wildlife on either side of the track</li> <li>Collision of wildlife with train</li> </ul>	<ul> <li>Provision of animal underpasses for wildlife near forest areas</li> <li>Provision of fencing, if feasible, along rail way in wildlife</li> </ul>		
Social Environment	habitat concentration areas to avoid collision.		
Social Environment	Compensation and assistance nackage will be planned in		
<pre-construction phase=""> <ul> <li>Loss of livelihood and properties</li> </ul></pre-construction>	Compensation and assistance package will be planned in the Rehabilitation and Resettlement Plan, separately from the EIA.		
Construction Phase >     Disturbance of vehicle traffic and pedestrian passage	Provision of detour with adequate sign board and instruction		
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE		

Serial No					
Sub-Sector		Railway			
Reference No.	LFP-1				
Project Title		Mandalay – Muse New Railway Line Development (Implementation)			
Executing Agency		MR			
Relevant Ministry	MOTO				
		Outline of	the Project		
<ul> <li>To meet with increasing cargo demand on the regional transportation network;</li> <li>To improve and expand the existing infrastructure;</li> <li>To upgrade the efficiency of operation of</li> </ul>			Location Muse-Lasho-Kyaukmae-Pyinoolwin-Mandalay (431.0) Km		
<ul> <li>To upgrade the efficiency of operation of linkage between Muse the border city of Myanmar with China and Mandalay as a central hub of northern Myanmar: and</li> <li>To enhance railway cross-border cargo transport between Myanmar and China, and also to connect Trans Asian Railway (TAR) network.</li> </ul>			Mandalay  Mandal	Ishio THE	
Rationale			Project Plan (outline)		
<ul> <li>It is an important part of Myanmar-China international passageway that provide an access to the sea port for China;</li> <li>It is an important part of western Corridor for Trans-Asia Railway network.</li> <li>It enhances the economic and trade exchange in large volume through the logistics corridor by a rapid freight transport</li> </ul>		To prepare a detailed ar Feasibility Study report.	ia compre	Terisive	
mean. Input		Estimated Cost (US\$ollar)	Schedule		
Feasibility study on the		US\$ 5 billion	Calendar Year	Start	End
development of a railway			1. Preparation	2018	2019
linking Muse and Manda			2. Feasibility Study	2020	2022
with standard gauge and					
ton axle load railway trac					
The estimated cost of th	_				
project is US\$ 5.0 billion					
Total Estimated Cost for	F/S	US\$ 5 billion			
Expected Output			Action Plan		
<ul><li>Lower the transport cost</li><li>Shorter the lead time</li></ul>			Conduct feasibility study		
Necessity of Technical A	ssistar	nce			
Technical and Financial Viability Study					
Remarks	,	•			

Serial No.:						
Sub-Sector	Railw					
Reference No.	LFP-	14				
Project Title	Mand	Mandalay – Tamu New Railway Line Development (Implementation)				n)
Executing Agency	MR	MR .				
Relevant Ministry	MOT	MOTC				
		Outline of	the Proie	ct		
Objectives			Location			
-	reacin	a carao demand		alay-Kalewa-Segy	i-Monywa-Mano	dalay
<ul> <li>To meet with the increasing cargo demand on the regional transportation network;</li> <li>To improve and expand the existing infrastructure;</li> <li>To upgrade the efficiency of operation and connectivity between Tamu the border city of Myanmar with India and Mandalay as a central hub of northern Myanmar; and</li> <li>To enhance railway cross-border cargo transport between Myanmar and India; and</li> <li>To connect Trans Asian Railway (TAR) network.</li> <li>Rationale</li> <li>Since 1990, India continuously strives to strengthen diplomatic, trade and investment relation with Myanmar.</li> <li>Existing railway line linking Pakkokku –</li> </ul>		Project Plan (outline)  To finalize the route alignment of missing rail link between India and Myanmar.  To make a Feasibility Study report.  The study will find a feasible railway route				
Gangaw - Kalay is a			To meet updated demand Forecast.			
border with India do			To meet updated demand Forecast.			
international standa						
Input Input	iu con	Estimated Cost (US\$ollar)	Schedule	е		
Feasibility study on the		US\$ 3.0 mil.	Calenda	r Year	Start	End
development of a railway	V		1. Prepa		2018	2019
linking Tamu and Manda				oility Study	2020	2022
with standard gauge and			Z. I Gasik	onity Study	2020	2022
ton axle load railway trad						
The estimated cost of						
project is US\$ 5.8 billion						
		LICE O O!!				
Total Estimated Cost for	r/5	US\$ 3.0 mil.	A -4:	I =		
Expected Output			Action P			***
Lower the transport cost			Proposed to the Government of India in line with			
Shorter the lead time				EC program to arr		ıcaı
Necessity of Technical A						
Technical and Financial	Viabilit	ty Study				
Remarks						-

Sub-Sector	Railway				
Reference No.	LFP-15				
Project Title	High Speed Railwa	y Linking Between	Yangon and	Hanthawaddy	
•	(Implementation)		J	•	
Executing Agency	MR				
Relevant Ministry	MOTC				
•	Outline o	of the Project			
Objectives		Location			
<ul> <li>To develop a new rail</li> </ul>	way link as a rapid	Alignment Image			
access for the passer	nger movement	6 12.5 25 92 75 100 swing. Nitrace (Data principles	Larred and <sup>18</sup> Hydron.	Miles Z	
between Yangon and			7	75	
	tional Airport of which	(	a		
location is around 77	km away from		Kom	<b>■ FT 106</b>	
Yangon.		tempo	And the state of t	7)dono 512	
		100 Promise PAGGI	NOST AND	Yangon	
		Nay Pyi Taw		WORZ WORT	
		Bago Hanthawaddy	Airport Yangon	Area Detail Map	
		RW00 (Planned)	RC43		
		R 041 A002	13 /	R042	
			RW001	R.042	
				RW010 Thilawa SEZ	
		Yangon-	0 RW013	1022	
		Hanthawaddy High speed Railway	1042	R023 PT001	
		Specu Ruilway	A001 IW0	Yangon Wozi	
		z-	Jan Daniel	7	
		Source: NTMP, JST E	dited		
Rationale		Project Plan (outline)			
<ul> <li>A rapid passenger tra</li> </ul>	nsport mean is	New railway line will be prepared between			
needed to meet with	the passenger	Yangon and Hant			
demand for accessing		international airpo	ort		
•	ort and the capital city				
Yangon.	T =				
Input	Estimated Cost	Schedule			
	(US\$ million)				
Conduct feasibility study	US\$ 1,466 mil.	Calendar Year	Start	End	
between Yangon and		1. Preparation	2018	2019	
Hanthawaddy by High		2. Feasibility Study	2020	2022	
speed railway					
Tatal Fating at 1.10 at	1100 4 400 "				
Total Estimated Cost	US\$ 1,466 mil.	A ation Divi			
Expected Output	. la advica a la di	Action Plan			
A rapid access connecting between the Hanthawaddy International Airport and Yangon		Conduct the feasibility	study		
•	a Airport and Yangon				
City Necessity of Technical Ass	sistanco				
•					
Feasibility study is needed Remarks	J.				
The target year of comple	ting the Hanthawaddy	International Airport is 2	0033		
The larget year or comple	ung une manunawaddy	international Allpoit 18 2	.023.		

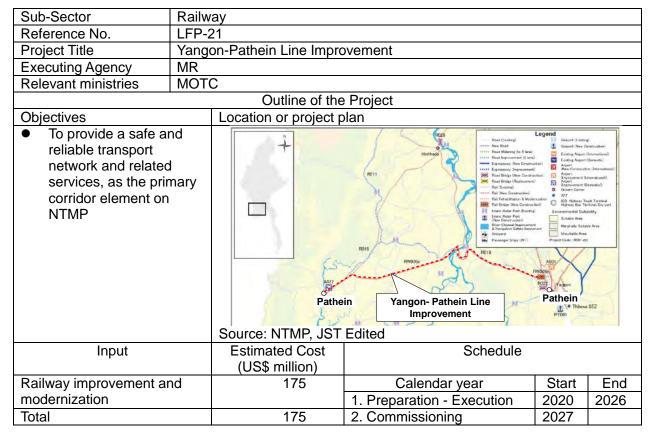
Sub-Sector	Railway			
Reference No.	LFP-16			
Project Title	Yangon-Mandalay Raily	vay Track Improvement		
	MR	vay Track improvement		
Executing Agency Relevant ministries	MOTC			
Relevant ministries		the Ductors		
	Outline of	the Project		
Objectives		Location or project plan	]	
<ul> <li>Existing railway condition is quite poor due to unexperienced track maintenance and old-fashioned railway system.</li> <li>Yangon – Mandalay axis is selected as the priority corridor in NTMP.</li> <li>In this project, existing railway system between Yangon and Mandalay to be modernized in three phases.</li> </ul>		Phase-2,3 Approx. 361km		
Input	Estimated Cost		nedule	
	(US\$ million)	` `	/Phase-2,3)	
Railway improvement	1,283	Calendar year	Start	End
and modernization		1. Preparation		
		2. Feasibility Study	/ 2018	/2018
		3. Funding	/2017	/2018
		Arrangement		
		4. Execution	2018/2019	2020/2024
		5. Commissioning	2021/2025	
Total	1,283			

	•			
Sub-Sector	Railway			
Reference No.	LFP-17			
Project Title	Bago-Mawlamyine Line	Improvement		
ggy	MR			
Relevant ministries	MOTC			
	Outline of	the Project		
Objectives		Location or project plan		
To improve railway infrastructure and enhance railway transport services along the priority corridors (e.g. Yangon – Mandalay Section, Yangon - Hanthawaddy / Bago Section, Bago - Mawlamyine Section, Yangon-Pyay Section) on NTMP		Track improvement: Bago – Mawlamyine  Yangon  Thilawa	Legend:  Existing  Main S	To Thailand via Myawaddy
Input	Estimated Cost (US\$ million)	Schedule		
Railway improvement and	d 268	Calendar year	Start	End
modernization		Preparation - Execution	2017	2026
		2. Commissioning	2027	
Total	268			

Sub-Sector F	Railway				
Reference No.	_FP-18				
Project Title N	Myohaung-N	Myitkyina Railway	y Improvement		
Executing Agency N	ИR				
Relevant ministries N	ИОТС				
		Outline of the F	•		
Objectives			Location or project plan		
<ul> <li>There are several s reach cities near in such as Myitkyina, L and Thanbyuzayat an</li> <li>To aim strategic devinternational inter-moments be considered international partners</li> </ul>	aternational Lashio, Kala ad Dawei in elopment, o dal facilities ed in coo	border areas, ay in the north, the south. development of in these areas ordination with	Mandalay Myohau  Yangon Bago	ement	-
Input	E	estimated Cost	Schedule		
Pailway improvement and	1	(US\$ million) 667	Calandar year	Stort	End
Railway improvement and modernization		007	Calendar year	Start 2016	2030
Total		667	<ol> <li>Preparation - Execution</li> <li>Commissioning</li> </ol>	2016	2030
iotai		007	Z. Commissioning	2031	

Sub-Sector Ra	lway				
Reference No. LF	LFP-19				
Project Title Ba	go-Hanthawaddy Lin	e Improvement			
Executing Agency MF		-			
Relevant ministries MC	TC				
	Outline of	the Project			
Objectives		Location or project plan			
Objectives  To improve railway infrastructure and enhance railway transport services along the priority corridors (e.g. Yangon – Mandalay Section, Yangon - Hanthawaddy / Bago Section, Bago - Mawlamyine Section, Yangon-Pyay Section) on NTMP.		2 3 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8			
Input	Estimated Cost (US\$ million)	Schedule			
Spur line from Bago to	21	Calendar year	Start	End	
Hanthawaddy Int'l Airport (single track)		Preparation - Execution	2020	2023	
Total	21	2. Commissioning	2024		

Sub-Sector	Railway			
Reference No.	LFP-20			
Project Title	Nay Pyi Taw – Bagan L	ine Improvement		
Executing Agency	MR			
Relevant ministries	MOTC			
	Outline of	the Project		
Objectives		Location or project plan		
Special purpose trip aimed.		Nay Pyi Taw - Baga Improvement	Legend  Not Bright Not Controlled State St	ADD Committee bismonium of the committee
Input	Estimated Cost (US\$ million)	Schedule		
Railway improvement an	, ,	Calendar year	Start	End
modernization	400	Preparation - Execution	2024	2030
		2. Commissioning	2031	2000
Total	406	9		



Sub-Sector	Railw	ay			
Reference No.	LFP-2	22			
Project Title	Myoh	aung-Monywa Line In	nprovement		
Executing Agency	MR				
Relevant ministries	MOT				
		Outline of the			
Objectives		Location or project p			
To improve the connectivity of Mandalay- Tamu co on NTMP	rridor	Strong Marie	Andrea Service	Technical Services (Services)  Technical Services (Services)	
la must		1-			
Input		Estimated Cost (US\$ million)	Schedule		
Railway improvement ar	nd	94	Calendar year	Start	End
modernization			1. Preparation - Execution	2024	2030
Total		94	2. Commissioning	2031	

Sub-Sector	Railway				
Reference No.	LFP-23				
Project Title	Pyawbwe-	-Shwenyaung Line	Improvement		
Executing Agency	MR				
Relevant ministries	MOTC				
		Outline of the F	Project		
Objectives		Location or proje	ct plan		
<ul> <li>To provide high-sp high-capacity railwa and service, c major ports and airp</li> <li>Source: NTMP, J</li> </ul>	y network onnecting orts.		Pyawbwe-Shwenyaung Line Improvement  Pyawbwe-Shwenyaung Line Improvement  Nay Pyi Taw  Nay Pyi T	Add Technical Control of Control	
Input		Estimated Cost	Schedule		
		(US\$ million)			
Railway improvement an	ıd	282	Calendar year	Start	End
modernization			Preparation - Execution	2024	2030
Total		282	2. Commissioning	2031	

Sub-Sector	Railway			
Reference No.	LFP-24			
Project Title	New Railway Bridge Cro	ossing the Hlaing River		
Executing Agency	MR			
Relevant ministries	MOTC			
	Outline of	the Project		
Objectives		Location or project plan		
	nectivity between west .g., Hlaingtharyar and n.	New Railway Bridge  Source: NTMP, JST Edited	gon Area De	Yangon  Yangon  Thilawa SEZ  O23 PT001  angon
Input	Estimated Cost	Schedule		
Dailean Daidea	(US\$ million)	Calaradania	04	F., .1
Railway Bridge	21	Calendar year	Start	End
Construction		1. Preparation - Execution	2020	2026
T. ( . )	0.4	2. Commissioning	2027	
Total	21			

Sub-Sector	Waterborne Transport					
Reference No.	LWP-01					
Project Title	Yangon Port (Thilawa Terminal) Development					
Executing Agency	Myanma Port Authority					
Relevant Ministry	MOTC					
,		f the Project				
Objectives		Location				
Provide necessary of the second	container handling	Jillin 40m	*			
	re demand of Myanmar	(Artry) (Actry)				
project.	Oi IIIIIawa i IIase II					
project:		Phase II Pinne   Pinne				
		Plot 26 Plot 25 Plot 24	Plot 23			
		200				
		(Yant) (Yant) (Yant)				
		Yangon Port – Thilawa Conta	ainer Termin	al Area		
Rationale		Project Plan (outline)		ai Aita		
	ne container handling	Implement the Phase III	olan of Thile	wa		
	area will reach its limit	container terminal develo				
by 2025 at the lates		domainer terminar develo	priioni proje	JOI.		
4,500,000						
4,000,000						
3,500,000	1					
3,500,000	Conversion from					
- E -	GC to CNT Terminals					
2,500,000	New Terminal Capacity (TEUs/year)					
1,500,000	Existing terminal Capacity (TEUs/y)					
1,000,000	— Demand Forecast (High Case,					
500,000	TEUs/y)  — Demand Forecast (Low Case,					
TEUs/ypar	TEUs/y)					
2012 2013 2014 2015 2016 2017 2018 2019 2020 2						
Input	Estimated	Schedule				
	Cost (US\$ million)					
1. Terminal (L:400 m, E		Calendar Year	Start	End		
m) (4 berths) with	330	1. Preparation	2019	2019		
container yard,		2. Feasibility Study	2019	2019		
Jonanion July		3. Funding Arrangement	2022	2021		
		4. Execution	2023	2026		
		5. Commissioning	2026			
Total Estimated Cost	330					
Result of Evaluation			1			
Expected Output		Action Plan				
1. Meet the needs of co	ontainer handling	1. Preparation of the feasib	lity study			
capacity requiremen	t of Myanmar		- •			
Necessity of Technical A						
1. Conduct a feasibility	study					
Remarks	<u> </u>					

## **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project - Improvement of Yangon River Water Transport		
Key Potential Impacts	Mitigation Measures	
Pollution Control	•	
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> </ul>	
construction equipment and vehicular traffic	Use of low emission construction equipment, vehicles and generator sets	
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>	
Wastewater from construction activities with suspended impurities     Wastewater disposal from the workers camp and sludge generated from construction sites     Losing of top soil and vegetation cover due to excavation and	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> </ul>	
back filling  • Deterioration of soil quality	<ul> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>	
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>	
Natural Environment		
<ul> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna due to the accidental oil spill into water bodies</li> <li>Operation Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water bodies</li> </ul>	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents	
Social Environment		
<construction phase=""> <ul><li>Disturbance of vehicle traffic</li></ul></construction>	Provision of detour with adequate sign board and instruction	
Disturbance to water way users	Prior announcement or notice of construction activities and schedule for water way	
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE	

	i ioject			
Sub-Sector	b-Sector Waterborne Transport			
Reference No.	LWP-02			
Project Title	Yangon Port (Domestic Port) Improvement			
Executing Agency	Myanma Port Authority (MPA)			
Relevant Ministry MOTC				
	Outline of	the Project		
Objectives		Location		
<ol> <li>To redevelop the narro and Kyeemyindan Are</li> </ol>		1. Lamadaw Area 2.		nyindang
<ol> <li>To utilize a part of the area adjacent to the waterfront for the urban development of Yangon.</li> <li>To increase the cargo handling productivity of coastal shipping and inland water</li> </ol>				
transport Rationale		Project Plan (outline)		
Both the Lamadaw Are	ea and	1. Lamadaw Area		
Kyeemyindang Area a adjacent to the city are 2. There is no space in the city are t	re narrow and ea.			
city area suitable for the existing port facilities.				
3. There is a need to improductivity by the intr	oduction of	as transco-	Google E	arth
mechanical handling t		2. Kyeemyindang Area		
increase in the cargo handling volume.  4. It is possible to utilize the Lamadaw area, which is close to the city area and faces the valuable water area for the future city development.		Waterfront Park Constal Shipping Term of (220m)	Google Ea	
Input	Estimated	Schedule		
	Cost (US\$ million)			
Terminal;		Calendar Year	Start	End
<ol> <li>Inland water transport</li> </ol>		1. Preparation	2018	2018
(L: 500m, B:100m) (7bert		2. Feasibility Study	2018	2019
2. Coastal shipping(L:850		3. Funding Arrangement	2019	2019
B:100m) (12 berths)	58.7	4. Execution	2020	2025
		5. Commissioning	2026	
Total Estimated Cost	93.2			
Result of Evaluation				
Expected Output		Action Plan		
<ol> <li>To increase the cargo handling productivity</li> <li>To improve the environment of Yangon</li> </ol>		Conduct of a feasibility st	udy	
Necessity of Technical Ass				
<ol> <li>Conduct of a feasibility</li> </ol>	study			
Remarks				

### **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project - Ya	ngon Port (Domestic Port) Improvement
Key Potential Impacts	Mitigation Measures
Pollution Control	
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>
Wastewater generated from vessel and office building	Installation of domestic wastewater treatment system
Natural Environment	
<ul> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna due to the accidental oil spill into water bodies</li> <li>Operation Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water bodies</li> </ul>	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents
Social Environment	
<construction phase=""> • Disturbance of vehicle traffic</construction>	Provision of detour with adequate sign board and instruction
Disturbance to water way users	Prior announcement or notice of construction activities and schedule for water way
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE

Sub-Sector	Waterborne Transport	
Reference No.	LWP-03	
Project Title	Sittwe Port Improvement	
Executing Agency	Myanma Port Authority (MPA)	
Relevant Ministry	MOTC	
Outline of the Dunion		

Outline of the Project

#### Objectives

- To develop the port with the transit function of general cargo for the population of nearby villages where road network is still poor.
- 2. To establish an international multi-modal transport route connecting Myanmar with Bangladesh and India.
- 3. To develop the port as a core of border trade between Myanmar and Bangladesh and India.

#### Location



#### Rationale

- Sittwe Port is located near the borders of Bangladesh and India and utilized as a part of a waterborne detour route of road transport at the east of those countries where road development is weak.
- This port plays an important role as a distribution base to villages facing the coastal areas of Myanmar and the Kaladan River where roads are not well developed due to the existence of many tributaries.
- 3. Sittwe Port acts as a transit port of general cargo (and container cargo in future).

- Project Plan (outline)
  - . Development of a multi-purpose terminal (D;-10m, L; 400m, B; 100m) for container and general cargo ships.
  - Development of a piled pier with pontoon section (L; 210m) at Minga Creek.





			210	ARTICLE STREET, STREET
Input	Estimated Cost (US\$ million)	Schedule		
1. Reclamation (L;400m,	6.0	Calendar Year	Start	End
B;200m)	0.0	1. Preparation	2018	2018
D,200111)		i. Fieparalion	2010	2010
2. Terminal	16.4	2. Feasibility Study	2019	2020
3. Piled pier (L;140m,B;30m)	10.1	3. Funding Arrangement	2021	2021
4. Pontoon (L;70m,B;10m)	1.3	4. Execution	2022	2024
5. Access road (L;240m)	1.3	5. Commissioning	2025	
Total Estimated Cost	35.1			
Result of Evaluation				
Expected Output		Action Plan		
Transit function for international multi-modal		1. Conduct of a feasibility st	udy	
transport route				

Necessity of Technical Assistance

1. Conduct of a feasibility study

### **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project – Kaladan Multi-Modal Transit Transport Project		
Key Potential Impacts	Mitigation Measures	
Pollution Control		
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust,</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water</li> </ul>	
especially during dry season, and gaseous emissions from construction equipment and vehicular traffic	sprinkling on unpaved haul roads and vulnerable areas of the construction sites  • Use of low emission construction equipment, vehicles and generator sets	
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>	
Wastewater from construction activities with suspended impurities     Wastewater disposal from the workers camp and sludge	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site</li> </ul>	
<ul> <li>generated from construction sites</li> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>to prevent hygiene problems due to water contamination</li> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>	
Operation Phase > <ul> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>	
Natural Environment		
<ul> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna due to the accidental oil spill into water bodies</li> <li>Operation Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water bodies</li> </ul>	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents	
Social Environment		
<construction phase=""> <ul><li>Disturbance of vehicle traffic</li></ul></construction>	Provision of detour with adequate sign board and instruction	
Disturbance to water way users	Prior announcement or notice of construction activities and schedule for water way	
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE	

Sub-Sector	Waterborne Transport			
Reference No.	LWP-04			
Project Title	Dawei Port Development (Implementation)			
Executing Agency	Myanma Port Authority (MPA)			
Relevant Ministry	MOTC			
o. Relevant Ministry		f the Project		
Objectives	Oddino of	Location		
4. To develop the area as	a core of SE7 and	NOTIFIED TO STATE OF THE PROPERTY OF THE PROPE		
<ul> <li>industrial development (light industry, heavy and chemical industry and energy).</li> <li>5. To develop the area as a logistic gate to the west (India, Africa and Middle East) from GMS and AEC zone.</li> <li>6. To develop the area as a deep-sea gateway port at the southern part of Myanmar.</li> </ul>		M. Y. A. M.	FHUNMRON DIECEPONT M. A. R.	
Rationale		THE RESIDENCE OF THE PARTY OF T		
	000 ha is secured and	Project Plan (outline)  1. Initial Layout Plan		
<ol> <li>A wide land area of 20,000 ha is secured and a part of road, reservoir, residential area and land filling is completed.</li> <li>A deep-water area is available for the port development.</li> <li>This area has the potential to be a core of Myanmar's economic development.</li> <li>This area is designated as the west side gate of the south coastal corridor of GMS.</li> </ol>		Further detailed study is reformulation of a layout	needed for t	he
Input	Estimated	Schedule		
	Cost			
3. breakwater	(US\$ million)	Calendar Year	Start	End
4. pier		1. Preparation	Staff	⊏⊓u
5. dredging			2021	2022
6. revetment		2. Feasibility Study	2021	2022
7. building and equipmen	t	3. Funding Arrangement	2023	
7. Dunung and equipmen	•	Execution     Commissioning	2025	2030
Total Estimated Cost		J. Commissioning	2031	
Result of Evaluation	I		<u> </u>	
Expected Output		Action Plan		
Economic development and an efficiency		Conduct of a feasibility stu	ıdv	
increase in logistics in Myanmar and GMS		1. Conduct of a leasibility sti	uuy	
Necessity of Technical As				
Conduct of a detailed		<u> </u>		
The Data Collection Sur	<u> </u>	Planning in Tanintharyi Reg	ion and Da	awei SF7
(DPTD)	, ioi Dovolopinioni	a.iiiiig iii laiiiillialyi 110g	.c.i and De	
is on-going.				

## **Expected Key Potential Impact and Mitigation Measures for Target Project**

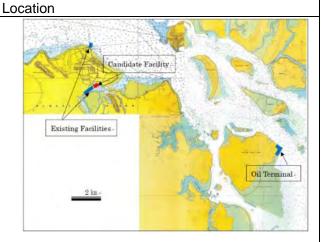
Project - Dawei SEZ Port Development (Implementation)		
Key Potential Impacts	Mitigation Measures	
Pollution Control		
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>	
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>	
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>	
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>	
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>	
Wastewater generated from vessel and office building	Installation of domestic wastewater treatment system	
Natural Environment		
<ul> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna due to the accidental oil spill into water bodies</li> <li>Operation Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water</li> </ul>	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents	
bodies Social Environment		
<pre><construction phase=""> • Disturbance of vehicle traffic</construction></pre>	Provision of detour with adequate sign board and instruction	
Disturbance to water way users	Prior announcement or notice of construction activities and schedule for water way	
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE	

Sub-Sector	Waterborne Transport	
Reference No.	LWP-05	
Project Title	Kyaukpyu Port Improvement	
Executing Agency	Myanma Port Authority (MPA)	
Relevant Ministry	MOTC	

#### Outline of the Project

### Objectives

- To develop the port as a component of the coastal shipping transport network.
- 2. To achieve transport efficiency of goods necessary for the population in the area.



#### Rationale

- The port is very important as an integral part of the coastal shipping network to transport necessities and other cargoes to surrounding areas.
- There is no rationale for developing the port as a deep-sea port, which handles cargo for the hinterland such as Nay Pyi Taw due to the long distance (about 500km) from the port.
- There is potential to develop a deep-sea port for petrochemical or gas related industrial development by utilizing the available water depth, which exceeds 20m.

Project Plan (outline)

 To develop a piled pier with pontoon section (d;-5m, L;210m,B;30m) at the east side of the existing port area.



avaliable water deptir, wir	ich exceeds zon.			
Input	Estimated Cost	Schedule		
	(US\$ million)			
Piled pier		Calendar Year	Start	End
(L:140m, B:30m30m)	10.1	1. Preparation	2018	2018
2. Pontoon (L:70m, B:10m)	1.3	2. Feasibility Study	2019	2019
3. Access road (L:350m)	9.0	3. Funding Arrangement	2020	2020
,		4. Execution	2021	2023
		5. Commissioning	2024	
Total Estimated Cost	20.4			
Result of Evaluation	•			<u> </u>

Result of Evaluation	
Expected Output	Action Plan
Increase of cargo handling productivity and capacity	Conduct of a feasibility study

### Necessity of Technical Assistance

1. Conduct of a feasibility study

### **Expected Key Potential Impact and Mitigation Measures for Target Project**

Proj	ect - Kyaukpyu Port Improvement
Key Potential Impacts	Mitigation Measures
Pollution Control	
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>
Wastewater generated from vessel and office building	Installation of domestic wastewater treatment system
Natural Environment	
<ul> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna due to the accidental oil spill into water bodies</li> <li>Operation Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water bodies</li> </ul>	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents
Social Environment	
Construction Phase > <ul> <li>Disturbance of vehicle traffic</li> </ul>	Provision of detour with adequate sign board and instruction
Disturbance to water way users	Prior announcement or notice of construction activities and schedule for water way
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE

Sub-Sector	Waterborne Transport			
Reference No.	LWP-06			
Project Title	Thandwe Port Improvement			
Executing Agency	Myanma Port Authority (MPA)			
Relevant Ministry	MOTC			

### Outline of the Project

### Objectives

1. Currently, there is no port facility for handling general cargo including the daily necessities required by the population of Thandwe. Consequently, the transport of general cargo depends on truck transport. In order to enhance transportation efficiency, it is recommended to develop this port as a domestic port to handle general cargo.

#### Location



#### Rationale

- There is no general cargo berth
- 2. There is a calm sea area available
- 3. Cargo transport demand for the population of about fourteen thousand is substantial.

Project Plan (outline)

 To develop a reclamation terminal (d;-5m, L; 60m, B; 15m) for coastal shipping vessels at a calm sea area located at the north side of the bay. A breakwater-cum-access bridge of about 250m, which connects the terminal and the land, will be constructed.



	T				
Input	Estimated Cost	Schedule			
	(US\$ million)				
Breakwater-cum-acces	(000	Calendar Year	Start	End	
s road (L:250m),	3.5	1. Preparation	2017	2017	
2. Reclamation	1.5	2. Feasibility Study	2018	2018	
(L:60m, B:15m)		3. Funding Arrangement	2019	2019	
3. Quay wall (L:60m,	0.9	4. Execution	2020	2022	
B:15m)		5. Commissioning	2023		
Total Estimated Cost	5.9				
Expected Output		Action Plan			
Realization of transport efficient	ency	Conduct of a feasibility study			
1. Necessity of Technical As	sistance				
Conduct of a feasibility study					

Remarks:

# **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project - Thandwe Port Improvement				
Key Potential Impacts Mitigation Measures				
Pollution Control	•			
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>			
<ul> <li>Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries</li> </ul>	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>			
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>			
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>			
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>			
<ul> <li>Wastewater generated from vessel and office building</li> </ul>	Installation of domestic wastewater treatment system			
Natural Environment				
Construction Phase > <ul> <li>Effect on aquatic fauna due to the accidental oil spill into water bodies</li> </ul>	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents			
<ul> <li>Operation Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water bodies</li> </ul>				
Social Environment				
<construction phase=""> • Disturbance of vehicle traffic</construction>	Provision of detour with adequate sign board and instruction			
Disturbance to water way users	<ul> <li>Prior announcement or notice of construction activities and schedule for water way</li> </ul>			
Possible to occur the accidents	<ul> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> </ul>			

Sub-Sector	Waterborne Transport		
Reference No.	LWP-07		
Project Title	Pathein Port Improvement		
Executing Agency	Myanma Port Authority (MPA)		
Relevant Ministry	MOTC		
O discontinuity Desired			

## Outline of the Project

# Objectives

- 1. To maintain the function of coastal shipping and inland water port.
- 2. To increase cargo handling productivity and alleviate traffic congestion on roads around the port.

3. To secure the navigation safety and increase productivity.









#### Rationale

- 1. To provide efficient transport means for the large volume and long haul transport needs of cargoes such as cement and rice.
- 2. The navigation safety and productivity increase can be expected.

# Project Plan (outline)

- To extend the existing piled pier by 140m to increase cargo-handling capacity.
- 2. To provide cargo handling area (810mx15m).



		(810mx15m).		
Input	Estimated Cost	Schedule		
·	(US\$ million)			
Cargo handling yard		Calendar Year	Start	End
(L:810m, B:15m)	31.6	1. Preparation	2018	2018
2. Piled pier (L:140m, B:20m)	6.1	2. Feasibility Study	2019	2019
3. Access road		3. Funding Arrangement	2020	2020
(L:70m, B:10m)	1.9	4. Execution	2021	2023
4. Channel Dredging & Nav.	34.0	5. Commissioning	2024	
aid		9		
Total Estimated Cost	73.6			
Result of Evaluation				
Expected Output		Action Plan		
Increase of cargo handling productivity and		Conduct of a feasibility study		
capacity	•		•	
2. Alleviation of traffic congesti	on on roads near			

# Necessity of Technical Assistance

1. Conduct of a feasibility study

# Remarks:

the port.

# **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project - Pathein Port				
Key Potential Impacts	Mitigation Measures			
Pollution Control				
Construction Phase > <ul> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>			
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>			
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>			
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>			
Operation Phase > <ul> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>			
Natural Environment				
<ul> <li>Construction Phase &gt;         <ul> <li>Effect on aquatic fauna due to the accidental oil spill into water bodies</li> <li>Operation Phase &gt;             <ul> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic</li> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna in case of accidenta</li></ul></li></ul></li></ul>	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents			
chemical release into water bodies				
Social Environment	<u> </u>			
<construction phase="">  • Disturbance of vehicle traffic</construction>	Provision of detour with adequate sign board and instruction			
Disturbance to water way users	Prior announcement or notice of construction activities and schedule for water way			
Possible to occur the accidents	<ul> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> </ul>			

Reference No.	LWP-08
Project Title	Mawlamyine Port Improvement
Executing Agency	Myanma Port Authority (MPA)
Relevant Ministry	MOTC

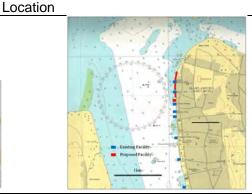
# Outline of the Project

#### Objectives

To increase cargo handling productivity and capacity

2. To alleviate traffic congestion on roads around the port.





#### Rationale

- The existing jetties extend at the narrow space beside a coastal road. It results in poor cargo handling productivity and traffic congestion on the coastal road.
- Future increasing cargo shall be handled at jetties, which are expected to be constructed at the opposite island.
- Transport of daily necessities shall be handled at existing facilities, which is to be improved.

# Project Plan (outline)

- Construct the cargo handling yard (500mx15m)
- 2. Construct the piled pier (140mx30m) and pontoon jetty (70mx10m) which can employ mechanical handling



			HE STATE OF THE ST	The same of
Input	Estimated	Schedule		
	Cost			
	(US\$ million)			
Cargo handling yard		Calendar Year	Start	End
(L:500m, B:15m)	19.5	1. Preparation	2018	2018
2. Piled pier (L:140m, B:30m)	10.1	2. Feasibility Study	2019	2019
3. Pontoon(L:70m, B:10m)	1.3	3. Funding Arrangement	2020	2020
4. Channel Dredging & Nav.	34.0	4. Execution	2021	2023
Aid		5. Commissioning	2024	
Total Estimated Cost	64.9			
Expected Output		Action Plan		
1. Increase of cargo handling p	roductivity and	1. Conduct of a feasibility st	udy	
capacity				
Alleviation of traffic congestion on roads				
around the port.				
Necessity of Technical Assistance	ce	·		

1. Conduct of a feasibility study

# **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project - Mawlamyine Port Improvement			
Key Potential Impacts	Mitigation Measures		
Pollution Control			
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
<ul> <li>Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries</li> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the</li> </ul>	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> </ul>		
workers camp and sludge generated from construction sites	Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination		
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>		
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>		
Wastewater generated from vessel and office building	Installation of domestic wastewater treatment system		
Natural Environment			
<ul> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna due to the accidental oil spill into water bodies</li> <li>Operation Phase &gt;</li> </ul>	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents		
Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water bodies			
Social Environment			
<construction phase=""> • Disturbance of vehicle traffic</construction>	Provision of detour with adequate sign board and instruction		
Disturbance to water way users	Prior announcement or notice of construction activities and schedule for water way		
Possible to occur the accidents	<ul> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> </ul>		

				1	
Sub-Sector					
Reference No.	LWP-09				
Project Title		Kyaikami International Grain Terminal / Port Development			
Executing Agency	Myanma Port Authority (MPA) MOTC				
Relevant Ministry		of the Drainet			
Objectives	Outline	of the Project Location			
•	ort ovport cargoos	Location			
To enhance and support of rice and bean.	on expon cargoes			rt	
2. To function as a subst	itute for Yangon			Loca ai Po	
Port.	itate for rangem		11/1/17/	idate	
3. To develop as a west	side gateway to the	Laboratory Control		Cand	
East-West Economic		and a second		1	
4. To handle regional car	goes of the Bago,			June 1	
Mon and Kayin States		Mawl Port F			
		I			
Rationale		Project Plan (outline)			
<ol> <li>This area is the neares</li> </ol>		~~	4		
section from Yangon a		Shore Line	7		
area of rice and beans					
2. This area has a geogra		Future Expansion Area	3		
in terms of its distance		Caus	eway		
the available water dep		XX	1 × 8		
3. This port can substitute	e for Yangon Port.	Turning Basin	7		
		100	> 5		
		The Death	N		
		Break Water			
		-12	m		
		0 500 1000	W. C.		
		U 300 1000	UNIT: m		
Input	Estimated Cost	Schedule			
	(US\$ million)				
Breakwater, Reclamation,	363	Calendar Year	Start	End	
Quay wall, Access road,		1. Preparation	2017	2017	
Utility, Building, Equipment		2. Feasibility Study	2018	2018	
		3. Funding Arrangement	2019	2019	
		4. Execution	2020	2023	
		5. Commissioning	2024		
Total Estimated Cost	363				
Expected Output		Action Plan			
Cover the shortage of		Prepare for conducting a	a feasibility s	study	
cargo handling capaci	ty at				
Yangon Port including					
alleviation of the draug	ynt				
limit					
2 Noococity of Tooksiss	Assistance				
2. Necessity of Technica					
Conduct of a feasibility	study				
Remarks					

# **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project - Kyaikami Port Improvement			
Key Potential Impacts	Mitigation Measures		
Pollution Control			
<ul> <li>Construction Phase &gt;</li> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>		
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>		
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>		
Wastewater generated from vessel and office building	Installation of domestic wastewater treatment system		
Natural Environment			
<ul> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna due to the accidental oil spill into water bodies</li> <li>Operation Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water</li> </ul>	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents		
bodies			
<pre>Social Environment <construction phase=""> • Disturbance of vehicle traffic</construction></pre>	Provision of detour with adequate sign board and instruction		
Disturbance to water way users	Prior announcement or notice of construction activities and schedule for water way		
Possible to occur the accidents	Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE		

Sub-Sector	Waterborne Transport		
Reference No.	LWP-10		
Project Title	Dawei Local Port Improvement		
Executing Agency	Myanma Port Authority (MPA)		
Relevant Ministry	MOTC		
Outline of the Duningt			

## Outline of the Project

# Objectives

- To increase cargo handling productivity by constructing facilities which allow the use of cargo handling equipment
- 2. To Increase cargo handling productivity by constructing cargo handling yards.
- 3. To secure the navigation safety and increase productivity.





### Rationale

- It is necessary to widen the narrow cargo-handling yard to increase handling productivity.
- 2. It is necessary to alleviate traffic congestion on roads around the port.

# Project Plan (outline)

- 1. Construct cargo-handling yard (430mx15m).
- Construct the piled pier (140mx30m) and Pontoon Jetty (70mx10m) to employ cargo-handling equipment.



			A CONTRACTOR OF STREET	
Input	Estimated Cost (US\$ million)	Schedule		
1. Cargo handling yard (L;430m,	(000 1111111011)	Calendar Year	Start	End
B;15m)	16.8	1. Preparation	2018	2018
2. Piled pier (L;140m, B;30m),	10.1	2. Feasibility Study	2019	2019
3. Pontoon (L;70m, B;10m),	1.3	3. Funding	2020	2020
4. Channel Dredging & Nav. aid	34.0	4. Execution	2021	2023
		5. Commissioning	2024	
Total Estimated Cost	62.2	_		
Result of Evaluation				
Expected Output		Action Plan		
Increase of cargo handling productivity and capacity.		1. Conduct of a feasibility	study	
2. Alleviation of traffic congestion				
the port.				
Necessity of Technical Assistance				
Conduct of a feasibility study				
Remarks:				

Sub-Sector	Waterborne Transport				
Reference No.	LWP-11				
Project Title	Myeik Port Improvement				
Executing Agency	Myanma Port Authority (MPA)				
Relevant Ministry	MOTC				
	Outline of th	ne Project			
Objectives		Location			
To develop new access channels which will contribute to secure navigation safety and to increase the cargo handling capacity of the port?		Proposed Channel Dredging  Existing Jetry :  2 June  1 S			
Pationalo		Project Plan (outline)	aux		
<ol> <li>Myeik Port is a domestic port, which is indispensable for handling fish and fish products as well as for the commuting of peoples from surrounding islands.</li> <li>This port plays an important role for international trade between Myanmar and Thailand.</li> <li>This situation is likely to continue in future and additional private jetties are expected to be constructed; it will not be necessary to develop new large-scale port facilities.</li> <li>The most important issue for this port is to secure deep channels so that ships can access the port anytime without waiting for high tide.</li> </ol>		To develop an access of about 3km and dept conduct the maintenar	th of 5m) ar	nd	
Input	Estimated Cost (US\$ million)	Schedule			
Channel dredging (L;	, , , , , , , , , , , , , , , , , , , ,	Calendar Year	Start	End	
about 3km, d;5m) & I		1. Preparation	2018	2018	
aid		Feasibility Study	2019	2019	
		3. Funding Arrangement	2020	2020	
		4. Execution	2021	2022	
		5. Commissioning	2023		
TO LEGIS OF LOCAL		2. 209			
Total Estimated Cost	20.2				
Result of Evaluation					
Formandad O. C. C.		Astis a Disa			
Expected Output		Action Plan			
Increase of cargo hall		1. Conduct of a feasibility s	stuay		
Necessity of Technical As					
Conduct of a feasibili	ty study				
Remarks:	Remarks:				

# **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project - Myeik Port Improvement			
Key Potential Impacts	Mitigation Measures		
Pollution Control			
Construction Phase > <ul> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>		
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>		
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>		
Wastewater generated from vessel and office building	Installation of domestic wastewater treatment system		
Natural Environment			
Construction Phase >     Effect on aquatic fauna due to the accidental oil spill into water bodies     Operation Phase >     Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water bodies	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents		
Social Environment			
<pre><construction phase=""> • Disturbance of vehicle traffic</construction></pre>	Provision of detour with adequate sign board and instruction		
Disturbance to water way users	Prior announcement or notice of construction activities and schedule for water way		
Possible to occur the accidents	<ul> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> </ul>		

Sub-Sector	Waterborne Transport	
Reference No.	LWP-12	
Project Title	Kawthaung Port Improvement	
Executing Agency	Myanma Port Authority (MPA)	
Relevant Ministry	MOTC	
Outline of the Project		

Objectives

1 To strengthen the function of the port as a

 To strengthen the function of the port as a transit port for handling international trade cargo between Myanmar and Thailand.



Rationale Project Plan (outline)

 To contribute to the enhancement of international trade between Myanmar and Thailand. 1. To extend the existing piled pier by 140m with a width of 20m.



Input	Estimated Cost (US\$ million)	Schedule		
1. Piled pier (L:140m,	6.1	Calendar Year	Start	End
B:10m)	3.4	1. Preparation	2018	2018
2. Access Bridge (L:160m)		2. Feasibility Study	2019	2019
		3. Funding	2020	2020
		Arrangement		
		4. Execution	2021	2022
		5. Commissioning	2023	
Total Estimated Cost	9.5			
Result of Evaluation				
1 Strengthening of the transit function of the port		1 Conduct of a feasibili	tv studv	•

Strengthening of the transit function of the port | 1. Conduct of a feasibility study
 Necessity of Technical Assistance

1. Conduct of a feasibility study

# **Expected Key Potential Impact and Mitigation Measures for Target Project**

Project - Kawthoung Port Improvement			
Key Potential Impacts	Mitigation Measures		
Pollution Control	_		
Construction Phase > <ul> <li>Deterioration of air quality due to particulate matter such as dust, especially during dry season, and gaseous emissions from construction equipment and vehicular traffic</li> </ul>	<ul> <li>Coverage of truck carrying soil, sand and stone to avoid spilling</li> <li>Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads and vulnerable areas of the construction sites</li> <li>Use of low emission construction equipment, vehicles and generator sets</li> </ul>		
Noise and vibration due to movement of vehicles, and operation of light and heavy construction machineries	<ul> <li>Use of low noise construction equipment</li> <li>Construction activities carried out near residential area preferably in daytime</li> <li>Provision of protective gears such as ear plugs etc. to construction personnel exposed to high noise levels</li> </ul>		
<ul> <li>Wastewater from construction activities with suspended impurities</li> <li>Wastewater disposal from the workers camp and sludge generated from construction sites</li> </ul>	<ul> <li>Provision of silt fencing near water bodies</li> <li>Control of quality of construction wastewater emanating from the construction site through suitable drainage system with sediment traps</li> <li>Provision of proper sanitation facilities at the construction site to prevent hygiene problems due to water contamination</li> </ul>		
<ul> <li>Losing of top soil and vegetation cover due to excavation and back filling</li> <li>Deterioration of soil quality</li> </ul>	<ul> <li>Adequate measures like adequate drainage, embankment consolidation and slope stabilization</li> <li>Conservation and restoration of top soils of the construction sites</li> <li>Avoidance of accidental spills</li> </ul>		
<ul> <li>Operation Phase &gt;</li> <li>Noise and vibration due to embarkation and disembarkation of vessels as well as cargo and container handling services</li> </ul>	<ul> <li>Provision on the schedules for embarkation and disembarkation of vessels</li> <li>New technologies incorporated to lower noise and vibration generation with respect to the machine for cargo and container handling</li> </ul>		
Wastewater generated from vessel and office building	Installation of domestic wastewater treatment system		
Natural Environment			
<ul> <li>Construction Phase &gt;</li> <li>Effect on aquatic fauna due to the accidental oil spill into water bodies</li> <li>Operation Phase &gt;</li> <li>Effect on aquatic fauna in case of accidental oil spill and toxic chemical release into water bodies</li> </ul>	Contingent actions for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents		
Social Environment			
<construction phase=""> <ul> <li>Disturbance of vehicle traffic</li> </ul></construction>	Provision of detour with adequate sign board and instruction		
Disturbance to water way users	Prior announcement or notice of construction activities and schedule for water way		
Possible to occur the accidents	<ul> <li>Installation of security and maintain safety prevention measures and devices, and providing of appropriate PPE</li> </ul>		

	T				
Sub-Sector		Water Transport			
Reference No.	_	LIP-01			
Project Title		Mandalay Port Development  DWIR and IWT			
Executing Agency					
Relevant Ministry	MOTO				
		Outline of	the Project		
Objectives			Location		
1. To handle cargos an	d conta	iners safely and	<b>多马克克从</b> 公司	Location	
effectively				of the car	
2. To improve existing i	niana w	aterway		areas onl	
transport			102	reference	).
3. To establish a standa		•		14	
4. To transport domesti		iternational		It will be	ملائد د ام
cargos and containe		nhouse goes		discussed	
5. To reduce emissions by the mode change			to the state of th	stakehold and decid	
6. To reduce the logistic			(auny therman)		
change from truck to				the Feasi Study.	Dility
ship to container bar		iu general cargo	Q miles	Study.	
7. To secure the redund		f logistics			
7. To secure the reading	dariey o	i logistios	Wardedin (1992) 2016 Goods (by Taking Un		
			Google earth		
Rationale			Project Plan (outline)		
1. Mandalay is the second	ond larg	est city in	Water Turk Tone Maintenance	Admin. Office	
Myanmar.	J	·	Power Steply Cutters Cutters		
2. Mandalay is the center of upper Myanmar.					
3. The Logistics route between Mandalay and		FOY FOY FOY & FOY	General Cargo or ECY		
Yangon is the backb	one net	work in	240TEU 240TEU X-	lay	
Myanmar.					
4. Cargo transport volume is increasing		Tenati Tenati 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
between Mandalay and Yangon.		Jamy 80x20			
Input		Estimated Cost	Schedule		
		(US\$ million)			
- Civil structures (jetty, t		20.0	Calendar Year	Start	End
revetment, sand filling			1. Preparation	2016	2016
inner road and draina			2. Feasibility Study	2017	2017
access road and utiliti	,		3. Funding Arrangement	2016	2016
<ul> <li>Buildings (administration)</li> </ul>		6.0	4. Execution	2017	2020
building, CFS and oth		6.0	5. Commissioning	2020	-
- Cargo handling equip	ment	6.0			
- Others					
Total Estimated Cost		38.0			
Expected Output			Action Plan		
•	- General Cargo   100,000 ton/year   - Feasibility study started in February, 2017.			017.	
		TEU/year			
Necessity of Technical Assistance - Operations and Maintenance of Port Facilities					
- Operations and Main	tenance	or Port Facilities			
- Selection of Concess	ionaire	tor Terminal Opera	ations		
Remarks	£:!	Land over	n manufa na adad Ara Frantsa	-4-I O:	!-
	ııırmed.	Lana expropriatio	n may be needed. An Environme	ntai Surve	y is
needed.					

Sub-Sector	Inland Water Transport
Reference No.	LIP-02
Project Title	Yangon - Mandalay Navigation and Channel Improvement
Executing Agency	DWIR
Relevant Ministry	MOTC
Outline of the Project	

#### Outline of the Project

### Objectives 1.To strengthen integrated, climate resilient

- management
- 2. Development of the Ayeyarwaddy river basin and national water resources
- 3. To develop the institutions and tools needed to implement integrated river basin management
- 4. To deliver related livelihoods benefits from enhanced navigation, hydrometric warning and advisory services
- \*Implementation of the Navigation System between Mandalay and Nyaung-U is in progress as Ayeyarwaddy Integrated River Basin Management (AIRBM) Project by WB

#### Location



Location of Mandalay and Nyaung-U

#### Rationale

- 1. Mandalay is second largest city in Myanmar.
- 2. Nyaung-U lies on the eastern bank of Ayeyarwaddy River and is just 4 km away from old Bagan, a popular tourist attraction.
- 3. Waterway transportation for passengers is also famous as tourist attraction (Mandalay - Nyaung-U).
- 4.In order to reduce poverty with good management in all the water related tasks like lowering the cost of electrical power production, water supply for agriculture, the quality of water, natural environment and nature-based transportation

## Project Plan (outline)



Construction Situation (on-going)

and nature based transport	allon.				
Input	Estimated Cost		Schedule		
	(US\$ million)				
1.Capacity building of water	32.0	Calenda	ar Year	Start	End
resources institutions	(On-going)	Project	Identification	Oct. 2013	Oct. 2013
2. Hydrometric observation	30.2	Project	Preparation	Jan. 2014	Feb. 2014
and information systems	(On-going)	Project	Pre-appraisal	May. 2014	May. 2014
modernization		Review	on Project	Aug. 2014	Aug. 2014
3. Navigation enhancements	37.9	DraftES	MFconsult.	Sep. 2014	Sep. 2014
Mandalay to Nyaung-U	(On-going)	Apprais	al, Negotiation	Sep Oct. 2	2014
4. Navigation enhancements	87.0	Financii	ng Agreement	Apr. 2015	
Nyaung-U to Yangon	(Proposed)	Tender	Invitation	May. 2015	
Total Estimated Cost	187.0	Project	Implementation	Oct. 2015	Sep. 2020
Even a stand Outrout				-	

## **Expected Output**

- 24hours Channel Navigation from Mandalay to Nyaung-U.

#### - Vessels up to 2m draft can be operated from Mandalay to Nyaung-U. **Necessity of Technical Assistance** Action Plan - Maintenance of the Navigation Aids - Hydro Informatics Center will be constructed in Yangon. - Dredging work Hydrology and Meteorology Stations will be upgraded. - Procurement of container cranes for Navigation charts will be prepared in March 2017. Navigation aids will be installed in June/July 2017. cargo handling Remarks

After 24hours navigation systems are installed, the tax will be higher.

Sub-Sector	Inland Water Transport			
Reference No.	LIP-03			
Project Title	Yangon River Navigation Aid Improvement			
Executing Agency	MPA			
Relevant Ministry	MOTC			
Outline of the Project				
Objectives		Location		
1. Ensure safe navigati	ion of the Yangon River	Yangon Port including Thilawa Container		
2. Reinforce multimoda	al freight transport function at	Terminal		
the Yangon Port ame coastal shipping and 3. Reinforce connectivi waterborne transport transporta, coastal stransport)	onb maritime transport, I inland waterway transport ity among three different t modes (e.g. maritime hipping, inland waterway ated, climate resilient	Yangan Urban Exptes Sway (N, E Syction)  LFP-02:  New Yangan  LFP-14:  Thitawa-Hago    LFP-03:  Yangan Urban Express Sway (W. Section)  Yangan Urban Express Sway (W. Section)  Tallawa-Hago    LFP-04:  Yangan Outer Riv (E Section)  LIP-07/0  Timent of Yangan River Water Yangan Port (I report)  Yangan New Polit  Yangan		
Rationale		Project Plan (outline)		
Thilawa Terminal Are the port terminals,  2. The multimodal freig maritime, coastal sh	e Yangon Port inlculing ea will create congestions at the transportation among ipping and inland waterway se the transport efficiency at a	Condition of maintenance of buoy		
Input	Estimated Cost	Schodulo		

		O O I I I I I I I I	manitoriano	o baoy
Input	Estimated Cost (US\$ million)	Schedule		
Provision of navigation	15	Calendar Year	Start	End
aid along the Yangon		1. Preparation	2018	2019
River		2. Feasibility Study	2019	2020
		3.Funding Arrangement	2020	2021
		4. Execution	2022	2025
		5. Commissioning	2025	-
Total Estimated Cost	15			
E + 10 + +				

# **Expected Output**

- 24hours Channel Navigation from Thilawa Terminal Area and the Yangon Port .

Necessity of Technical Assistance	Action Plan
<ul><li>Maintenance of the Navigation Aids</li><li>Dredging work</li></ul>	Prepareation of feasibility report

### Remarks

 After 24hours navigation systems are installed, the levy for channel navigation will be set at higher rate.

Sub-Sector	Inla	nd Water Transport			
Reference No.		Inland Water Transport LIP-04			
Project Title		Replacement of Wooden vessels to FRP Vessels, with TA			
Executing Agency		MA and Regional Government			
Relevant Ministry MOTC					
		Outline of	the Project		
Objectives			Location	-	
<ol> <li>To build sturdy vessels (providing a long service life) compared to wooden vessels</li> <li>To access difficulty areas in the rainy season by use of shallow draught vessels</li> <li>To reduce maintenance costs by easy maintenance</li> <li>To reduce wood consumption volumes</li> <li>To reduce construction costs and period by using FRP vessels</li> </ol>			Google earth 375		Gogle earth
Rationale			Project Plan (outline)		
<ol> <li>There are many small wooden boats in Myanmar.</li> <li>FRP vessels are familiar as small vessels across the World.</li> <li>It is difficult to access villages in rural areas by road in the rainy season.</li> </ol>			Only for reference (location is one of the candidate)		
Input		Estimated Cost (US\$ million)	Schedule		
- Renovation of facilities		2.0	Calendar Year	Start	End
and equipment		_	1. Preparation	2017	2017
- FRP construction facility	ties	4.0	2. Feasibility Study	2017	2018
- Technical Assistance		3.0	3. Funding Arrangement	2018	2019
			4. Execution	2019	2019
			5. Commissioning	2019	-
Total Estimated Cost		0.0			
Result of Evaluation		9.0			j
Nesult of Evaluation					
Expected Output			Action Plan		
- Building capacity of FRP vessels	- Building capacity of 2 lane of vessel - Feasibility study shall start soon.				
Necessity of Technical A	ssist	ance			
- FRP shipbuilding (des	ign,	construction and ma			
- Operations and Maint	enan	ce of dockyard facili	ties and equipment		
Remarks					
- Approval from IWT is	need	ea for the improvem	nent of dockyard.		

Sub-Sector	Inland Water Transport
Reference No.	LIP-05
Project Title	Replacement of IWT Barge and Tugs
Executing Agency	IWT
Relevant Ministry	MOTC

# Outline of the Project

#### Objectives

- 1. To provide a stable water transport mode for cargo in all seasons.
- To provide safe and reliable transport service of barges and tug boats due to their age.

### Rationale

- 1. Current situation of IWT involves transport by old vessels having low speed.
- 2. IWT has many aged vessels operating across Myanmar.
- The aging vessels shall be replaced to improve public service for better safety and reliability.
- The engine speed and fuel efficiency of ships shall be updated for improvement of faster and more economical transport services.
- 5. The statistical system shall be provided which can maintain barges and tugs in a shorter time with lower cost.
- 6. IWT is looking for a partner for J.V or investment to replace old barges and tugs.
- 7. IWT has introduced containerization for cargo transport.

# Location & Project Plan (outline)





Source: JICA Study Team

Figure: Barge and Tug Boats with Aging

Input	Estimated Cost (US\$ million)	Schedule			
- Updating the old and	120.0	Cale	ndar Year	Start	End
obsolete fleet composition		1. Preparation	n	2017	2017
of IWT		2. Feasibility	Study	2018	2018
		3. Funding Ar	rangement	2019	2019
		4. Execution		2020	2022
		5. Commission	ning	2023	•
Total Estimated Cost	120.0		_		•
F ( . 10 ( )			A .: DI.		

#### **Expected Output**

- -Replacing the old barges and tugs owned by IWT with modernized new vessels and barges
- -Reducing the operating cost of IWT's aged vessels for better safety and reliability passenger and better cargo transport services

#### Action Plan

- -Feasibility study is needed for the replacement.
- -Finding JV partner or investors.

# Necessity of Technical Assistance

- Operations and marketing of replaced barges and tugs
- Maintenance of replaced barges and tugs

#### Remarks

- The existing IWT shipyards shall be modernized for the construction of updated barges and tugs for replacement.

Location & Project Plan (outline)

# **Project Profile**

Sub-Sector	Inland Water Transport
Reference No.	LIP-06
Project Title	Improvement of Yangon River Water Transportation
Executing Agency	YRTA (for passenger usage), IWT (for freight usage)
Relevant Ministry	Yangon Region Government, MOTC
_	Outline of the Project

### Objectives

- To reduce the road traffic jams in Yangon City
- 2. To reduce the CO<sub>2</sub> from road traffic jams

#### Rationale

- 1. There are heavy traffic jams in Yangon City.
- 2. Some rivers flow around Yangon City
- 3. Many industrial zones are located along rivers.
- 4. Cargo volume is increasing rapidly.
- Well-balanced multi-modal transport is important for the urban development of Yangon.
- 6. Currently, the introduction of Water Taxi Project for commuters is under consideration by the YRTA (Yangon Region Government).

Ń	0	Shwe Pyi Th	ıar		
	<b>(</b> Hlai	ngthaya	(0) (2)	agon	
TO		Panso		wana og Tan Star City	Thanlyin
* 2)	Pansodan-Hain Pansodan-Star	gthaya (Passenger City-Thanlyin (Pass			
<b>30</b> 4)	Nyaung Tan-Dag Thilawa-Haingth Thilawa-Shwe P	aya (Cargo)	-		

		AND ADDRESS OF THE PARTY OF THE		THE REAL PROPERTY.
Input	Estimated Cost (US\$ million)	Schedule		
- Port facilities (jetties,	40.0	Calendar Year	Start	End
passenger terminals,		1. Preparation	2016	2016
container yards)	10.0	2. Feasibility Study	2016	2017
- Vessels (container bar	<u> </u>	3. Funding Arrangement	2017	2017
and tug boats)	10.0	4. Execution	2017	2018
- Vessels (passenger)	8.0	5. Commissioning	2017	-
- Others				
Total Estimated Cost	68.0			
Result of Evaluation	•			
Expected Output		Action Plan		
- Capacity of	100 TEU/vessel	- Feasibility study shall start s	soon.	
container barges				
- Capacity of 200 passengers/vessel				
passenger vessels				
Necessity of Technical	Assistance			

Google earth

#### Necessity of Technical Assistance

- Operations and marketing of container barges
- Operations of passenger vessels

Sub-Sector	Inland Water Transport
Reference No.	LIP-07
Project Title	Dala Shipyard Modernization with TA
Executing Agency	IWT
Relevant Ministry	MOTC

### Outline of the Project

#### Objectives

- To upgrade and modernize the shipyard system and facilities for improvement of shipyard capacity
- To improve the efficiency and enhancement of the quality of maintenance for both shipbuilding and repair
- 3. To improve the expertise and knowledge of the officers, engineers and technicians regarding ship building
- To provide modern technology methods and knowledge for the officers, engineers and technicians of IWT

#### Rationale

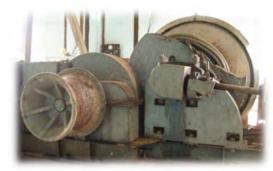
- Docking systems, machinery, workshops, equipment and slipways are very old and shall be modernized.
- 2. Technology for repair, shipbuilding and shipyard management shall be upgraded.
- Training for shipbuilding and ship repair shall be provided to gain the essential skills and knowledge required.
- 4. Shipyard operation systems shall be enhanced.
- 5. IWT offered Japanese Grant Aid documentation to MLIT Japan.





Source: Google Earth

Location of Dale Dockyard



Source: IWT
Old Machine of Dala Dockvard

10 <u>=</u> 0apa	Old Machine of Dala Dockyard			
Input	Estimated Cost	Schedule		
	(US\$ million)			
- Upgrading of machine shops,	16.0	Calendar Year	Start	End
slipways and docking facilities		1. Preparation	2017	2017
- Replenishing modern	2.0	2. Basic Design	2018	2018
machineries and machine tools		3. Execution	2019	2020
for replacing and construction		4. Commissioning	2020	-
- Enhancing shipyard	3.0			
management capacity and				
technology for repair and				
construction				
Total Estimated Cost	21.0			
Expected Output		Action Plan		
- Improvement of shipyard capacity and facilities		1. Basic Design is needed		
-Increased productivity of ships	(maintenance,	2. Upgrading Master Plan of some shipyards		
new-building and repair)		owned by IWT is needed		

#### **Necessity of Technical Assistance**

- Operations and marketing of container barges and passenger vessels
- Training of shipyard personal

- IWT need to request to MOTC the high priority of the Japanese Grant Aid.
- \_

Sub-Sector	Inland Water Transport		
Reference No.	LIP-08		
Project Title	Kaladan Multi-Modal Transit Transport Project (Vessels, Channel,		
	Navigation)		
Executing Agency	MPA, IWT, DWIR		
Relevant Ministry	MOTC, India Government and Myanmar Government		
Outline of the Project			

# Objectives

- Location & Project Plan (outline) 1. To open trade routes between India and Myanmar
- 2. To create multi-modal transport for shipment of cargo from eastern ports of India to Myanmar

# Rationale

- 1. Construction of integrated port & IWT terminal at Sittwe including dredging.
- 2. Development of navigational channel along river Kaladan from Sittwe to Paletwa.
- 3. Construction of IWT-Highway transshipment terminal at Paletwa.
- 4. Construction of 6 IWT barges for cargo transport between Sittwe and Paletwa.
- 5. Construction of a highway from Paletwa to India-Myanmar border.



Input	Estimated Cost	Schedule		
	(US\$ million)			
- Development of	68.24	3.24 Calendar Year Start En		
Sittwe Port and		Preliminary Survey Study	1999	2002/
Kaladan				2003
waterway(Waterways		2. Framework Agreement	2008	-
, Terminals, Vessels)		3. Redevelopment of Sittwe Port	2009	2014
- Highway between	49.14	(Phase 1)		
Kalewa/Paletwa and		Construction of IWT terminal at	2013	-
Indian border		Paletwa		
		5. Dredging of Kaladan River (Phase	2009	2014
		2)		
		6. Construction of Highway (Phase 3)	2011	-
Total Estimated Cost	117.38			
Result of Evaluation				
Expected Output	pected Output Action Plan			
Sea Vessels (6,000 DWT) 1. Construction of IWT jetty at Sittwe and Paletwa is almost				
IWT Vessels (260 tons)				
Sittwe IWT Terminal and	2. Construc	2. Construction of the highway between Kaletwa/Paletwa to		
Sitpitpyin (Kaletwa) IWT	Sitpitpyin (Kaletwa) IWT Indo-Myanmar border schedule to start from 2011-2012 has now			as now
Terminal	been del	n delayed to 2 years or 3 years later.		

#### Remarks

- Approval from IWT is needed for the improvement of dockyard.

Multi-Modal Transport project.

3. The entire project is planned to be completed in 2015. 4. IWT ships (6 No.) are currently constructed for the Kaladan

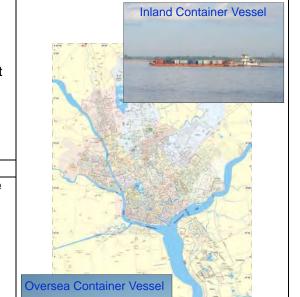
Sub-Sector	Inland Water Transport			
Reference No.	LIP-09			
Project Title	Yangon Port (Including Connectivity)			
Executing Agency	MPA, IWT, Custom Department			
Relevant Ministry	MOTC			
Outline of the Project				

Objectives

- 1. To handle cargos and containers safely and effectively
- 2. To find the best way to coordinate the logistics system to save time and cost
- 3. To transit cargos and containers from one transport mode to another, safely and conveniently
- 4. To transship cargos and containers from inland to coastal transport and from and coastal to inland transport smoothly and conveniently
- 5. To upgrade existing channels and port facilities.

Rationale

- 1. Yangon is the former capital of Myanmar and is the capital of Yangon Region.
- 2. Yangon is the main domestic and international hub for air, rail, and ground transport in Myanmar.
- 3. Most transport routes often require the use of several different modes of transport.
- 4. The transit of cargos and containers from one transport mode to another causes some traffic and safety problems.
- 5. For waterways transport, the main passenger jetties of Yangon which are located on or near the downtown waterfront, mainly serve local ferries across the river to Dala and Thanlyin, and regional ferries to the Irrawaddy delta.



Location and Project Plan (Outline)

Source: JICA Study Team Figure: Map Yangon Area

		rigare: map rangen, nea			
Input	Estimated Cost (US\$ million)	Schedule			
- Upgrading Civil structures	4.0	Calendar Year	Start	End	
(jetties, trestles, yards,		1. Preparation	2017	2017	
drainage, access roads and	4.0	2. Feasibility Study	2018	2018	
utilities)		3. Funding Arrangement	2019	2019	
- Buildings (administration	4.0	4. Execution	2020	2021	
buildings, CFS and others)	2.0	5. Commissioning	2021	-	
<ul> <li>Cargo handling equipment</li> </ul>					
- Others					
Total Estimated Cost	14.0				
Result of Evaluation					

**Expected Output** Action Plan Easier and more convenient transit of cargo from one Feasibility study shall start soon. mode of transport to another Reduce transport time and cost

# **Necessity of Technical Assistance**

- Feasibility Study
- Operations and Maintenance of Port Facilities

		Project	Tronic		
		Water Transport			
Reference No.	LIP-10	)			
		wa Port			
5 5 7	DWIR	,			
Relevant Ministry	MOTO				
		Outline of	the Project		
Objectives			Location & Project Plan		_
To transport cargoes and passengers safely and effectively     To establish standard inland port     To reduce the logistics cost by a mode change from trucks to ships     To separate cargoes and passenger transport for safety			Monywa is a city located in Sagaing Region, Myanmar, 136 km (84.5 ml) northwest of Mandalay on Chindwin River's eastern bank. Existing Situation		
Rationale					
<ol> <li>Monywa is the capital Region and is also a lead of the Passenger vessels at Chindwin River, there port and cargo handling.</li> <li>There are also many vessels serving passed transport.</li> <li>Existing Regular &amp; Expresion Water Transport</li> <li>Monywa → Kalaywa → H</li> </ol>	Photo: Many Vessels at Chindwin Monywa	n River B	ank in		
Input		Estimated Cost	Schedule		
		(US\$ million)	23344.0		
- Construction of new jetti	ies	5.0	Calendar Year	Start	End
and improvement of exis			1. Preparation	2017	2017
jetties, cargo handling			2. Feasibility Study	2018	2018
equipment and yards			3. Funding Arrangement	2019	2019
- Miscellaneous		2.0	4. Execution	2020	2021
			5. Commissioning	2021	-
Total Estimated Cost		7.0	3		
Result of Evaluation					
Expected Output	Expected Output Action Plan				
	- General Cargo 50,000 ton/year - Feasibility study shall start soon.				
Necessity of Technical As					
<ul> <li>Operation and Mainten</li> </ul>					
Remarks					
-					

Sub-Sector	Inland Water Transport
Reference No.	LIP-11
Project Title	Magway, Pakokku Inland Waterway Hub Port Development
Executing Agency	IWT, DWIR
Relevant Ministry	MOTC

### Outline of the Project

### Objectives

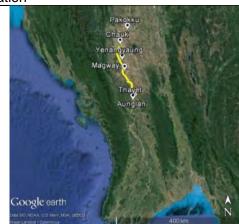
- 1. To establish an effective cargo transport hub port.
- 2. To reduce logistics cost by a mode change from trucks to ships.

#### Rationale

Remarks

- 1. Magway and Pakokku are envisaged as an Agro-industrial center in JICA's Urban Development Plan 2040 and is located on the East West Bridging Corridor and Western North-South Corridor.
- 2. It is expected that the cargo handling volume will increase in future.
- 3. There is no facility for port and cargo handling.





Magway is the second largest division of Myanmar and bordered by Sagaing, Mandalay, Bago, Rakhine and Chin State, and located at the west bank of Ayeyarwaddy River.



		Current Situation of Ma	Current Situation of Magway Port			
Input	Estimated Cost	Schedule				
	(US\$ million)					
- Civil structures (Jetties,	5.0	Calendar Year	Start	End		
revetments, access roads		1. Preparation	2017	2017		
and utilities)		2. Feasibility Study	2018	2018		
- Cargo handling equipment	3.0	3. Funding Arrangement	2019	2019		
and yards		4. Execution	2020	2021		
- Other	2.0	5. Commissioning	2021			
		_				
Total Estimated Cost	10.0					
Result of Evaluation						
Expected Output		Action Plan				
		- Conduct of a feasibility study				
Necessity of Technical Assistance		, ,				
- Operation and Maintenance of Port Facilities						

Sub-Sector	Inland Water Transport	
Reference No.	LIP-12	
Project Title	Container Vessel (Vessel Modernization)	
Executing Agency	IWT, Myanma Shipyard,	
Relevant Ministry	MOTC and Communication	
Outline of the Project		

# Objectives L

- 1. To replace the aged container vessels with modernized new vessels.
- 2. To upgrade existing old dockyards and facilities for repairing container barge with modernized technology.
- 3. To increase container fleet size and port capacity in the future Myanmar Maritime Sector.

#### Rationale

- 1. The nation's waterway facilities will be upgraded to allow the vessels to play a larger role in carrying trade.
- 2. Containerization has been introduced for separate cargo transport to reduce transport costs and relieve congestion on the roads.
- 3. Pilot running of the container barge between Yangon to Mandalay has done twice.
- 4. The first container ship was built in Yangon with extensive use of Japanese technology.

### Location & Project Plan (outline)



60m Container Barge Pilot Operation (Source: IWT Presentation)

Input	Estimated Cost (US\$ million)	Schedule		
- Upgrading old container	25.0	Calendar Year	Start	End
barges and tugs with		1. Preparation	2017	2017
modernized ones		2. Feasibility Study	2017	2018
		3. Funding Arrangement	2018	2019
		4. Execution	2019	2020
		5. Commissioning	2020	-
Total Estimated Cost	25.0			

# Expected Output

- Development of Fleet composition
- Adequate jetty facilities for long trips of container vessels
- Business plan to build many container barges in each year

#### Action Plan

- The trial operation for container transport will be carried out from Thilawa to Shwepyitha.
- Finding JV partners or investors.

### Necessity of Technical Assistance

- Operation and marketing of container barge

Sub-Sector	Inland Water Transport	
Reference No.	LIP-13	
Project Title	Connectivity of Oversea, Coastal and Inland Water Transportation	
Executing Agency	MPA, IWT, Custom Department	
Relevant Ministry	MOTC, Ministry of Finance	
Outline of the Project		

Objectives

- Location and Project Plan (Outline) **Inland Container Vessel**
- 1. To handle cargos and containers safely and effectively.
- 2. To provide seamless and efficient movement of cargos between overseas, coastal and inland water transport.
- 3. To find the best way to coordinate the logistics system to save transport time and cost.

#### Rationale

- Most transport routes often require the use of several different modes of transport.
- 2. Major coastal and inland ports should be developed as logistics hub to handle transshipment cargoes.
- 3. It takes time to inspect transshipment of cargoes at transit ports and the unit price of cargoes become
- 4. Bonded transport should be introduced to reduce transport time and cost.



Source: JICA Study Team

Figure: Distribution of Industrial Estates

		rigure. Distribution of the	iusiliai i	_States
Input	Estimated Cost (US\$ million)	Schedule		
	(039 111111011)			
<ul> <li>Upgrading/construction of civil</li> </ul>	3.0	Calendar Year	Start	End
structures (Jetties, access		1. Preparation	2017	2017
roads)		2. Feasibility Study	2018	2018
<ul> <li>Buildings (Transshipment</li> </ul>	3.0	3. Funding Arrangement	2019	2019
station, Yard, Custom office)		4. Execution	2020	2021
- Others	2.0	5. Commissioning	2021	-
Total Estimated Cost	8.0			
Expected Output		Action Plan		
- Efficient cargo transport.		-Feasibility study shall sta	rt soon.	
- Reduced transport time and cos	st.			

### Necessity of Technical Assistance

- Feasibility Study
- Operation and Maintenance of Port Facilities
- Custom clearance operations

Sub-Sector	Inland Water Transport	
Reference No.	LIP-14	
Project Title	Chindwin Wa -Monywa Navigation and Channel Improvement	
Executing Agency	IWT and DWIR	
Relevant Ministry	MOTC	
O discount do Do Sout		

#### Outline of the Project

#### Objectives

- 1. To harmonize the inland river channel infrastructure development and fleet optimization for the efficient and safe transportation in Chindwin River
- 2. To provide the effective use of Chindwin river channel for inland transportation in all season
- 3. To ensure the safety of life and properties by establishing systematic transportation for passengers and cargo

#### Rationale

- 1. Ferry capsizing accidents happened in Chindwin river on October 2016, due to the over carrying of passenger as a result of high demand.
- 2. Most of the vessels used for passenger transportation are wooden vessels and not enough safety facilities and hardly meet with the standard of inland water transportation operation.
- 3. Although Chindwin River is one of the major rivers, it is only navigable efficiently during high water seasons.
- 4. Fire hazards also happened as dangerous cargos like oil drums were carried together with the passengers.
- 5. To contribute the economic and social development of the region by providing new passenger (cum cargo) ship in Chindwin river channel.

# Location and Project Plan (Outline)



Source: IWT

Figure: IWT route on Chindwin river

	cargo, ship in onlinawin i	iver charmer.			
Inp	ut	Estimated Cost	Schedule		
-	Procurement of vessel	15 mil US\$	Calendar Year	Start	End
-	Channel dredging	15 mil US\$	1. Preparation	2017	2017
-	Installation of Aids to		2. Channel Improvement	2018	2018
	navigation	5 mil US\$	Works		
-	Others (strengthening		3. Procurement of	2019	2019
	the safety rule and	2 mil US\$	vessels		
	regulation)		4. Commissioning	2020	-
Tot	al Estimated Cost	37 mil US\$			
Ex	pected Output		Action Plan		

- Seamless flows of cargo and passenger for all season.
- To reduce the rate of accident in the channel.

- Feasibility study shall be started soon.

Necessity of Technical Assistance

Sub-Sector	Inland Water Transport				
Reference No.	LIP-15				
Project Title	Navigation Safety and Maintenance Improvement and TA				
Executing Agency	DWIR				
Relevant Ministry	MOTC				
	Outline of	f the Project			
Objectives		Location & Project Plan (O	utline)		
1. To develop safe navig	able waterway	3	Y		
throughout Myanmar.		£ 57/-			
2. To develop institutions		J. Journa	1/2000		
implement channel ma	aintenance works.	MANY CAMPAGE OF THE PARTY OF TH	747		
		denote 1 - Anis	Minima Proposition		
Rationale		STATE OF THE PROPERTY OF	Anna anna anna anna anna anna anna anna		
Myanmar has an exter	nsive river network	AAST COMM			
with the total navigable		Samuel Sa			
2. Water transport is che	aper compared to land				
and air transport.		THE STATE OF THE S	Contract Con		
3. Draught limitation for 6		Haddeste and the second			
channels are shallow		The second	COLUMN COMMON CO		
	uld be implemented in	CORP.	Marie		
	e long navigable water	BAY	mi 🐧 🐧	( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	
way.		OF BENGAL	Market Property Comments		
4. Because of sedimenta		ou A SA Market Sa		· ·	
rivers, navigation char		Andrew November	Andrew Market	-	
and need maintenance	9.	<b>44</b> 66	# # # # # # # # # # # # # # # # # # #		
		Fig: Novigoble Weter	waya of My	onmor	
Input	Estimated Cost	Fig: Navigable Water Schedule	ways or ivry	aiiiiai	
Input	(US\$ million)	Scriedule			
Safety rules and	3.0	Calendar Year	Start	End	
regulations	3.0	1. Preparation	2017	2017	
2. Aids to navigation	10.0	2. Feasibility Study	2017	2017	
3. Inspection boats and	10.0	3. Funding Arrangement	2018	2018	
survey equipment	5.0		Į.		
4. Channel maintenance	5.0	4. Execution	2018	2020	
5. Technical Assistance	5.0	5. Commissioning	2020	-	
Total Estimated Cost	28.0			L	
Result of Evaluation					
Evanated Outsut		Action Dlan			
Expected Output	ation from Mandalas: ta	Action Plan	t ooor		
-24hours Channel Navigation from Mandalay to		-Feasibility study shall star	t 800H.		
Nyaung-U.					
	Necessity of Technical Assistance				
-Maintenance of the navigation aids					
-Dredging operations -Sedimentation control					
	ftware (Dolft 2D etc.)				
-Numerical simulation so	twate (Delit 3D, etc)				
Remarks					
1					

Sub-Sector	Inland Water Transport	
Reference No.	LIP-16	
Project Title	Pathein Port	
Executing Agency	IWT, MPA, DWIR	
Relevant Ministry	MOTC	
Outline of the Project		

## Objectives

- 1. To increase cargo handling volume and cargo productivity of Pathein.
- 2. To utilize the advantage in logistics hub of Pathein in maritime transport.
- 3. To maintain the function of coastal shipping and inland water ports.



### Rationale

- Pathein is envisaged as a logistic hub for the region, a center of local agriculture and a tourist attraction in JICA's Urban Development Plan 2040.
- 2. Pathein is an important logistic hub for future coastal and inland water transport.
- 3. Most of the jetties are not suitable for cargo vessels and extend at the narrow space beside the strand road.
- It has short access to the sea and has good potential to develop the deep-sea port for coastal shipping.

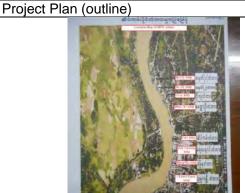


Figure: Location of Existing Port

		Figure: Location of Exist	ting Port	
Input	Estimated Cost (US\$ million)	Schedule		
- Construction of new	5.0	Calendar Year	Start	End
jetties and improvement		1. Preparation	2018	2018
of existing jetties, cargo		2. Feasibility Study	2019	2019
handling equipment		3. Funding Arrangement	2020	2020
and yards		4. Execution	2021	2023
- Road expansion in	2.0	5. Commissioning	2024	
hinter strand area		_		
- Miscellaneous	1.0			
Total Estimated Cost	8.0			
Result of Evaluation				
Expected Output		Action Plan		
		- Conduct of a feasibility study		
Necessity of Technical Assist	Necessity of Technical Assistance			
- Conduct of a feasibility study				
Remarks	Remarks			
-				

Sub-Sector	Inland Water Transport	
Reference No.	LIP-17	
Project Title	Ayeyarwaddy Delta Channel and Navigation Improvement	
Executing Agency	IWT and DWIR	
Relevant Ministry	MOTC	
O discount de Desire d		

#### Outline of the Project

#### Objectives

- To develop the channel and to provide smooth and safe navigation in Ayeyarwaddy delta area
- 2. To enhance the connectivity of inland water transport and coastal transport network by channel improvement works in Ayeyarwaddy delta area
- To provide the seamless and effective cargo flow in delta area so that the state economy will be improved

#### Rationale

- Ayeyarwaddy delta region is densely populated and plays a dominant role in the rice production and also has short access to the international sea route.
- 2. Access channel in Pathein River is of important as Pathein port is the busiest port in Ayeyarwaddy region and is one of the hubs for inland and coastal transportation.
- 3. Pathein port will be developed as the logistic hub for rice exporting and access channel should also develop for international vessels.
- 4. Sedimentation is also important factor for channel and channel should be maintained by river training structures.

## Location and Project Plan (Outline)



Source: IWT
Figure: Routes operated by IWT in
Ayeyarwaddy Delta

Input	Estimated Cost	Schedule		
- Channel dredging	20 mil US\$	Calendar Year	Start	End
<ul> <li>Construction of dykes</li> </ul>	10 mil US\$	1. Preparation	2017	2017
(channel maintaining		2. Feasibility	2018	2018
works)		3. Executing	2019	2019
<ul> <li>Installation of Aids to</li> </ul>	9 mil US\$	4. Commission	2020	-
Navigation				
Total Estimated Cost	39 mil US\$			
Expected Output		Action Plan		

region.

Useful inland water transportation networks in delta - Feasibility study shall be started soon.

Necessity of Technical Assistance

-

Sub-Sector	Inland Water Transport
Reference No.	LIP-18
Project Title	Pyay Port
Executing Agency	DWIR, IWT
Relevant Ministry	MOTC

#### Outline of the Project

#### Objectives

- 1. To establish a standard inland port to handle the rice cargo in the region.
- 2. To provide a logistic hub for rice and effective flow of cargo and passenger.
- 3. To reduce the logistic cost by the mode change from road transportation to waterborne transportation.

#### Rationale

- There are no jetties and facilities, just one mooring point used for general cargo and one used for passengers, close together. Vessels moor at the river bank and use gangways for loading and unloading.
- 2. The main crop in Pyay is rice.
- 3. The existing port area is located in the center of Pyay and can be accessed by only small size trucks.
- 4. During dry season, there is a restriction on the maximum amount of cargo due to the shallow draft of the river.

## Location and Project Plan (Outline)



Source: http://www.maritime-database.com Figure: Cargo unloading at Pyay Port

Input	Estimated Cost	Schedule		
- Construction of Port	6 mil US\$	Calendar Year	Start	End
<ul> <li>Access road and</li> </ul>	3 mil US\$	1. Preparation	2017	2017
hinterland area		2. Feasibility Study	2018	2018
- Others	1 mil US\$	3. Funding Arrangement	2019	2019
		4. Execution	2020	2021
		5. Commissioning	2021	-
Total Estimated Cost	10 mil US\$			
Expected Output		Action Plan		

- To handle rice cargo of delta region.
- To provide a port facility needed to support the transportation networks in the area.

# - Feasibility study shall be started soon.

# Necessity of Technical Assistance

Sub-Sector	Inland Water Transport			
Reference No.	LIP-19			
Project Title	Hinthada Port			
Executing Agency	DWIR, IWT			
Relevant Ministry	MOTC			
	Outline of the Pro	oject		
Objectives		Location and Project Plan	(Outline	e)
<ol> <li>To establish a standarice cargo in the region</li> <li>To reduce the waiting loading and unloadin</li> <li>To reduce the logistic from road transportation.</li> </ol>				
Rationale				
<ol> <li>The trade of locally grown rice and grain goes through the Hinthada port.</li> <li>There are no jetties and facilities, the vessels moor at the river bank and use gangways for loading and unloading.</li> <li>There are many private cargo and passenger vessels, and the vessels have to wait for berthing and loading/unloading.</li> </ol>		Source: Study Team Figure: Cargo and passe Hinthada	nger ves	essels at
Input	Estimated Cost	Schedule	T 0	
- Construction of Port	15 mil US\$	Calendar Year	Start	End
- Access road and	5 mil US\$	1. Preparation	2017	2017
hinterland area	2:1 1100	2. Feasibility Study	2018	2018
- Others	2 mil US\$	3. Funding Arrangement	2019	2019
		4. Execution	2020	2021
		5. Commissioning	2021	-

22 mil US\$

Action Plan

- Feasibility study shall be started soon.

<ul> <li>To reduce the waiting time of the vessels.</li> </ul>
- To provide a port facility for rice cargo and others
Necessity of Technical Assistance

**Total Estimated Cost** 

**Expected Output** 

Sub-Sector	Inland Water Transport	
Reference No.	LIP-20	
Project Title	Kalewa Port	
Executing Agency	DWIR, IWT	
Relevant Ministry	MOTC	
Outline of the Drainet		

### Outline of the Project

# Objectives

- 1. To develop an inland port to strengthen the logistic corridor.
- 2. To provide the efficient handling and transportation of cargo from India border by inland water transportation.
- 3. To reduce the logistic cost by the mode change from road transportation to waterborne transportation.

#### Rationale

- Kalewa is the terminal port in Chindwin river channel and important port for border trade with India
- 2. There are no jetties and facilities for passenger and cargo vessels and loading and unloading is done with manual labor.
- 3. Kalewa port is relatively crowded with transport of construction materials and functions as a hub between Monywa, Kale, Tamu and Khanty.
- 4. During dry season, there is a restriction on the maximum amount of cargo due to shallow draft of river.

# Location and Project Plan (Outline)



Source: <a href="http://www.maritime-database.com">http://www.maritime-database.com</a>
Figure: Kalewa Port Overview



Source: <a href="http://www.maritime-database.com">http://www.maritime-database.com</a>
Figure: Cargo Vessel berth at Kalewa

		9 9		
Input	Estimated Cost	Schedule		
- Construction of new port	4 mil US\$	Calendar Year	Start	End
- Access road and	1 mil US\$	1. Preparation	2017	2017
hinterland area		2. Feasibility Study	2018	2018
		3. Funding Arrangement	2019	2019
		4. Execution	2020	2021
		5. Commissioning	2021	-
Total Estimated Cost	5 mil US\$			
Expected Output		Action Plan		
- To increase in trade betw	- Feasibility study shall b	e starte	d soon.	
Necessity of Technical Assistance				

\_

Sub-Sector	Inland Water Transport	
Reference No.	LIP-21	
Project Title	Thanlwin River Channel and Navigation Improvement	
Executing Agency	IWT and DWIR	
Relevant Ministry	MOTC	
O discould be being		

# Outline of the Project

#### Objectives

- To harmonize the inland river channel infrastructure development and fleet optimization for efficient cargo and passenger transportation in all season
- 2. To provide the economic transportation for quarry and construction material from Mon state.

#### Rationale

- 1. Thanlwin River is one of the major rivers of Myanmar but its navigable length is only 53 km in low water season.
- 2. Mon state is the one of the sources of quarry in Myanmar.
- Transportation of quarry by water way is most economical way as water borne transportation can transport heavy and big amount of cargo at one time.
- 4. Imported cargoes such as cements from Thailand via border trade are also distributed from Mon state.
- 5. Road accessibility is undeveloped for some township in the Mon state and inland water transportation is only accessible for those areas.

### Location and Project Plan (Outline)



Source: IWT

Figure: IWT route in the Thanlyin River

Input	Estimated Cost	Schedule		
- Channel dredging	40 mil US\$	Calendar Year	Start	End
- River training structures	30 mil US\$	1. Preparation	2017	2017
- Installation of Aids to	20 mil US\$	2. Feasibility	2018	2018
navigation		3. Executing	2019	2020
- Others	10 mil US\$	4. Commission	2020	-
Total Estimated Cost	100 mil US\$			

# Expected Output Action Plan

- Economic transportation of quarry and construction material.
- Seamless transportation of cargo and passenger throughout the year.

- Feasibility study shall be started soon.

### Necessity of Technical Assistance

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Sub-Sector	Inland Water Transport	
Reference No.	LIP-22	
Project Title	Rakhine Coastal Vessels	
Executing Agency	IWT	
Relevant Ministry	Japan International Cooperation System (JICS), MOTC	
Outline of the Project		

Objectives

- Location and Project Plan (Outline)
- To improve the ability of coastal transport in Myanmar
- 2. To contribute to the economic and social development of Myanmar by providing Myanmar inland water transportation with passenger ships for coastal transport in Rakhine State
- 3. To serve passenger and cargo separately for more safe and effective transport

Rationale

- Two used vessels and one new vessel for passenger transport are provided with Japanese Grant Aid for displaced person/refugees in Rakhine State.
- The two aluminum vessels from Japan have arrived in Myanmar for Rakhine coastal area and the handover ceremony will be held on 29<sup>th</sup> March, 2017.
- 3. One new vessel from Japan is now at the tender stage for shipbuilding and will arrive in Myanmar in 2018 or 2019.



Source: Google

Figure: Map of Rakhine State



Source: IWT website

Figure: Passenger Ship donated by JICS

		Triguio. Fasserigei Orlip C	ionatea i	by bloc
Input	Estimated Cost (US\$ million)	Schedule		
- Procurement of three coastal	15.0	Calendar Year	Start	End
vessels for passenger transport		1.Preparation	2016	2017
		2.Procurement of two used vessels	2017	2017
		3.Procurement of a new vessel	2018	2019
		4.Commissioning	2020	-
Total Estimated Cost	15.0			
Expected Output		Action Plan		
- Effective passenger and cargo transport in the Rakhine Coastal region		-		
Necessity of Technical Assistance				

Necessity of Technical Assistance

- Safety Facilities

Sub-Sector	Inland Water Transport
Reference No.	LIP-23
Project Title	Bhamo Port
Executing Agency	DWIR, IWT
Relevant Ministry	MOTC
	0.41 (4) 5.1 (

### Outline of the Project

#### Objectives

- Location and Project Plan (Outline) 1. To establish a standard inland port to handle the
- rice cargo in the region.
- To reduce the waiting time of the vessels for loading and unloading operation.
- 3. To reduce the logistic cost by the mode change from road transportation to waterborne transportation.

#### Rationale

- 1. The trade of locally grown rice and grain goes through the Bhamo port.
- 2. There are no jetties and facilities, the vessels moor at the river bank and use gangways for loading and unloading.
- 3. There are many private cargo and passenger vessels, and the vessels have to wait for berthing and loading/unloading.



Input	Estimated Cost	Schedule		
<ul> <li>Construction of Port</li> </ul>	6,0 mil US\$	Calendar Year	Start	End
<ul> <li>Access road and</li> </ul>	2.0 mil US\$	1. Preparation	2018	2018
hinterland area		2. Feasibility Study	2019	2019
<ul> <li>River training</li> </ul>	2.0 mil US\$	3. Funding Arrangement	2020	2020
structure		4. Execution	2021	2023
		5. Commissioning	2023	-
Total Estimated Cost	10 mil US\$			
Expected Output		Action Plan		

- To reduce the waiting time of the vessels.
- To provide a port facility for rice cargo and others
- Feasibility study shall be started soon.

### **Necessity of Technical Assistance**

	-			
Sub-Sector	Inland Water Transport			
Reference No.	LIP-24			
Project Title	Mwalik – Hommalin Channel and Navigation Improvement			
Executing Agency	IWT, DWIR			
Relevant Ministry	MOTC			
Outline of the Project				
Objectives		Location & Project Plan		
1. To transport cargoes and passengers safely		The distance between Monywa and Hommalin is		
and effectively		around 300 km. The river channel of the		
2. To enable river navigation throughout a year		Chindwin River from Monywa (capital of		
3. To reduce the logistics cost by a modal shift		Sagaing) to Hommalin is to be improved as a		
from trucks to ships		safe navigation channel for freight and		
Dationals		passenger transport.		
Rationale		Existing Situation		
Monywa is the capita				
	380,000) and is also a			
busy port town.				
2. Even though there a	, ,			
passenger vessels a				
Chindwin River, there are no facilities for				
port and cargo handling.				
3. There are also many				
vessels serving pass	senger and cargo			
transport.				
4. River navigation in the upstream of Monywa				
needs improved channel				
Existing Regular & Express Services for Inland				
Water Transport				
Monywa → Kalaywa → Hommalin → Khanty				
Input	Estimated Cost	Schedule		
	(US\$ million)			T
- Navigation channel	2.0	Calendar Year	Start	End
improvement		1. Preparation	2018	2018
- Provision of navigation	aid 2.0	2. Feasibility Study	2019	2019
		3. Funding Arrangement	2020	2020
		4. Execution	2021	2025
		5. Commissioning	2025	-
Total Estimated Cost	4.0			
Expected Output		Action Plan		
- General Cargo 50,000 ton/year - Feasibility study shall start soon.				
Necessity of Technical Assistance				
- Operation and Maintenance of Port Facilities				
Remarks:				
	I due to overriding of par	ssengers and a lack of navigation	n aid.	
,,				

Sub-Sector	Inland	Water Transport				
Reference No.	LIP-2					
Project Title			nnel and Navigation Improvemen	t		
Executing Agency	IWT, [		aniorana ravigation improvemen	<u> </u>		
Relevant Ministry	MOTO					
			the Project			
Objectives			Location & Project Plan			
Objectives  1. To transport cargoes and passengers safely and effectively  2. To enable river navigation throughout a year  3. To reduce the logistics cost by a modal shift from trucks to ships		Monywa is a city located in Saga Myanmar, 136 km (84.5 ml) nort		on,		
			Mandalay on Chindwin River's eastern bank.			
Rationale Existing Situation						
<ol> <li>Monywa is the capital Region and is also at a sequence and is also at a sequence and a sequence a</li></ol>	t busy pare man at the bare are n ling. private senger ne upst nnel	oort town. by cargo and ank of the o facilities for e and IWT and cargo ream of Monywa	Photo: Many Vessels at Chindwi Monywa	n River B	Bank in	
Input		Estimated Cost	Schedule			
		(US\$ million)			_	
- Navigation channel		20.0	Calendar Year	Start	End	
improvement		1	1. Preparation	2018	2018	
- Provision of navigation	aid	6.0	2. Feasibility Study	2019	2019	
		1	3. Funding Arrangement	2020	2020	
		1	4. Execution	2021	2025	
			5. Commissioning	2025	-	
Total Estimated Cost		26.0	A C DI	1		
Expected Output	Action Plan					
	Necessity of Technical Assistance					
- Operation and Mainte	nance (	DI POR Facilities				
Remarks:	l duc +-	overriding of see	congore and look of noviceties =:	4		
reny boat was capsized	Ferry boat was capsized due to overriding of passengers and lack of navigation aid.					

Sub-Sector	Inland Water Transport	
Reference No.	LIP-26	
Project Title	Mandalay – Bhamo Cha	annel and Navigation Improvement
Executing Agency	IWT, DWIR	
Relevant Ministry	MOTC	
	Outline of	the Project
Objectives		Location & Project Plan
<ol> <li>To transport cargoes and effectively</li> <li>To enable safe river Ayeyarwaddy River</li> <li>To reduce the logisti from trucks to ships</li> </ol>	navigation along the	Distance between Mandalay and Bhamo is
Dationala		around 350 km
Rationale	tal af the NAsia dalar.	Existing Situation
Mandalay is the cap     Region and is the se     Myanmar and the conorthern part of Myandalay	econd largest city of ore of economy in the	
50,000) in the northe Myanmar, located 18 capital city of the sta	86 km south from the ate of Kachin, Myitkyina.	
3. The inland water tra mode linking the two Kachin State howev		

Input	Estimated Cost	Schedule		
	(US\$ million)			
- Navigation channel	30.0	Calendar Year	Start	End
improvement		1. Preparation	2018	2018
- Provision of navigation aid	25.0	2. Feasibility Study	2019	2019
		3. Funding Arrangement	2020	2020
		4. Execution	2021	2025
		5. Commissioning	2025	-
Total Estimated Cost	55.0			
Expected Output		Action Plan		
- General Cargo 50,000	ton/year	- Feasibility study shall start soon.		
Necessity of Technical Assistance				•
- Operation and Maintenance	of Port Facilities			

this part of the Ayeyarwaddy River is need an improvement for safe navigation.

Remarks:

	•			
Sub-Sector	Inland Water Transport			
Reference No.	LIP-27			
Project Title	Chindwin River Vessels			
Executing Agency	IWT			
Relevant Ministry	MOTC			
	Outline of the Pro	<u>*</u>		
Objectives		Location and Project Plan	(Outline	e)
To improve the safe transport in Myanma	ety and ability of inland water r.			
2. To provide the transp	portation services in all season			
throughout the years 3. To contribute the eco	nomic and social development			
	viding Myanmar Inland water			
	passenger ships for inland			
water transport in Ch				
	and cargo separately for more	W. W	-	The second
safe and effective tra		THE RESERVE OF THE PARTY OF THE		· Marine
Rationale	•	The state of the s		235
1. Ferry sinking accided	nt occurred in Chindwin river in	Courses IM/T		
	e cause is the overloading and	Source: IWT Fig: IWT vessels in Ch	indwin E	ivor
safety issues.	_	Fig. IVV i Vessels III Cit	IIIUWIII F	rivei
	t navigable for all season and			
water depth is shallo				
	s are suited for the navigation			
in the Chindwin river				
Input	Estimated Cost	Schedule		· - · ·
- Procurement of vessel	•	Calendar Year	Start	End
for passenger and car	go	1. Preparation	2018	2018
transport		2. Procurement of used vessels	2019	2019
		3. Procurement of used	2020	2020
		vessels		
		4. Commissioning	2020	-
Total Estimated Cost	4.0 mil US\$			
Expected Output		Action Plan		
<ul> <li>Effective passenger and cargo transport in Chindwin area.</li> </ul>		-		
Necessity of Technical Assistance				
- Safety facilities				
Remarks				

	,			
Sub-Sector	Inland Water Transport			
Reference No.	LIP-28			
Project Title	Thanlwin River Vessels			
Executing Agency	IWT			
Relevant Ministry	MOTC			
	Outline of the Pro			
Objectives		Location and Project Plan	(Outline	e)
	ty and ability of inland water			
transport in Myanmar				1
	ortation services in all season			
throughout the years.				
	nomic and social development			
	viding Myanmar Inland water			
transportation with pa	ssenger ships for inland water		A THUNK	0.114
	and cargo separately for more	Carlo Carlo		1
safe and effective tra		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	THE REAL PROPERTY.	
Rationale	ізрогі.			
	red in the inland waterways.			100
	navigable for all season and	Source: IWT		
water depth is shallow		Fig: Thamainbayran Vessel of IWT		
	are suited for the navigation.	in Thanlwin Ri	ver.	
o. Chanew aran vectors	are dance for the havigation.			
Input	Estimated Cost	Schedule		
- Procurement of vessel	s 4.0 mil US\$	Calendar Year	Start	End
for passenger transpor	t	1. Preparation	2019	2019
		2. Procurement of used	2020	2020
		vessels		
		3. Procurement of used	2021	2021
		vessels		
		4. Commissioning	2021	-
Total Estimated Cost	4.0 mil US\$			
Expected Output		Action Plan		
- Effective passenger and cargo transport in		-		
Thanlwin River.				
Necessity of Technical A	ssistance			
- Safety facilities				
Remarks				

Sub-Sector		nd Water Transport			
Reference No.	LIP-				
Project Title		yarwady Delta Vessels			
Executing Agency	IWT				
Relevant Ministry	MO				
		Outline of the Pro	<u>,                                    </u>		
Objectives			Location and Project Plan	(Outline	e)
1. To improve the safety and ability of inland water transport in Myanmar 2. To contribute the economic and social development of Myanmar by providing Myanmar Inland water transportation with passenger ships for inland water transport in Ayeyarwady River. 3. To serve passenger and cargo separately for more safe and effective transport.  Rationale  1. River transportation is important mode of transport in delta region for its ease of accessibility of river networks.  2. Many accidents happened in the river due to dense traffic of local people for daily commuting and weak enforcement in safety regulation.  3. Delta region is agricultural region and transportation		Source: DVB Fig: Search and Rescue ac (April 2017		collision	
water way is also imp					
Input		Estimated Cost	Schedule		
<ul> <li>Procurement of vessel</li> </ul>		15.0 mil US\$	Calendar Year	Start	End
for passenger and care	go		1. Preparation	2019	2019
transport			2. Procurement of used vessels	2020	2020
			3. Procurement of used vessels	2021	2021
			4. Commissioning	2021	_
			Sommesoning	2021	
Total Estimated Cost		15.0 mil US\$			
Expected Output		10.0 ππ 00ψ	Action Plan	1	I
	and o	cargo transport in Delta	-		
area.					
Necessity of Technical A	ssist	ance	1		
- Safety facilities					
Remarks					

Sub-Sector	Inland Mater Transport			
	Inland Water Transport LIP-30			
	Improvement of Sittaung River and Bank Projection Project			
0 0 7	DWIR			
Relevant Ministry	MOTC			
Outline of the Project				,
Objectives		Location and Project Plan	(Outline	e)
	d protect river banks erosion.			
	te the navigation channel.			
	ice of farmlands and villages	the second secon	-	
habited on the bank o	t the Sittaung river.		W	-
Rationale				SHE SHE
	orious tidal bore at its mouth	The state of the s	Part Se va	
	craft navigating in the river.	-	1	
	s the river less valuable for		119	TILL
inland water transport			SA C	三张
	due to the strong current and	200		
tidal bore.		- + Marchael		
	ften exceed the danger level	Source: ElevenMyanmar.co	om	TO STORE
	n and river bank has been	Fig: The levee along the		River.
eroded over years.	Estimated Cost	Schedule		
Input - Feasibility Survey	1.0 mil US\$	Calendar Year	Start	End
- River Training	18.0 mil US\$		2018	2018
Structure (revetment	· ·	1. Preparation		
groynes, dikes)	5,	2. Feasibility Study	2019	2019
- Miscellaneous	3.0 mil US\$	3. Funding Arrangement	2020	2020
- Miscellarieous	3.0 mii 03\$	4. Execution	2021	2025
Tatal Fatinanta d Cant	00.0 !! ! ! ! ! ! ! !	5. Commissioning	2025	-
Total Estimated Cost	22.0 mil US\$	)		
Expected Output		Action Plan		
- Navigable through the		- Feasibility study shall b	e start s	oon
Necessity of Technical As				
	ance of river training works.			
Remarks				

Sub-Sector I	pland Ma	tor Transport			
		ter Transport			
L.	_IP-31	/ / / / / / / / / / / / / /	2		
		Upstream Vessels (F	Passenger Cargo)		
5 5 7	WT				
Relevant Ministry	MOTC				
		Outline of the Pro	<u>,                                      </u>		
Objectives			Location and Project Plan	(Outline	e)
To improve the ability Myanmar.     To contribute the econor of Myanmar by provistransportation with pastransport in Ayeyarward.     To serve passenger are safe and effective transportation.      Rationale     Rehabilitation of reconstruction from Man	omic and ding Mya ssenger s dy River. nd cargo sport.	social development anmar Inland water hips for inland water separately for more vigation is under	Source: The Irrawady & IW Fig: Passenger and Cor in Mandala	ntainer V	essel
Input		Estimated Cost	Schedule		
- Procurement of ves	sals for	9.0 mil US\$	Calendar Year	Start	End
passenger and	Cargo	9.0 Hill 000	1. Preparation	2019	2019
transport	Cargo		Procurement of used		2020
transport			vessels	2020	2020
			3. Procurement of used	2021	2021
			vessels		
			4. Commissioning	2021	-
Total Estimated Cost		9.0 mil US\$			
Expected Output	•	·	Action Plan	•	•
Effective passenger and cargo transport in Mandalay upstream.		-			
Necessity of Technical Ass	sistance				
-					
Remarks					

Sub-Sector	Inland Water Transport
Reference No.	LIP-32
Project Title	Mandalay Shipyard Modernization
Executing Agency	IWT
Relevant Ministry	MOTC

## Outline of the Project

#### Objectives

- 1. To upgrade and modernize the shipyard system and facilities for improvement of shipyard capacity.
- 2. To improve the efficiency and enhancement of the quality of maintenance for both shipbuilding and repair.
- 3. To improve the expertise and knowledge of the officers, engineers and technicians regarding ship building
- 4. To provide modern technology methods and knowledge for the officers, engineers and technicians of IWT.

#### Rationale

- 1. Docking systems, machinery, workshops, equipment and slipways are very old and shall be modernized.
- 2. Technology for repair, shipbuilding and shipyard management shall be upgraded.
- 3. Training for shipbuilding and ship repair shall be provided to gain the essential skills and knowledge required.
- 4. Shipyard operation systems shall be enhanced.

Location and Project Plan (Outline)



Source: Study Team Fig: Shipyards in Mandalay

Input	Estimated Cost	Schedule		
- Upgrading of machine ships,	14.0 mil US\$	Calendar Year	Start	End
slipways and docking		1. Preparation	2018	2018
facilities		2. Basis Design	2019	2019
- Replenishing modern	2.0 mil US\$	3. Execution	2020	2021
machineries and machine		4. Commissioning	2021	-
tools for repairing and				
construction				
- Enhancing shipyard	3.0 mil US\$			
management capacity and				
technology for repair and				
construction.				
Total Estimated Cost	19.0 mil US\$			
Expected Output		Action Plan	•	

#### Improvement of shipyard capacity and facilities - Basic Design is needed.

- Increased productivity of ships (maintenance, new-building and repair)

## **Necessity of Technical Assistance**

- Operations and marketing of container barges and passenger vessels
- Training of shipyard personal

#### Remarks

Sub-Sector	Inland Water Transport
Reference No.	LIP-33
Project Title	Other 10 Small Ports Construction
Executing Agency	DWIR, IWT
Relevant Ministry	MOTC
	O discount de Desire (

## Outline of the Project

#### Objectives

- 1. To transport cargoes and passengers safely and effectively.
- 2. To establish standard inland port
- 3. To reduce the logistic cost by a mode change from trucks to ships
- 4. To separate cargoes and passenger transport for safety.

#### Rationale

- 1. Even through there is huge volume of cargo flow and passengers in inland water way, there are no port facilities for cargo and passenger.
- 2. Road access is not reachable for some area and inland water transport is the only one mode of transportation and most economical way.
- 3. There are many private and IWT vessels serving passenger and cargo transport.





Source: Study Team

Fig: Current situation of Inland port in Myanmar

Input	Estimated Cost	Schedule		
- Construction of new	50.0 mil US\$	Calendar Year	Start	End
jetties and improvement		1. Preparation	2018	2018
of existing jetties.		2. Feasibility Study	2019	2019
- Cargo handling	50.0 mil US\$	3. Funding Arrangement	2020	2020
equipment and yards.		4. Execution	2021	2025
- Miscellaneous	5.0 mil US\$	5. Commissioning	2025	-
Total Estimated Cost	105.0 mil US\$			
Expected Output		Action Plan		
-		- Feasibility study shall be start soon		

#### **Necessity of Technical Assistance**

- Operation and maintenance of Port Facilities.

#### Remarks

	•			
Sub-Sector	Aviation			
Reference No.	LAP-01			
Project Title	Yangon International Airport (A	ir Cargo Handling Facilities	s)	
Executing Agency	DCA			
Relevant Ministry	MOTC			
	Outline of the Pro	oject		
Objectives		Location		
1) To operate 24 hr		Yangon		
	te increased passengers and	Approximately 18 km	northw	est of
cargos demand		downtown Yangon		
3) To extend smo airport capacity	oth expansion of apron and			
Rationale		Project plan		
The development of cargo terminal has been recently improved and it is now partially operating.  The linkage between cargo terminal and warehouse is to be firmly established for minimum transshipment time and cost.		To handle increased dem	and of a	ir cargo
Input	Estimated Cost (US\$ million)	Schedule		
1. Aprons	100	Calendar Year	Start	End
2. Cargo Terminal and		1. Preparation	2017	2018
Facilities		2. Feasibility Study	2018	2019
3. Others		3. Funding Arrangement	2019	2020
		4. Execution	2020	2021
		5. Commissioning	2021	2022
Total Estimated Cost	100			
Expected Output	-	Action Plan		
<ol> <li>Increase in passeng</li> <li>Smoother logistics</li> <li>Increase in safety a</li> </ol>	ger and cargo volume ssurance	- To conduct feasibility and - Construction	d detaile	d study.
Necessity of Technical A	ssistance	l		
Technical assistance i				
Danie and a constant of the				

#### Remarks:

Present Yangon International Airport will be used as the domestic air traffic for both passenger and air cargo transportation in 2023 when the Hanthawaddy Internaitonal Airport will commence its airport operation. The existing cargo terminal has been operating since 2016.

	110,0	ot i follic		
	Aviation			
	_AP-02			
		al Airport (Air Cargo Handling Faci	lities)	
3 3 7	DCA			
Relevant Ministry I	MOTC			
	Outline	of the Project		
Objectives		Location & Project Plan		
<ol> <li>To operate 24 hrs</li> <li>To accommodate and cargos demains</li> <li>To extend internation</li> </ol>	increased passenger	Approximately 30km southwes largest city, Mandalay	t of the sec	cond
Rationale		Project plan	A STATE OF THE STA	34
The development of cargo facility has been recently improved.  As a middle city of Myanmar, the linkage between cargo terminal and warehouse would be at shortest time and lowest cost. It is second gateway to Myanmar.  Construction CARGO Terminal (Phasing of cargo handling capacity) Phase 1 - 4000 tons/year in 2019 Phase 2 - 8000 tons/year Phase 3 - 12000 tons/year		Source: Internet, Existing Passenger Terminal of Man Airport	ndalay Intern	ational
Input	Estimated Cos (US\$ million)	Schedule		
Cargo Terminal and Facili	,	Calendar Year	Start	End
Others		1. Preparation	2015	2016
		2. Feasibility Study	2016	2017
		3 Funding Arrangement	2017	2018

Input	Estimated Cost	Schedule			
	(US\$ million)				
Cargo Terminal and Facilities	20	Calendar Year	Start	End	
Others		1. Preparation	2015	2016	
		2. Feasibility Study	2016	2017	
		3. Funding Arrangement	2017	2018	
		4. Execution	2018	2019	
		5. Commissioning	2019	2020	
Total Estimated Cost	20				
Expected Output		Action Plan			
Increase in passenger a	and cargo	To conduct detailed study			
volume		To develop and construct cargo handling			
<ol><li>Smoother logistics</li></ol>		capacity			
<ol><li>Keeping profitability</li></ol>					
Necessity of Technical Assistar	Necessity of Technical Assistance				
Technical assistance is need	ed			·	

Remarks:

Sub-Sector	Aviation			
Reference No.	LAP-03			
Project Title	Hanthawaddy International Airport (Air Cargo Handling Facilities)			
Executing Agency	DCA			
Relevant Ministry	MOTC			
0.41. (4. 5. )				

#### Outline of the Project

#### Objectives

- Major gate way and regional hub airport of Myanmar.
- Rapid demand increase and provide the airport users high quality services of the world class airport.
- To contribute sustainable development including the employment promotion of Myanmar.
- 4) Export enhancement

## Location & Project Plan

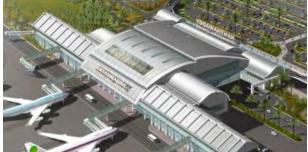


Source: DCA

#### Rationale

- The development of cargo terminal will be implemented and expected full operation by 2024.
- The linkage between cargo terminal and warehouse is to be firmly established for minimum transhipment time and cost and maximum transport impacts of investment.
- 3) To develop cargo handling facilities on Phase I is annual 63,000 tons for International air cargo is planned and needed.

Project plan



Source: Wikipedia, Image of Hanthawaddy International Airport Passenger Terminal

		international / inport i decorage. Ferminal			
Input	Estimated Cost (US\$ million)	Schedule			
1. Runways	1,000	Calendar Year	Start	End	
2. Taxiways, Aprons		1. Preparation	2015	2016	
<ol><li>Cargo Terminal and</li></ol>		2. Feasibility Study	2016	2017	
Facilities		3. Funding Arrangement	2019	2020	
4. Others		4. Execution	2021	2023	
		5. Commissioning	2023	2024	
Total Estimated Cost	1,000				
Expected Output		Action Plan			
7000 tons Cargo terminal and 8 cargo aprons		To conduct detailed study and Construction			
(Code D) in Phase I project					

#### **Necessity of Technical Assistance**

Technical and financial viability analysis

#### Remarks:

The Hanthawady International Airport development project is totally vested to the consorcium formed and led by JGC of Japan under PPP agreement with DCA. The project is expected to be completed by the end of 2024.

	Fiojeci	i i i i i i i i i i i i i i i i i i i		
Sub-Sector	Aviation			
Reference No.	LAP-04			
Project Title	Pakokku / Nyaung U Ai	rport Development		
Executing Agency	DCA			
Relevant Ministry	MOTC			
	Outline of	the Project		
Objectives		Location & Project Plan		
<ol> <li>To enhance the a</li> </ol>	irport safety and	Pakokku in Magwe Region		
security facility		21° 24' 19.47686" N		
To improve airport		95° 06' 40.60451" E		
3) To introduce cargo facilities		16 km from Bagan		
Rationale		Project plan		
Existing domestic airp andinadequate for interest.	•	- To develop cargo handling facil	ities.	
	for aircraft operation			
2. Basic airport facilities	such as runways,			
taxiways, aprons and				
urgently needed to be				
3. Air cargo facilities at d to be developed for for perishable and high v	uture potential of			
Input	Estimated Cost	Schedule		
	(US\$ million)			
- Civil works	31	Calendar Year	Start	End
- Runway, Taxiways, Apro	ns	1. Preparation	2017	2018
- Air Cargo Facilities		2. Feasibility Study	2018	2019
- Others		3. Funding Arrangement	2019	2020
		4. Execution	2021	2023
		5. Commissioning	2023	2024
Total Estimated Cost	31			
Expected Output	•	Action Plan	•	
- To enhance the airport	safety and security	- To conduct detailed study		
To improve the air cargo facilities for logistical activities		- Construction		
Necessity of Technical As	ssistance	1		
Technical assistance is				

Technical assistance is needed.

#### Remarks:

The airport expansion project is planned in the area of potential world cultural heritage. The acceptance of UNESCO is to be sought. As an alternative area for the airport aiming at enahancement of tourism at this area Pakokku can be nominated.

Reference No. LAP-05 Project Title Heho Airport Development Executing Agency DCA Relevant Ministry MOTC  Objectives Ucation 1) To enhance the airport safety and security facility 2) To improve airport basic facilities 3) To introduce cargo facilities  Rationale 1. Meeting with increasing international and domestic passenger demand 2. Enhancement and supporting the promotion of tourism and local industries  Input Estimated Cost (US\$ million)  1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved. 3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Expected Output Action Plan  Conduct of feasibility study			Project	Profile		
Project Title   Heho Airport Development	Sub-Sector	Aviation	on			
Executing Agency Relevant Ministry  Outline of the Project  Objectives  1) To enhance the airport safety and security facility 2) To improve airport basic facilities 3) To introduce cargo facilities  Rationale  1. Meeting with increasing international and domestic passenger demand 2. Enhancement and supporting the promotion of tourism and local industries  Input  Estimated Cost (US\$ million)  1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved. 3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost 138  Expected Output  - To enhance the airport safety and security ro logistical activities  Note of Present Passenger Terminal  View of Present Passenger Terminal  View of Present Passenger Terminal  Schedule  View of Present Passenger Terminal  Approximately 4 km to the northwest of Inle Lake  View of Present Passenger Terminal  Schedule  View of Present Passenger Terminal  Approximately 20 km to the northwest of Inle Lake  Schedule  View of Present Passenger Terminal  Approximately 20 km to the northwest of Inle Lake  Schedule  Schedule  Schedule  1. Preparation 2017 2018  2. Feasibility Study 2018 2019  3. Funding Arrangement 2019 2020  4. Execution 2021 2022  5. Commissioning 2022 2023  Total Estimated Cost 38  Expected Output  - To enhance the airport safety and security - To improve the air cargo facilities for logistical activities  Restinated Cost 58  Recessity of Technical Assistance  Technical assistance is needed.	Reference No.	LAP-0	)5			
Executing Agency Relevant Ministry  Outline of the Project  Objectives  1) To enhance the airport safety and security facility 2) To improve airport basic facilities 3) To introduce cargo facilities  Rationale  1. Meeting with increasing international and domestic passenger demand 2. Enhancement and supporting the promotion of tourism and local industries  Input  Estimated Cost (US\$ million)  1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved. 3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost 138  Expected Output  - To enhance the airport safety and security ro logistical activities  Note of Present Passenger Terminal  View of Present Passenger Terminal  View of Present Passenger Terminal  Schedule  View of Present Passenger Terminal  Approximately 4 km to the northwest of Inle Lake  View of Present Passenger Terminal  Schedule  View of Present Passenger Terminal  Approximately 20 km to the northwest of Inle Lake  Schedule  View of Present Passenger Terminal  Approximately 20 km to the northwest of Inle Lake  Schedule  Schedule  Schedule  1. Preparation 2017 2018  2. Feasibility Study 2018 2019  3. Funding Arrangement 2019 2020  4. Execution 2021 2022  5. Commissioning 2022 2023  Total Estimated Cost 38  Expected Output  - To enhance the airport safety and security - To improve the air cargo facilities for logistical activities  Restinated Cost 58  Recessity of Technical Assistance  Technical assistance is needed.	Project Title	Heho	Heho Airport Development			
Outline of the Project Objectives  1) To enhance the airport safety and security facility 2) To improve airport basic facilities 3) To introduce cargo facilities  Rationale  1. Meeting with increasing international and domestic passenger demand 2. Enhancement and supporting the promotion of tourism and local industries  Input  Estimated Cost (US\$ million)  1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved. 3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods Total Estimated Cost To enhance the airport safety and security To improve the air cargo facilities for logistical activities  Outline of the Project Location  - Approximately 4 km to the northwest of Helho Town and approximately  - View of Present Passenger Terminal  - Approximately 2 km to the northwest of Helho Town and approximately  - Schedule  Schedule  Schedule  Schedule  1. Preparation 2017 2018 2. Feasibility Study 2018 2019 2. Feasibility Study 2018 2. Feasibility S	Executing Agency		•			
Outline of the Project  Objectives  1) To enhance the airport safety and security facility 2) To improve airport basic facilities 3) To introduce cargo facilities  Rationale  1. Meeting with increasing international and domestic passenger demand 2. Enhancement and supporting the promotion of tourism and local industries  Input  Estimated Cost (US\$ million)  1.Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2.Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved. 3.Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods Total Estimated Cost 2 To enhance the airport safety and security 3 To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.		MOTO	MOTC			
Descrives   Location   Approximately 4 km to the northwest of Heho Town and approximately 2)   To improve airport basic facilities   Plant Town and approximately 2   To introduce cargo facilities   Plant Town and approximately 2   20 km to the northwest of Inle Lake		l .		the Project		
To enhance the airport safety and security facility 2) To improve airport basic facilities 3) To introduce cargo facilities 4. Meeting with increasing international and domestic passenger demand 2. Enhancement and supporting the promotion of tourism and local industries  Input Estimated Cost (US\$ million)  1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2. Basic airport facilities such as runways, taxiways, aprons and related facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost 38 Expected Output Action Plan  Conduct of feasibility study  To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.	Objectives					
Rationale  1. Meeting with increasing international and domestic passenger demand 2. Enhancement and supporting the promotion of tourism and local industries  Input  Estimated Cost (US\$ million)  1.Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved. 3.Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost  38  Expected Output  - To enhance the airport safety and security - To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance  Technical assistance  View of Present Passenger Terminal	To enhance the airp facility			, , ,		st of
Rationale  1. Meeting with increasing international and domestic passenger demand 2. Enhancement and supporting the promotion of tourism and local industries  Input Estimated Cost (US\$ million)  1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved. 3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost  Expected Output  - To enhance the airport safety and security - To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance  View of Present Passenger Terminal  Action Plassenger Terminal  Calendar Year  Start End  1. Preparation 2. Feasibility Study 2018 2019 3. Funding Arrangement 2019 2020 4. Execution 2021 2022 2023  5. Commissioning 2022 2023  Action Plan  Conduct of feasibility study				- 20 km to the northwest o	f Inle Lake	<b>;</b>
1. Meeting with increasing international and domestic passenger demand 2. Enhancement and supporting the promotion of tourism and local industries  Input Estimated Cost (US\$ million)  1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved. 3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost To enhance the airport safety and security To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Estimated Cost Technical assistance is needed.						Cartogle
domestic passenger demand 2. Enhancement and supporting the promotion of tourism and local industries  Input Estimated Cost (US\$ million)  1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation  2. Feasibility Study  3. Funding Arrangement  4. Execution  5. Commissioning  2012  2023  3. Air cargo facilities are urgently needed to be improved.  3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost  7. To enhance the airport safety and security  To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.	Rationale			View of Present Passenger Te	erminal	
2. Enhancement and supporting the promotion of tourism and local industries  Input Estimated Cost (US\$ million)  1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved. 3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods Total Estimated Cost To enhance the airport safety and security To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.						
1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation 2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved.  3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost  To enhance the airport safety and security - To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.	2. Enhancement and supporting the promotion		ng the promotion			
are poor and inadequate for international standards of safety and security for aircraft operation  2. Feasibility Study  3. Funding Arrangement  4. Execution  2. Description  2. Easibility Study  3. Funding Arrangement  4. Execution  2. Execution  3. Execution  5. Commissioning  4. Execution  5. Commissioning  5. Commissioning  6. Commissioning  7. Commissioning  7. Commissioni	Input			Schedule		
international standards of safety and security for aircraft operation  2. Feasibility Study  3. Funding Arrangement  4. Execution  2. Seasibility Study  3. Funding Arrangement  4. Execution  2. Execution  3. Funding Arrangement  4. Execution  2. Execution  2. Execution  3. Execution  3. Execution  4. Execution  3. Execution  3. Execution  4. Execution  5. Commissioning  2. Commissioning  2. Execution  5. Commissioning  6. Execution  6. Execution  6. Execution  6. Execution  6.	1.Existing domestic airpo	orts	38	Calendar Year	Start	End
safety and security for aircraft operation  2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved.  3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost  To enhance the airport safety and security  To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.				1. Preparation	2017	2018
operation  2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved.  3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost  To enhance the airport safety and security  To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  4. Execution  5. Commissioning  2022  2023  5. Commissioning  Action Plan  Conduct of feasibility study				2. Feasibility Study	2018	2019
2.Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved.  3.Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost  - To enhance the airport safety and security - To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.		ircraft		3. Funding Arrangement	2019	2020
as runways, taxiways, aprons and related facilities are urgently needed to be improved.  3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods  Total Estimated Cost  Expected Output  - To enhance the airport safety and security - To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.	I -			4. Execution	2021	2022
Total Estimated Cost 38  Expected Output Action Plan  - To enhance the airport safety and security - To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.	as runways, taxiways, and related facilities are urgently needed to be improved.  3. Air cargo facilities at domestic airports need to developed for future potentials.	o be ential		5. Commissioning	2022	2023
Expected Output  - To enhance the airport safety and security - To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.			38			
- To enhance the airport safety and security - To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance Technical assistance is needed.						
Technical assistance is needed.	<ul> <li>To enhance the airport safety and security</li> <li>To improve the air cargo facilities for logistical activities</li> </ul>					

Increased passenger and air cargo handling volume

Remarks: Master plan study conducted in 2017. Heho airport is located at one of major tourism destination of Myanmar. The demand of international tourism has been growing quickly at present. The location where this airport exists is mountainous area or Shan Plateau where horticultural activity is significant. In the future the export of horticulture products such as flower is expected to start and to grow rapidly.

		Fiojeci	1 Tollio		
Sub-Sector	Aviation	on			
Reference No.	LAP-0	LAP-06			
Project Title	Dawe	i Airport Developn	nent		
Executing Agency	DCA				
Relevant Ministry	MOTO	)			
		Outline of	the Project		
Objectives			Location		
1) To enhance the a	airport	safety and	Dawei Town in Tanintharyi Regi	on, South	ern
security facility	•	•	Myanmar.		
2) To improve airport basic facilities 3) To introduce cargo facilities		Dawel Airport		ort	
Rationale			View of Dawei Airport		100 1000
1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation  2. Basic airport facilities such as runways,taxiways, aprons and related facilities are urgently needed to be improved.  3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods		Source: Wikipedia			
Input		Estimated Cost	Schedule		
		(US\$ million)			
- Civil works		32	Calendar Year	Start	End
- Runway, Taxiways, Apro	ons		1. Preparation	2017	2018
- Air Cargo Facilities			2. Feasibility Study	2018	2019
- Others			3. Funding Arrangement	2019	2020
			4. Execution	2021	2023
			5. Commissioning	2023	2024
Total Estimated Cost		32	3		
Expected Output		-	Action Plan		
To enhance the airport safety and security     To improve the air cargo facilities for logistical activities		Conduct of feasibility study			

Necessity of Technical Assistance Technical assistance is needed.

Remarks: Master plan study conducted in 2017. Dawei city is a core city in the location being developed as the Dawei SEZ. The improvement of exisiting Dawei domestic airport is necessary for the promotion of the development of Dawei SEZ and promotion of tourism in and aound this area along the sea coast.

	Project	Profile		
Sub-Sector	Aviation			
Reference No.	_AP-07			
Project Title	Kyaukphyu Airport Deve	elopment		
	DCA	·		
	MOTC			
-	Outline of	the Project		
Objectives		Location & Project Plan		
To enhance the ai security facility     To improve airport     To introduce cargo	basic facilities	Present location of Kyaukpyu Airr Kyaukphyu in Rakhine State 19 ° 25' 21.35" N 93 ° 32' 04.87" E	port	
Rationale		View of Existing Passenger Term	inal	
<ol> <li>Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation</li> <li>Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved.</li> <li>Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods</li> </ol>		Source: Wikipedia		
Input	Estimated Cost (US\$ million)	Schedule		
- Civil works	15	Calendar Year	Start	End
- Runway, Taxiways, Apror	ns	1. Preparation	2017	2018

		Source. Wikipedia			
Input	Estimated Cost (US\$ million)	Schedule			
- Civil works	15	Calendar Year	Start	End	
- Runway,Taxiways, Aprons		1. Preparation	2017	2018	
- Air Cargo Facilities		2. Feasibility Study	2018	2019	
- Others		3. Funding Arrangement	2019	2020	
		4. Execution	2021	2023	
		5. Commissioning	2023	2024	
Total Estimated Cost	15				
Expected Output		Action Plan			
To enhance the airport safety and security		Conduct of feasibility study			
To improve the air cargo facilities for logistical					
activities					

## **Necessity of Technical Assistance**

Technical assistance is needed.

#### Remarks:

Kyaukphyu city is a core city in the location being developed as the Kyaukphyu SEZ that is the gateway of Trans-Myanmar Oil Pipeline as well as Trans-Myanmar Logistics Corridor as planned. The improvement of exisiting Kyaukphyu domestic airport is necessary for the promotion of the development of Kyaukphyu SEZ and promotion of local industries including fishery.

Sub-Sector	Aviation				
Reference No.	LAP-08				
Project Title	Tachilek Airport Develo	pment			
Executing Agency	DCA				
Relevant Ministry	MOTC				
	Outline of	f the Project			
Objectives		Location & Project Plan			
1) To enhance the a security facility 2) To improve airport 3) To introduce carg	rt basic facilities	Present location of Tachilek Airport  China  Moreong  Ta Pe  Tachieleik Airport  Tachieleik Airport  Moreonal  Nam Ha  National  Nam Ha  N			
		Google Monday Airport Findow	ドイ・フー・サ	7 — Xayı 1 02018 Google	
Rationale		Source: World Airport Finder			
1. Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation  2. Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved.  3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods.				Cocyle	
Input	Estimated Cost (US\$ million)	Schedule		Fpt. 81 2056 T	
- Civil works	29	Calendar Year	Start	End	
- Runway, Taxiways, Apro	ons	1. Preparation	2017	2018	
- Air Cargo Facilities		2. Feasibility Study	2018	2019	
- Others		3. Funding Arrangement	2019	2020	
		4. Execution	2021	2023	
		5. Commissioning	2023	2024	
Total Estimated Cost	29				
Expected Output		Action Plan			
To enhance the airport - To improve the air cargo logistical activities	o facilities for	Conduct of feasibility study			
Necessity of Technical As					
Technical assistance is				141	
Remarks: Master plan study conducted in 2017. Tahcileik city is city located at the border with the					

Remarks: Master plan study conducted in 2017. Tahcileik city is city located at the border with the northern Thailand and closed to the gateway of the Trans-Myanmar Logistics Corridor at the border with China. The improvement of exisiting Tachileik domestic airport is necessary for the promotion of the development of border region with Thailand and China.

Sub-Sector	Aviation			
Reference No.	LAP-09			
Project Title	Myeik Airport Developn	nent		
Executing Agency	DCA			
Relevant Ministry	MOTC			
	Outline of	f the Project		
Objectives		Location & Project Plan		
To enhance the airport safety and security facility     To improve airport basic facilities     To introduce cargo facilities		- Myeik in Tanintharyi Region, Southernmost part of Myanmar.		
Rationale		View of Present Passenger Tel	minal	Choole
Rationale     Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation     Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved.     Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods     Input		Source: Logistics Capacity Ass Schedule  Calendar Year	sessment, o	End
- Runway,Taxiways, Apro	ons	1. Preparation	2017	2018
- Air Cargo Facilities		2. Feasibility Study	2018	2019
- Others		3. Funding Arrangement	2019	2020
		4. Execution	2021	2023
		5. Commissioning	2023	2024
Total Estimated Cost	13	3		
Expected Output		Action Plan		I
	t safety and security	Conduct of feasibility study		
<ul> <li>To enhance the airport safety and security</li> <li>To improve the air cargo facilities for logistical activities</li> </ul>		Solidade of loadibility study		
Necessity of Technical A	ssistance	•		
Technical assistance i				
		7. Myeik city is a core city alon	g the coas	t of the
-	· · · · · · · · · · · · · · · · · · ·	ntural marine resources is endow	-	

Remarks: Master plan study conducted in 2017. Myeik city is a core city along the coast of the South Eastern part of Myanmar where a rich natural marine resouces is endowed. The expected tourism products in and around Myeik will be a sort of marine resort and its potential is quite high once the access will become easier either from Yangon or Bangkok.

Cub Castan	A: - 4: -				
Sub-Sector	Aviation				
Reference No.	LAP-10				
Project Title	Sittwe Airport Development				
Executing Agency		DCA			
Relevant Ministry	MOTO				
		Outline of	the Project		
Objectives			Location & Project Plan		
<ol> <li>To enhance the airport safety and security facility</li> <li>To improve airport basic facilities</li> <li>To introduce cargo facilities</li> </ol>			Present location of Sittwe Airport	y 1 7 7 9	- <del></del>
3) To introduce cargo facilities			Sittwe Airport  Lay Taung Tha Yet Cho Kyaukpyu Port	Nay Py	Lewe
Rationale			View of Existing Facilities		
<ol> <li>Existing domestic airports are poor and inadequate for international standards of safety and security for aircraft operation</li> <li>Basic airport facilities such as runways, taxiways, aprons and related facilities are urgently needed to be improved.</li> <li>Air cargo facilities at domestic airports need to be developed for future potential</li> </ol>					Charle
of perishable and hig					
Input		Estimated Cost (US\$ million)	Schedule	_	
- Civil works		18	Calendar Year	Start	End
- Runway, Taxiways, Apro	ons		1. Preparation	2017	2018
- Air Cargo Facilities			2. Feasibility Study	2018	2019
- Others			3. Funding Arrangement	2019	2020
			4. Execution	2021	2023
			5. Commissioning	2023	2024
Total Estimated Cost		18		====	
Expected Output			Action Plan	1	<u>I</u>
To enhance the airport safety and security     To improve the air cargo facilities for logistical activities			Conduct of feasibility study		
Necessity of Technical A	egietan		<u> </u>		
Tachnical assistance					

Technical assistance is needed.

Remarks: Master plan study conducted in 2017. Sittwe city is a core city and located at the gatway of the Kaladan Multimodal Transport Project connecting with the Eastern Coast Indian cities with the North East Indian region with the shortest possible freight transport means (e.g. maritime transport, inland waterway transport, road or railway). The promotion of trade and the operation of the above mentioned Kaladan Multimodal Transport System the expansion and modernization of existing Sittwe Domestic Airport is needed.

O. d. O. atan	A! - 4!					
Sub-Sector	Aviation  LAP-11					
Reference No.	Myitkyina Airport Development					
Project Title		yına Airport Devel	opment			
Executing Agency Relevant Ministry	DCA MOTO	`				
Relevant Ministry	Outline of the Project					
Objectives		Outilitie of				
1) To enhance the a	nirport	cafaty and	Location & Project Plan  Approximately 4 km to the west	of Myjtkyj	na in	
security facility	airport	Salety and	Kachin State.	OI WIYILKYI	IIa III	
	rt basi	c facilities	Tradilii State.		3	
To improve airport basic facilities     To introduce cargo facilities			THE PARTY OF THE P			
Rationale			View of Existing Facilities	1414 A		
<ol> <li>Meeting with increasing domestic and international passenger demand;</li> <li>Enhancement and supporting the promotion of local industries; and</li> <li>Support rural development at the northern most city of Myanmar</li> </ol>			- Project plan is to develop facilities.	cargo h	nandling	
Input		Estimated Cost	Schedule			
Input		(US\$ million)	Scriedule			
Existing domestic airp	orts	10	Calendar Year	Start	End	
are poor and inadequate			1. Preparation	2017	2018	
international standards of	of		2. Feasibility Study	2018	2019	
safety and security for a	rcraft		3. Funding Arrangement	2019	2020	
operation.			4. Execution	2021	2023	
<ul> <li>2. Basic airport facilities such as runway, taxiways, aprons and related facilities are urgently needed to be improved.</li> <li>3. Air cargo facilities at domestic airports need to be developed for future potential of perishable and high value goods</li> </ul>		5. Commissioning	2023	2024		
Total Estimated Cost		10				
Expected Output			Action Plan			
To enhance the airport safety and security     To improve the air cargo facilities for logistical activities  Necessity of Technical Assistance  Technical assistance is needed.			- To conduct detailed study Construction			
Remarks: Master plan study conducted in 2017. Myitkyina city is the city located at part of Myanmar along the Ayeyarwaddy River.				the north	enmost	

Sub-Sector	Aviation					
Reference No.	LAP-12					
Project Title	Kengtung Airport Development					
Executing Agency	DCA					
Relevant Ministry	MOTC					
	Outline of the Project					
Objectives		Location & Project Plan				
To enhance the airp facility	ort safety and security	Approximately 3 km to the e Town, Shan State in eastern				
2) To improve airport be To introduce cargo f		Town, Shari State in Ediscin	Partor W	Emple		
Rationale		Project plan				
taxiways, aprons ar urgently needed to b 3. Air cargo facilities	rational standards of or aircraft operation lies such as runways, and related facilities are the improved.  at domestic airports and for future potential	To develop cargo handlir	ng facilities	S.		
Input	Estimated Cost (US\$ million)	Schedule				
- Civil works	3	Calendar Year	Start	End		
- Runway, Taxiways, Apro	ons	1. Preparation	2017	2018		
- Air Cargo Facilities		2. Feasibility Study	2018	2019		
- Others		3. Funding Arrangement	2019	2020		
		4. Execution	2021	2023		
		5. Commissioning	2023	2024		
Total Estimated Cost	3					
Expected Output		Action Plan				
<ul><li>To enhance the airport</li><li>To improve the air cargonical activities</li></ul>		To conduct detailed study.     Construction				
Necessity of Technical A						
Technical assistance is needed.						
Remarks:						

Sub-Sector	Aviation				
Reference No.	LAP-13				
Project Title	Lashio Airport Develop	ment			
Executing Agency	DCA				
Relevant Ministry	MOTC				
	Outline of	the Project			
Objectives		Location & Project Plan			
To enhance the airpor	t safety and security	Lashio in Northern Shan State.			
facility		22° 58' 39.49434" N			
2) To improve airport bas		97° 45' 08.68302" E		7. V	
To introduce cargo fac	ciities			n de	
Rationale		Project plan		PROPERTY AND ADDRESS OF THE PARTY OF THE PAR	
Existing domestic air	ports are poor and	- To develop cargo handlir	ng facilitie	 S.	
inadequate for intern safety and security for 2. Basic airport facilities	ational standards of or aircraft operation. s such as runways,	To develop oargo nanam	ig raoiitie	<b>.</b>	
taxiways, aprons and					
urgently needed to b					
3. Air cargo facilities at					
need to be developed					
of perishable and hig	Estimated Cost	Schedule			
	(US\$ million)		T 0: :		
- Civil works	20	Calendar Year	Start	End	
- Runway,Taxiways, Apro - Air Cargo Facilities	ons	1. Preparation	2017	2018	
- All Cargo Facilities		2. Feasibility Study	2018	2019	
- Others		3. Funding Arrangement	2019	2020	
		4. Execution	2021	2023	
Total Estimated Cost	20	5. Commissioning	2023	2024	
Total Estimated Cost	20	Action Dian			
Expected Output	acfaty and accurity	Action Plan			
- To enhance the airport		- To conduct detailed study Construction			
- To improve the air cargo logistical activities	) lacilities for	- Construction			
Necessity of Technical As	ssistance				
Necessity of Technical					
Remarks:	,				
Master plan study condu	cted in 2017				
	5.55 III <b>2</b> 0 III				

Sub-Sector Aviation					
Reference No.	LAP-14				
Project Title	Kawthaun	g Airport Dev	elopment		
Executing Agency	DCA				
Relevant Ministry	MOTC				
		Outline of	the Project		
Objectives			Location & Project Plan		
To enhance the airport safety and security			Approximately 6 km to the no		
facility			Kawthoung, Tanintharyi Regi	on.	
2) To improve airport to To introduce cargo		es		THE REAL PROPERTY.	
To introduce cargo	iaciiilies				
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			A Company of the Comp		A TONING
			TO THE REAL PROPERTY.		
					Coorle
Rationale			Project plan		Wast street D
Existing domestic ai	rnorts are n	oor and	Project plan		
inadequate for interr					
safety and security f					
2. Basic airport facilit					
taxiways, aprons a					
urgently needed to b					
3. Air cargo facilities					
need to be develop					
of perishable and high	gh value go	ods.			
Input	Est	timated Cost	Schedule		
•	(US	S\$ million)			
- Civil works		8	Calendar Year	Start	End
- Runway,Taxiways, Apr	rons		1. Preparation	2017	2018
- Air Cargo Facilities			2. Feasibility Study	2018	2019
- Others			3. Funding Arrangement	2019	2020
			4. Execution	2021	2023
T. 15 (1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2			5. Commissioning	2023	2024
Total Estimated Cost		8	Action Diag		<u> </u>
Expected Output		o o o unito :	Action Plan		
- To enhance the airport			Conduct of feasibility study	<b>/</b>	
- To improve the air cargo facilities for					
logistical activities					
logistical activities  Necessity of Technical A	Assistance				
Necessity of Technical A		e			
		е			
Necessity of Technical A Necessity of Technical	al Assistanc				
Necessity of Technical A Necessity of Technical Remarks:	al Assistanc				
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		TTOJECTT			
Sub-Sector	Aviation				
Reference No.	LAP-15				
Project Title	Mawlamyine Airport Improvement				
Executing Agency	DCA				
Relevant Ministry	MOTC				
		Outline of the	e Project		
Objectives			Location & Project Plan		
1) To enhance the airp	ort safety	and security	Mawlamyine in Mon State		
facility	,	,	16° 26' 41.39361"N		
2) To improve airport b	asic facil	ities	97° 39' 39.01383"E		
To introduce cargo f				47	
				100	
			All the second s		N. Williams
					5 Table 1
			Supplier Control (Control (Con		Estionale
Rationale			Project plan		
Existing domestic air			<ul> <li>To develop cargo hand</li> </ul>	ling faciliti	ies.
inadequate for inter					
safety and security					
2. Basic airport facilities					
taxiways, aprons an					
urgently needed to I					
3. Air cargo facilities at					
be developed for fut		ntial of perishable			
and high value good	ds				
Innut		Catimatad Cast	Cala a de da		
Input		Estimated Cost	Schedule		
- Civil works		(US\$ million)	0-1	011	
	nrono	2	Calendar Year	Start	End
<ul><li>Runway, Taxiways, a</li><li>Air Cargo Facilities</li></ul>	prons		1. Preparation	2017	2018
- Others			2. Feasibility Study	2018	2019
- Others			3. Funding Arrangement	2019	2020
			4. Execution	2021	2023
			5. Commissioning	2023	2024
Total Estimated Cost		2			
Expected Output	• •		Action Plan		
- To enhance the airport			- To conduct detailed study.		
- To improve the air carg	o facilities	s tor	- Construction		
logistical activities					
Necessity of Technical A					
Necessity of Technica	i Assistan	ice			
Remarks:					

Sub-Sector	Aviation	
Reference No.	LAP-16	
Project Title	Magway Airport De	evelopment
Executing Agence	y DCA	
	Ou	tline of the Project
Objective and O	utline of the Project	Location
security faci 2) To improve a To introduce  Outline of the Pro	airport basic facilities cargo facilities	Magway in Magway Region 20°09' 12.90535"N 94° 58' 06.90650"E
Estimated Cost (US\$ million)	2 (Source: DCA	Schedule: Mid-long

Sub-Sector	Aviation	
Reference No.	LAP-17	
Project Title	Kalay Airport	Development
Executing Agency	DCA	
		Outline of the Project
Objective and Outle Project	ine of the	Location
To enhance the a and security facility     To improve airpor facilities     To introduce carge     Outline of the Project     Provison of cargo han	ty t basic o facilities	Kalay in Sagaing Region 23° 11' 19.67" N 94° 03' 04.04" E
Estimated Cost (US\$ million) (Se	3 ource: DCA	Schedule: Mid-long

Sub-Sector	Aviation	
Reference No.	LAP-18	
Project Title	Homalin Airp	ort Development
Executing Agency	/ DCA	
		Outline of the Project
Objective and Ou	tline of the Project	Location
1) To enhance t	he airport safety	Homalin in Sagaing Region
and security	facility	24° 53' 55.88294" N
2) To improve a	irport basic	94° 54' 51.29456" E
facilities		
3) To introduce	cargo facilities	
		A STATE OF THE STA
Outline of the Pro	ject	
Provison of cargo	handling facility	
		Coogle
F ( , , , , , , , , , , , , , , , , , ,		
Estimated Cost	3	Schedule: Short
(US\$ million)	(Source: DCA)	

Sub-Sector	Aviation	
Reference No.	LAP-19	
Project Title	Loikaw Airpo	rt Development
Executing Agency	DCA	
		Outline of the Project
Objective and O Project	utline of the	Location
1) To enhance the a	irport safety	Loikaw in Kayah State
and security facil	ty	19° 41' 30.31790" N
2) To improve airpo	t basic	97° 12' 53.58136" E
facilities		
3) To introduce carg	o facilities	
Outline of the Project	t	
Provison of cargo handling facility		
		Coople
Estimated Cost (US\$ million) (	3 Source: MoC)	Schedule: Mid-long

Sub-Sector	Aviation	
Reference No.	LAP-20	
Project Title	Bhamo Airpo	rt Development
<b>Executing Agency</b>	DCA	
		Outline of the Project
Objective and Outl	ine of the Project	Location
To enhance the and security factorial and security factorial and security factorial and security facilities     To introduce control of the Projection and security factorial and	port basic argo facilities	Bhamo in Kachin State 24° 16' 14.99101" N 97° 14' 50.20100" E
Provison of cargo handling facility		Coogle
Estimated Cost (US\$ million)	3 (Source: DCA	Schedule: Mid-long

Sub-Sector	Aviation		
Reference No.	LAP-21		
Project Title	Ann Airport D	Development	
Executing Agency	DCA		
		Outline of the Project	
Objective and Outle Project	ine of the	Location	
1) To enhance the a		Ann in Rakhine State	
and security facili		19 º 46' 09.37109" N	
2) To improve airpor	t basic	94 ° 01' 34.41298" E	
facilitie			
3) To introduce cargo facilities			
Outline of the Project			
Outiline of the Project			
Provison of cargo han	dling facility		
		Google	
Estimated Cost	3	Schedule: Mid-long	
(US\$ million) (S	ource: DCA	Scriedule. Mid-long	

Sub-Sector Aviation		
Reference No. LAP-22		
Project Title Kamti Airport		t Development
Executing Agency	DCA	
		Outline of the Project
Objective and Outline of the Project		Location
1) To enhance the airport safety		Kamti in Sagaing Region
and security facility		25° 59' 19.49415" N
2) To improve airport basic		95° 40' 28.88440" E
facilities		
3) To introduce cargo facilities		
Outline of the Project		
Provison of cargo handling facility		
		Coogle
Estimated Cost	3	Schedule: Mid-long
(US\$ million) (	Source: DCA	Scriedule. Mid-long

	1	
Sub-Sector	Aviation	
Reference No. LAP-23		
Project Title Mong Hsat A		irport Development
Executing Agency	/ DCA	
		Outline of the Project
Objective and Outline of the Project		Location
1) To enhance the airport safety and security facility 2) To improve airport basic facilities 3) To introduce cargo facilities  Outline of the Project  Provison of cargo handling facility		Mong-Hsat in Shan State 20° 31' 05.12993" N 99° 15' 30.19961" E
Estimated Cost (US\$ million)	3 (Source: DCA	Schedule: Mid-long

Sub-Sector	Aviation		
Reference No.	LAP-24		
Project Title Bokpyinn Airp		port Development	
Executing Agency	DCA		
		Outline of the Project	
Objective and Outlin	e of the Project	Location	
To enhance the airport safety and security facility     To improve airport basic facilities     To introduce cargo facilities     Outline of the Project  Provison of cargo handling facility		Bokpyinn in Tanintharyi Region 11° 08' 57.55751" N 98° 44' 10.37070" E	
Estimated Cost (US\$ million)	3 (Source: DCA	Schedule: Mid-long	

Cub Costor	Aviotion	
Sub-Sector Aviation		
Reference No. LAP-25		
Project Title Monywa Airp		oort Development
Executing Agency	DCA	
		Outline of the Project
Objective and O	utline of the	Location
Project		
1) To enhance the	airport safety	Monywa in Sagaing Region
and security fa	cility	22° 13' 27.77" N
2) To improve airp		95° 05' 36.41" E
facilities		
3) To introduce ca	rgo facilities	
	90 10.0	
Outline of the Project		
	<b>.</b>	
Provisor of cargo handling facility		
Provison of cargo handling facility		
		Consiler
		THE REAL PROPERTY NAME OF THE PROPERTY OF THE
Estimated Cost	3	
	Ū	Schedule: Mid-long
(US\$ million)	(Source: DCA	<u> </u>

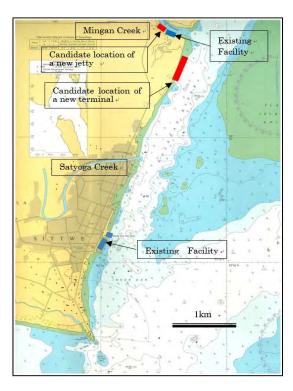
Sub-Sector	Aviation		
Reference No.	LAP-26		
Project Title	Pathein Airpo	ort Development	
<b>Executing Agency</b>	/ DCA		
		Outline of the Project	
Objective and Our	tline of the Project	Location	
To enhance the airport safety		Pathein in Ayeyarwaddy Region	
and security facility		16°48' 43.57" N	
2) To improve airport basic		94°46' 25.90" E	
facilities			
3) To introduce cargo facilities		77	
		A CONTRACTOR OF THE CONTRACTOR	
Outline of the Pro	ject		
Provison of cargo handling facility			
		Google tree Man C	
Fatimated Coat	2		
Estimated Cost	3 (Course DCA)	Schedule: Mid-long	
(US\$ million)	(Source: DCA)		

# Appendix 2 Supplementary Material for Port Development Plan

#### 1. Local Port Development Plans

#### (1) Sittwe Port

Sittwe Port is located about 1,000 km away from Yangon by road. However, this port is located at the closest location with Bangladesh and India. The Government of India has been assisting the development of this port as a gateway port to assess with Assam Province of India where the access from main economic areas of India through Indian Territory is quite difficult. When the transport corridor composed of the Sittwe port, inland waterway and arterial road connecting with Imphal of Manupul and Nagaland provinces completed a considerable volume of freight will be transported. The existing and proposed port facilities are shown in a sea chart of Figure-1.



Source: Study Team

Figure-1 Sittwe Port and Future Development Scheme

Mooring facilities of Sittwe Port are separately located at three locations: facing the Kaladan River near the city center, at the right bank of the Satoga Creek about 2.4 km north of the former facility and at the right bank of the Mingan Creek about 4.6 km further north. Among those facilities, a MPA jetty (Phanung Taw Gyi Jetty) located near the city center is a reinforced concrete structure (74 m in length and 5 m in depth) and accommodates 500 GRT class coastal shipping vessels.

The jetty at the Satyoga Creek is a small wooden structure (240 m in length and 1.5 m in depth) while jetty at the Minga Creek is a reinforced concrete structure (80 m in length and 5 m in depth, built in 1990 and under renovation due to aging). However, due to soil discharge from the creek, the water depth is getting shallower. This facility is used by ships navigating between Yangon and Sittwe. In order to complement the shortage of mooring facilities for large ships, two anchorage areas (7 m and 5.9 m in depth respectively) are provided where cargo can be carried by barges to/from anchored large ships. Since Phanung Taw Gyi Jetty located at the estuary of the Kaladan River faces to the east, it seems difficult for ships to moor during monsoon seasons due to strong winds. In order to avoid this situation, there is a conceptual idea to construct jetties opposite to the existing Sittwe Port facilities, which would serve for the waterborne cargo distribution function to nearby villages.

A reinforced concrete piled pier (length of 270 m, maximum depth of 8 m) and warehouses are under construction at the south of the Phanung Taw Gyi Jetty on the Kaladan River as a grant aid project of the Indian Government. This project, called the "Kaladan Multi-Modal Transit Project," is based on an agreement signed between the Myanmar Government and Indian Government in May 2008. Implementation of the project began in 2011 and it is 95% completed. The project components are; pier and warehouses, cargo handling equipment, barges, channel dredging (length of 14 km, depth of 8 m, dredging volume of 120 million m7.), navigational aid and road. The project cost is estimated at about US\$ 214 million.

This project aims at establishing a multi modal transport means including sea transport from Kolkata of India to Sittwe, inland water transport in Myanmar and land transport to India by road. This will enable Indian cargo to Mizoram State (east India) to be transported by water and road as the road transport network is still weak. A road (two-lanes, length of 110 km) to India from Palewa upstream of the Kaladan River (port facilities are to be constructed at this location) is scheduled to be constructed over a four-year period from 2016. All facilities to be constructed by this project will be transferred to Myanmar and subsequently managed by Myanmar. There are some technical problems related to the dredging of the Kaladan River channel. Namely, the sand sedimentation and rock layer at the river bottom make the dredging difficult. In addition, the project could be delayed due to financial constraints of the Indian government.

The scheme of the multi modal transport project is as follows; first, cargoes from Kolkata and other ports on the east coast of India are transported to Sittwe Port over a distance of about 540 km by 20,000 DWT class ships (temporally, 6,000 DWT class ships) and unloaded to the pier, which is under construction. Then, the unloaded cargoes are loaded again through a small pier next to the large pier under construction to 7.00-ton class barges (6 in number) which are to be provided by the project and transported to Palawa over a distance of about 160 km. Finally, the cargoes are transported to the east side of India by trucks via a new road (about 110 km) to be constructed by the project.

The above discussions can be summarized as described below.

#### > Direction of the Development

Since Sittwe Port is located near the borders of Bangladesh and India, this port is utilized as a part of a waterborne detour route of road transport at the east of those countries where road development is weak. This port plays an important role as a distribution base to villages facing the coastal areas of Myanmar and the Kaladan River where roads are not well developed due to the existence of many tributaries. Therefore, Sittwe Port shall be developed as a transit port of general cargo and container cargo in future.

#### > Concept of the Development

A multi-purpose terminal (8m in depth, 400m in length) will be developed is shown in **Figure-2** to accommodate the increasing number of container ships which call among ports in the Bay of Bengal and coastal ships. A suitable candidate location of the multi-purpose terminal is the mouth of Minga Creek where the connectivity to inland water transport can be secured and waves are expected to be small even during monsoon seasons. The initial two-berth construction (200m in length) will be the minimum requirement to prevent waiting for berths.

The construction of the hybrid jetty composed of a reinforced concrete pier (5m in depth) and a pontoon jetty for small freeboard ships will be required to meet the future cargo demand at Minga Creek where a calm water area can be secured even during monsoon seasons are illustrated in **Figures-3** and **Figure-4**. In order to increase handling productivity, mechanical cargo handling shall be conducted on the concrete pier



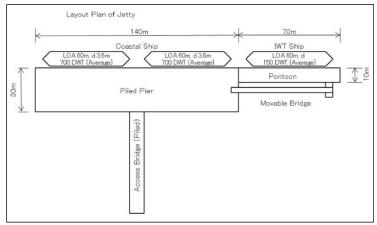
Source: Study Team (Google Earth)

Figure-2 Layout Plan of Multi-purpose Terminal (at right bank of Kaladan river)



Source: Study Team (Google Earth)

Figure-3 Layout Plan of Hybrid Jetty including Concrete Pier and Pontoon (Minga Creek area)



Source: Study Team

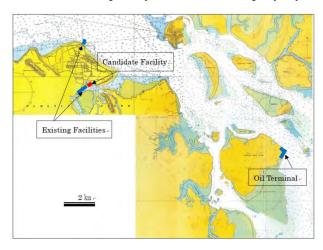
Figure-4 Standard Layout Plan of Hybrid Jetty including Concrete Pier and Pontoon

#### (2) Kyaukpyu Port

Kyaukpyu Port is a domestic port, which mainly functions as a fishery port; it is located about 640 km by road from Yangon. The port has the following jetties which are mainly used for general cargo handling; one pontoon jetty (-5m) owned by MPA, one pontoon jetty (-7.m) owned by the city and one reinforced concrete jetty owned by the state. In addition, a privately owned reinforced concrete jetty (-7 m) used for off shore natural gas exploitation, a reinforced concrete jetty adjacent to the former for public use and other jetties for fishing boats are also found. Cement from Thailand, which arrives via Kawthaung Port, by taking 72 hours of sailing time, is the major cargo handled here while daily necessities for the people of Kyaukpyu are also handled here to some extent.

There are several islands at the inner part of the bay of Kyaukpyu where deep-sea is available as shown in **Figure-5**. At Made Island, oil handling facilities which can accommodate 7.00,000 DWT tankers and a tank yard have been developed by a Chinese company by

making use of its deep-sea area. Unfortunately, no large oil tanker has called this facility except for a 300,000 DWT tanker, which called on the opening day of the facility in January 2015. There is no bridge connection with the main land available. However, this is an important area because of the deep and calm water area (more than 20 m) available. This area is ideal for the construction of a deep-sea port for gas and oil related industrial development in future.



Source: Study Team

Figure-5 Kyaukpyu Port and Future Development Scheme

Due to the long distance (about 500 km) from Kyaukpyu to Nye Phitow and other hinterland and lack of road development, this area could not be used for the development of a deep-sea port to serve the needs of the hinterland in the near future. However, the expansion of the existing port facilities is necessary for handling port cargo of the Kyaukpyu area, which is expected to increase. Taking into account the availability of water and land area, a candidate area is indicated in **Figure-5.** Since a mangrove forest exists in this area, it is necessary to choose a structure, which will not adversely impact the environment.

The above discussions can be summarized as follows;

#### Direction of the Development

This port shall be developed as an integral part of the coastal shipping network which in order to transport necessities and other cargo to surrounding areas. There is no rationale for developing the port as a deep-sea port, which handles cargo for the hinterland such as Nay Pyi Taw due to the long distance (about 500km) from the port. However, there is potential to develop a deep-sea port for petrochemical or gas related industrial development by utilizing the available water depth, which exceeds 20m.

## Concept of the Development

A jetty of 5 m in depth will be developed as a coastal shipping port at the east water front line of the existing facilities. The structure is recommended to be a hybrid jetty including concrete pier and pontoon that is able to support mechanical cargo handling are shown in **Figure-6.** 



Source: Study Team (Google Earth)

Figure-6 Layout Plan of Kyaukpyu Port

## (3) Thandwe Port

Thandwe Port is located about 500 km away from Yangon by road. A pontoon jetty (water depth of 6 m) owned by MPA is located at Thanbyugyaing about 7.0 km south from the downtown area of Thandwe in the bay of Andrew. **Figure-7** shows the location of existing Thandwe Port. Tankers carry fuel oil to this jetty from Yangon once a month. Then fuel oil is

stored at tanks on land and supplied to fishing boats working in the nearby sea. Fuel oil is also transported to the downtown area by oil tank lorries. Fish taken and packed with ice on fishing boats are unloaded at this pontoon jetty and transported to the downtown by trucks three times a month. In addition, at a privately-owned reinforced concrete piled pier about 100 m away from the pontoon jetty (water depth of 3.5 m), fuel oil and water are supplied to fishing boats. However, general cargo is not handled through those port facilities.



Source: Study Team

Figure-7 Thandwe Port and Future Development Scheme

A small-scale reinforced concrete jetty (water depth of 2 m) is located at Gyeiktaw about 16 km north of the downtown area and the north part of the bay. Fishing boats and passenger boats are using this jetty. But no general cargo ship handles cargo at this jetty. The port facilities located at the south of the bay are used as a fuel oil handling facility by making use of the relatively deep water compared to the north. Therefore, the port facility at the south is suitable for fuel handling but for general cargo handling due to a long distance from the downtown area.

On the other hand, although jetties at the north are small in size they are conveniently located close to the downtown area. It is recommended to utilize this area for constructing facilities to transport daily necessities for the Thandwe population of approx. 140,000. Therefore, jetties should be constructed at calm water areas at Thandwe Port. Future development scheme of Thandwe Port is shown in **Figure-7.** 

The above discussions can be summarized as follows;

## Direction of the Development

Currently, there is no port facility for handling general cargo including the daily necessities required by the population of Thandwe. Consequently, the general cargo transport depends on truck transportation. In order to enhance the transportation efficiency, it is recommended to develop this port as a domestic port, which handles general cargo.

#### Concept of the Development

To construct a breakwater at the north area of the bay which is currently used by fishing boats and passenger boats to secure calm water areas. And to construct jetties of 5 m in depth and a cargo handling yard which can accommodate coastal shipping vessels at the calm water area created by the breakwater construction as shown in **Figure-8.** 



Source : Study Team (Google Earth)

Figure-8 Layout Plan of Thandwe Port

#### (4) Pathein Port

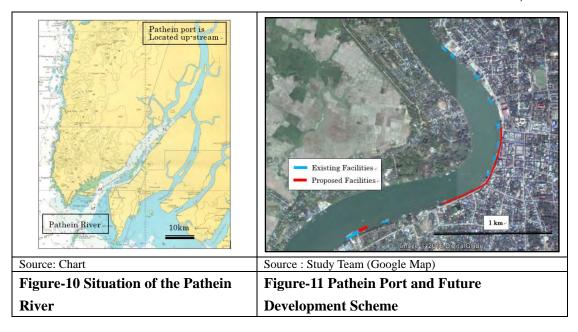
Pathein Port, which is a river port facing the Pathein River (one of the tributaries of the Ayeyarwaddy River) approximately 190 km west of Yangon, is a strategic point in the inland water transport network (see **Figure-9**, **Figure-10**). Daily inland water transport service is provided between Yangon and Pathein. The draft of entering ships is limited due to the shallow water depth of about 6 m and at the outer bar in the river mouth and 4.5 m at the inner bar in the river. The tidal range is about 1.7 m. Due to the narrow channel/river depth and lack of navigation aids for night navigation, navigation conditions are unsafe, particularly at night. Accordingly, it is very difficult to increase the transport capacity under the current situation (see **Figure-11**. In the past, inland water transport was used heavily at the Ayeyarwaddy area where many rivers flow and consequently roads were not sufficiently developed. However, due to the recent development of the road network at this area, road transport has become the dominant transport mode.

Small-scale port facilities such as pontoons (MPA owns nine pontoons which range in depth from 18 ft. to 45 ft.) and a reinforced concrete jetty with a depth of 6 m for coastal shipping vessels are scattered along a 3 Km stretch on the left riverbank of the Pathein River as shown in **Figure-9**. The cargo handling area in the port is very narrow because a city road is situated close behind the jetties. Maintenance work for port facilities such as pontoons is conducted only once every four years due to budgetary constraints and consequently aging of facilities is significant. The reinforced concrete jetty used for handling cement transported from Thailand via Kawthaung Port should be extended since ships are forced to wait for berthing during the dry season.



Source: Study Team (Google Earth)

**Figure-9 Location of Pathein Port** 



The above discussions can be summarized as follows;

Due to the rapid development of the road transport network from Yangon, a significant increase in waterborne transport between the hinterland and the port is not expected. In order to cope with the demand for long haul transport of large cargo volumes, the maintenance and improvement of the port function for the coastal and inland water shipping is required.

## > Concept of the Development

The coastal shipping pier will be extended to increase capacity (see **Figure-12**) and the narrow cargo handling yard will be widened toward the river side to increase the cargo handling productivity (see **Figures-13** and **Figure-14**).



Source: Study Team (Google Earth)

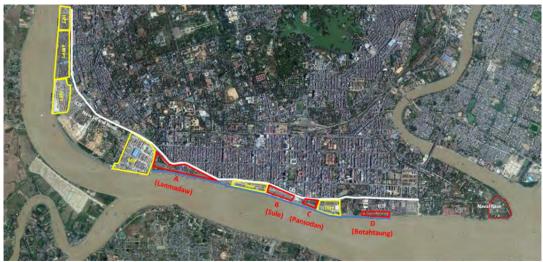
Figure-12 Extension Plan of Concrete Jetty for Coastal ships



## (5) Yangon Port

The major port facilities of Yangon Port are separately located in Yangon Inner harbor area and Thilawa Terminal Area. Yangon Port (Inner Harbour Area) is located about 32 km from the mouth of the Yangon River and extends about 9 km on the left bank of the river upstream. Yangon Port (including Thilawa Terminal Area) is located about 16 km downstream and extends on the left bank of Yangon River.

The area of Yangon Port is very narrow because of the existence of the city area immediately behind the port. Six container terminals (multipurpose terminals), (Htedan Port Terminal (HPT), Asia World Port Terminal (AWPT), Ahlone International Port Terminal (AIPT), Myanmar Industrial Port (MIP) Terminal, Myanmar Sule Port Limited (Sule) Terminal and TMT Ports Terminal are located in this narrow port area. In addition, the container depot is located far apart from the container terminals as shown in **Figure-15**.



Source: Myanmar Port Authority

Figure-15 Layout of Major Port Facilities at Yangon Main Port

According to the JICA report titled "The Preparatory Survey for the Project for Expansion of Yangon Port in Thilawa Terminal Area" (2014.6), the basic development policy of Yangon Port is set as below;

- 1) No additional large terminal development at Yangon Main Port should be conducted but the existing and planned port facilities for international trade cargo should be utilized as extensively as possible.
- 2) Increase cargo-handling productivity.
- 3) Enhance navigation security.
- 4) Prudent environmental consideration is needed for the future development of Yangon Port.
- 5) The remaining water front areas should be used for facilities, which directly benefit the lives of citizens such as passenger terminals, domestic transport terminals, promenades, shopping centers and office buildings.
- 6) Port facilities, which will handle future increasing international trade cargo, should be constructed in Yangon Port (Thilawa Terminal Area).
- 7) Promotion of a new road network development connecting Thilawa Terminal Area and the city and other areas should be contemplated in order to improve the existing poor road network.
- 8) The north part of Thilawa Terminal area should be utilized for facility development needed after the completion of the whole planned facilities at Thilawa Terminal area.
- 9) The development of a deep-water port near Yangon in the future shall be examined as a long-term issue.

In line with the above mentioned basic development policy, it is realistic to handle the international cargo such as the containerized cargo at the above mentioned four container terminals before concentrating the container handling operation at a new deep water port in Yangon. It is necessary to conduct a study on the development of a new container terminal at the northern part of Thilawa Terminal Area in order to relieve the expected shortage of container handling capacity at Yangon Port even after the completion of the MPA Thilawa Container Terminal (ODA Loan Project) and the full operation of MITT Terminal on a middle or long-term basis.

The coastal cargo volume handled mainly at the Lamadaw Area since 2009 has remained at one million tons per annum level figure. On the other hand, the inland water cargo volume shows a declining trend since 2004, registering 600 thousand tons per annum in 2015. The demand for those cargoes is expected to increase due the economic development of the country however the annual increase rate of cargo demand is estimated at 7.8% in the report entitled "The Preparatory Survey for the Project for Expansion of Yangon Port in Thilawa Terminal area (2014.6)". According to this estimate, the annual demand of coastal shipping cargo and inland water transport cargo in 2030 can be estimated at 1.75 million tons and 1.05 million tons respectively.

The cargo handling productivity of coastal ships which employ mechanical handling and inland water transport ships which employ manual handling is estimated at about 500 tons per day and 120 tons per day respectively according to the Team's observations. Assuming that berth utilization rate is 80%, annual cargo handling capacity of coastal ships is estimated at about 146 thousand tons. Consequently, 12 coastal shipping berths will be required to handle the annual cargo demand of 1.75 million tons. In case of the manual handling operation, 30 inland water transport berths would be required. If the manual handling is converted to mechanical handling, however, the annual cargo handling capacity per one inland water ship berth becomes 105 thousand tons which is 3.0 times the manual handling capacity. Thus, the required number of the inland water transport berths becomes 10.

The standard size of coastal shipping vessels is shown in **Table-1**.

**Table-1 Dimensions of Typical Coastal Ship** 

Ship Type		Length		Width		Draft	
		feet	meter	feet	meter	feet	meter
Large Size	Steel	200	60	32	9.6	16	4.8
	Wooden	200	60	32	9.6	18	5.4
Small Size	Wooden/ Steel	99	30	20	6.0	12	3.6

Source: Myanmar Coastal Cargo Shipping Association

## (6) Port Facility Development Plan

The coastal and inland water transport of cargo and passengers are handled at such areas as Lamadaw, Pansodan and Botathaung. Pansodan and Botathaung where passenger transport is the major operation are situated very close to the city area. MPA has a plan to convert these areas into urban development areas including shopping centers, office buildings and passenger terminals by making use of the amenity-rich waterfront nature of these areas. Lanmadaw area (total length of about 1,500 m as shown in **Figure-16**) where the cargo handling area is quiet narrow (maximum width is 150 m and minimum width is 20 m) handles almost all-domestic cargo. In order to improve the cargo handling productivity, it is necessary to redevelop this area. Since this area is adjacent to the city area, it is recommended to use this area as an amenity-rich waterfront urban development space including shopping centers and office buildings. In addition to Lamadaw area, the port area at Kyeemyindang (see **Figure-17**), which exclusively handles bananas, is recommended to be redeveloped similar to Lamadaw area redevelopment.



Source: Study Team (Google Earth)

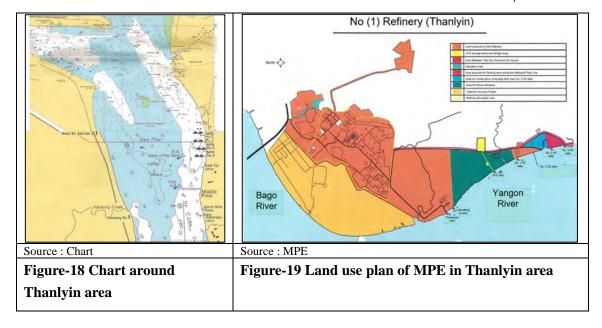
Figure-16 Location of Port Facilities at Lamadaw Area



Source: Study Team (Google Earth)

Figure-17 Location of Port Facilities at Kyeemyindang Area

If the port facilities at Lamadaw and Kyeemyindang area were to be relocated, candidate areas for the relocation would have to have a sufficient water depth and be as close as possible to Yangon (large market). From this viewpoint, the eastern area of Thanlyin where sufficiently deep-water area and land area are available was once evaluated as a candidate site (see Figure 8.6.4.23). However, the Myanma Petrochemical Enterprise (MPE) of the Ministry of Electricity and Energy owns the area shaded in orange in Figure-18 and operates the refinery (production capacity is 20 thousand barrels per day). The refinery expansion project is expected at this area to increase production capacity to 100 thousand barrels per day by the year 2020. In addition, a further expansion project is expected in future by utilizing the area shaded in green in Figure-19. Further south of this area, there is a sufficiently deep-water area for port development. However, this area cannot be used for the port development because it is owned and occupied by the navy. Therefore, it is not possible to relocate the port facilities at Lamadaw and Kyeemyindang area in the vicinity of Yangon. The redevelopment of Lamadaw and Kyeemyindang area at their present locations is only solution that satisfies the requirement of providing space for urban development including waterfront amenity while still maintaining port function.



The above discussions can be summarized as follows;

## Direction of the Development

To redevelop Lamadaw and Kyeemyindang area at present location to meet with the requirement that this area shall provide the space for urban development with waterfront amenity while maintaining port function.

## > Concept of the Development

To redevelop Lamadaw and Kyeemyindang area at their present location as shown in Figure-20 and Figure-21.



Source: Study Team (Google Earth)

Figure-20 Layout Plan of Lamadaw Area Redevelopment

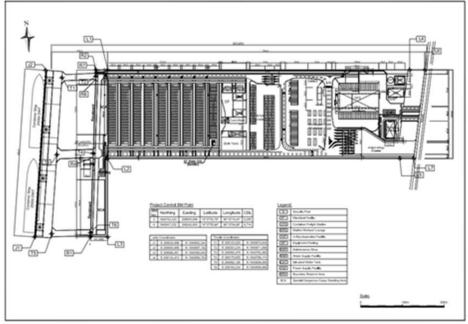


Source: Study Team (Google Earth)

Figure-21 Layout Plan of Kyeemyindang Area Redevelopment

# (7) Yangon Port (Thilawa Terminal Area)

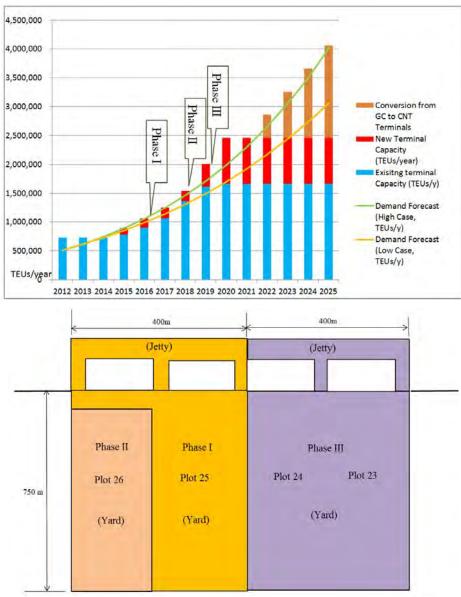
Almost all of the 37 Plots of Thilawa Terminal Area have been sold to private companies and the development and operation of some areas has been commenced. The MPA container terminal is under construction at Plots 25 and 26 by using Japanese ODA; the Phase I project is expected to be completed in 2018. The Phase I project is composed of a quay wall of 400 m in length and a container yard of 200 m in width as the minimum requirement for container terminal as shown in **Figure-22**. In order to fulfill the container terminal function, however, it is necessary to widen the container yard to 400 m corresponding to the length of the quay wall after the completion of the current construction project.



Source: "The Preparatory Survey for the Project for Expansion of Yangon Port in Thilawa Terminal Area" (2014.6)

Figure-22 Layout Plan of Thilawa Terminal Area's Container Terminal (Phase I)

The container handling volume at Yangon Port has steadily increased in accordance with the economic development of the country, reaching about 900,000 TEUs in 2015. This volume is slightly higher than the demand forecast of about 850 thousand TEUs estimated at the time of the original development plan study. Therefore, it will be necessary to complete the construction of the Phase II container yard (Plot 26, 200m in width) by 2018 as shown in **Figure-23** to meet the High Case Demand. Similarly, it will be necessary to complete the Phase III project (Plots 27. and 24, 400m in width) by 2019. Even in the case of Low Case estimates, the Phase I project should be completed by 2020 and the Phase III by 2027. The container handling demand after 2025 will exceed the capacity of the Thilawa Terminal Area even if the current project is successfully realized and some Plots are converted to container terminals. Therefore, it is necessary to develop new terminals at other areas.



Source: "The Preparatory Survey for the Project for Expansion of Yangon Port in Thilawa Terminal Area" (2014.6)

Figure-23 Stage-wise Development Plan of Thilawa Container Terminal

Candidate sites for the next stage container development project (Post Thilawa Project) will be needed beyond 2025 when Myanmar is expected to face a shortage of container handling capacity. The candidate project site shall be selected from various candidate sites including the Yangon River mouth area. Thanlyin area, which was considered a promising candidate area, will be

### Direction of the Development

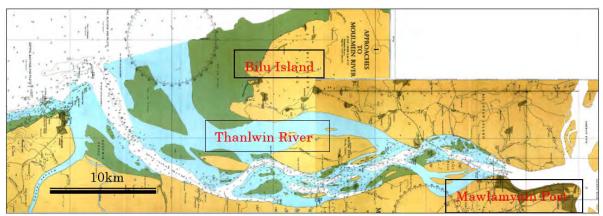
To promote the formulation and implementation of terminal development to cope with the container handling demand in future.

## Concept of the Development

To promote the project implementation of Thilawa Container Terminal Phase II and Phase III succeeding to the current Phase I project. To commence the formulation of a container terminal development plan at the area apart from Thilawa Terminal Area where no space is available for future development.

#### (8) Mawlamyine Port

Mawlamyine Port is a river port located at the confluence of the Thanlwin River and the Jyain River. The water depth is only 4.5 m. Even when utilizing the spring tide (4.2 m) or the neap tide (2.4 m), the maximum draft of ships, which can enter the port, is only 4.5 m. Cargo from deep draft ships, which anchor off Kyaikami area near the estuary of the Thanlwin River is carried by small boats to Mawlamyine Port. The estuary of Thanlwin River is shallowing due to the sedimentation of the river. Thus it is necessary to deepen and maintain the channel at the estuary (see **Figure-24**, the present water depth at the estuary is shallower than this chart which depicts old water depth measurement results).



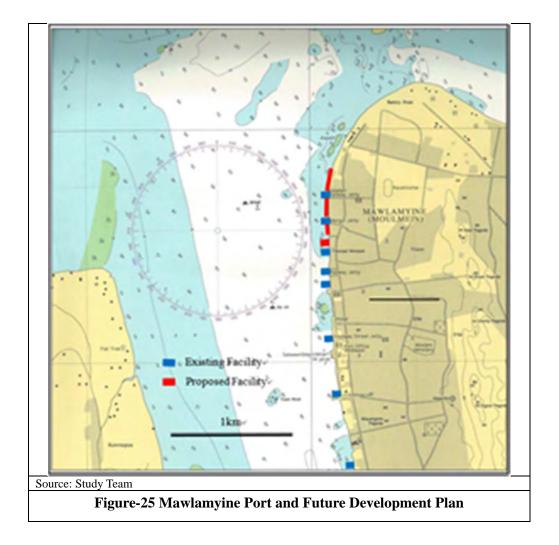
Source: Chart

Figure-24 Situation of the Thanlwin River (Present depth at the estuary is shallower than this chart)

There are eight pontoon type jetties and two reinforced concrete piers at the port as shown in **Figure-25**. Because the port is adjacent to the downtown area, roads are located just behind the port area and consequently the space for cargo handling is very narrow. Cargo is manually handled without using any handling equipment.

The port handles foods, edible oil products, daily goods, construction materials and auto-parts

which are shipped from domestic ports and diesel oil which is imported from Singapore.



Construction materials such as sand and gravel are transported to other parts of the country. To cope with the expected increase in cargo transport demand, a new port shall be constructed at Kyaikami as proposed in section 4.2.2. The demand for daily goods can be met by improving the existing facilities. In order to increase cargo handling productivity and alleviate traffic congestion, the port area shall be expanded toward the river by providing space in front of the existing riverbank either by the construction of a piled platform or reclamation.

The above discussions can be summarized as follows;

## Direction of the Development

The increasing demand will be handled at new jetties to be constructed on the island of Bilu located opposite of Mawlamyine and a connecting bridge construction is being conducted. Other daily use general cargo shall be handled at the existing jetties with some improvement, which is located near the cargo demand area of the city. It is necessary to maintain the channel depth in the Thanlwin River.

## Concept of the Development

The existing jetties extend at the narrow space beside a coastal road. Therefore, it causes poor cargo handling productivity and traffic congestion on the coastal road. An expansion of a port area in front of the coastal road either by a reclamation method or the construction of a piled structure can be proposed as shown in **Figure-26.** 

In addition to the above, it is recommended to construct a hybrid type jetty, which is composed of a concrete jetty and a pontoon jetty for small freeboard ships as shown in **Figure-26.** Mechanical cargo handling equipment can be employed on this jetty and thus the cargo handling productivity will increase. The dredging of the river mouth is needed to maintain the water depth of the channel.



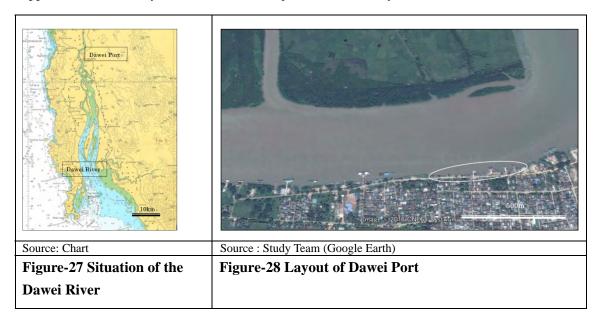
Source: Study Team (Google Earth)

Figure-26 Layout Plan of Mawlamyine Port

#### (9) Dawei Local Port

Dawei Port is situated about 270 km south of Mawlamyine and is expected to serve as a terminal on the western edge of the GMS South Coastal Corridor. However, the road between the Thailand border and Dawei has not been developed. Dawei Port is a river port located on the left bank of Dawei River at a distance of about 45 km from the Dawei River mouth and about 65 km upstream from the open sea. There are total of nine jetties (concrete structure type, wooden structure type and pontoon type) over the distance of about 2 km owned by both MPA and private companies (see **Figure-27** and **Figure-28**). The size of ships calling to the port is reduced due to the accumulation of sediment in the entrance channel. In order to know the situation of the channel, it is necessary to conduct a sounding survey on the channel at first. Subsequently, necessary channel improvement program shall be established. Cement is imported from Thailand and fuel oil is imported from Malaysia and goods such as fishery products, sugar and palm are handled at Dawei port. Daily consumption goods for Dawei (a

major city of Tanintharyi Region with a population of about 140 thousand) are mainly transported via the road network since waterborne transport is in underdeveloped state. The cargo handling productivity at this port is very low because mechanical handling cannot be applied at the narrow yard, which is located just behind the city road.



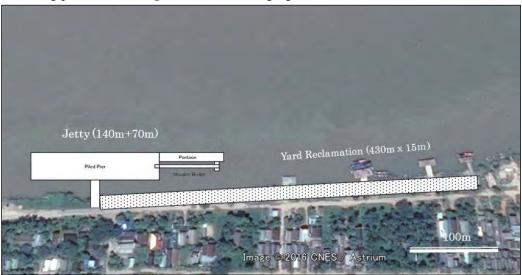
The above discussions can be summarized as follows;

# Direction of the Development

This port will continue to handle the daily necessities, construction materials and fuel oil transport for the Dawei area population. It is necessary to maintain the channel depth

#### > Concept of the Development

The narrow handling yard will be extended and a hybrid jetty with reinforced concrete pier and pontoon jetty will be constructed for small freeboard ships in order to make mechanical handling possible (see **Figure-29**). The dredging of the shallow channel is needed.

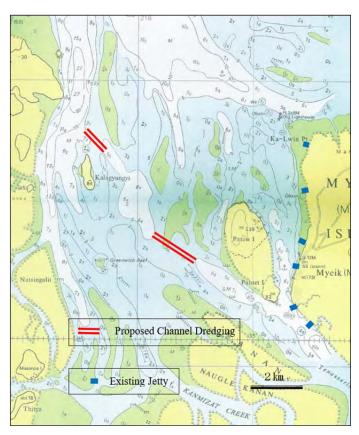


Source: Study Team (Google Earth)

Figure-29 Layout Plan of Dawei Port

### (10) Myeik Port

Myeik Port is located about 800 km away from Yangon by road. Since many islands surround this area, the water area near Myeik Port is calm even during the monsoon season. There are four MPA jetties as well as many jetties owned by private companies and a national petroleum company found at the port. In addition to commuting passengers, the jetties are used for the handling of fish, fish paste, frozen fish, rubber, lumber, cement, oil and the supply of ice to fishing boats. Although the water depth at the MPA jetties is 4 m and it is 6 m at privately-owned jetties, calling ships have to wait for high tide (tidal range is about 5m) due to the shallowness of the channel entrance (2m).



Source: Study Team

Figure-30 Myeik Port and Future Development Scheme

**Figure-30** illustrates the location of existing jetties.

Despite its multipurpose usage, Myeik Port actually seems to be a fishing port judging from the many fishing boats (approx.700), which generally station here for operations etc. Most of the import cargo is diesel oil and edible oil from Malaysia and Thailand. Some general cargo is transported by container ships of about 1,500 GRT (LOA of 70 m and draft of 5 m), which are capable of carrying about 40 TEUs twice or three times per month. Imported container cargoes are consumed in this area though some are transferred to Yangon, Dawei and Kawthaung by coastal shipping vessels of about 500 GRT. On the other hand, most export cargoes are fish paste and frozen fish bound for Japan via Penang, Malaysia.

The Myeik Economic Zone is under construction by a private company on a 260 ha parcel of land facing the inner channel of Myeik Port. This project will be implemented over a 10-year period from 2014 to 2024. The purpose-wise land use plan of this project is as follows; industrial zone (7%), commercial zone (19%), residential zone (7.7%), sports zone (9%), road (15%) and port zone (18%). Since the water depth in front of the port zone is about 7 m, it is possible to construct piers for larger size ships.

As noted above, a major problem facing Myeik Port is the shallowness of the entrance channel, which adversely affects the operating rate of jetties. In order to resolve this problem, off shore cargo handling by barges is conducted by utilizing the deep and calm sea area at this port. Should the problem of shallow water channel be resolved, deep berths could be constructed at the Myeik Economic Zone, which would lead to an increase in the overall cargo handling capacity. The increase of cargo handling capacity at Myeik Port can be achieved by the dredging and the use of channels (total length of about 7. km and the depth of 5 m).

The above discussions can be summarized as follows;

## > Direction of the Development

Myeik Port is a domestic port, which is indispensable for handling fish and fish products as well as for the commuting of peoples of surrounding islands. In addition, this port plays an important role for the international trade between Myanmar and Thai. Since this situation is likely to continue in future and additional private jetties are expected to be constructed, it will not be necessary to develop new large-scale port facilities. Therefore, the most important issue for this port is to secure deep channels so that ships can access the port anytime without waiting for high tide.

#### > Concept of the Development

To dredge channels to 5 m in depth and maintain the depth.

#### (11) Kawthaung Port

Kawthaung city is adjacent to Thailand which is located only about 4 km away over the Pachain River and it is a base of international trade with Thailand. Since there are no roads that connect to the Thai side near Kawthaung city, waterborne transport is vital for trade. Although there is a road to Dawei which is located about 67.0 km north of Kawthaung, bridges on this road are in poor condition. Cargo volume of daily necessities for Kawthaung city is not large as the population is only about 60,000. Approximately 80 % of the international cargo transported from Thailand is cement while the remainder consists of general cargo and fuel oil.

Cement from Thailand is loaded to coastal ships at Ranon Port. The manifests of ships are inspected for about one to two hours by customs at the anchoring area of Kawthaung Port. The ships are inspected again at their first calling ports in Myanmar. This double inspection is performed under cabotage system in which international shipping vessels are not allowed to transport cargo directly to several domestic ports from foreign ports.

Domestic cargoes of Kawthaung Port are exports of palm oil to Yangon, daily necessities of this area and general cargo bound for other ports in Myanmar. No significant increase in the volume of general cargo at this port is expected. However, even now, ships have to wait for a long time to berth due to a shortage of jetties of 5 m in depth at this port. Although cement imports are expected to increase in future, it will not be necessary to expand jetties provided that customs inspections will continue to be carried out at the anchorage areas. This is possible

due to the geographical features of Kawthaung area, which is surrounded by many islands, and consequently calm throughout the year. MPA owns a reinforced concrete pier (length of 110 m, width of 9 m and depth of 5 m) for ships of 1,500 to 2,000 GRT, which handle general cargoes, and two pontoon jetties for passenger boats, fishing boats and sight-seeing boats of 200 GRT class. At privately-owned jetties, petrol, fish, general cargo and passengers are handled (see **Figure-31**).



Source: Study Team

Figure-31 Kawtaung Port and Future Development Plan

It is necessary to construct quay walls in order to eliminate long berth waiting times and the dangerous side-by-side berthing. Since water depth is shallow due to the sedimentation of discharged river sand, the location of new pier construction sites should be carefully examined.

The above discussions can be summarized as follows;

## Direction of the Development

To maintain and enhance the functions of Kawthaung Port as a transit port for international trade between Myanmar and Thailand

#### > Concept of the Development

To expand the pier near the existing MPA pier (depth of 5 m) where deep-sea is available as shown in **Figure-32**.



Source: Study Team (Google Earth)

Figure-32 Layout Plan of Kawthaung Port

#### 2. Deep-sea Ports Development Plans

### (1) Dawei SEZ Port

# 1) Development History

A mutual agreement on the development of the Dawei area, which is located at around 600 km south of Yangon, was signed by the Myanmar Government and Thai Government in May 2008. Based on this agreement, a Thai private developer of Italian-Thai Development (ITD) acquired a 75-year concession for the development and management of a deep-sea port and industrial park from the Myanmar Government. ITD intended to invest US\$ 850 million for the first phase of the project. ITD planned to invited private investors from Japan, Korea and India to formulate a joint venture company and some companies expressed interest. However, due to the weak financial situation of ITD, the project has been suspended.

Under this situation, the Myanmar Government and Thai Government signed a Memorandum of Understanding to declare that the Dawei Development Project including the construction of a deep-sea port and the establishment of SEZ shall be implemented as a national project of both governments. In 2013, a Special Purpose Vehicle (SPV) was established with both governments investing an equal amount and the concession has been transferred to the SPV. Under this framework, individual project components are to be handled by each Special Purpose Company (SPC), which would be established under the initiative of the SPV.

A tripartite agreement of Myanmar, Thai and Japan regarding the cooperation on the development of Dawei SEZ project was signed on 4<sup>th</sup> July 2015 on the occasion of the 7<sup>th</sup> summit meeting of Japan and Mekong region countries. This agreement includes the following cooperation, which will be implemented step-by-step.

The Data Collection Survey for Development Planning in Tanintharyi Region and Dawei SEZ (DPTD) is on-going and the further implementation scheme will be determined among Myanmar, Thailand and Japan based on the result of the survey.

- ✓ Equal basis capital investment to the SPV
- ✓ Dispatch of JICA experts to the SPV for the development masterplan preparation
- ✓ Conduct of a pre-feasibility study to examine needs and method of a new trunk road linking with Bangkok and Dawei

### 2) Dawei SEZ Development Project

Myanmar Government through the Dawei Special Economic Zone Management Committee signed a contract on 5<sup>th</sup> August 2015 to commence the initial development project with a consortium composed of ITD, Rojana Industrial Park Co., Ltd (a joint venture of Nippon Steel & Sumikin Bussan Corporation and Vinichbutr's Group of Thai) and LNG Plus International Co., Ltd of Thai. The initial development project includes the construction of a small port, a small power plant, a two-lane road to Thai border, a residential estate and an industrial park where labor-intensive industries such as garment and food production are expected to be established.

#### 3) Contents and Scale of Development

As shown in **Figure-33** the Dawei Development Project is expected to be developed over a large area extending along the coastal line situated about 20 km north from the downtown area of Dawei. This area is temporally connected with Thai border by a road of 132 km in length.

As shown in **Figure-34**, the original development plan of ITD was a large project, which included the development of an industrial park including facilities with the following functions. The industrial park was planned to be developed around a new excavation type port.

Facilities to be developed in the original plan; steel mill, ship building, oil refinery, petrochemical industry, plastic product, fertilizer, cement, power plant, water resource, car assembly, tire, food processing, pharmacy, container logistics, general cargo logistics and residential area etc.



Source: ITD (Italian-Thai Development Public Company Ltd.)

Figure-33 Location of Dawei SEZ Development Project



Source: ITL

Figure-34 Original Plan of Dawei Development Project

The original port layout plan was an excavation-type construction as shown in **Figure-35.** However, in accordance with the scale and deposit depth of rock layer believed to exist, it is possible that a reclamation-type port construction would be more economical than an excavation-type construction. Therefore, it is recommended to conduct a detailed soil investigation and subsequent port layout planning.

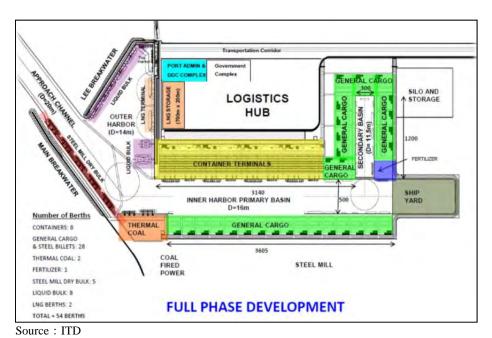


Figure-35 Original Layout Plan of Dawei Development Project

The original development plan shall be reviewed and revised.

#### 4) Development Scenario

The southern coastal area can provide a huge area suitable for the development of coastal industry by making use of gas produced off-shore of this area. Dawei area is suitable for the development of heavy industries by processing coal and ore those are to be imported by large size vessels through a possible new deep sea port which can be constructed at a nearby deep sea area. Cargo transport time from Laem Chabang Port in Thailand to the west may be reduced by 2 to 3 days if the Dawei deep-sea port can be used as a western gate of Thailand. However, the economic merit of this transport route cannot be realized if the land transport cost in Myanmar is still expensive. Even the economic and time merit is materialized the priority for transport route through Dawei for Thailand cargo will be still low unless the frequency of this shipping service increases.

The Dawei deep-sea port development cannot be realized unless the following situation is materialized;

• The shipping cargo demand increases in accordance with the development of industry including light industries at this area.

• The shipping service level reaches a certain level for instance an annual container transport demand exceeds 1.4 million TEUs/Year for the economic deployment of 3,800 TEU container vessels (50,000DWT, 13m draft).

Until the above situation is realized, the development of a small port for supporting the coastal industrial development (light industry is a core) will be a realistic solution.

The above discussions can be summarized as follows;

### > Direction of the Development

To be developed as a core infrastructure of Myanmar as well as GMS by making use of the expected deep-sea port, the availability of a large area of about 20,000 ha, the easy access to Thailand and the expected development of the southern coastal economic corridor.

The function of this port as a logistic hub shall be realized when the base cargo increases to a certain level.

## Concept of the Development

To develop a new deep-sea port of -14 m in depth either by excavation or reclamation and a SEZ and industrial park and a logistic base by utilizing a large area extended behind the port.

## (2) Kyaikami Port (out port of Mawlamyine Port)

Along the southern coast of Myanmar, a water depth of -12m is only available at the south coast of the Kyaikami Temple situated at the estuary of the Thanlwin River. In this area, candidate areas for the development of a deep-sea port are the Kyaikami coast and the Kaleguk area situated along the southern coastline about 75 km from Kyaikami. The candidate sites are shown in **Figure-36** while an evaluation of the candidate sites is shown in **Table-2**.

Based on its close proximity to Yangon Port which is the most important factor in determining whether a port is suitable for serving as a substitute of Yangon Port, the Kyaikami area is judged to be the superior location compared to other areas. The distance by road from Yangon to Kyaikami is about 370 km but it is only 180 km by sea. Therefore, it is possible to transport cargo not only by trucks but also by coastal shipping vessels and barges. If waterborne transport by shallow draft barges becomes available, the cargo transport between the inland cargo demand areas and ports will become a convenient and effective transport means.

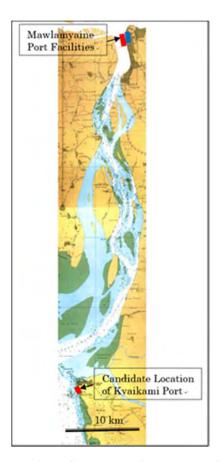
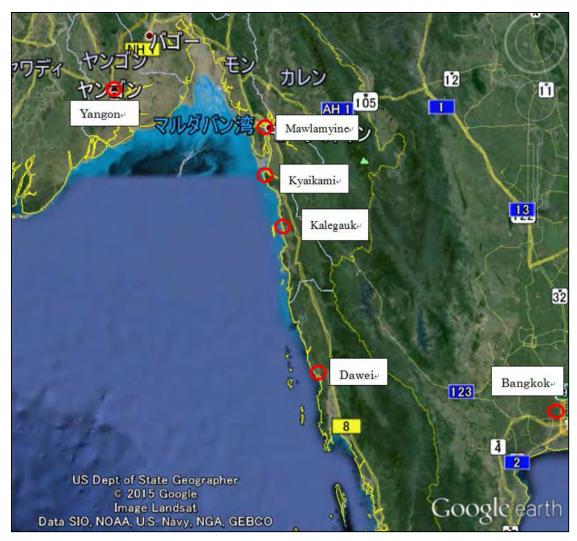


Figure-36 Location of Mawlamyine and Kyaikami Port

The export of rice and beans (the increase of this commodity is considered the national strategy) can be handled at this port instead of the Yangon Port, which has the draft limit of 9m. This port is relatively near the production areas of rice and beans and able to accommodate ships of 40,000DWT class (draft of about 11m) which can transport cargos as far as Middle-East and Africa. However, since the candidate area for the development of the new deep-sea port faces the Bay of Bengal, marine conditions during monsoon seasons are expected to be severe. Consequently, this port should have a breakwater. In addition, land reclamation to secure a water depth of -12 m will be necessary because no deep-sea area is available in the vicinity of the coastline. **Figure-37** shows the candidate locations of deep-sea ports.



Source: Study Report of Port Development Projects in the Southern Area of Myanmar (2015, MLIT)

Figure-37 Location and Candidate Places of Port Development in the Southern Area of Myanmar

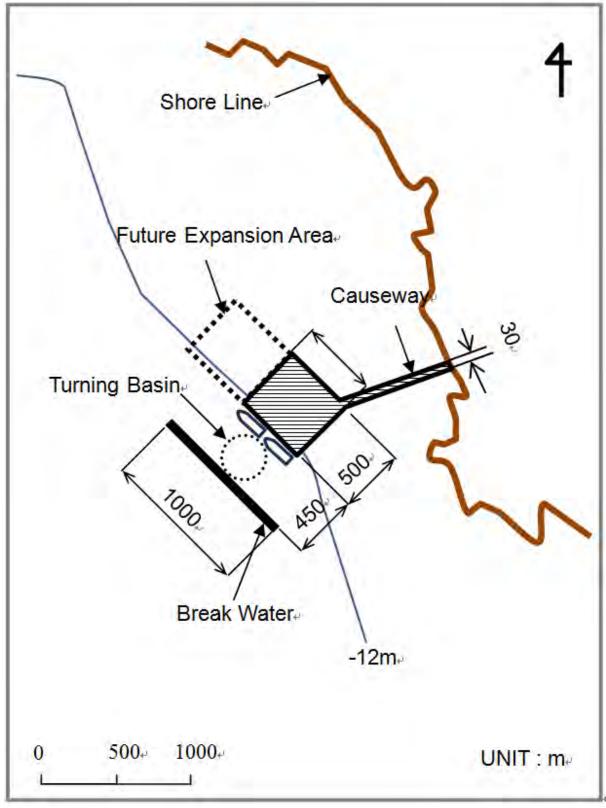
The above discussions can be summarized as follows;

## Direction of the Development

To be developed as a substitute port of Yangon Port due to its close proximity and availability of deep-sea.

## Concept of the Development

To develop a port with a water depth of -12 m and a breakwater for handling cargoes such as containers (see **Figure-38**)



Source : Study Report of Port Development Projects in the Southern Area of Myanmar (2015, MLIT)

Figure-38 Layout Plan of Kyaikami Ports

# 3. Direction and Concept of Port Development

The direction and concept of port development is as shown in Table-2.

**Table-2 Direction and Concept of Port Development** 

Port	Direction of Port Development	Concept of Port Development
Yangon Main Port	Present port extends on a narrow space adjacent to the downtown. Major functions of Yangon Port shall be moved to other area for the improvement of cargo handling efficiency as well as proper land use of this area.	To redevelop the port area in conformity with Yangon City Development Plan. Major port functions shall be transferred to new areas such as Thanlyin area
Thilawa and Thanlyin Area Port	A part of the function of Yangon Main Port shall be integrated into Thilawa Terminal area and Thanlyin areas to strengthen the capacity of the port.	To promote Phase II and Phase III project of Thilawa Container Terminal.  Re-arrange the land use plan of Thilawa Terminal area port.  Utilize Thanlyin area for the expansion of Yangon Main Port and Thilawa Container Terminal.
Sittwe Port	Sittwe port is used as a part of detour waterborne transport route to Bangladesh and the east of India where road development is insufficient. This port plays an important role as a cargo distribution port to villages located at the coast and Kaladan river where road development is hampered because of the existence of many tributaries at this area. Develop this port as a cargo distribution port including container transport for neighboring countries and isolated villages from road connection.	To develop wharves of 8m in depth for container ships of coastal and the Bay of Bengal area shipping which connects ports of this area and is expected to increase calling frequency in the future.  A candidate development area is the mouth of Minga Creek.  The construct of a hybrid jetty composed of a reinforced concrete pier (5m in depth) and a pontoon jetty for small freeboard ships will be required to meet the future cargo demand at Minga Creek where a calm water area can be secured even during monsoon seasons.
Kyaukpyu Port	This port shall be developed as a port composing coastal shipping network, which aims at transporting cargo demand in the surrounding area of each port. There is no rationale for developing the port as a deep-sea port, which handles cargo for the hinterland such as Nay Pyi Taw due to the long distance (about 500km) from the port. However, there is potential to develop a deep-sea port for petrochemical or gas related industrial development by utilizing the available water depth, which exceeds 20m.	To develop a jetty of 5 m in depth as a coastal shipping port at the east water front line of the existing facilities. The structure is recommended to be a hybrid jetty including concrete pier and pontoon, which is able to apply mechanical cargo handling.
Thandwe Port	Transport of daily necessaries for Thandwe population of about 14 thousand depends solely on land traffic. Because Thandwe port has no facility to be used for general cargo handling but fish handling purpose. In order to supply daily necessaries to the population effectively by waterborne transport, Thandwe port needs general cargo handling facilities.	To contract a break water at north part of the bay where fishing boats and passenger boats are berthing to secure a calm water area and jetties of 5m in depth and cargo handling yard which are capable of receiving coastal shipping ships.

Pathein Port	Due to the development of the road transport network from Yangon, a significant increase of waterborne transport between the hinterland and the port is not expected. In order to cope with the demand of the large volume and long haul transportation, the maintenance and improvement of the port function for the coastal and inland water shipping is required.	To extend the coastal shipping pier which faces shortage of capacity in addition to the widening of the narrow cargo handling yard toward riverside to increase the cargo handling productivity.
Mawlamyine Port	The increasing demand will be handled at new jetties to be constructed on the island of Bilu located opposite of Mawlamyine and a connecting bridge construction is being conducted. Other daily use general cargo shall be handled at the existing jetties with some improvement, which is located near the cargo demand area of the city. It is necessary to maintain the channel depth in the Thanlwin River.	The existing jetties extend at the narrow space beside a coastal road resulting poor cargo handling productivity and traffic congestion on the coastal road. It is recommended to expand the port area in front of the riverside road either by a reclamation method or the construction of a piled structure.  In addition to the above, it is recommended to construct a hybrid type jetty, which is composed of a concrete jetty and a pontoon jetty for small freeboard ships. Mechanical cargo handling equipment can be employed on this jetty and thus the cargo handling productivity will increase. The dredging of the river mouth is needed to maintain the water depth of the channel.
Dawei Port	This port will continue to handle the daily necessities, construction materials and fuel oil transport for the Dawei area population. It is necessary to maintain the channel depth	To extend the area of the narrow handling yard and construct a hybrid jetty with reinforced concrete pier and pontoon jetty for small freeboard ships in order to make the use of mechanical handling possible. The dredging of the shallow channel is needed.
Myeik Port	Myeik port is an indispensable port for handling fish and fish related cargo as well as for the commutation of people living in scattered islands. This port also plays an important role of cargo transit function in the trade between Thai and Myanmar. The roles of this port are expected to remain unchanged in future. Considering the expected increase in private jetty constructions, a new large-scale port development will not be needed. However, it will be necessary to maintain the depth of the access channel.	To conduct capital dredging of -5m in depth and subsequent maintenance dredging.
Kawthaung Port	Cargo transit function of this port in the trade between Thai and Myanmar shall be maintained and enhanced.	A jetty with 5m in depth shall be constructed in the vicinity of the existing MPA jetty where relatively deep water is available.

Source: Study Team