Technical Assistance Report

Project Number: 46370-002
Capacity Development Technical Assistance (CDTA)
October 2015

Republic of the Union of Myanmar: Improving Road Network Management and Safety

(Financed by the Japan Fund for Poverty Reduction)

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 30 September 2015)

Currency unit	–	kyat/s (MK)
MK1.00	=	$0.00077
$1.00	=	MK1,290

ABBREVIATIONS

ADB	–	Asian Development Bank
DOH	–	Department of Highways
HDM-4	–	Highway Development and Management-4 software
km	–	kilometer
MOC	–	Ministry of Construction
RAMS	–	road asset management system
RTAD	–	Road Transport Administration Department
TA	–	technical assistance

NOTE
In this report, "$" refers to US dollars.

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CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data — **Project Number:** 46370-002

Project Name	Improving Road Network Management and Safety	**Department /Division**	SERD/SETC
Country	Republic of the Union of Myanmar	**Executing Agency**	Ministry of Construction
Borrower	Republic of the Union of Myanmar		

2. Sector

	Sector	Subsector(s)	Financing ($ million)
✓	Transport	Transport policies and institutional development	2.00
		Total	**2.00**

3. Strategic Agenda

Strategic Agenda	Subcomponents
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded

Climate Change Information

Climate Change impact on the Project	Low

4. Drivers of Change

Drivers of Change	Components
Governance and capacity development (GCD)	Institutional development
Partnerships (PAR)	Bilateral institutions (not client government) Official cofinancing
Private sector development (PSD)	Conducive policy and institutional environment

Gender Equity and Mainstreaming

Some gender elements (SGE)	✓

5. Poverty Targeting

Project directly targets poverty	No

Location Impact

Not Applicable

6. TA Category: B

7. Safeguard Categorization Not Applicable

8. Financing

Modality and Sources	Amount ($ million)
ADB	**0.00**
None	0.00
Cofinancing	**2.00**
Japan Fund for Poverty Reduction	2.00
Counterpart	**0.00**
None	0.00
Total	**2.00**

9. Effective Development Cooperation

Use of country procurement systems	No
Use of country public financial management systems	No

I. INTRODUCTION

1. By transitioning quickly to a market economy and democracy, Myanmar hopes to enter a sustained period of economic growth. Modernizing the country's transport system will support this transformation. It is estimated that Myanmar's per capita gross domestic product could quadruple from 2010 to 2030, reaching $3,500, if the Government of Myanmar implements necessary market policies and large infrastructure investments, particularly those aimed at rehabilitating and improving Myanmar's highway network.[1]

2. The government has asked the Asian Development Bank (ADB) for a capacity development technical assistance (TA) to enhance its road safety and asset management capacity. First, ADB helped the Ministry of Construction (MOC) set up a road inventory, as well as assess and prioritize pavement maintenance and improvement needs.[2] ADB also provided advice on road safety and priority actions.[3] Building on these measures, the government requested support to build the capacity of the Department of Highways (DOH)[4] and the Road Transport Administration Department (RTAD) to prepare and deliver new network-wide programs of road safety improvements, and highway rehabilitation works.

3. This report is based on understandings reached with the government during the TA reconnaissance mission fielded in June 2015. It reflects agreements reached on the impact, outcome, outputs, implementation arrangements, cost, financing arrangements, and terms of reference. The design and monitoring framework is in Appendix 1.[5]

II. ISSUES

4. Inadequate investment, technology, and maintenance have rendered Myanmar's highway network underdeveloped, unsafe, and in poor condition. This constrains the economic development of the country, which relies heavily on its roads for national and international transport. Periodic maintenance and rehabilitation programs and safety improvements will improve the condition of Myanmar's highway network and reduce the number of road accidents.

5. Myanmar's highway network is extensive but low in quality. In 2014, Myanmar had 157,000 kilometers (km) of roads, of which only 34,700 km were paved. The country's network of trunk roads extends for over 40,000 km and is managed by the DOH under the MOC. Despite significant investment over the past decade, only 53% of these roads are currently paved. Of the paved trunk roads, two-thirds are only 12 feet wide, and half are in poor condition, requiring immediate rehabilitation. Vehicle speeds are slow, road alignments often dangerous, and basic safety features generally missing.

6. This situation is rooted in the method and magnitude of government investment in the road sector. In recent decades, Myanmar has spent about 1% of its gross domestic product on trunk roads (against 2%–3% in comparable countries), with spending long earmarked for remote areas rather than the core network, and standards kept low. More recently, the government has dedicated resources to widening roads, but without improving alignments. Pavements have

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1 ADB. 2014. *Myanmar: Unlocking the Potential. Country Diagnostic Study*. Manila.
2 ADB. 2013. *Draft Final Report for TA-8327. Developing the Asset Management Program for Myanmar Roads*. Nay Pyi Taw.
3 ADB. 2014. *Technical Assistance for Improving Road Safety in the Association of Southeast Asian Nations*. Manila (TA 8075-REG).
4 This department was formerly known as the Department of Public Works.
5 The TA first appeared in the business opportunities section of ADB's website on 11 September 2015.

been maintained and repaired, but these measures have generally fallen short of lasting improvements. For most road works, the DOH has applied low quality standards and relied on labor-intensive techniques. This has kept costs and technology requirements low, and enabled a sizeable expansion of the network; however, the economic impact of this expansion has been limited. Road transport remains costly and slow, even on Myanmar's main roads and international corridors.

7. With assistance from ADB, the MOC has assessed highway maintenance and improvement needs and prepared a medium-term plan for improving highway conditions (footnote 2). The TA successfully created the first computerized inventory of the MOC network, surveyed the condition of 27,000 km of highways, set up a pavement management system, and identified a medium-term investment priority plan.

8. To implement the plan and modernize the road network, past practices must be discontinued. Investments must increase and focus on main roads where traffic is important. Highway pavements should be rehabilitated and equipped with better safety features. Technologies and delivery mechanisms must be changed, the use of asphalt concrete generalized, and labor-intensive methods phased out on high-volume roads. This will require outsourcing works, rather than carrying them out by force account. Contracting mechanisms on highways managed by private concessionaires will also need to be improved.[6] Future TA projects will help the MOC implement these changes gradually.

9. Road safety in Myanmar has also reached a critical juncture. The number of road-related deaths has doubled since 2009, reaching 4,300 in 2014, and one-third of all injuries reported in hospitals are from road crashes. While the level of fatalities remains below that in other Southeast Asian countries, this is largely because Myanmar's motorization rates are still low. Over the next 5 years, the number of annual fatalities is expected to double once more, and could reach 15,000 by 2025 if the situation continues unchecked.

10. Although the Myanmar Road Safety Action Plan, 2014–2020 under the National Road Safety Council provides a robust institutional framework for road safety management, it is at risk of remaining unimplemented because the RTAD and DOH lack the capacity to design safety enhancing programs and update the regulatory framework. In 2015, ADB carried out a rapid assessment of road safety in Myanmar and trained officials in preparing road safety projects (footnote 3). The assistance was successful and led to the identification of priority actions and possible demonstration projects; however, the RTAD and DOH do not have enough staff skilled in road safety to develop the projects fully.

11. Improving the pavement of trunk roads with established traffic would have significant economic benefits. By focusing on higher priority roads, a medium-term program of periodic maintenance and rehabilitation of about 4,000 km of paved highways at a cost of $1.2 billion may save approximately $30 billion in transport costs over 15 years. Improving highway safety could expand these benefits further. The number of road crashes has been increasing by more than 15% each year. Road safety investments could slow this trend and reduce crash severity. Reducing the number of crashes by 20% would save more than 40,000 lives over 15 years and add $5.7 billion to Myanmar's economy.[7]

[6] About 5,500 km of MOC highways are managed under so-called build–operate–transfer contracts.
[7] ADB. Forthcoming. *Transport Sector Policy Note*. Manila.

12. On 30 March 2015, the minister of construction sent a letter to ADB (i) expressing high satisfaction with the results of the previous TA project, (ii) announcing that the DOH had set up two road asset management units and a road safety unit based on ADB's recommendations, and (iii) asking ADB for further highway asset management support. The Ministry of Rail Transportation and the RTAD also requested ADB support to help implement the National Road Safety Action Plan. This TA project forms part of ADB's response. ADB is also considering financing the DOH's program for the periodic maintenance and rehabilitation of highway pavement, as well safety demonstration projects under the planned 2017 Transport Sector Modernization Program.[8]

III. THE PROPOSED CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE

A. Impact and Outcome

13. The TA is aligned with Myanmar's 2014 National Transport Sector Development Master Plan, which hopes to develop safe, all-weather infrastructure for road transport.[9] The TA outcome will enhance the government's road safety and asset management capacity. Specifically, the TA seeks to enable the DOH and RTAD to launch new programs relating to road safety and the periodic maintenance and rehabilitation of highway pavements. These programs may be financed by the government, ADB, other development partners, or the private sector.

B. Methodology and Key Activities

14. **Output 1: Road safety programs and management capacity developed**. The TA will develop road safety programs and capacity in the RTAD and DOH. The TA will support the DOH by (i) reviewing current road safety engineering practices and recommending new or improved practices, (ii) carrying out safety audits and crash risk surveys of highways with high traffic, (iii) developing a medium-term road safety investment program (in coordination with the RTAD), and (iv) helping establish the DOH's new road safety unit.

15. The TA will advise the RTAD on (i) auditing road safety, (ii) developing a road crash data system, (iii) improving the national driver licensing system, (iv) developing a demerit licensing system linking police offence data with driver licenses, (v) improving heavy commercial vehicle safety, and (vi) developing a road safety research system. It will also (i) carry out policy reviews, (ii) prioritize actions for the National Road Safety Action Plan, and (iii) review highway accident patterns.

16. **Output 2: Periodic maintenance and rehabilitation program and management capacity for highways developed.** The TA will help the DOH prepare and implement a program of periodic maintenance and rehabilitation for highways, prioritized with the DOH's road asset management system (RAMS). The TA will (i) review and recommend improvements to pavement repair design and implementation practices, (ii) prepare a design guideline for pavement periodic maintenance and rehabilitation; (iii) recommend main features and an approach for the program; (iv) recommend performance standards for maintenance contracts; (v) recommend tendering process and supervision procedures; (vi) prepare model bidding documents; (vii) prepare an operational manual covering program and project preparation,

[8] ADB. 2013. *Country Operations Business Plan: Myanmar, 2015–2017*. Manila
[9] Japan International Cooperation Agency. 2014. *Myanmar—National Transport Master Plan*. Nay Pyi Taw.

management, delivery, and monitoring; and (viii) help establish implementation arrangements and train staff.

17. **Output 3: Demonstration projects prepared**. The TA will prepare the first phases of the road safety investment and periodic maintenance and rehabilitation programs. It is estimated that the TA will help prepare pavement repair and improvement works on at least 500 km of highways. These works may include asphalt concrete or penetration macadam overlays, pavement rehabilitation, and shoulder repairs and improvements. These measures will be confined to the current road width and will not require full reconstruction or widening of the road. Road safety demonstration projects are expected to consist of (i) blackspot treatments, (ii) the installation of safety features on dangerous corridors, and (iii) targeted infrastructure (e.g., for motorcycles and pedestrians) combined with coordinated actions from road safety stakeholders. For each subproject, the TA will prepare basic engineering designs using standardized cross-sections, typical drawings and costing, initial environmental evaluation, bidding documents, and economic analysis.

18. **Output 4: Road asset management system institutionalized within the Department of Highways**. Under the previous TA, the DOH developed a road database and pavement management system (footnote 2). This output will help upgrade and institutionalize those systems. The TA will (i) develop key maintenance performance indicators and standards; (ii) prepare the first DOH annual report; (iii) improve maintenance prioritization; (iv) improve the pavement management system calibration to improve its success rate and facilitate its use by field staff; (v) develop and implement new RAMS functions (global positioning system centerlines, video logging, a drainage inventory, a geographic information system interface, and standard reports); (vi) train and help the RAMS units carry out new surveys and database updates; and (vii) help implement necessary policies and processes.

19. Myanmar's economic and democratic transition presents both opportunities and risks for development projects. The general elections scheduled for November 2015, the subsequent transition period, and the new government's accession by March 2016 make policy continuity uncertain. However, the change of government should not affect the TA objectives because (i) the civil servants composing the office of the MOC permanent secretary will remain in office after the elections, (ii) improving road pavements is highly likely to remain an economic priority, and (iii) the flexible program design can accommodate specific government requests. As in any country, the new government may not prioritize road asset management and safety when making investment decisions. The TA will partly mitigate this risk by building the capacity of government agencies to provide evidence justifying these expenditures.

C. Cost and Financing

20. The TA is estimated to cost $2,050,000, of which $2,000,000 will be financed on a grant basis by the Japan Fund for Poverty Reduction and administered by ADB. The government will provide counterpart support in the form of (i) counterpart staff; (ii) an appropriate furnished office in Nay Pyi Taw; (iii) local communications in Nay Pyi Taw; (iv) local transportation for site visits; (v) vehicles and staff for surveys; (vi) logistical assistance to organize events; (vii) access to relevant information, staff, data, and reports; and (viii) other in-kind contributions.

D. Implementation Arrangements

21. The MOC will be the executing agency and the DOH will be the implementing agency. The RTAD and DOH will form a project steering committee. ADB will also set up a technical

review committee to ensure the quality of the TA products. The TA will be implemented over 23 months from 1 March 2016 to 31 January 2018.

22. The TA will provide 54 person-months of international consultant inputs and 88 person-months of national consultant inputs in the following areas: road management, road maintenance planning, road management systems, information technology, pavement maintenance engineering, road safety management, road safety engineering, road maintenance contracting, environmental management, and social development. ADB will recruit consultants in accordance with the Guidelines on the Use of Consultants (2013, as amended from time to time). ADB will recruit a consulting firm using a quality- and cost-based selection method with a quality to cost ratio of 90:10, following submission of full technical proposal. ADB will also recruit resource persons to form a TA technical review committee and participate in review workshops.

23. Consultants will manage surveys, workshops, training, and seminars under the TA budget. Equipment will be procured in compliance with ADB's Procurement Guidelines (2015, as amended from time to time). The assets and equipment procured under the TA will be handed over to the executing agency and/or implementing agency when the TA is completed. Proceeds of the TA will be disbursed in line with the *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).

24. ADB will monitor and evaluate the TA based on the design and monitoring framework and according to standard ADB procedures. Parts of the final TA report may be published and disseminated.

IV. THE PRESIDENT'S RECOMMENDATION

25. The President recommends that the Board approve ADB administering technical assistance not exceeding the equivalent of $2,000,000 to the Government of Myanmar to be financed on a grant basis by the Japan Fund for Poverty Reduction for Improving Road Network Management and Safety.

DESIGN AND MONITORING FRAMEWORK

Impacts the Project is Aligned with
All-weather and safe road transport infrastructure developed by 2030 (National Transport Sector Development Master Plan, 2014)[a]

Project Results Chain	**Performance Indicators with Targets and Baselines**	**Data Sources and Reporting**	**Risks**
Outcome Government road safety and asset management capacity enhanced	**By 2019** a. At least five priority actions under the National Road Safety Action Plan launched (2015 baseline: 0) b. At least 30% of maintenance works carried out by private contractors based on priorities identified in the DOH's RAMS (2015 baseline: 0)	a–b. DOH annual report	Delays and loss of momentum for policy dialogue after the elections Government fails to prioritize road asset management and safety improvements.
Outputs 1. Road safety programs and management capacity developed	**By 2018** 1a. National road safety investment program prepared (2015 baseline: no program) 1b. Safety policy reviews carried out and systems development initiated (2015 baseline: 0) 1c. DOH road safety unit functioning and at least 20 staff trained (2015 baseline: unit just established)	1a. DOH annual report 1b–1c. RTAD annual report	Political considerations reduce scope for economically sound decisions on investment priorities.
2. Periodic maintenance and rehabilitation program and management capacity developed	2a. Instructions for identifying, prioritizing, and implementing periodic maintenance and rehabilitation works issued by the DOH (2015 baseline: none) 2b. Guidelines for the design of periodic maintenance and rehabilitation works, safety auditing, risk assessment, and the design of safety features acceptable to the DOH disseminated (2015 baseline: none) 2c. Performance standards for maintenance contracts acceptable to the DOH set (2015 baseline: no performance standards) 2d. Model contract documents acceptable to the DOH prepared (2015 baseline: the DOH carries out works by force account) 2e. At least 50 DOH staff trained (2015 baseline: none)	2a–2e. DOH annual report	Loss of knowledge due to leadership and management changes.

Project Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
3. Demonstration projects prepared	3a. Basic designs and contractual documents for 500 km of periodic maintenance and rehabilitation works prepared (2015 baseline: none) 3b. Basic designs and implementation plans for demonstration road safety projects prepared (2015 baseline: none)	3a–3b. Consultant reports	
4. RAMS institutionalized within the DOH	4a. Annual DOH report or business plan with performance indicators published (2015 baseline: none) 4b. Performance standards for maintenance planning approved by the DOH (2015 baseline: no performance standards) 4c. RAMS updated and improved (2015 baseline: database includes first inventory and condition survey) 4d. Road asset management unit functioning and at least 20 staff trained in road asset management. (2015 baseline: none)	4a–4d. DOH annual report	

Key Activities with Milestones

Output 1: Road safety programs and management capacity developed

1.1 Review crash patterns and safety practices, including issues faced by vulnerable groups such as women (Q2 2016)
1.2 Propose structure and main components of road safety investment program (Q2 2016)
1.3 Carry out road safety surveys (Q3 2016)
1.4 Prepare road safety investment program (Q2 2017)
1.5 Select demonstration projects (Q2 2016)
1.6 Train DOH and RTAD staff (Q4 2017)
1.7 Carry out policy reviews (Q2 2017)
1.8 Advise on the development of road safety systems (Q2 2017)

Output 2: Periodic maintenance and rehabilitation program and management capacity developed

2.1 Review pavement maintenance guidelines and practices (Q2 2016)
2.2 Propose program structure and main features (Q2 2016)
2.3 Propose operational pavement maintenance and improvement strategy (Q1 2017)
2.4 Prepare design guide for the periodic maintenance and rehabilitation of pavements (Q1 2017)
2.5 Recommend tendering process, supervision procedures, and model contract documents (Q1 2017)
2.6 Define performance standards and monitoring mechanisms for maintenance contracts (Q1 2017)
2.7 Prepare operational manual (Q1 2017)
2.8 Help establish implementation arrangements and train staff (Q4 2017)

Key Activities with Milestones

Output 3: Demonstration projects prepared

3.1 Review priorities identified under the Technical Assistance to Myanmar for Developing the Asset Management Program for Myanmar Roads and propose scope of pilot projects (Q2 2016)
3.2 Coordinate with stakeholders regarding the preparation of road safety projects (Q4 2016)
3.3 Prepare feasibility study and implementation plan for pilot projects (Q4 2016)
3.4 Prepare initial environmental evaluation and social analysis for pilot projects (Q4 2016)
3.5 Estimate costs and economic benefits (Q4 2016)
3.6 Prepare basic designs for pilot projects (Q1 2017)
3.7 Prepare contract documents (Q1 2017)

Output 4: Road asset management system institutionalized within the Department of Highways

4.1 Design and define implementation plan for RAMS improvements and prepare survey plan (Q2 2016)
4.2 Train RAMS unit staff, facilitate data collection surveys, and help input data into the database (Q2 2016–Q4 2017)
4.3 Develop and implement new RAMS functions (Q2 2017)
4.4 Help set up RAMS unit policies and processes (Q2 2017)
4.5 Improve pavement management system calibration based on surveys (Q1 2017)
4.6 Improve the maintenance prioritization mechanism (Q1 2017)
4.7 Help prepare an annual maintenance plan (Q2 2017)
4.8 Develop key maintenance performance indicators and maintenance standards for the DOH (Q2 2017)
4.9 Draft first DOH annual report (Q2 2017)

Inputs

Japan Fund for Poverty Reduction: $2,000,000

Assumptions for Partner Financing

Not applicable.

DOH = Department of Highways, RAMS = road asset management system, RTAD = Road Transport Administration Department, Q = quarter.

[a] Government of Myanmar. 2014. National Transport Development Master Plan. Nay Pyi Taw.

Source: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN

($'000)

Item	Amount
Japan Fund for Poverty Reduction[a]	
1. Consultants	
a. Remuneration and per diem	
i. International consultants (54 person-months)	1,355.0
ii. National consultants (88 person-months)	165.0
b. International and local travel	65.0
c. Reports and communications	10.0
2. Equipment[b]	50.0
3. Workshops, training, seminars, and conferences[c]	
a. Resource people	25.0
b. Training	80.0
c. Workshops and seminars	10.0
4. Surveys and studies[d]	85.0
5. Miscellaneous administration and support costs	5.0
6. Contingencies	150.0
Total	**2,000.0**

Note: The technical assistance (TA) is estimated to cost $2,050,000, of which contributions from the Japan Fund for Poverty Reduction are presented in the table above. The government will provide counterpart support in the form of counterpart staff; an appropriate furnished office in Nay Pyi Taw; local communications in Nay Pyi Taw; local transportation for site visits; vehicles and staff for surveys, logistical assistance to organize events; access to relevant information, staff, data, and reports; and other in-kind contributions. The value of the government contribution is estimated to account for 2.5% of the total TA cost.

[a] Administered by the Asian Development Bank.

[b] Equipment

Type	Quantity	Cost
Office equipment (computers, printer)	4 sets	$10,000
Road surveying equipment	5 sets	$30,000
Specialized software		$10,000

Equipment will be turned over to the executing agency upon physical completion of the TA. The equipment will be procured according to ADB's Procurement Guidelines (2015, as amended from time to time) by the TA consulting firm.

[c] Workshops, training, seminars, and conferences

Purpose	Venue
Training programs	Yangon, Nay Pyi Taw
Road safety workshops	Yangon, Nay Pyi Taw
Review workshops	Nay Pyi Taw

[d] Surveys and studies

Purpose	Cost
Road condition and inventory surveys	$30,000
Road safety surveys	$25,000
Pavement structural surveys	$30,000

Source: Asian Development Bank

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Scope of Work

1. The consultancy's objective is to enable the Department of Highways (DOH) and Road Transport Administration Department (RTAD) to launch new programs for road safety and the periodic maintenance and rehabilitation of highway pavement. To enable Asian Development Bank (ADB) financing, a full set of preliminary demonstration projects will be prepared.

2. The consultant's expected outputs are as follows:
   - (i) Technical assessments of accident patterns, safety engineering issues, pavement maintenance practices, and private sector capacity.
   - (ii) Road safety program and capacity building, including the production of
     - (a) a medium-term national road safety investment program in the form of a strategy document, as well as investment and action plans;
     - (b) safety policy reviews and enabling systems development initiated;
     - (c) safety engineering guidelines; and
     - (d) a training program aimed at operationalizing the DOH and RTAD road safety units.
   - (iii) A periodic maintenance and rehabilitation program, including
     - (a) a program overview document;
     - (b) an operational manual containing complete design guidelines, social and environmental frameworks and management plans, performance standards for contracts, model contractual documents, and staff instructions for identifying, prioritizing, and implementing works;
     - (c) a training program enabling the DOH to use the operational manual; and
     - (d) a proposal for a capacity development technical assistance project enabling the DOH to manage the program and the private sector to deliver the works.
   - (iv) Demonstration projects, including the preparation of
     - (a) a feasibility report for each subproject, preliminary costing, implementation arrangements, and an economic analysis using the Highway Development and Management-4 software (HDM-4);
     - (b) specific requirements and implementation arrangements for demonstration road safety projects;
     - (c) an initial environmental evaluation, as well as financial management, procurement, and poverty and social assessments;
     - (d) a basic engineering report, including detailed costing; and
     - (e) bidding documents for civil works.
   - (v) Road asset management capacity building, including
     - (a) an annual DOH report or business plan with performance indicators;
     - (b) policies and procedures for road asset management system (RAMS) use;
     - (c) performance standards for maintenance planning;
     - (d) assistance enabling the DOH to update the RAMS to include 2016 data;
     - (e) RAMS improvements (the geographic positioning of centerlines, video logging, a drainage inventory, geographic information system interface, and standard reports); and
     - (f) a training program to fully operationalize the road asset management unit.

Table A3.1: Summary of Consulting Services Requirements

Positions	Person-Months	Qualification Requirements
International		
Team leader and road management specialist [a]	15	Civil engineer. Preferred 15 years of experience in the road sector with full understanding of road asset management and institutional reforms, and prior experience leading capacity-building projects for a development organization.
Road safety engineer[a]	7	Civil engineer. Preferred 10 years of experience in traffic engineering and/or management, including experience in road safety auditing and design, and preparing road safety investment programs. Qualified road safety auditor.
Road safety management specialist[a]	7	Preferred 10 years of experience in strengthening government capacity for road safety management and developing road safety policies and strategies. Qualified road safety auditor. Relevant background.
Pavement maintenance engineer[a]	8	Civil engineer. Preferred 15 years of experience in pavement design, pavement maintenance, engineering, and data collection. Prior experience in tropical developing countries preferred.
Road maintenance contracting specialist[a]	4	Civil engineer. Preferred 10 years of experience in highway contract procurement, including experience designing performance-based road maintenance contracts, especially in developing countries.
Road maintenance planning specialist[a]	3	Civil engineer or transport economist. High level of proficiency in HDM-4 required. Preferred 10 years of experience in road maintenance planning, including experience in the preparation of medium-term maintenance plans in developing countries.
Road management system specialist[a]	3	Civil engineer or IT specialist. Preferred 10 years of experience in all aspects of road data collection, data processing and analysis, data quality assurance, and asset database development. Experience with relational database management systems and PostgreSQL required. Experience using Roadroids systems for road data collection is an advantage.
IT or GIS specialist	3	IT specialist. Preferred 10 years of experience in designing IT applications, with at least 5 years of experience in GIS.
Environment specialist	2.5	Preferred 10 years of experience in preparing environmental impact assessments of infrastructure projects, including road projects, and hands-on experience with ADB safeguard procedures.
Social development specialist	1.5	Preferred 10 years of experience in social analysis and resettlement management for infrastructure projects. Hands-on experience with ADB safeguard procedures required.
National		
Deputy team leader and highway engineer[a]	18	Civil engineer. Preferred 10 years of experience in preparing or implementing road construction and maintenance projects. English fluency is necessary.
Highway engineer	12	Civil engineer. Preferred 5 years of experience in preparing or implementing road construction and maintenance projects. Working level of English is necessary.
Road safety specialist	10	Civil engineer or other relevant background. Experience in traffic engineering is required. Preferred 3 years of experience in the area of road safety.
Road survey specialist	16	Civil engineer. Preferred 5 years of experience in planning and conducting road surveys. Working level of English is necessary.
Data management and GIS specialist	16	Preferred 5 years of experience in developing and manipulating databases and setting up GIS. Working level of English is necessary.
Training specialist	6	Preferred 5 years of experience in coordinating events, preferably including training programs. Working level of English is necessary.
Procurement specialist	4	Preferred 5 years of experience in civil works procurement. Working level of English is necessary.
Environment specialist	3	Preferred 3 years of experience in environmental management. Working level of English is necessary.
Social development specialist	3	Preferred 3 years of experience in social analysis, including experience in conducting surveys and stakeholder consultations. Working level of English is necessary.

GIS = geographic information system, HDM-4 = Highway Development and Management-4 software, IT = information technology.
[a] Key experts for evaluation purposes.
Source: Asian Development Bank.

B. Detailed Tasks

3. **Team leader and road management specialist** (international, 15 person-months) **and deputy team leader and highway engineer** (national, 18 person-months). The specialists will coordinate the team and be responsible for the quality and timely delivery of all outputs. Specific tasks include (i) recommending the strategy, scope, financing, and implementation arrangements of the programs and demonstration projects; (ii) recommending a mechanism to implement the programs on existing build–operate–transfer roads; (iii) setting up processes and policies to implement the programs in the DOH, collect data, and institutionalize the RAMS; (iv) helping the DOH establish or strengthen relevant units (such as those relating to safety, the RAMS, design, procurement, and quality assurance); (v) drafting the first annual DOH report; (vi) helping the DOH communicate and justify the programs to stakeholders; and (vii) drafting or compiling the technical assistance reports.

4. **Road safety management specialist** (international, 7 person-months; national, 10 person-months). The specialist will (i) review patterns and main causes of road crashes; (ii) review the issues faced by different genders and age groups; (iii) recommend objectives, scope, implementation mechanisms, and financing for the highway safety investment program (together with the road safety engineer); (iv) help prepare demonstration road safety projects by (a) selecting demonstration projects, (b) ensuring that solutions meet the needs of vulnerable groups such as women, (c) coordinating with stakeholders, (d) advising on required actions, and (e) proposing an implementation mechanism; (v) carry out priority policy reviews and help the RTAD plan priority actions under the National Road Safety Action Plan; (vi) train counterpart staff and other stakeholders in road safety management; and (vii) advise the RTAD on (a) developing a road crash data system, (b) improving the national driver licensing system, (c) developing a demerit licensing system linking police offense data with driver licenses, (d) developing a road safety research system, and (e) improving safety for heavy commercial vehicles.

5. **Road safety engineer** (international, 7 person-months). The consultant will (i) review current highway safety features and engineering practices in the DOH to identify issues requiring attention; (ii) recommend highway safety engineering practices, such as (a) blackspot evaluation, (b) road safety auditing and design, (c) the design of signs, markings, and intersections, and (d) the management of roadside hazards, motorcycles, and nonmotorized traffic; (iii) consolidate these recommendations in a handbook and train DOH and RTAD staff accordingly; (iv) recommend procedures for road safety auditing by the DOH and RTAD; (v) carry out safety audits of highway sections identified by the DOH for possible inclusion in the demonstration projects; (vi) develop a medium-term national highway safety investment program by (a) proposing the program scope, such as treating blackspots, installing safety features, removing hazards, improving safety during rehabilitation, and ensuring safer road demonstration corridors, (b) proposing an investment selection approach, (c) organizing data collection and surveys, and (d) proposing the scope of the first program phase; (vii) prepare demonstration road safety projects by (a) finalizing the selection of demonstration projects, (b) carrying out blackspot analysis, and (c) preparing basic safety designs; (viii) recommend a safety approach for the periodic maintenance and rehabilitation program, including a safety risk assessment method and generic safety features; (ix) prepare safety features for inclusion in the basic design of the first phase of the periodic maintenance and rehabilitation program; (x) help the DOH establish a road safety unit; and (xi) recommend safety indicators for the annual DOH report.

6. **Pavement maintenance engineer** (international, 8 person-months) **and highway engineer** (national, 13 person-months). The consultants will (i) review current design guidelines and DOH practices relating to the maintenance and rehabilitation of bituminous highway pavement to identify issues requiring attention, (ii) review current implementation practices in construction and maintenance to identify issues affecting pavement performance, (iii) define an operational strategy for the new periodic pavement maintenance and rehabilitation program and select the scope of the first phase, (iv) organize the surveys necessary to design first phase projects, (v) help the DOH prepare basic designs as references for bidding documents and detailed cost estimates, (vi) recommend improvements to design and implementation practices for bituminous highway maintenance and rehabilitation, (vii) prepare a design guide for periodic maintenance and rehabilitation works, and (viii) train counterpart staff in applying the recommendations.

7. **Road maintenance contracting specialist** (international, 4 person-months) **and procurement specialist** (national, 4 person-months). The consultants will (i) review national private sector capacity for (a) periodic pavement maintenance and rehabilitation works and (b) road safety improvement works; (ii) identify the potential for performance-based contracting for routine and periodic maintenance; (iii) recommend a support program to build national private sector capacity to carry out periodic maintenance and rehabilitation of highway pavement; (iv) prepare an operational manual recommending a procurement strategy as well as procurement and supervision procedures, prepare model bidding documents acceptable by the government, and train counterpart staff in applying these processes; (v) recommend performance standards and verification procedures applicable to both build–operate–transfer and performance-based maintenance contracts; and (vi) prepare a procurement plan and bidding documents for the demonstration projects. At least one of the contracts will include performance-based routine maintenance.

8. **Road maintenance planning specialist** (international, 3 person-months). The specialist will (i) define maintenance performance indicators and standards; (ii) review and improve the maintenance prioritization mechanism defined under the Technical Assistance to Myanmar for Developing the Asset Management Program for Myanmar Roads so that it can be used by central and local government staff for maintenance planning, train staff accordingly, and update the 5-year maintenance program; (iii) help select first phase periodic maintenance and rehabilitation works and prepare a summary economic analysis of works selected based on basic design cost; (iv) train counterpart staff in HDM-4 concepts and use; and (v) improve the pavement management system calibration (using HDM-4).

9. **Road management system specialist** (international, 3 person-months), **road survey specialist** (national, 16 person-months), **and data management and geographic information systems specialist** (national, 16 person-months). The specialists will (i) train RAMS staff and assist in various RAMS functions; (ii) recommend a new road survey scope and methods, procure equipment, and prepare survey plans; (iii) train in surveying methods; (iv) help plan and conduct surveys; and (v) help preprocess and input survey and other data in the database.

10. **Information technology specialist** (international, 3 person-months). The consultant will (i) design and implement a simple geographic information system interface with automatic data mapping in web mapping systems; (ii) prepare automatic statistical reports of road conditions and traffic amounts (key performance indicators); (iii) add new inventory items (such as bridge, drainage, and right-of-way video logging) to the database and synchronize video, location, and image viewing; (iv) develop functions to export data to Excel; (v) create a tool to process

centerline changes automatically; (vi) develop an easier process to import and update data; and (vii) develop a user-friendly interface for the database.

11. **Environment specialists** (international, 2.5 person-months; national, 3 person-months). The specialists will (i) assess issues with current DOH environmental and legal frameworks, practices, staffing, and procedures, particularly with regard to maintenance and rehabilitation works; (ii) propose a system to classify typical environmental impacts of road maintenance and safety activities under the two programs, and in each case recommend mitigation measures and implementation mechanisms that the DOH could introduce in 3–5 years; (iii) develop (a) an initial environmental evaluation of the demonstration projects and (b) a plan to manage environmental impacts in accordance with ADB's Safeguard Policy Statement (2009), Appendix 1: Safeguard Requirements 1: Environment; (iv) carry out or assist the DOH with public consultations and involvement as well as the development of a grievance redress mechanism under the assumption that these projects will be proposed for ADB financing; (v) confirm that projects proposed for ADB financing avoid works and sites that could trigger a Category A classification by ADB; and (vi) develop an environmental assessment and review framework to provide the DOH with an environmental due diligence planning tool.

12. **Social specialists** (international, 1.5 person-months; national, 3 person-months). The specialists will (i) conduct a poverty and social assessment of the demonstration projects; (ii) recommend a social development and gender action plan to make the project design more socially inclusive and avoid associated social risks; (iii) survey and screen the demonstration projects for any involuntary resettlement impacts (if these are unavoidable, resettlement plans must be prepared for these sections in accordance with ADB's Safeguard Policy Statement); (iv) prepare a simple resettlement framework to cover unforeseen impacts of project design and implementation; and (v) assess the DOH's capacity to manage social issues associated with the programs and demonstration projects, and propose a program to strengthen this.

13. **Training specialist** (national, 6 person-months). The specialist will coordinate the training program.

C. Deliverables and Reporting Requirements

14. Consultant deliverables and reporting requirements are listed in Table A3.2. The consultant will also send a brief report detailing the progress of each deliverable at the end of each month. The inception report will detail the project phasing, including interim milestone achievements that will be monitored in the monthly progress reports.

Table A3.2: Implementation Milestones and Consultant Reporting Requirements

Major Milestones	Expected Completion Date
Consultant mobilization	Mar 2016
Inception report	Apr 2016
Progress report, including technical assessments, proposed demonstration projects, and discussion note on the scope of the safety and rehabilitation programs	Jun 2016
Demonstration projects (feasibility study including an IEE)	Oct 2016
Demonstration projects (basic design and bidding documents)	Mar 2017
Interim report	Jan 2017
RAMS improvements installation	Jan 2017
Draft final report	Nov 2017
RAMS database update and approval	Nov 2017
Final report	Jan 2018

IEE = initial environmental examination, RAMS = road asset management system.
Source: Asian Development Bank.